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Assessment of Skills and Competencies of Built Environment Graduates

Influence of Critical Factors on the Skills and Competencies of Built Environment Graduates in Abuja, Nigeria

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str. A.Russo 15, of. 61, Chisinau-2068, Republic of Moldova Europe

Printed at: see last page

ISBN: 978-620-5-49954-2

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ASSESSMENT OF SKILLS AND COMPETENCIES OF BUILT ENVIRONMENT GRADUATES

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ABSTRACT

It has been established that there exist discrepancies between the skills requirements of industries and the acquired skills of university graduates in the labour market from the employers of labour in the Nigerian construction industry. Consequentially, graduates are forced to accept inferior jobs so as to enter the job market. The study assessed the critical factors influencing the skills and competencies expected of built environment graduates in construction firms in Abuja, Nigeria. Quantitative research was adopted using structured questionnaire administered on 159 respondents at a response rate of 83.56%. Analysis of data was undertaken using frequency count, percentage and Mean Item Score (MIS). Findings from the study revealed that the: most important barrier to the development of skills and competencies for built environment graduates was “financial difficulty” (MIS = 4.85); most significant driver for the development of skills and competencies for built environment graduates is “Individual resources” (MIS = 4.85); labour market opportunities (MIS = 4.76); and labour market structure (MIS = 4.56); current level of skills and competencies offered by the graduates of built-environment professions are moderately significant (average MIS = 3.51); and most important roles of professional associations in the development of skills and competencies of built environment graduates was “Using course accreditation processes to ensure that University programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach” (MIS = 4.76). It was concluded that the critical factors influencing the skills and competencies expected of built environment graduates in construction firms in Abuja are significant. It was thus recommended that more attention should be focused more to address the barriers and uphold the drives identified so as to bridge the gap between academic knowledge and professional practice.

Keyword: Barriers; Built environment; Competencies; Construction Firms; Drivers; Graduates; Skills.

1.0 INTRODUCTION

The built environment, also referred to as the man-made environment, includes both the buildings in which people spend their time (home, school, workplace, factories, etc.) and their supporting infrastructure (Bolaji, 2020). The Built Environment Professions (BEPs) comprise several specialized disciplines in a bid to meet the changing needs of clients and cope with the complexities of modern construction (Bolaji, 2020). Professionals in the built environment include Estate Surveyors and Valuers, Land Surveyors, Civil/Structural Engineers, Builders, Mechanical and Electrical (M/E) Engineers, Town Planners, Architects, and Quantity Surveyors. Currently, there are 100 tertiary institutions producing thousands of built environment professionals annually for the nation's construction industry. This is made up of 47 Universities and 53 Polytechnics and a total of 502 approved academic programmes in built environment in Nigeria (Bolaji, 2020; Joint Admission and Matriculation Board, 2019).

In order to excel in today's diverse and competitive industry, Eldeen *et al.* (2018) established that employers in various countries including USA, Ireland, South Africa and Australia among others, expect graduates to possess skills other than mere subject knowledge skills. Sa'ad and Majid (2014) blamed the educational system and practices in developing countries which focus on theoretical concepts rather than practical learning on the unemployment challenges, thereby reducing graduates' chances of meeting the demands of their employers. Also, Ahn *et al.* (2012) noted that in addition to a solid technological foundation in construction skills, graduates of built environment courses must also learn competencies such as teamwork, communication, innovation, and problem-solving skills. Employers demand a workforce with specific competences and personal talents in addition to strong academic credentials (Ogundele & Kayode, 2013). As a result, it is critical that graduates learn practical skills that will help them excel in the construction industry. Various studies have determined the relevant skills and competencies required of graduates in various built environment disciplines across the globe from the perspectives of both graduates and professionals, with the goal of transforming graduates into confident, aggressive, and purposeful individuals to bridge the gap between unemployment and job creation (Ahn *et al.*, 2012; Moreno *et al.*, 2012). In line with this, employability is matter of concern for students, universities, government and economy at large (Poon, 2014; Agnihotri *et al.*, 2021). This is due to employer's expectation of graduates to be equipped with necessary skills to perform a job with minimum supervision (Agnihotri *et al.*, 2021). Employers emphasize more on an individual's personal attribute and soft skills in comparison to his/her degree (McMurray *et al.*, 2016) and technical/subject knowledge (Finch *et al.*, 2013; Saeed, 2015; Agnihotri *et al.*, 2021), because they are concerned about what an individual can do rather than what he/she knows.

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Employers want workers with many skills who can handle a wide range of responsibilities, but to thrive in such a dynamic and constantly changing technological world demands radical restructuring with the responsibility of impacting skills and knowledge on trainees (Mailafia, 2020). Laboissiere and Mourshed (2017) stated that industries cannot find graduates with the skills they want for entry-level work, and the industries complain about a lack of graduate preparation for entry-level employment. Undoubtedly, many industries have argued that graduates are not well trained to the benefit of national development and are inadequately trained, ill-equipped, or not properly prepared and trained for industrial jobs (Adebakin *et al.*, 2015). Unfortunately, employability skills have become an emerging issue for graduates from universities and industries. Adebakin *et al.* (2015), argued that graduates were poorly equipped and unprepared for a job due to the fact that the theoretical gap between education training in universities and the industrial match of jobs in the labour market was not collaborated. According to Adebakin *et al.* (2015), Pitan and Adedeji (2012), and Aloysius *et al.* (2018), there are discrepancies between the skills requirements of industries and the acquired skills of university graduates in the labour market from the employers of labour. Consequentially, graduates are forced to accept inferior jobs so as to enter the job market. John and Camilus (2020) attributed the high rate of unemployment among

graduates to lack of requisite employability skills and competences. McMurray *et al.* (2016) opined that outdated school curricula and a lack of employability skills are the root causes of unemployment among graduates. This assertion was corroborated in a study of employers' expectation of employability skills of Estate Management graduates in Nigeria (Ayedun *et al.*, 2013) which revealed that employers expect certain basic skills from job seekers. Eldeen *et al.* (2018) established that employers in various countries, including the USA, Ireland, South Africa, and Australia, among others, expect graduates to possess skills other than mere subject knowledge skills.

According to Ayoubi *et al.* (2017), the responsibility of developing and enhancing employability in graduates lies with higher educational institutes. But mostly higher education institutes are unaware of the employer's demand (Agnihotri *et al.*, 2021), and consequentially graduates are forced to accept inferior jobs so as to enter the job market. John and Camilus (2020) attributed the high rate of unemployment among graduates to lack of requisite employability skills and competences. McMurray *et al.* (2016) opined that outdated school curricula and a lack of employability skills are the root causes of unemployment among graduates. This assertion was corroborated in a study of employers' expectation of employability skills of Estate Management graduates in Nigeria (Ayedun *et al.*, 2013) which revealed that employers expect certain basic skills from job seekers. Eldeen *et al.* (2018) established that employers in various countries, including the USA, Ireland, South Africa, and Australia, among others, expect graduates to possess skills other than mere subject knowledge skills.

Majority of current studies in Nigeria and elsewhere looked at competencies from the viewpoint of employers, and some of them reported similar skills emphasized by employers and experienced professionals in the built environment, with a few of them reporting some discrepancies that could be explained by environmental factors (Acheampong, 2013; Aliu & Aigbavboa, 2018; Aliu & Aigbavboa, 2019; Dalibi, 2017; Maina, 2018; Maina & Daful, 2017). In the current literature, the perspectives of students and graduates, which can improve the consistency and balance of approaches to improving the situation, have been largely ignored. It is within this perspective that this research will assess the skills and competencies offered by built environment graduates in construction firms in Abuja.

Previously, competencies and professional skills were considered as a by-product of education process but now they are considered as an important part of a degree (Agnihotri *et al.*, 2021). The responsibility of developing employability skills in students lies with students, faculties, placement officers, industry professionals and higher educationalists. However, those skills and competencies are mostly required in practice and therefore, the need to engage employers on their expectations. Existing literature pertaining to employability skills shows a gap between expected and possessed skills in students. This study filled this gap in previous studies by assessing the critical factors influencing the skills and competencies expected of built environment graduates in construction firms in Abuja, Nigeria with a view to bridging the gap between academic knowledge and professional practice. To achieve this aim, the study identified the major barriers to the development of skills and competencies for built environment graduates; identified the major drivers of the development of skills and competencies for built environment graduates; determined the level of skills and competencies offered by the graduates of built environment professions; determined the most important roles of professional associations in the development of skills and competencies for built environment graduates in construction; and proposed measures for

enhancing the skills and competencies for built environment graduates in construction firms in Abuja, Nigeria.

