

# AN ASSESSMENT OF ARCHITECTURE STUDENTS' PERCEPTION ON THE SOFT AND PRACTICAL SKILLS INTEGRATION INTO THE CURRICULUM STRUCTURE FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

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## Abstract

Graduates' unemployment is a critical issue in Nigeria. The government and Higher Learning Institutions (HLIs) emphasis on the soft and practical skills integration in the curriculum structure is to turn out graduates with balanced capacities, diversities and flexibilities to survive the competitive labour market. Even though, little empirical findings are available on the level of soft and practical skills integration in the Nigeria public universities, particularly architecture programmes, the construction industry is seen as a major contributor to national economic development. Contemporary skills requirement for the graduating architects' self-empowerment is still contentious in the academic circle. This paper aimed to propose Architects' Career Skills Development (ArCaSD) assessment model and ten hypotheses were postulated to test the model. It is premised that the architecture students' perception on the level of infusion and acquisition of the entire range of soft skills and practical workshop practice embedded in the architecture's curriculum structure for self-empowerment be evaluated. Quantitative research methodological approach and structural equation modelling were employed to analyse the data collected from 153 students. The finding showed that all the ten hypotheses were supported and positively significant. In addition, the perception of the students on the soft skills integration is substantially positive and above average. The findings further indicates that, despite the practical skills acquisition, there is need to focused more on the architectural design rather than combining it with practical training in entrepreneurship and pragmatic workshop practice. In conclusion, students' narrow-mindedness on the importance of entrepreneurship and practical skills development call for innovation in architecture's curriculum structure and pedagogical approach to facilitates capacity building for employment creation and national economic development in Nigeria.

**Keywords :** *Graduate employability; skills integration; Nigeria*

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## 1.0 Introduction

In the past few decades, Nigerian educational system has witnessed critical reform. In fact, Federal Government of Nigeria as the sole provider of Higher Institution of Learning (HIL) is a thing of past. The educational system in Nigeria is fast becoming predominate private sector shortly, especially with the establishment of home-grown (federal, state and individuals) public/private owned and foreign universities' outreach campuses. Currently, the educational reform has resulted in the yearly increase of graduates competing for employment in the labour market, in fact, graduates' unemployment is one of the critical challenges in Nigeria today (Olotu, et al., 2015).

The graduates' joblessness does cut across every field of study and construction industry is more affected by the current Nigerian economy depression. Olotu et al. (2015) reported that over 65

percent of the graduates were unemployed several years after graduation and university's graduates ranked highest. One of the reasons for low employment opportunity is the lack of fundamental cognitive, technical and entrepreneurial soft skills knowledge (Ugwu et al., 2013; Shannon, 2012). Many scholars have reported that most graduates lack employability skills such as idea development and problem solving, analytical thinking and information computer technology-ICT as well as moral and professional ethics (Pavlova, 2008).

In the same perspective, Pitan and Adedeji (2012) and Olotu, et al. (2015) noted that HLIs are responsible for students' soft skill deficiencies and upgrading the standard of soft/practical skills in the Nigerian education system is still contentious. Aliyu (2016) stated that ineffective integration of soft skills in the universities' curriculum structure, and use of inappropriate pedagogical approaches have largely contributed to graduates inability to acquire the required skills to create job after graduation and architecture students are no exceptions. In fact, the primary goal of making architecture's graduates self-reliant and self-sufficient has not been achieved since a larger percentage of their population are among the topmost unemployed graduates (CBACS, 2010; BLS, 2012). More so, every year both the universities and polytechnics are still producing more graduates into the distressed labour market.

However, it is accepted that architectural education is the foundation for the attainment of sustainable built environment and national economic advancement. The position of this paper is in agreement with the positive opinion of several scholars on the integration of practical skills acquisition to provide students with the essential know-how for self-realisation and self-empowerment in the competitive labour market. Though, the level of soft and practical skills attainment in most of the Nigerian schools of architecture is not yet ascertained. On this account, this research assesses architecture students' perception on the level of the infusion and acquisition of the soft and practical skills embedded in the architectural curriculum structure for self-empowerment. The purpose of the research is to establish the extent and whether the soft and practical skills acquired by the architecture students are sufficient and suitable for their self-reliance after graduation. Hence, the study will ascertain areas of strength and weakness in the range of skills designated in the education of architectural training. The research findings would be a valuable input for the improvement and advancement of the architecture programmes' curriculum structure and pedagogical approaches.

## **2.0 Literature Review**

The key to graduates' employability and self-empowerment is through the development of soft and practical skills in the Higher Learning Institutions (HLIs). The vital soft skills are communication, problem-solving, creativity, information communication technology, teamwork and lifelong learning (Dacre Pool & Sewell, 2007). It has been established that both soft and practical skills are not just for getting employment but to develop graduates' potential for self-realization and sustainable employment. Other personal attributes like creativity; leadership; entrepreneurship; adaptability; honesty; commitment; capacity to cope with pressure and; motivation has also been attributed to essential employability skills for professional development. All these skills have been attributed to transferable skills, and they are fundamental to the field of a jack of all trade like architecture (Bodine & Hilty, 2009 Gafar et al., 2012).

Several studies have established the issues related to graduates' unemployment in Nigeria. Some of the findings revealed graduates' low capacity in critical thinking, creativity and problem-solving (Ezepue & Ezepue, 2008) and this is simply because the teaching approach is predominately theoretical and academic in nature that lacks the mixture of practical job market's skills required for sustainable employment (Brown & Sack, 2012). Other studies also established that majority of organisations preferred graduates that are creative/self-initiative; dynamic/flexible; enthusiasm and confident with good communication skill for employment. At the same time, empirical studies have shown that employers, graduates and graduating students shared the same opinion that universities'

curriculum contents and teaching approaches used by the educators lack the critical skills require to gain employment/create a job in the competitive labour market (Kennedy, 2011).