2.0 LITERATURE REVIEW

This section presents the review of related literature undertaken in line with the research aim and objectives. This extant review of literature assisted in addressing the research problem because it made it possible for the research variables required for data analysis to be identified. Expatiating more on the critical factors influencing the skills and competencies expected of built environment graduates in construction firms in Nigeria, this section looked at it from two perspectives. The first are negative factors which are referred to as barriers. The second ones are negative factors which are referred to as drivers in the context of this study.

2.1 The Concept of Employability

The concept of employability is very wide in scope and encompasses all aspects of employment criteria which affects both society and individual. Employability has been researched and explained by many researchers such as Wickrmasighe and Pereira (2010); Finch *et al.* (2013); Smith *et al.* (2015), Aloysius *et.al* (2018). These have been seen as the major criterion for skills acquisition and securing of different type of job or work. Saar *et al.* (2014) stated that how does an employer's opinion of specific skills as a major indicator of graduate's capacity to learn in a different area of work and study. Therefore, it is very essential to outline employability skills that effect of job security and its quality of knowledge, experience, skill, behaviour, characteristics, and attributes that would enhance graduates to be gainful employment and also fostered lifelong career objectives. Every university, industry, private, government and other stakeholders should have given various suggestions on how to increase and enhanced graduates' employability.

There is an assertion of development and prove of innovative processes to enhance graduate employability within the university training processes which collaborates with employability skill to maintain graduate skills assessment. There is clear evidence from previous studies that there is link exist among employability of university graduates and that of training, learning through different extra curricula activities graduates ought to acquire in the university programs (Sumanasiri *et al.*, 2015).

The aim and objective of universities, education and employability-skills have been criticized for many years and argued as lacking infrastructural facilities and social amenities required to advance and upgrade our university education system. Graduate employability is seen as ability, self-confidence, competence and work performance to adapt into a new work environment challenge in career development, and adaptability has been recognized as essential ability or capacity in enhancing proactive, competence, employable graduates and sustainable comparative competitive of labour market merit (Chet, 2012; Coetzee *et al.*, 2015; Ismail, 2015; Aloysius *et. al.*, 2018). The role of university education is to train a graduate for specialized skills requirement meant for the general workforce. It means that there should be a career development and training opportunities among graduates to enable skill acquisition and prepared graduates for general work force.

2.2 Definition of Skill

“Skill” is defined as “the ability to competently perform a particular task assigned” (United Kingdom Commission Employer Skills Survey, 2010) or to perform “a specified task at a certain level of expertise” (Shah & Burke, 2003; Trendle, 2008). Similarly, a ‘skill’ can be described as

“the capability to carry out job assigned to a level of competence and this can be built upon through learning” (OECD, 2011). Within the construction industry, skill therefore is an activity involving knowledge, judgement, accuracy and mastery, all of which are acquired as a result of long training and practice in a workplace (Odusami, 2002; Awe, 2010). The concept of skill has been defined differently by writers in different forms. Skills could also be looked into from another perspective as being expert in area of specialization (Wood, 1988), having competence (Boyatzis *et al.*, 2002; Olaitan *et al.*, 2000) dexterity and knowledge of the workforce (Awe, 2010; Mangham & Silver, 1986). In the same vein, due to some school of knowledge skill, is a special ability to perform duties, majorly acquired through formal or informal training (Tether *et al.*, 2005). Definition of skill according to some school of thought should entail the ability of the skilled artisan to work in various sections of the industry or the workplace independently (Spenner, 1983; Olaitan *et al.*, 2000). It could be termed as capability to carry out jobs perfectly without supervision. Overwhelmingly, a skill, and various types of skills within the literature are linked to an activity or a job (Clarke & Winch, 2006).

As skill is linked with a particular task, a person who does not have skill is unlikely to be able to carry out a given job or will be less productive than somebody who possesses the skill. Skills are often linked and have some alliance with qualifications (Mawer & Jackson, 2005; Sattinger, 2012; Cappelli, 2014) and acquisition through formal education and training which is adequate in quality and quantity. Construction skills and training needs are continually changing. These alongside with the introduction of new business processes, organizing production and technical and vocational innovation which require the construction workforce to be more highly skilled in their various areas of expertise (Spenner, 1983; Mackenzie *et al.*, 2000; Forde & MacKenzie, 2004).

2.3 Classification of a Skill

Skills could be classified into few different ways, though skill have many characteristics. In this study skills could be classified as been generic, technical skill or non-technical skill and hard skill (Ofori, 2004). Other skill categories include academic and cognitive and employability. Skills can be classified under a number of different skill types since these are overlapping categorization with varying relevance for specific job sector or roles. The classification will be discussed in this section with a view to creating a categorization relevant for measuring skills in the construction industry.

i. Academic or cognitive skills

These are basic academic skills needed to support learning in different subjects such as physics, English, mathematics, and biology among other subjects. Most importantly, it is mandatory for all secondary school students to have academic skills in order to further their education in higher institutions of learning. These subjects are learned in school and it should be transferable to applications where needed. They are assessed using standardized test (Jayaram & Musau, 2017). Be that as it may, for graduates of technical training institutions to gain employment into the world of work or the construction industry, courses offered including the construction skills should be reviewed and updated. Employers in construction industry referred to some courses in which students are deficient to include communication skill, English, physics and host of other subjects which needed to be transferred for use in the real context, in writing letters and memos and other areas that needs calculation while on the field. Students should be well equipped in academics, in order to be able to interpret and use what they have learnt in the real context. It is well noted that

deficiencies in mathematics and English affects graduates in solving statistical and mathematical problems where needed in construction works (Kearns, 2001; Jayaram & Musau, 2017).

ii. Generic or specific skills

This is a combination of skills that deal with problem solving, communications, or teamwork. The combination of these skills is applicable for use across all jobs and are meant for use in all situations and across disciplines (Kearns, 2001; Pumphery, 2001). Other names for generic skills include general skills, key skills, employability skills, key competencies, core skills, necessary skills, transferable skills and essential skills. They are equally transferable across work settings. Generic skills have meaning in different work context (Stasz, 2001).

Generic skills are multifarious in nature. They consist of analytical skills which is problem solving, (i.e. the ability to both formulate a problem and execute what is required to solve the problem), communication skills (i.e. the written presentation that require ability to communicate in writing in an effective manner and in different formats and for various types of recipients as well as, the oral presentation, which is to communicate, verbally in an effective manner for presentation for and at different groups and audience), and information skills (i.e., having the ability to know that there is a need for a certain type of information to complete a task, like information retrieval and information evaluation).

The social and ethical skills entail the ability to carry out the duties alone without supervision autonomously, and the ability to work with others in a group or in a teamwork, and finally having the ability to apply ethical judgement in various societal issues arisen from your workplace (Sorrel, 2017). The importance of generic skills is known all over the globe, it is well noted for use across disciplines and workplaces. Majorly technical and vocational education imbibe the use of generic skills in disseminating instructions to students, moreover all educational training institutions and workplaces passes instruction and use generic skills in daily routine of work-done and in real life situations. (Singh, 2015).

iii. Technical skills

These are specific skills for use across professions which are technical in nature, to include academic subjects like mathematics, physics, chemistry, biology and other subjects applied in different programmes like, mathematics applied in plumbing works, physics applied in electrical installation with respect to equipment's and facilities (e.g., operation of a switch gear). Technical skills are defined as those skills acquired both at formal and non-formal institution of learning relating to the profession of one's choice as an apprentice, in the replica of the workplace for employment (Litecky *et al.*, 2004). They are always coded in job description and they are measured using standardized assessment (Sorrel, 2017). Technical skills are skills meant for an occupation in which the skilled worker has competency in his area of discipline or related profession which require the use of tools, in technical or engineering field (Medina, 2010). Technical skills issues relating to the use of equipment's and tools meant for work and related issues are linked with technical skills. This could be learnt in educational training institutions and non-formal settings (Handler & Healy, 2009).

iv. Soft-skills

Having possess soft skills are part of requirement that makes you qualified to successfully work as part of a growing industry. Soft skills are defined as an array of person's attributes and way of life to include goals, skills possessed, friendliness, reasoning, and motivation that makes an individual in life (Sorrel, 2017; Litecky *et al.*, 2004). Soft skills entail work ethics, attitude, and communication. It could be referred to such construct as motivation and dispositions (Jayaram & Musau, 2017). Soft skills could be evaluated using questionnaires and through individual impression.

v. Employability skills

These are set of skills acquired by individual in order to gain employment into a workplace. These skills are used for the development of oneself and for gaining employment into the world of work, these set of skills makes you to be successful and becomes competent in your field of discipline (Robinson, 2000). These skills could be acquired through formal and non-formal training institutions, the purpose of employability skills is numerous, part of which are to gain employment and also to make contribution to the development of the workplace, possessing employability skills is an advantage, it gives edge to who possess it during promotion exercise than other counterparts who does not have it (Curtis & McKenzie, 2001; Bridgstock, 2009).

These skills comprise of some attributes that employers are looking for in graduates seeking employment, they include; communication and interpersonal skills, working under pressure and to deadlines, problem solving skills, initiative and self-motivation, numeracy, team working, negotiation, ability to learn and adapt and valuing diversity and difference, though these attributes differ from one workplace to another. These attributes if possessed by an employee is useful for all and sundry, even though these skills are found lacking in most graduates looking for employment and those already engaged in employment (Dacre Pool & Sewell, 2007). Employability skills are divided under two, headings namely: interpersonal skills and generic employment skills.

The aforementioned skills fall under these two categories and they are meant for use both in industry and in the newly recruited graduates. Newly recruited graduates are found to be deficient in employability skills, it is therefore, imperative to include these skills into the school curriculum (York & Knight, 2006; Cranmer, 2006). Generally, most employers and organizations are looking for employees who possess the attributes of employability skills (Bagshaw, 1996; Sorrel, 2017; Jayaram & Musau, 2017; Jayaram & Engmann, 2017). It was observed that the requirements of the industry in terms of skill requirements kept on changing due to technology development, this suggest that education and training should look into the curriculum and review or make changes so as to include employability skill into the new curriculum (York & Knight, 2006; Cranmer, 2006).

2.4 Barriers to the Development of Skills and Competencies for Built Environment Graduates in Nigeria

Previous research by Obiegbu (2002) and Olaitan *et al.* (2006) among others affirmed a host of components that combine together to cause skills gap part of which are: demand for multi-skill approach, demand for new skills, lack of educational training, rapid change in technology and inappropriate skills and inadequate training. It has been noted that the construction craftsmen have

been criticized due to incompetency in their various disciplines and this has caused a bad impression on the kind of jobs produced and delivered. They are not regarded because of their low performance and poor work attitude which has an adverse effect on the industry. Researches have also been conducted in this regard and noted other challenges therein (Yang & Chang, 2005; SLIM Report, 2002; Chan & Kaka, 2003; Cotton *et al.*, 2005; Alinaitwe *et al.*, 2008; Nowak, 2005). Table 1 gives a summary of these factors contributing to the skills barrier:

Table 1: Summary of Barriers to the Development of Skills and Competencies for Built Environment Graduates

S/No	Barriers	Source(s)
1	Demand for multi-skill approach	Obiegbu (2002); Ejohwomu <i>et al.</i> , 2006); Olaitan <i>et al.</i> (2006); Lill (2009)
2	Demand for new skills	Cordery (1989); Mackenzie <i>et al.</i> (2000); Obiegbu (2002); Wells and Walls (2003); Olaitan <i>et al.</i> (2006)
3	Lack of educational training	Olaitan <i>et al.</i> (1999); Obiegbu (2002); Olaitan <i>et al.</i> (2006); Oketch (2007); World Bank (2007); Livanos (2009); Awe (2010); Namuddu <i>et al.</i> (2017); Nicoleau and Sackman (2017)
4	Rapid change in technology	Obiegbu (2002); Olaitan <i>et al.</i> (2006); Ede (2013); Femi (2014)
5	Inappropriate skills	Obiegbu (2002); Olaitan <i>et al.</i> (2006); Awe (2010); Udofia <i>et al.</i> (2012); Nicoleau and Sackman (2017)
6	Inadequate training	Obiegbu (2002); Olaitan <i>et al.</i> (2006); Awe (2010); Udofia <i>et al.</i> (2012); Nicoleau and Sackman (2017)
7	Staff being new on the role	Egan (1998); Whittock (2002); Forde and Mackenzie (2004); Oketch (2007); Awe (2010); Mackenzie <i>et al.</i> (2000)

2.5 Drivers of the Development of Skills and Competencies for Built Environment Graduates in Nigeria

In order to better understand the questions surrounding employability, it is essential to examine its drivers. In addition, studies have seen these drivers as factors that could be used to enhance the formulation of effective strategies for improving the skills and competencies of a graduate for built environment graduates in construction firms. In line with this, several drivers of the development of skills and competencies for built environment graduates identified from extant literature review are summarised in Table 2.

Table 2: Summary of Drivers to the Development of Skills and Competencies for Built Environment Graduates

S/No	Drivers	Source(s)
1	Situational factors	Atkinson (1984); von Hauffe <i>et al.</i> (2015)
2	Labour market structure	Atkinson (1984); von Hauffe <i>et al.</i> (2015)
3	Labour market opportunities	Atkinson (1984); von Hauffe <i>et al.</i> (2015)
4	Organisational factors	Moolman <i>et al.</i> (2014); Ali <i>et al.</i> (2019)
5	Individual resources	Moolman <i>et al.</i> (2014); Ali <i>et al.</i> (2019)

6	Knowledge and skills	Prikshat <i>et al.</i> (2019)
7	Social capital	Pinto (2018); Asonitous <i>et al.</i> (2019); Pais-Montes <i>et al.</i> (2019)
8	Attitudes	Lianes <i>et al.</i> (2019)
9	Demographics	McQuaid and Lindsay (2005); Van der Heijde and Van der Heijden (2005)
10	Dispositions	Ali <i>et al.</i> (2019); Ornellisi <i>et al.</i> (2019)

2.6 Level of Skills and Competencies Offered by the Graduates of Built Environment Professions in Nigeria

Job advertisements often contain job specifications, which describe what a job entails, minimum skills needed for a job, knowledge and abilities required to perform a certain job effectively. Those requirements are the attributes that determine the employability of a job applicant. The employer considers those requirements essential to satisfactory performance on the job. Job requirements may include specific skills, area and length of work experience, personal qualities, educational qualifications, professional certifications, or areas of knowledge (Doyle, 2019). Employability skills can be classified into transferable/functional skills (basic skills); personal traits/attitude (soft skills); and knowledge-based skills (hard skills). Hard skills comprise formal education or training in a particular field of study, and work experience. They are associated with competencies in a specialized area, analytical ability (ability to use appropriate tools and techniques) and academic knowledge.

McMurray *et al.* (2016) reported that employer's value good relevant work experience. Work experience was also seen to improve soft skills, increase confidence, produce more rounded individuals and improve their connections to the labour market. Soft skills on the other hand are skills, abilities and traits that pertain to personality, attitude and behaviours rather than formal or technical knowledge. Majid *et al.* (2012) asserted that soft skills are useful for social interaction as well as for career advancement while Swarna-Latha (2013) opined that soft skills provide and empower the young graduate with proper job etiquettes and abilities to get along well in the workplace. Soft skills can be broken into job readiness skill (related to job preparation process); job searching soft skills and job keeping soft skills.