Aliyu (2016) and Audu (2013) noted that mainstream universities are failing, only because they are providing students with white-collar training as against the blue-collar experience require in this era. The time when the government are the primary employer of the university's graduates is over, in fact, employment opportunity in the public sector is more than saturated. At the moment, the majority are job seekers in the already saturated job market. As such, several scholars, non-governmental bodies and employers have called for both tertiary institutions to introduce sustainable soft and practical skills into their curriculum structure. Smith et al. (2007) also stressed the need for universities and industries interconnectivity as an avenue to provide the students of HLIs with the practical workplace experience in the private sector's job placement is obvious for nation's sustainable development.

In Nigeria today, desperation for employment among the larger population of universities graduates is extremely high but the greater percentage of them lack the necessary soft skills and entrepreneurial capacity to create the real jobs. Recently, National Universities Commission (NUC) launches soft-skills and practical entrepreneurial development in the National Youth Service Corps's campus (NUC, 2015). The essence is for the graduates of tertiary institutions across every field of studies to undertake training before going to the labour market. More so, the policy is to provide exposure and experience through learning by doing in a practical working environment, above and beyond is to improve the graduates' business and technical competence. However, the reality on the NYSC's campus is far different from the noble initiatives; in fact, the impact of the programmes is unclear as the graduates' unemployment is still on the increase.

Notable scholars have challenged the Nigerian universities curriculum structure, particularly, courses offered in some programmes of studies. In the case of architecture as a field of study, the courses offered at various schools of architecture are not systemic and characterised by complex criticism (Adewale, 2014; Olotuah & Adesiji, 2005). Up till now the architecture graduating students' dominant training approaches are based on fragmentation rather than connection, linkages and innovative courses for sustainable development. From a practical perspective, Gafar et al. (2016) view architectural education as a value enhancer for the students' self-reliance, self-sufficient and self-discovery in the quest for meaningful development of their potential and creating an innovative solution in the built environment. The problem in built environment are enormous and this supposed to generate endless job opportunity, but the reverse is the case of Nigerian society.

However, unemployment challenge of the architecture graduates is not peculiar to Nigeria alone; in fact, they are ranked among the highest unemployed graduates in the United States of America (BLS, 2012; CBACS, 2010). In the case of Nigeria, accurate data on the number of unemployed architecture graduates is sketchy, but Nigerian Bureau of Statistic recorded over sixty-eight percent graduates' unemployment in 2014. The current declining of Nigerian mono-economy is compounding the unemployment issue. Pitan and Adedeji (2012) noted that other major factors contributing to the graduates' unemployment dilemma are: First is the quality and quantity of the universities students' new intake. Second is the standard of the curricula offered in the universities and its level of relevance to today's job market. Third is the educators' experience/exposures, skills/talent and commitment to work. Most importantly is the poor initiative in research development (Yorgancioglu, 2013; Atlay, 2006).

Nevertheless, little empirical findings are available on the level of soft and practical skills integration in the architectural curriculum structure in the Nigerian public universities. More so, inadequate attention has been given to several sustainability dimensions of the relationship between education and skills development in HLIs. Research in this domain would provide valuable knowledge on the aspirations of graduating students to sustain their interest on post-education self-

empowerment. Therefore, this study assesses the students' perception of the integration and acquisition of the entire range of skills embedded in the architecture's course structure and practical workshop practice. The aim is to determine the level of adequacy and the type of competencies acquired by students at the end of their undergraduate programme.

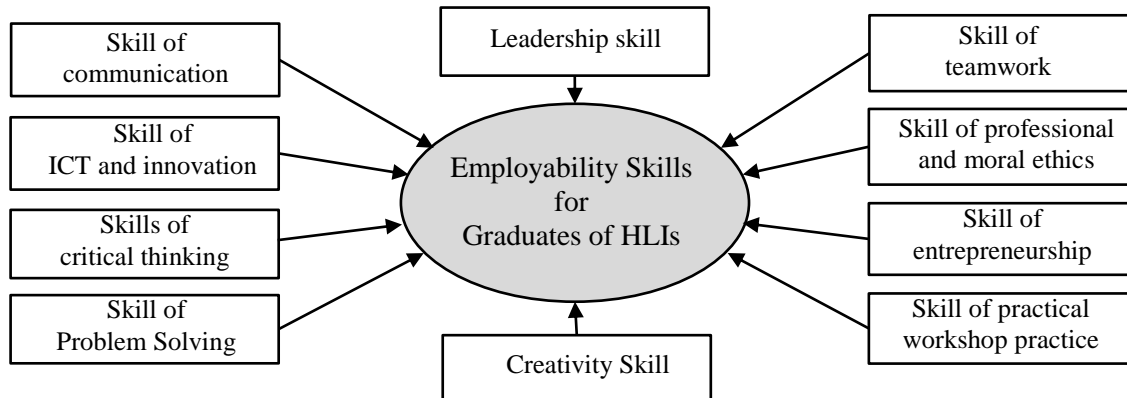
## **2.1 The Development and Integration of Soft and Practical Skills in HLIs**

The fundamental processes to develop and inculcate soft and practical skills on the students of HLIs could be achieved through course structure and content, campus/off-campus practical workshop practice and an internship with support programmes such as multidisciplinary initiatives and industry-university collaboration. The original essence of the HLIs' skills development is for the graduating students to be able to transfer the skills and knowledge acquired from the academic community to the real-life place of work for national economic development. Notable scholars have proposed diverse approaches on how to integrate soft and practical skills in the HLIs but, in the context of this research two were discussed based on their applicability and relevance in the Nigeria setting.

On one hand, the concept of Group Collaborative Learning Model (GCLM) was proposed by Gates (1997). The idea revolves around five fundamental intuitions. First, Gates believed that every group member in a collaborative learning is interdependence for success and progress. Second, he was of the opinion that hand-on-hand promote interrelationship for mutual learning. Third, he asserted that teamwork promotes equal distribution of involvement and responsibility that create knowledge-sharing. Fourth, diverse-inputs are generated from the skill's collaborative learning process. Lastly, every group member's reflection and feedback provide initiatives for effective improvement and advancement of learners' skills acquisition.

On the other hand, the Contemporary Skills Partnership Framework was developed by intellectual scholars in 2007 (Smith et al., 2007; Salih, 2007). The idea revolves around the technological advancement of the 21st century as the global economy is shifting from production-based to a knowledge-based economy. Global economic paradigm shift called for flexibility, adaptability and diversity of the graduates of HLIs by the inculcation of added-value skills of communication; finance and marketing; entrepreneurship and commercial awareness. The model emphasised interdisciplinary teaching approach that reflects the reality of the competitive labour market. The simple reason is that the knowledge students' acquired in one field of study is not enough to provide the skills of strategies graduates require to overcome the challenges of the job market. It is on this account that NUC promulgated compulsory entrepreneurial development in 2012 for all the Nigerian tertiary institutions.

Several scholars have established that university's graduates lack employability and essential skills to create their own business (Ugwu et al., 2013), and NUC identified relevant skills require to be developed in the Nigerian universities (see Figure 1.0).



**Figure 1:** Graduates' Employability Skills (National Universities Commission, 2015)

Currently, the pedagogical approach and integration process is still contentious. Though some universities are using single-course approach while other are have employed embedded or a combination of both teaching methodological approaches. Regardless of the teaching and learning approach adopted/adapted by the universities there is the need to establish the current level of students' knowledge ability on soft and practical skills which will serve as a feedback that is required for curriculum improvement on the most efficient integration approaches for the architecture students' skills gain.

Therefore, the focus of this research is precisely to the advancement of soft and practical competencies in the architecture training process using an embedded pedagogical approach as previous studies provided that inculcation of skills on the students of HLIs are best impacted in a multi/interdisciplinary approach rather than stand-alone course structure.

## **2.2 Theoretical Foundation on Skills Acquisition in Architectural Education**

Architects' education is a complex process that encourages learners to articulate different approach on how to develop a conceptual idea through critical thinking and create as a capable and competent designer of the built environment. It is an education that is practically involved with the advancement of new intellectual concepts, skills and values. Hence, teaching is a process of acquiring knowledge/skills and transferring the same is the primary goal of any educational institutions. So, architectural education is all about students' skills development that revolves around evolving their intellectual capacity building, physically and enthusiastically, socially and ethically, politically and economically before graduation from the tertiary institutions.

The debate on architectural education is predominately about the need to provide students with a broad liberal training and the job-related/vocational requirement to prepare them to fit for a professional career. Even though the training is commonly project-based, and course structure focused more on the design studio. By nature, architectural education should be rich, diverse and interdisciplinary in skill development. Aderonmu (2012) noted that inculcation of skills on to the students of architecture is essential in the current competitive job market and realisation of this noble initiative is best to achieve when academic teaching instructions are synchronised with practical activities and repetition is imperative.

Dacre Pool and Sewell (2007) outlined generic and practical skills as two necessary modules of expertise required for technically related professions. Literature has shown considerable debate on generic/core/transferable skills. Sada et al. (2012) stated technological revolution have shown that skills of ICT (e-drafting; e-modelling and animations) in architectural education is unavoidable for the architecture students. Aliozor (2014) argued that ICT's skills in not enough for the students of architecture to survive and be relevant in the current competitive job market, so, practical skills in building technology, metalwork and woodwork are also indispensable. Gafar et al. (2012) were of the

opinion that e-studio and practical workshop/laboratory should be complementary platforms for the students to demonstrate/practice the skills taught in a condition that are close to the job market. He further explained that laboratories were provided for the science students, only for them to demonstrate and understand the practical aspect of the subject taught in theory. So, architecture students' skill development is incomplete without a platform for efficient workshops practice and entrepreneurship. Also, inculcation of those skills on the architecture students practically involve four key stages: observation, imitation, repetition and participation. Therefore, it is the combination of these four steps that could provide a genuine education for the creation of dynamic entrepreneurial-architects require in the current Nigerian economic dispensation.

However, HLIs' objective to produce architecture students that are self-reliance and self-sufficient in the job creation/market has not been fully attained (Awogbenle & Iwuanmadi, 2010). It is also common knowledge that university graduates are not well equipped with employability skills and job creation proficiencies, although, more students are graduating every year. So, graduates' job placement and employment opportunity in both public and private is becoming more problematic. Possible area for employment re-fertilization such as university-industry partnership, innovation in hands-on skills development has not been fully harnessed/developed. The improvement on pedagogical approaches for course delivery in the Nigerian universities is still orthodox, knowing that this is a modern-age that require innovation and capacity development in every aspect architecture education in Nigeria.

Predominately, scholars are the belief that rising rate of unemployment is as a result of economic recession (John, 2015; Olotu, 2015). On the contrary, Gafar et al. (2016) stated that Nigerian graduates' employment decline is multidimensional, and it started before the current economic downturn. For more than a decade, unemployment's rate has been growing, and the larger percentage of the Nigerian graduates lack employability/entrepreneurial skills. The reality is, what can they offer? Why looking for employment? When there are so many entrepreneurial opportunities in every Nigerian community. Even, if there is no opportunity, they can just create one by identifying the problems in the society, develop solutions that could automatically create jobs.