Of all these types of soft skills, at recruitment stage, employers focus mostly on job preparation soft skills, which essentially involve skills that help an employee to make informed decisions, solve problems, think critically and creatively, communicate effectively and build healthy relationships. The top five important soft skills identified in Majid *et al.* (2012) are teamwork and collaboration, decision-making, problem solving, time management, and critical thinking skills. Akinyemi *et al.* (2012) listed other employability attributes to include verbal and written communication (basic skills), analytical and investigative abilities, entrepreneurship and managerial competencies, teamwork abilities, computer know-hows, time management capabilities, as well as drive and flexibility. A combination of the different categories of skills is important for employability.

Helyer and Lee (2014) highlight that more than half of the top graduate recruiter's states that due to the very obvious benefits of work experience to an individual's skillset, graduates with work experience are prioritised in their selection processes. In a study carried out to determine employers' demand for business and management graduates in the Scottish workforce, McMurray

et al. (2016) found that first degree, relevant work experience, personal attitudes, relevant employability skills, and classifications of degrees are considered most important to employers during recruitment. In a related study of employability skills of engineering and Information, Communication and Technology (ICT) graduates, Saad *et al.* (2013) reveal that problem-solving, tool-handling competency, presentation skills and team working skills feature highly as important skills demanded of applicants by employers.

2.7 Roles of Professional Associations in the Development of Skills and Competencies for Built Environment Graduates in Nigerian Construction Firms

The roles of university in preparing graduates for the workforce is a long-standing and controversial (Barnette, 2000). It is compounded by the ever-changing needs and expectations of employers, who are increasingly interested in what their employees can do and less in what they know, recently there has been tension between universities and their curricula and employer expectations of graduates. Many employers and students believe that university education has the primary purpose of preparation for work and that it is possible to develop work-ready skills simply by undertaking three or four years of university education (Walker *et al.*, 2012). Individual perceptions and response of universities to needs and expectations of employers vary from one university to another. Understanding the roles that universities, employers, graduates and professional association could play in the professional preparation of new graduates for work can help the alignment of these expectations. These roles have been reviewed from literature and are summarised in Table 3.

Table 3: The Roles of Stakeholders

Stakeholders	Responsibilities
University (Professional Faculties)	<ul style="list-style-type: none"> • Preparing graduates to face unfamiliar, unknown and unknowable situations. • Preparing graduates to cope with complex and dynamic work requirements. • Preparing graduates to learn how to learn. • Increasing students' knowledge and awareness of workplace environments. • Assisting graduates with initial job expectations. • Developing well-rounded global graduates. • Maximising and using diversity in university environments to assist graduates in developing social and cultural skills.
Employers	<ul style="list-style-type: none"> • Training new graduates when they commence work. • Facilitating workplace learning and organisational learning. • Increasing work socialisation. • Increasing students' exposure to industry through scholarships, internships and job ready programmes.
Professional associations	<ul style="list-style-type: none"> • Making recommendations to the government and employers on issues that matter most for their professionals and profession. • Using course accreditation processes to ensure that university

	<p>programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach.</p> <ul style="list-style-type: none"> • Developing professional skills both within and outside university studies.
New graduates	<ul style="list-style-type: none"> • Managing their career. • Managing themselves. • Self-assessing in the workforce. <p>Certain professional skills can be developed only in practice sites. Stakeholders have to cooperate with each other to:</p> <ul style="list-style-type: none"> • Link theory and practice and learning on the job. • Develop employability and work-ready skill sets. • Facilitate work placement experiences. • Encourage part time employment (in discipline specific areas or otherwise) in parallel to university studies. • Provide work-based learning opportunities.
Shared responsibilities	

Sources: Barnette (2000); Abishek (2012); Walker *et al.* (2012); Jenny (2015)

Many universities are running focus groups with employers, surveying employers to measure satisfaction with graduates, or involving employers and industry leaders on coordinating committees or course advisory committees. Some professional bodies accredit university programs, using their own established frameworks to do this. Professional bodies have established links with the workforce through their membership; generally, they also have credibility with relevant faculties or schools within universities. A very good example of this is the accreditation of building courses in the Nigerian universities and polytechnic by council of registered builders of Nigeria (CORBON). Some of the contributions and recommendations of the professional bodies to construction education includes:

1. To explicitly identify employability skills in all university and polytechnic curriculum.
2. To improve and increase access to Work Integrated Learning (WIL).
3. To enhance teaching and assessment of employability skills.
4. To offer students self-assessment options for employability skills
5. To ensure that construction education continually satisfies the requirements of
6. construction managers.
7. To explicitly report on employability skills demonstrated through Work Integrated
8. Learning.
9. To encourage more effective integration of employability skills in student e-portfolios.

Universities work to develop employability skills in their students by providing academic staff with relevant support and resources, integrating these skills into curriculum and course design (taking advice from construction managers), providing students with work placements and exposure to professional settings and providing advice and guidance through career services. Furthermore, universities offer students opportunities for developing themselves through participation in clubs, societies and university life. In addition to the part that universities play in

developing students “employability skills, it be recognised that most students are concurrently developing these skills through part-time employment, volunteer work and community participation” (Abishek, 2012).

2.8 Measures for Enhancing the Skills and Competencies of Built Environment Graduates in Construction Firms in Nigeria

Extant review of literature identified several measures that are capable of enhancing the skills and competencies of built environment graduates in construction firms. These measures are discussed in this section under eight (8) sub-headings.

i. Apprenticeship training

In combating the skills gap that is evident, Germany has taken the step of introducing a dual modern apprenticeship model. To develop a world first class workforce and resolve the challenges that are prevailing, vocational technical education is the answer in Germany (OECD, 2011). Apprenticeship training programme have been organized and identified by the vocational and education training as a route of providing successful and highly skilled workers. The workforce is employed in various workplace of interest where the apprentice becomes an expert in a chosen profession. Development and training of the skilled labour pool is of paramount importance to German government (Zwick, 2007). Many companies in different countries to include Japan, Canada and USA have imitated the idea of running an apprenticeship training programme to build a skilled workforce who will become experts in their various chosen fields (Zwick, 2007). The companies in-charge of the apprenticeship training program collaborate with the education and training to develop a curriculum guiding their program of study in relevant areas, the training of the instructors and issuing of certificates are solely the responsibilities of education and training. It was noted that in many countries in Europe, over half of the students are enrolled in vocational technical education program (OECD, 2011). Presently, dual apprenticeship has been adopted by other countries like Switzerland, Denmark and Austria. In these countries’ students spend an average of three days outside with the company they have intention to work with relative to the training acquired in the workplace. At BMW, Porsche, and Mercedes Benz for example, students learn the physics, engineering and maths required to design and build luxury cars (Zwick, 2007).

The results analysed from 17 countries concluded that to most teenagers, vocational education is the most effective way to learn (OECD, 2011). OECD (2011) also found that this approach better facilitates the student’s entry into the labour market. In that vein, U.S. research by Holzer and Lerman (2007) suggested that apprenticeships also help to close skills gap. Apprenticeship is another form of system used, to transfer skills within the skilled labour pool and other working group, which is basically based on implicit knowledge. Despite the advantages of apprenticeship form of training, it has its limitations to include, lack of a formal curriculum to guide the apprenticeship training, there is no formal assessment as it operates in the formal training, skills learnt is through imitation and hands on practice in the replica of where the apprentice choose to work (Attwell, 1997; Rauner & Smith, 2010; Lerman, 2010; Lerman *et al.*, 2009).