In this modern age, university graduates need to be distinctive, creative and innovative. In fact, they have to synchronise their passion with their inherent abilities. The few that have to discover this secret are self-sufficient and self-employed. Probably, this suggests why the entertainment industry in today's Nigeria pays more than the traditional education industry. It is important to note that educators could teach, counsel and guide in graduates' skills development but their ultimate occupational choice must be born out of his/her personal attitudes, passion and conviction. It is such drives and efforts require to successfully practice architecture that has become so innovative and competitive than ever before. On a practical note, fundamental problem calls for a radical solution, and this implies that there is critical need to ask for a shift in the architectural curriculum development.

### **2.2.1 Contemporary Skills' Construct for Architecture Graduates**

The enigma of plenty employed by scholars in describing endowed and extreme poverty in a nation like Nigeria. Inconsistency in policy formulation and implementation in every sector (political, education, environment, health and so on) have been the major setback for great oil-rich Nigeria. Particularly, several government policies on the educational reform are aimed to increase the capacity building of skilled human resource development among the professionals. Architectural profession is concerned with the urban development and its role in transforming Nigeria to acquire her rightful position in the 21st-century global economy cannot be overstressed because the human environment's quality is fundamental to architecture. The demand for the practice of architecture is enormous, and diversity of clients, buildings and environment/economy suggest a paradigm shift if the profession is to maintain its credibility and relevance in the built environment (Olotuah & Adesiji, 2006; Ilesanmi,

2016). Therefore, education of architecture is to rise to the challenges of modern age and equip students with the innovative skills for solving environmental problems.

Globalisation and knowledge economy have shown that era of conformist is over. In fact, graduates must excel in both academics and skills of employability to compete in the current competitive economy/place of work. Inculcating soft and practical skills in the students of HLIs is a global issue, but Nigerian situation is more critical. According to Sada et al. (2012), innovation development, expertise in soft and hands-on skills are fundamental requirement that students must have to diversify into a different sector of the economy after graduation. In fact, the purpose of inculcating generic skills (communication; problem solving; critical thinking and skills of ICT) on the Nigerian HLIs' students are practically for self-empowerment. According to Shannon (2012), the hierarchy of employability skills require to hire architecture graduates are based on skills and capacity to lead, manage and control, communication, creative and innovation, critical thinking and problem solving, lifelong learning and knowledge of ICT. Pitan and Adedeji (2012) provided evidence indicating that such employability skills favourably affect graduates' self-efficacy in the labour market. Therefore, the set of hypotheses regarding architecture graduates' employability skills and self-empowerment are as follows:

- H<sup>1</sup>: Leadership skill has a significant impact on self-empowerment.
- H<sup>2</sup>: Communication skill has a significant impact on self-empowerment.
- H<sup>3</sup>: Critical thinking and creativity skills have a significant impact on self-empowerment.
- H<sup>4</sup>: Problem solving skill has a significant impact on self-empowerment.
- H<sup>5</sup>: ICT's skill has a significant impact on graduates' self-empowerment.

Subsequently, Savage et al. (2009) outlined sixteen attributes/skills that graduates require to practice architectural profession (conceptual and critical thinking skills; problem-solving and analytical skills; ICT skill; capacity to perform in teamwork; skilfulness to develop/learn new things; technical capabilities; flexibility and adaptability in different work condition; entrepreneurship; management and marketing/presentation skills; professional ethics; capacity to work hard and independently). He found that these sixteen skills are key determinants that influence graduates of architecture's resourcefulness and professional competency (self-reliance) require to satisfied their employers and clients efficiently. Therefore, the set of hypotheses regarding architecture graduates' employability skills and self-empowerment are as follows:

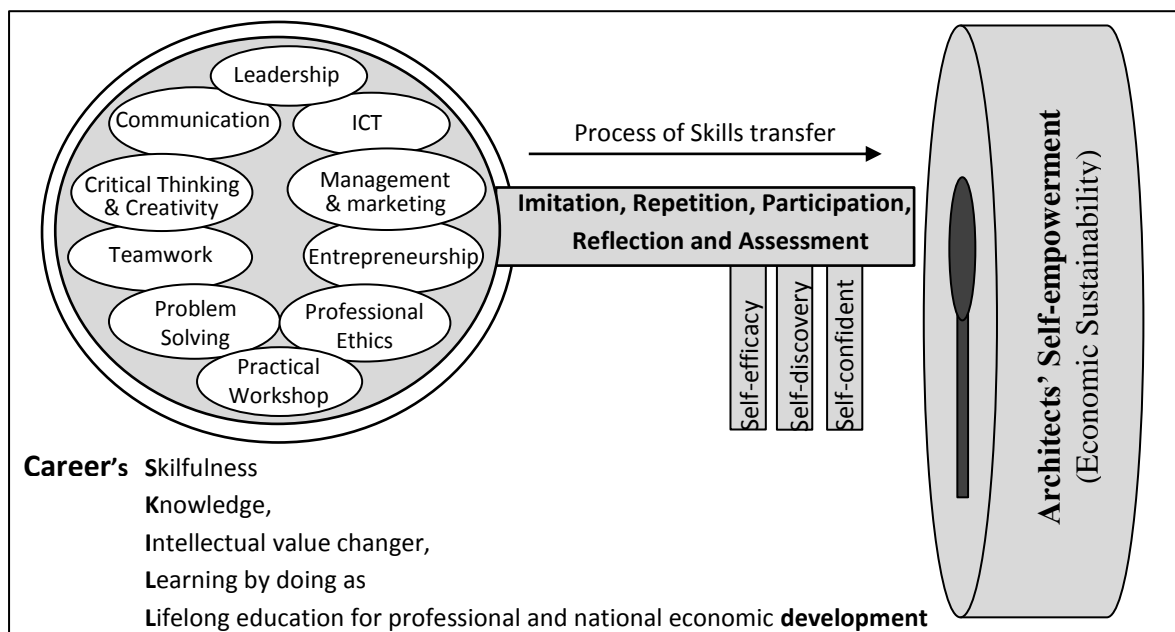
- H<sup>6</sup>: Teamwork skill has a significant impact on self-empowerment.
- H<sup>7</sup>: Entrepreneurship skill has a significant impact on self-empowerment.
- H<sup>8</sup>: Management and marketing skills have a significant impact on self-empowerment.
- H<sup>9</sup>: Professional ethics skill has a significant impact on self-empowerment.