According to Holzer and Lerman (2007) the body that makes up the construction industry in some states attest to the fact that apprenticeship as a form of training has improve the quality and competence of trained skilled craft men. The apprenticeship scheme has been yielding positive

result. They emphasized that college degrees and internship don't produce the same quality of worker as intensive on the job apprenticeship. An apprenticeship is a real job while internship involves a slight amount of work. Germany serves as a role model in solving issue of skills gap, and they have proffered solution in closing the skills gap that exist among the workforce: - to include making investment in the education and training of craft men, preparing them for employment by issuing them certificates after graduation. This was given to neighbouring schools and colleges to imbibe the idea of introducing apprenticeship training to young students who has developed flair for programme in craft construction as alternative to secondary and high schools training in general studies only. Several companies all over the globe adhered to the instruction and advice of running apprenticeship training scheme, knowing the benefits accrued there-in to train and build competent skilled workforce of the private sector/state/local government in developing new programmes which help modernize their employee's skill sets (Brockmann *et al.*, 2008).

ii. The use of constructivist model

The model of learning-by-doing is proposed by the constructivist and is commonly adopted in vocational and technical education. Some of the most skills intensive professions in developed countries use the same form of learning. It was observed and noted that students who receive some vocational training at the same time as they are taking academic courses tend to do better in those courses than students taking only academic courses (Kelly & Kellam, 2009).

iii. Retaining the aging workforce

Dantong *et al.* (2011) believes that the experience gathered on the job by the aging skilled workforce helps in combating the skills gap that exist, the organizational training and retaining of the aging workforce helps in combating the skills gap faced by the industry. The newly recruited craft men do not possess the adequate skill and training that will be useful for the construction industry, because of the poor workmanship possessed by the newly recruited craft men, this will hinder the progress of the industry in terms of GDP. The construction industry in sub-Saharan Africa retains skilled employees in work after retirement age, mainly to overcome labour shortages, because of skills possessed in which experience acquired is a replacement for evaluating proficiency (Haupt, 2001; Hailstone, 2002). Smallwood and Haupt (2005) reported that the older skilled workers were resourceful to the construction industry in that they possess experience and produce better quality of work than younger skilled workers. They don't really require training, though the ageing workforce may not possess the latest skills as new technologies emerge but due to the acquired experience on the job, they are more quickly responded to training than the younger workers they could benefit from skills training (Smallwood & Haupt, 2005).

iv. Training and retraining the skilled workforce

Training and retraining of the workforce will contribute to closing the skills gap, as training and retraining all refer to the process of imparting skills on the workforce (Bokini, 2005). The training could be in form of classroom training as recommended by (Solomon *et al.*, 2012), trade group training by (Solomon *et al.*, 2012), apprenticeship training recommended by (Zou *et al.*, 2008) on the job training as recommended by (Awe, 2010) and coaching and mentoring by (Umar, 2005; Ugwuja, 2010; Odesola & Idoro, 2014), as they all contribute to combating the skills gap.

v. Introduction of robots

Robots have been introduced into the construction industry to perform excellently well in place of humans, they can conform to different kinds of jobs ranging from installation, fixing and erecting pillars within and around the construction site (Warszawski, 1984; Jackson, 1990). The robots possess some economic potentials to include saving the number of employees recruited into the industry, the robots work especially under unsafe, laborious and demanding environment, and they produce superior kind of job. The application of robotics to construction to date have been very limited in scope (Jayaraj & Divakar, 2018). Robots are used in every area of construction work to include Electrical installation for high voltage transmission lines, obstacle recognition for power transmission line inspection among other installations both in Electrical domestic and industrial installations (Jayaraj & Divakar, 2018). Though robots are very effective in improving the quality of the work done, it equally increased profitability, increase efficiency and some other factors, despite these advantages, it has its limitations to include type of tasks the machine can carry out in terms of performance, the robot does not have every function built into it, so for robots to perform excellently well, the use of good trusted robot integrators must be applied (Jayaraj & Divakar, 2018).

vi. Employability skills on government perspective

The ongoing research is enhancing to paint a clear picture of graduates' employability challenges, and how we can begin to solve them (Moss, 2017). In 2005 the Nigerian government has seen the importance to adopt a system of wide reform; it was absorbed and implemented under Nigeria/UNESCO Science, Technology and Innovation (STI) initiative. Nigeria has ascribed many development initiatives such as (MDGs) aimed at poverty reduction, (WSSD) the World Summit on Sustainable Development, (BCRA) the Blair Commission Report for Africa, (NEPAD) the new partnership for Africa development triggered to re-enforce Africa economy and the mission to be achieved in not later 2015. Nigeria government has entered into various initiatives to enhance framework for the development of science and technology (S&T), and the initiative has linkages through public-private partnership (PPP). The human capital theory enhances educational paradigm anchored to uphold, promote and expand the university educational system within governmental policy created to enhance positive economic effects, progressing and development of any country like Nigeria as a concept known as driven economic based knowledge. University links with the government to enhance sources of public funding to enable improvement in technology transfer and human training activities (Barnes *et al.*, 2002).

The findings have been anchored much on graduate education is based on a generalized conception of how to get a good job and still remain as best qualified; have greater work opportunities (Johnes, 2006). Nigeria has been underpinned to take a major review of their national standard of education provision after graduation to provide Nigeria Higher Education on Graduation Statement (NHEGS). The main benefit of employability of government perspective is to look into reward incentives as an essential mechanism that shapes the kind of invention that are transferable employability skills in the labour market through researcher interviewed in these studies foster to rank lack of facilities; and research finding as one of the most critical factors that affects university performance. Employability Skills on Individual Perspective. The importance of employability and reason is to understand the value of individual ability, characteristic and performance towards work ethics; and there is a need to link with one another assigned into the transition of the workforce. Gert and Roulin (2009) show the evidence to develop skills through employability

skills and discussed an importance of career development. This describes a method for improving your resume and cover letter, graduates who are interested in attending the meeting, will involve much abstract problem and not employment skills. The availability of training opportunities at job leads to a rise in the overall job quality Euro found (2016). As part of the measures to achieve, Nigeria graduates require general skills for more specialized work and collaborative learning that would enable the graduate to improve sandwich and extra training or lifelong learning. The role of universities assumes adding an essential value within the industrial system through an individual system of innovation (Frontes, 2003).

The self-efficacy is the norm and values of the ability to budget, plan, implement, organize and execute the plan of the active drives to management applicant condition and situation. The learning enhances new ideas for combining experiences Hakansson (1987). Therefore, it is necessary to empower graduates who have good communication skills, be able to reach out through his/her speech which is fluent and eloquent, the organization; work with people as a team and have a critical thinking; and work to solve industrial problems. According to Odigbo (2013), students who are empowered to perform better and have a better relationship with the staff.

vii. Built environment professional skills

Construction projects involve teamwork and, depending on the type and nature of construction operation, different built environment professionals are involved at various stages of a project (Owolabi & Olatunji, 2014). Prior to project initiation, the land surveyor and the Town/Urban planner play vital roles. The land surveyor is concerned with the size, topography, location, features on and beneath the land upon which any development is built, including issues related to land ownership and property boundaries (Anyanwu, 2013). No proper, effective and accurate planning, design and execution of building projects can be carried out without the input of the land surveyor. The Town/Urban planner's principal role on the other hand is that of development control which has to do with physical, social and economic planning of development within regions and sub-regions, layout plan, transportation plan, processing building plans for proposed projects among others (Waldigit, 2013).

From project initiation through procurement to handover, the Architect, Civil/Structural Engineer, and Mechanical/Electrical (M/E) Engineer are responsible for their respective designs, while the Builder/Construction Manager and Quantity Surveyor play managerial roles at the construction stage. The Architect helps the client to formulate his requirements in an understandable form, bearing in mind the statutory conditions that may apply, and prepare, detailed working drawings and specifications besides other roles. The Structural Engineer carry-out structural analysis to produce structural drawings of foundation, columns, and beams among other structural elements; specifications; schedules and other relevant data that may be required for the overall structural integrity of the project. Building services experts perform the mechanical and electrical engineering services in construction. Their roles essentially involve making buildings comfortable and safe for people to live, work or learn in. They work with the Architect and Structural Engineer to ensure a building is in the right temperature, and it is well-ventilated and well-lit among others thus ensuring functionality (Hussin & Omran, 2009). The professional at the heart of the physical construction of buildings is the Builder. Hussin and Omran (2009) assert that the builders' role in building development process in general is to translate designs, working drawings, schedules and specifications into a physical structure.