In the same perspective, Dacre Pool and Sewell (2007) postulated "CareerEDGE" model that outlined essential key for graduates' career choice. The lesson drawn from this model is essential and applicable for the architectural education skill development. The model provided the real-world explanation of the practical skills requirement for graduates' professional success in the job market, particularly now that architect's design skill is not enough to guarantee his/her employability in the Nigerian competitive job market. Development of integrative learning (practical workshop practice) in the architectural curricula practically reinforced graduates' personal characteristic in self-empowerment (Yorgancioglu, 2013). Consequently, Dacre Pool and Sewell (2007) found that when uncertainty in the labour market are considered, practical workshop practice takes a critical role in influencing the system value (self-empowerment) of the graduates toward diversification which resultantly promote the creation of more jobs after graduation. In fact, Kareem et al. (2016) and Kayode et al. (2010) found that skills of practical workshop practice promote the resourcefulness and self-empowerment of the graduates that could facilitate the economic sustainability of Nigeria as a nation. On this account, last research's hypothesis was derived.

H<sup>10</sup>: Skills of practical workshop practice have a significant impact on self-empowerment.

In line with past theoretical and aspherical studies, CareerEdGE model and essential skills framework for the Nigerian universities identified in the wealth of literature provided the foundation for this research’s assessment framework. From both models, the key to Architects’ Career Skills Development Model (ArCaSD-Model) was formulated (see Figure 2.). Therefore, the proposed model provided ten research hypotheses (H1 to H10) and tested with the data collected from the final students of architecture.

The symbolic representation of a key in the ArCaSD-Model indicates the importance of the generic and practical skills advancement in architectural education as an unavoidable expertise. It epitomised real-life explanation for the architects’ self-empowerment. The model is to provide the key to secure personal development planning and career growth that will determine graduates of architecture attaining professional success after graduation.

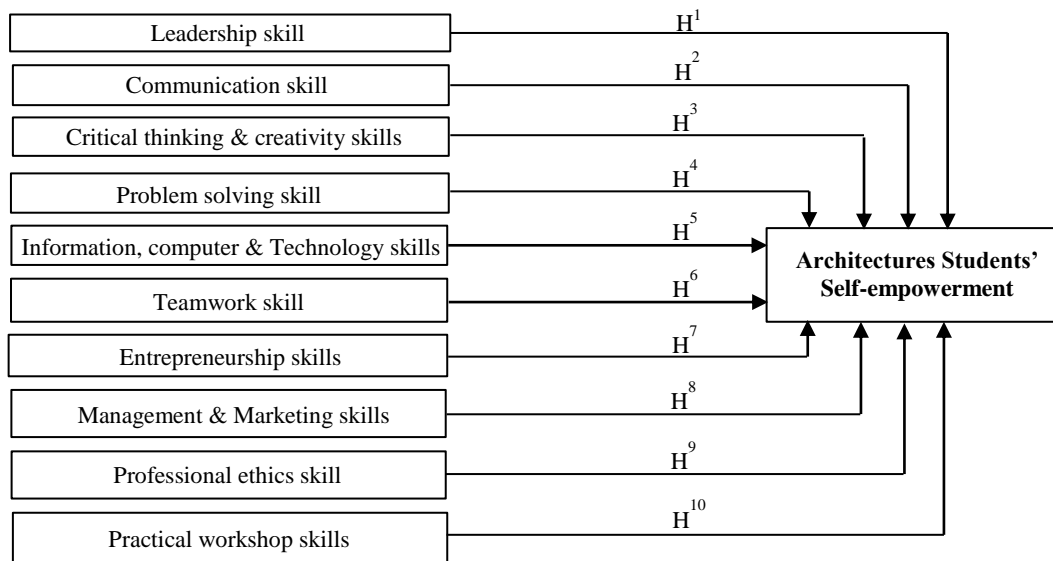


**Figure 2:** The Key to Architects’ Career Skills Development for Economic Sustainability  
 Source: Adapted from Dacre Pool & Sewell, 2007 and NUC, 2010).

ArCaSD-Model demonstrated the need for architecture students and educators to acquire the necessary skills, plan, reflect and reassess their know-hows. The purpose is to improve on their value system that hinged on passion, creativity, innovation, dynamism and partnership through university-industry collaboration. Also, the model is to understand how to make practical and appropriate career plans based upon their reflective self-knowledge, how to exhibit their employability skills and manage future professional development for self-empowerment. More so, self-discovery, self-efficacy and self-confidence components in the model denote significant linkages between knowledge, understanding, skills, experience and personal characteristic attributes for architects and national economic sustainability. In summary, the principal aim of any academic institution is to prepare students with the intellectual skills (value-changer), learning by doing (practical experience), efficacy beliefs (capacity to think, motivate themselves and take action), and develop key interests for lifelong education. Lastly, the assessment model also provided new evaluation tools-kit, performance indicator and research development on architects’ employability intervention for practitioners, educators and students.