According to Anyanwu (2013), the builder brings his production management expertise to bear on the necessary resources on the site for execution of building projects. The Builder's role in building development process starts from the planning/design stage but takes prominence at the construction stage. The Quantity Surveyor render essential services to the client as he is responsible for measurement of quantities, preparation of preliminary estimates, bill of quantities, procurement advice, contract administration and cost control throughout the construction process. The Estate Surveyor and Valuer is involved right from the conception stage of a project especially when the project is being undertaken for investment purposes, and it is necessary to conduct feasibility and viability study to protect the investment. He is also involved in land acquisition and land optimization prior to project initiation. His involvement also extends to the operational stage of a project, where he is involved in facilities management, and property valuation.

viii. Human capital theory

The theoretical framework of this study can be explained by the Human Capital theory. This theory according to Schultz (1963) emphasizes the role of investment in education to boost economic and social achievement. Human capital theory equally suggests that education or training raised the productivity of workers by imparting useful life skills on the individuals (see Figure 1). In line with the above, Becker (1962; 1964) believed that the height of workforce production has positive relationship with the educational and training form in which the higher the educational and training form a person gets, the higher the productivity/achievement of an individual. According to Lange and Topel (2004), a person with great skills will be able to increase employers or the workplace productivity. It is believed that by virtue of this theoretical framework, students need to possess employability skills that will enable them to function effectively and efficiently in the world of work.

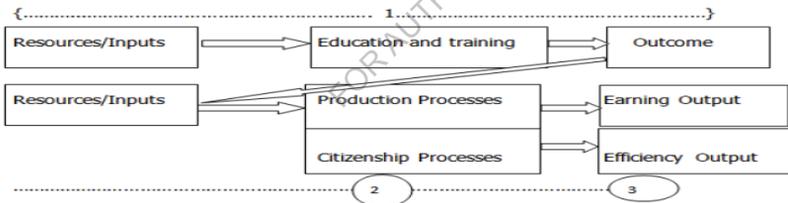


Figure 1: A model of Human Capital Theory (Swanson, 2001)
Source: Oluwakemi and Adeolu (2017)

The diagrammatic representation of the human capital theory above presents the key relations in human capital theory. The first relationship 1 represents the concept of production as applied in education and training. This relationship means that investment in education and training results in increased learning (Imeokparia & Ediagbonya, 2012). The relationship 2 presents the relationship between learning and increased productivity. This means that increased learning can result to an increased productivity. This relationship emphasizes the human capital relationship that exists between increased productivity and increased wages and business learning.

This relationship 3 pointed out that an increased productivity does result in increased wage for individuals. The human capital theory is a replicate of the human resource development theory which places emphasis on the investment in the training and development of human resources. Therefore, according to human capital theory, it can be concluded that when adequate resources

are committed to the development of human capital which is the stock of competencies, knowledge, habit, social and personality attributes of the society, the nation will witness growth and development. This theory is of relevance because when governments at all levels are committed to the development of human capital through provision of qualitative education, the employability of Nigerian universities output will improve.

2.9 Summary of Reviewed Literature

The review of related literature section has identified and thoroughly discussed the barriers and drivers of the development of skills and competencies for built environment graduates in the Nigerian construction industry. Based on these reviews, there was an outstanding support for studies that proffered measures for enhancing the skills and competencies of built environment graduates in construction firm in Nigeria. Therefore, the study was able to determine the current level of skills and competencies offered by the graduates of built environment professions in construction firms and the most important roles of professional association in the development of skills and competencies for built environment graduates in construction firms in Abuja. This literature review section has successfully reviewed these core concepts in this research and the theme emerging from literature that needs further contextual investigations.

3.0 METHODOLOGY

According to Uji (2009), research design is the program that guides the researcher in the process of collecting, analyzing, and interpreting observations. This study was carried out using a quantitative research approach. This research was broadly divided into two parts. The first part of this work includes a literature survey to be undertaken to provide the background information required for this research, while the second part is comprised of the use of a questionnaire to obtain data from construction companies and firms in Abuja.

This study was carried out using a quantitative research approach. This research was broadly divided into two parts. The first part of this work includes a literature survey to be undertaken to provide the background information required for this research, while the second part was comprised of the use of a questionnaire to obtain data from construction firms in Abuja, Nigeria. The study population for this study was determined using the number of construction companies registered with the Abuja Business Directory in Abuja. These firms engage in building and civil Engineering works and function within the city. According to the Abuja Business Directory (2021), there are 255 construction companies listed in the Abuja Business Directory with Abuja as their registered address. The sample size for the study was 159 based on Glen (2013) formula presented as Equation 1.

$$n = \frac{N \dots \dots}{1 + N (e)^2} \dots \dots \dots (1)$$

Where;

n = Sample size

N = Population size in the sample unit

e = Level of precision which is + 5% (0.05)

The sampling technique that was adopted for the study was a simple random sampling technique. This is in line with the assertion of past studies that sampling is the process of selecting sample groups (Shanti & Shasi, 2017). It is the process of selecting a group of people or products that is

used as a representative or random sample (Shanti & Shasi, 2017). The goal of sampling is to provide a realistic means of enabling the data collection and processing component of research to be carried out (Shanti & Shasi, 2017).

Data was obtained with the use of a structured questionnaire in the close-ended response format. The questionnaire was designed on a five-point Likert Scale format. The questionnaire was made up of two sections (see Appendix). The first section addressed the issues concerning the general profile of respondents. The other sections addressed issues concerning the research objectives respectively. Of the 159 respondents given questionnaire, only 146 returned the completed questionnaire; giving a response rate of 91.82%. The data collected for this study was analysed with the use of frequency counts percentage and Mean Item Score (MIS). Percentage was used to analyse data on respondents' profile while MIS was employed in order to analyse the data collected on the research objectives. The formula used for computing MIS is presented as Equation 2, while the decision rule adopted for the MIS analysis is shown in Table 4.

$$MIS = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + n_1}{(n_5 + n_4 + n_3 + n_2 + n_1)} \text{----- (2)}$$

Where: n₁ = number of respondents who answered very low
 n₂ = number of respondents who answer low
 n₃ = number of respondents who answer average
 n₄ = number of respondents who answer high
 n₅ = number of respondents who answer very high

Table 4: Decision Rule for MIS Analysis

Scale	Cut-off points MIS	Remarks/ Decision		
		Importance	Awareness	Effectiveness
5	4.50 -5.00	Very important	Very High	Very Effective
4	3.50 -4.49	Important	High	Effective
3	2.50 -3.49	Fairly Important	Average	Fairly Effective
2	1.50 -2.49	Less Important	Low	Less Effective
1	1.00 -1.49	Least important	Very Low	Least Effective

Source: Adapted and modified from Morenikeji (2006); Agumba and Haupt (2014); Shittu *et al.* (2016)

4.0 RESULTS AND DISCUSSION

This section presents and discusses the results of analyses of the data collected. Conclusions and recommendations made are based on the findings of the results of the study.

4.1 Respondents' Profile

The profile of the respondents who participated in this study is presented in Table 5.

Table 5: Respondents' Profile

PROFILE	STATISTICS	
Gender of Respondent	Frequency	Proportion (%)
Male	122	83.56
Female	24	16.44

Profession of respondents	Frequency	Proportion (%)
Quantity surveyors	54	36.99
Engineers	45	30.82
Architects	38	26.03
Estate valuers	7	4.8
Land surveyors	2	1.36
Education attainments	Frequency	Proportion (%)
MSc	102	69.86
HND/BSc	41	28.08
PhD	3	2.06
Work experience of respondent	Frequency	Proportion (%)
16 – 25 years	63	43.2
5 – 15 years	55	37.7
More than 25 years	21	14.4
Less than 5 years	7	4.7
Total	146	100

It was shown from Table 5 that out of the 146 respondents sampled, 122 (83.56%) were male, while 24 (16.44%) were female. This study was thus, of necessity, biased in favour of males, based on the peculiar structure of the construction firms, where females are few in number. Table 5 also revealed that out of the 146 respondents considered for the study, 54 were Quantity Surveyors, 38 were Architects, 45 were Engineers (Structural, Electrical and Mechanical), and 7 were Estate Valuers and 2 were Land Surveyors. This shows that the majority of respondents (54%) were Quantity Surveyors. It was also shown that 69.86% of the respondents are Master's Degree holders. This is followed by Bachelor's Degrees (BTech/BSc) and Holders of Higher National Diplomas (HND), which represent 28.08% of the respondents. PhD holders, representing the minority of the respondents, constitute 2.06% of the population of respondents. This shows that the respondents have the requisite educational qualifications to give reliable responses required for the study. The profile of respondents also indicates that 43% of the respondents have between 16 and 25 years of experience; 38% of the respondents have between 5 and 15 years of experience; 14% of the respondents have more than 25 years of experience, and 5% of the respondents, representing the minority, have less than 5 years of experience. This shows that the respondents are experienced enough to give reliable information needed for the study.