Unfortunately, most of the architectural research in the academic community focused more on the alternative energy and green building index while few examined the educational development of the architects' professional training. Knowing that this is fundamental to the economic sustainability of the architects and creation of new economic landscape for national technological transformation. On this account, the research was designed to assess the architecture students' perception on the level of integration and acquisition of the entire range of soft skills and practical workshop practice embedded into the architecture's curriculum structure for self-empowerment. In summary, the structural representation of proposed assessment (ArCaSD-model) with the postulated hypotheses was presented in Figure 3.



**Figure 3:** ArCaSD-Model with the Research's Hypotheses

### 3.0 Research Methodology

The research employed survey research methodological approach. It is an appropriate research method used to study large population through the process of data collection from a research sample size that reflects an accurate representation of the entire population, and the essence is to answer the research questions (Awang, 2014). Due to large studies' sample size, survey research design seems appropriate and efficient for the nature of this investigation. A structured questionnaire was adopted because of its convenience, unbiased and economical. Self-administer process was used because it offers a higher rate of return. Hence, the study also employed purposive sample technique since the research is exploratory in nature and it focused on a particular set of students in the architecture program of Nigerian public university. More so, the primary objective of assessing the adequacy of the skills integration and acquisition could be answered through purposive sample and procedure of this sampling method is not much difference from random sampling. Finally, 153 graduating students were sampled from a population of 585 students during the academic year 2015 to 2016.

Specifically, the tested students were in their second semester of their final year study, and it's the level that is almost ready to go into the labour market. At the same time, they are the class of students that have participated and taught in all the undergraduate's skills development courses whether as a single or embedded courses through the theoretical or/and practical teaching and learning approaches. Therefore, they are appropriate for this research because the study was to gather relevant and valid information from the architecture students to establish the current level of skills acquisition on the entire range of soft skills and practical workshop practice embedded in the architecture's

curriculum structure for self-empowerment. Subsequently, the academic circle need to develop skills acquisition's peer-review mechanism to assess, measure performance and share knowledge and experiences to achieve share value that distinguishes and improve the marketability of the architecture graduates for self-reliance and self-sufficient.

The structured questionnaire was adapted from scholars' past research works (Devadason et al., 2010; Kareem et al., 2016; Savage et al., 2009). 44-items of questions employed to collect data from the target respondents. The ten exogenous variables (Leadership; Communication; Creativity and critical thinking; Problem solving; ICT; Management & Marketing; Entrepreneurship; Teamwork; Professional ethics and; Practical workshop practice) and endogenous variable (Self-empowerment), each construct contained 4-items of questions, and 5-Likert scale of measurement was used (1-Strongly disagree; 2-Disagree; 3-Moderate; 4-Agree; 5-Strongly agree). Both the face and construct validity of the questionnaire were checked by committee of researchers in the Department of Architecture, Ahmadu Bello University, Zaria, Nigeria.

Before the dissemination of original research questionnaire, a small number of the questionnaire were subjected to a pilot study test with forty-five respondents within the research's sample frame. The essence was to ensure that the questions were clear, simple to understand and take a short time to answer. Little changes were made to the questionnaire's organisation to reduce time to complete it within 15 to 20 minutes and facilitate data analysis. A Cronbach's alpha of 0.78 achieved which showed that the questionnaire's internal consistency was adequate and acceptable according to Pallant (2011). Finally, a total of one hundred and fifteen actual questionnaires were distributed to the final year students of architecture during a design studio class through a self-administered process. The merit of the process was that all the administered questionnaires were answered and returned fully.

A preliminary screen of missing value and Mahalanobis distance calculation were performed and data collected was found satisfactory for multivariate analysis. Finally, factor analysis was carried out with statistical package for social science (SPSS version 22), and structural analysis was performed with partial least squares because notable researchers have used it as an acceptable structural equation technique for students' skills acquisition assessment (Awang, 2014; Santos & Linan, 2007).

Finally, 153 students of architecture in their final year provided the data used for this research empirical analysis. Also, the items' reliability, composite reliability and Cronbach alpha for each of the construct examined to establish constructs' reliability test, and the results were satisfactory as shown in Table 1. The Constructs' Cronbach alpha were above 0.78, therefore, acceptable (Pallant, 2011). Factor analysis was performed on each of the eleven constructs separately. The factor loading for all the 4-items in every construct was above 0.4 (see Table 1) and satisfactory (Pallant, 2011; Awang 2014). Therefore, all the constructs' 44-items were included and used in the structural analysis. With the satisfactory outcome of factors analysis, structural equation model was used to perform confirmatory factor analysis on the proposed ArCaSD-model.