4.2 Results on the Major Barriers to the Development of Skills and Competencies for Built Environment Graduates in Abuja, Nigeria

The use of MIS was employed to rank perception of respondents on the barriers to the development of skills and competencies for built environment graduates in construction firms in Abuja in order of importance. The result of the MIS analysis is presented in Table 6.

Table 6: Barriers to the Development of Skills and Competencies for Built Environment Graduates in Construction Firms in Abuja

S/No.	Barriers	MIS	Rank	Interpretation
1	Financial difficulty	4.85	1 st	Very Important
2	Rapid technology advancement	4.61	2 nd	Very Important
3	Inappropriate skills and inadequate training	4.18	3 rd	Important

4	Lack of Educational Training	3.86	4 th	Important
5	Demand for new skills	3.52	5 th	Important
6	Demand for multi-skills approach	3.27	6 th	Important
7	Poor educational system	2.80	7 th	Moderately Important
8	Staff being new on the role	2.47	8 th	Less Important
Average MIS		3.69		Important

Table 6 revealed the result of MIS for the eight (8) identified barriers to the development of skills and competencies for built environment graduates in construction firms in Abuja. It was shown that the most important barriers were “Financial difficulty”, “Rapid technology advancement”, and “Inappropriate skills and inadequate training” with MIS values of 4.85, 4.61, and 4.18 respectively. While “Staff being new to the role” was identified to be of less importance with low MIS value of 2.47. On average, all the identified barriers to the development of skills and competencies for built environment graduates in construction firms in Abuja were important (average MIS = 3.69). Findings from the studies by Obiegbu (2002), Olaitan *et al.* (2006), and others affirm that the following are barriers to the development of skills and competencies for built environment graduates: Lack of educational training, rapid change in technology, inappropriate skills, and inadequate training are in support of the finding of this study by establishing that the financial difficulty and staff being new to the role have contributed to the skills gap, coupled with textbooks that are out-of-date, which the instructors use in transferring and imparting training to students (Udofia *et al.*, 2012).

4.3 Results on the Major Drivers of the Development of Skills and Competencies for Built Environment Graduates in Abuja, Nigeria

In order of significance, the use of MIS was applied to rank the perception of respondents on the drivers of the development of skills and competencies offered by built environment graduates in construction firms in Abuja. The result of the MIS analysis is presented in Table 7.

Table 7: Drivers of the Development of Skills and Competencies

S/No.	Drivers	MIS	Rank	Decision
1	Individual resources	4.85	1 st	Very significant
2	Labour market opportunities	4.76	2 nd	Very significant
3	Labour market structure	4.56	3 rd	Very significant
4	Situational factors	4.37	4 th	Significant
5	Organisational factors	4.23	5 th	Significant
6	Social capital	3.83	6 th	Significant
7	Knowledge and skills	3.48	7 th	Moderately significant
8	Attitudes	3.04	8 th	Moderately significant
9	Dispositions	2.95	9 th	Moderately significant
10	Demographics	2.94	10 th	Moderately significant
Average MIS		3.90		Significant

Table 7 shows that the most significant drivers for the development of skills and competencies for built environment graduates in construction firms were “Individual resources” (MIS = 4.85); “Labour market opportunities” (MIS = 4.76); and “Labour market structure” (MIS = 4.56). Other drivers for the development of skills and competencies for built environment graduates are also

significant and moderately significant. These range from “Situational factors” (MIS = 4.37) to “Demographics” (MIS = 2.94). On the average, all the drivers for development of skills and competencies for built environment graduates in construction firms in Abuja were significant (average MIS = 3.91). In support of this finding, Moolman *et al.* (2014), Von- Hauffe *et al.* (2015), Pinto (2018), Ali *et al.* (2019) identified in their study of individual resources, labour market opportunities, labour market structure, situational factors, organisational factors and social capital as the drivers for development of skills and competencies for built environment graduates.

4.4 Results on Current Level of Skills and Competencies Offered by the Graduates of Built Environment Professions in Abuja, Nigeria

The results of MIS employed to rate the opinion of respondents on the current level of skills and competencies offered by the graduates of built-environment professions in construction firms in Abuja are summarised in Table 8.

Table 8: Current Level of Skills and Competencies

S/No.	Current level of skills and competencies	MIS	Rank	Interpretation
1	Verbal and written communication (basic skills)	4.80	1 st	Very significant
2	Entrepreneurship and managerial competencies	4.71	2 nd	Very significant
3	Job readiness skill (related to job preparation process)	3.97	3 rd	Significant
4	Relevant employability skills	3.92	4 th	Significant
5	Computer know-hows	3.85	5 th	Significant
6	Teamwork and collaboration	3.78	6 th	Significant
7	Problem solving	3.68	7 th	Significant
8	Time management	3.53	8 th	Significant
9	Critical thinking skills	3.14	9 th	Moderately Significant
10	Teamwork abilities	3.14	9 th	Moderately Significant
11	Time management capabilities	3.13	11 th	Moderately Significant
12	Decision-making	2.99	12 th	Moderately Significant
13	Drive and flexibility	2.91	13 th	Moderately Significant
14	Classifications of degree	2.66	14 th	Moderately Significant
15	Analytical and investigative abilities	2.47	15 th	Less Significant
Average MIS		3.31		Moderately Significant

Table 8 indicates that the levels of “Verbal and written communication (basic skills)” and “Entrepreneurship and managerial competencies” were the most significant current levels of skills and competencies offered by the graduates of built-environment professions in construction firms (MIS = 4.80 and 4.71 respectively). This is followed by the “Job readiness skills (related to the job preparation process)”, “Relevant employability skills”, “Computer know-hows”, “Teamwork and collaboration”, “Problem solving”, and “Time management”, which were also significant current levels of skills and competencies offered by the graduates of built environment professions (MIS = 3.97, 3.92, 3.85, 3.78, 3.68, and 3.53 respectively). The least ranked current level of skills and competencies offered by the graduates of built-environment professions in construction firms was “Analytical and investigative abilities” (MIS = 2.47). On average, the current level of skills and

competencies offered by the graduates of built-environment professions in construction firms in Abuja were moderately significant (Average MIS = 3.51). The current level of skills and competencies as revealed in this study agrees with the study by Akinyemi *et al.* (2012), where it was listed that other employability attributes include verbal and written communication (basic skills), analytical and investigative abilities, entrepreneurship and managerial competencies, teamwork abilities, computer know-how, time management capabilities, as well as drive and flexibility. A combination of the different categories of skills is important for employability. In addition, the studies of Saad *et al.* (2013), Helyer and Lee (2014), and McMurray *et al.* (2016) also discovered that problem-solving, tool-handling competency, presentation skills, and team-working skills feature highly as important skills demanded of applicants by employers.

4.5 Result on the Roles of Professional Associations in the Development of Skills and Competencies for Built Environment Graduates in Construction Firms in Abuja, Nigeria

The MIS analysis results of the opinion of respondents on the most important roles of professional associations in the development of skills and competencies for built environment graduates in construction firms in Abuja are summarized in Table 9.