#### **4.0 Research Findings**

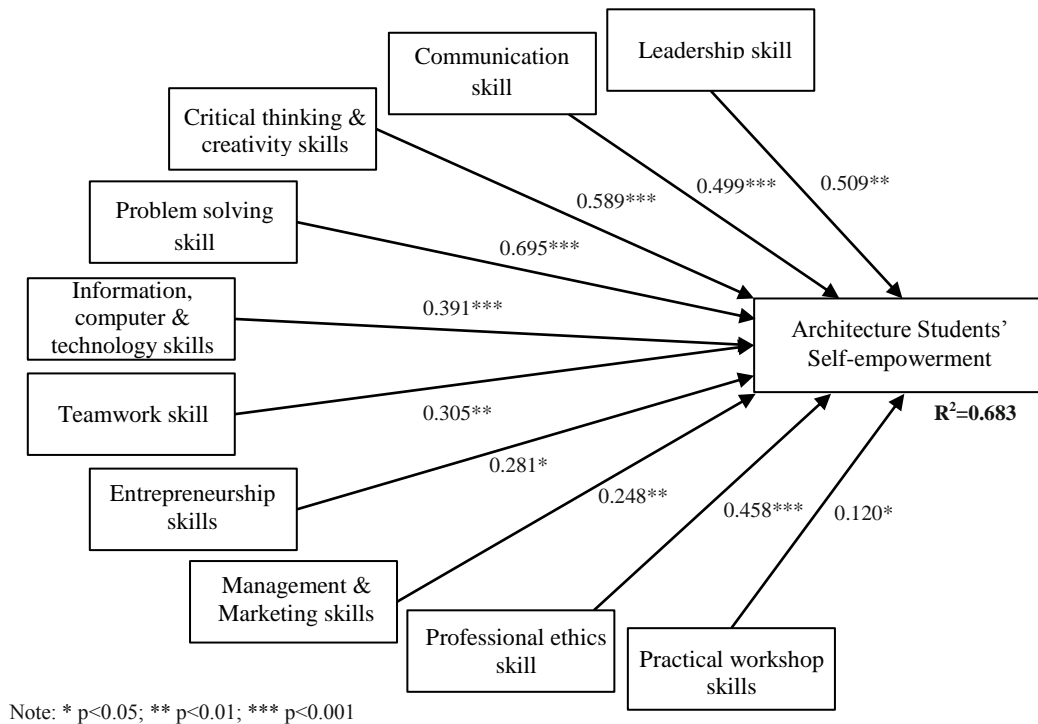
The descriptive analysis of the 153 respondents presented gender in the proportion of 62.3% of male and 37.7% of female. In Table 1, the average mean scores for the range of skills infusion and acquired by the students in the architecture program presented. The students' responses showed that skills immersion into the curriculum structure of architecture training was comprehensive and all-inclusive since the average mean scores for all collection of skills assessed were within the range of 2.04 to 4.50 (see Table 1). The interpretation of the average mean scores are as follows: below 2.50 denotes poor, 2.6 - 2.90 indicates fair, and 3.0 - 4.0 implies good and above 4.0 is regarded as excellent.

**Table 1:** Architecture Students’ Perception on the Level of Skills Infusion and Acquired through Curriculum Structure

Constructs	Item	Mean of skills infusion	SD	Remark	Mean of skills acquired	SD	Remark	Factor loading	Composite reliability	AVE <sup>a</sup>
Leadership	LED1	3.93	0.43	Good	3.21	0.58	Good	0.83	0.85	0.68
	LED2	3.90	0.30		3.37	0.61		0.72		
	LED3	3.78	0.63		3.62	0.47		0.86		
	LED4	3.13	0.59		3.77	0.62		0.88		
Communication	COM1	3.91	0.67	Excellent	3.02	0.81	Excellent	0.78	0.88	0.73
	COM2	4.12	0.42		3.65	0.32		0.80		
	COM3	4.02	0.42		3.81	0.60		0.85		
	COM4	4.09	0.55		3.55	0.48		0.79		
Critical thinking & creativity	CRE1	4.50	0.71	Excellent	3.73	0.43	Good	0.80	0.84	0.67
	CRE2	3.63	0.77		3.09	0.59		0.75		
	CRE3	4.34	0.49		3.56	0.68		0.84		
	CRE4	3.81	0.50		4.24	0.47		0.87		
Problem solving	PRS1	4.31	0.35	Good	3.00	0.61	Good	0.75	0.86	0.65
	PRS2	3.76	0.29		3.71	0.49		0.71		
	PRS3	4.07	0.43		3.23	0.51		0.63		
	PRS4	3.89	0.28		3.50	0.38		0.73		
Information computer technology	ICT1	3.87	0.43	Good	3.01	0.80	Good	0.69	0.83	0.63
	ICT2	4.02	0.26		3.53	0.56		0.86		
	ICT3	3.78	0.64		3.71	0.46		0.86		
	ICT4	4.00	0.63		4.02	0.43		0.83		
Teamwork	TEM1	3.23	0.33	Good	2.81	0.71	Fair	0.87	0.86	0.75
	TEM2	2.65	0.54		2.79	0.49		0.81		
	TEM3	3.35	0.32		3.00	0.72		0.84		
	TEM4	2.70	0.43		2.70	0.70		0.82		
Entrepreneurship	ENT1	3.21	0.38	Fair	3.00	0.62	Poor	0.86	0.89	0.69
	ENT2	2.81	0.56		2.38	0.39		0.88		
	ENT3	2.52	0.38		2.32	0.48		0.84		
	ENT4	2.04	0.53		2.20	0.50		0.87		
Management and marketing	MMS1	3.00	0.39	Good	3.08	0.72	Good	0.79	0.82	0.72
	MMS2	4.02	0.36		3.71	0.81		0.74		
	MMS3	3.91	0.29		3.82	0.58		0.84		
	MMS4	3.82	0.61		3.57	0.47		0.86		
Professional ethics	PRO1	3.94	0.54	Good	3.50	0.80	Good	0.72	0.79	0.62
	PRO2	3.18	0.52		3.73	0.51		0.76		
	PRO3	3.52	0.61		3.81	0.57		0.81		
	PRO4	3.66	0.54		3.57	0.63		0.69		
Practical workshop practice	PRA1	2.42	0.57	Fair	2.10	0.68	Poor	0.78	0.74	0.70
	PRA2	2.97	0.61		2.08	0.85		0.82		
	PRA3	2.71	0.42		2.52	0.72		0.79		
	PRA4	2.62	0.71		2.11	0.61		0.80		
Self-empowerment	SEM1	3.72	0.59	Good	3.21	0.40	Good	0.76	0.80	0.77
	SEM2	3.54	0.62		3.08	0.49		0.84		
	SEM3	3.73	0.41		3.62	0.62		0.81		
	SEM4	3.20	0.23		3.60	0.54		0.75		

Subsequently, Table 1 also shows that all the items used to measure students’ skills acquired were far above the minimum benchmark of 2.5 (fair) except entrepreneurship and practical workshop practice skills that were below the mean set average of 2.5. The students agreed that they had acquired necessary skills that could empower them in the labour market even though skills of entrepreneurship and practical workshop is not adequate. The analysis showed that architecture students were well exposed to professional skills while the hand on practical work in aluminium, steel and wood in building construction’s laboratory/workshop that could also enable them to be self-empowered after graduation is still diminutive in the curriculum structure of architecture program.

The result of inference analysis presented in Figure 4. Before the model measurement of ArCaSD-model, the reliability test for each of the research's construct examined. The outcome of composite reliability index which is the same with the commonly used Cronbach's alpha were above the minimum parameter of 0.6, therefore, they were all acceptable (Awang, 2014). As shown in Table 1, the entire research constructs score well above the minimum value 0.5 set as an acceptable average variance extracted (AVE<sup>a</sup>) that measures construct's convergent validity (Awang, 2014). Therefore, all the constructs used in the inference analysis certified the require benchmarks approved by the renowned researchers (Hair et al., 2011; Awang, 2014).



**Figure 4:** ArCaSD-model's Structural Equation Modelling

Regarding postulated hypotheses (H1 to H10), Hypotheses, the outcome of the structural equation modelling showed that all the hypotheses were positively significant and supported. The finding revealed that entire range of the skills assessed were significant predictors of self-empowerment based on the data collected from the architecture students. Notwithstanding, the correlation coefficient and degree of significant for the entrepreneurship and practical workshop skills are low. Therefore, these call for improvement in the curriculum structure and pedagogical approach used for course delivery.

By the revised literature, the result reaffirms studies conducted by Brown and Sack (2012). Hence, it supported the empirical studies' conclusions of Kennedy (2011) and John et al. (2016) that development of soft and practical skills in the Nigerian HLIs is the panaceas for graduates' unemployment and national economic sustainability. From all the indication, architecture students believed that both soft and practical skills embedded in the program of study and level of skills they have gained would positively enable them to compete favourably in the labour market for self-empowerment.

#### **4.1 Discussion of Research Findings**

The paper proposed ArCaSD-model as the key for architects' career skills development for economic sustainability based on Dacre Pool and Sewell's skills development framework in 2007. The model provided a real-world explanation of the value changer skills for architecture graduates' professional success, particularly, now that architect's design skill is not enough to guarantee his/her employment and sustenance in the Nigerian competitive job market.

Subsequently, a vigorous effort made in the development of research's instrumentation, data collection and analysis were based on validated procedures by renowned scholars (Creswell, 2012; Devadason et al., 2010; Palant, 2011). The research finding revealed that entire range of soft and practical skills do have a significant influence on architecture students' self-empowerment. As earlier observed in the literature, creativity thinking and design skills had the strongest effect on the architecture students' self-empowerment which synchronised and reaffirmed the works of Bodine and Hilty's (2009) as well as Brown and Sack (2012). They observed that architecture education training focused more on the architectural design skills rather than inculcating other relevant skills such as green entrepreneurship, marketing and practical workshop practice skills fundamental for sustainable future.

Given the relationship between perceived skills acquired and self-empowerment, it is not surprising that perception of the architecture students in entrepreneurship skills are closely related to creativity, problem-solving and marketing and management skills. In a practical sense, entrepreneurship development is far more than the skills mentioned above. In fact, entrepreneurship development is an aggregate of students' capacity building in problem recognition, idea development, risk taking proficiency reinforces the inspiration to start a business/firm. Students of HLIs' practical skill development is certainly necessary for Nigeria been a country advocating for a production-based economy. Therefore, the need to engage architecture students in befitting real-world skills that will empower them to be designers and creators of jobs rather than seekers of jobs.

Regarding the positive result of the tested hypotheses, it indicated that architecture students' had acquired a significant magnitude of skills that could strengthen and promote their intuition that establishing architectural firms/businesses is possible and achievable upon graduation. As suggested by Yorgancioglu (2013) and Kaseem et al. (2016) that one of the initiatives or platforms to boost students' soft and practical skills is to provide workshop practice designated to address the advancement of those core transferable skills. More so, possessing such generic and practical skills could facilitate efficient management and operation of the architectural firm and new ventures creation for sustainable professional practice.

#### **5.0 Conclusion**

The research proposed ArCaSD-model and provided constructive understanding on the essential career skills through which architecture students' self-empowerment perception are formed, which could determine their economic sustainability after graduation. More so, architectural education in Nigeria had evolved over many decades but, the critical issue is to promote architectural programs that could accommodate today's economic reality which is the driving force for the current ingenuities to realise value change in the architectural training. The paper attempted to redefine architectural education for the development of dynamic graduates as future entrepreneurial-architects (business-minded designers) that are endowed with multidisciplinary skills for the challenges of the labour market. As its today, Nigeria's economic situation demand graduates that possess not only professional knowledge but have all-inclusive skills, competence and the right attitude require for employability and self-empowerment in the 21st century.

Even though, incorporation of wide-range of skills into the architectural curricula for graduates' flexibility and adaptability in the job market is a multi-dimensional issue. The demand on how to advance multi-disciplinary skills through reforms in curricula structure of the architectural education concern not only the curricular content but also the approach the content of architectural education is taught. The metaphorical explanation is that building's aesthetics (curricular content) is not as important as the building's structural stability (teaching methodology). Therefore, to foster integrative pedagogical approaches for comprehensive skills development in architectural education is a challenge that requires clear strategic implementation policy through future research and development.

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