Table 9: Roles of Professional Associations

S/No.	Roles of professional associations	MIS	Rank	Interpretation
1	Using course accreditation processes to ensure that university programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach.	4.76	1 st	Very important
2	Explicitly identify employability skills in all university and polytechnic curriculum.	4.61	2 nd	Very important
3	To ensure that construction education continually satisfies the requirements of construction managers.	4.37	3 rd	Important
4	Developing professional skills both within and outside university studies.	4.16	4 th	Important
5	Making recommendations to the government and employers on issues that matter most for their professionals and profession.	3.88	5 th	Important
6	To explicitly report on employability skills demonstrated through Work Integrated Learning.	3.61	6 th	Important
7	To offer students self-assessment options for employability skills	3.58	7 th	Important
8	To enhance teaching and assessment of employability skills.	3.18	8 th	Fairly Important
9	To encourage more effective integration of employability skills in student e-portfolios.	2.53	9 th	Fairly Important
10	Improve and increase access to Work Integrated Learning (WIL).	2.52	10 th	Fairly Important
Average MIS		3.72		Important

Table 9 shows that the most important roles of professional associations in the development of skills and competencies of built environment graduates in construction firms in Abuja were “Using course accreditation processes to ensure that University programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach” (MIS = 4.76); and “Explicitly identifying employability skills in all university and polytechnic curriculum” (MIS = 4.61). Other roles of professional associations in the development of skills and competencies offered by a built environment profession Graduate were also important. These range from “Measures to ensure that construction education continually satisfies the requirements of construction managers” to “Offer students self-assessment options for employability skills” (MIS = 3.58). On the average, all the roles of professional associations in the development of skills and competencies offered by graduates of the built environment professions were important (average MIS = 3.72). In support of this finding, Jenny (2015) opined that professional bodies have established links with the workforce through their membership; generally, they also have credibility with relevant faculties or schools within universities. A very good example of this is the accreditation of building courses in Nigerian universities and polytechnics by Council of Registered Builders of Nigeria (CORBON).

4.6 Results on the Measures for Enhancing the Skills and Competencies of Built Environment Graduates in Construction Firms in Abuja, Nigeria

The result of the MIS analysis undertaken to rate the identified measures for enhancing the skills and competencies for built environment graduates in construction firms in Abuja is summarized in Table 10.

Table 10: Measures for Enhancing the Skills and Competencies of Built Environment Graduates in Construction Firms in Abuja

S/No	Measures	MIS	Rank	Interpretation
1	Curriculum must be relevant with industrial needs	4.90	1 st	Very effective
2	Graduates change their attitudes and personalities to be competitive	4.66	2 nd	Very effective
3	Government must be committed in assisting employability skills training programs and minimize unemployment	4.52	3 rd	
4	Employer involvement in training programs and education	4.17	4 th	Effective
5	Focus more on skills development	4.13	5 th	Effective
6	Industry must recognize training programs	4.02	6 th	Effective
7	Initiate appropriate training programs based on demands and needs	3.64	7 th	Effective
8	Apprenticeship Training	3.56	8 th	Effective
9	The use of Constructivist Model	3.02	9 th	Fairly Effective
10	Retaining the Aging Workforce	3.01	10 th	Fairly Effective
11	Training and Retraining the Skilled Workforce	2.83	11 th	Fairly Effective
12	Introduction of Robots	2.76	12 th	Fairly Effective
<i>Average MIS</i>		3.78		<i>Effective</i>

It was revealed from Table 10 that of the twelve (12) measures for enhancing the skills and competencies of built environment graduates in construction firms in Abuja, Curriculum must be relevant with industrial needs (MIS = 4.90); Graduates change their attitudes and personalities to be competitive (MIS = 4.66); and Government must be committed in assisting employability skills training (MIS = 4.52) were the most effective measures. On the average, all the identified measures for enhancing the skills and competencies of a graduate for effective career take-off in built environment professions in construction firms in Abuja, Nigeria were effective (average MIS = 3.76). In line with this finding, Ugwuja (2010) argues that the curriculum must be relevant to industrial needs and apprenticeship training as effective measures for enhancing the skills and competencies of a graduate for effective career take-off. Also, in support of the finding of this study and in the Nigerian context, Odesola and Idoro (2014) identified graduates' changing attitudes and personalities to be competitive, and the government must be committed to assisting employability skills training programs and minimizing unemployment as the most effective strategies for improving the skills and competencies for built environment graduates in construction firms in Abuja.

4.7 Summary of Findings

Based on the findings from the results of data analyses undertaken in this study, the following are the major findings:

- i. The study identified ten (10) drivers of the development of skills and competencies for built environment graduates in construction firms in Abuja of which individual resources (MIS = 4.85); labour market opportunities (MIS = 4.76); and labour market structure (MIS = 4.56) are the most significant drivers. The least significant drivers are of the development of skills and competencies are Dispositions (MIS = 2.95) and Demographics (MIS = 2.94). On the average, all the drivers for development of skills and competencies for built environment graduates in construction firms in Abuja are significant (average MIS = 3.91).
- ii. The study identified eight (8) barriers to the development of skills and competencies for built environment graduates in construction firms in Abuja out of which Financial difficulty (MIS = 4.85) and Rapid technology advancement (MIS = 4.61) are the most significant. The least significant barriers to the development of skills and competencies for built environment graduates are Poor educational system (MIS = 2.80) and Staff being new on the role. On the average, all the barriers to the development of skills and competencies for built environment graduates in construction firms in Abuja are significant (average MIS = 3.69).
- iii. The most significant level of skills and competencies of built environment graduates in construction firms in Abuja are Verbal and written communication (basic skills) (MIS = 4.80) and Entrepreneurship and managerial competencies (MIS = 4.71). The least significant level of skills and competencies is significant level of skills and competencies (MIS = 2.47). On the average, all the level of skills and competencies of built environment graduates in construction firms in Abuja are moderately significant (average MIS = 3.31).
- iv. The most important roles of professional associations in the development of skills and competencies of built environment graduates in construction firms in Abuja are: using course accreditation processes to ensure that University programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach (MIS = 4.76); and explicitly identifying employability skills in all university and polytechnic curriculum (MIS = 4.61). The least important roles of professional associations in the

development of skills and competencies of built environment graduates are to encourage more effective integration of employability skills in student e-portfolios (MIS = 2.53) and improve and increase access to WIL (2.52). On the average, all the roles of professional associations in the development of skills and competencies of built environment graduates are important (MIS = 3.72).

- v. The most effective measures for enhancing the skills and competencies of built environment graduates in construction firms in Abuja are Curriculum must be relevant with industrial needs (MIS = 4.90); Graduates need to change their attitudes and personalities to be competitive (MIS = 4.66); and Government must be committed to assisting with employability skills training programs and minimize unemployment (MIS = 4.52). The least effective measures for enhancing the skills and competencies of built environment graduates are Training and Retraining the Skilled Workforce (MIS = 2.83) and Introduction of Robots (MIS = 2.76). On the average all the measures for improving the skills and competencies of built environment graduates in construction firms in Abuja are effective (average MIS = 3.78).

5.0 CONCLUSION AND RECOMMENDATIONS

This study identified a problem of established discrepancies between the skills requirements of industries and the acquired skills of university graduates in the labour market from the employers of labour in the Nigerian construction industry. Consequentially, graduates are forced to accept inferior jobs so as to enter the job market. In view of this, the study assessed the critical factors influencing the skills and competencies expected of built environment graduates in construction firms in Abuja, Nigeria with a view to bridging the gap between academic knowledge and professional practice. Quantitative research was thus adopted with the use of questionnaire survey administered to 159 respondents at a response rate of 83.56%. Analysis of data was undertaken using frequency count, percentage and Mean Item Score (MIS). Findings from the analysis of data led to significant conclusions stated in this section.

The study found that the most important barrier to the development of skills and competencies for built environment graduates in construction firms is “Financial difficulty”. On average, all the identified barriers to the development of skills and competencies for built environment graduates in construction firms in Abuja are important. It was also revealed that the most significant driver for the development of skills and competencies for built environment graduates in construction firms is “Individual resources”. On the average, all the drivers for development of skills and competencies for built environment graduates in construction firms in Abuja are significant. In addition, the current level of skills and competencies offered by the graduates of built-environment professions in construction firms is moderately significant. Finally, it was shown that the most important role of professional associations in the development of skills and competencies of built environment graduates in construction firms is “Using course accreditation processes to ensure that University programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach”. On the average, all the roles of professional associations in the development of skills and competencies offered by graduates of the built environment professions were important. Finally, the most effective strategy for enhancing the skills and competencies of built environment graduates in construction firms in Abuja are Curriculum must

be relevant with industrial needs. On the average, all the strategies for enhancing the skills and competencies of built environment graduates in construction firms in Abuja are effective. It can therefore be concluded that the critical factors influencing the skills and competencies expected of built environment graduates in construction firms in Abuja are significant and capable of bridging the gap between academic knowledge and professional practice.

In view of the findings and conclusions of this study, it is recommended that more attention should be focused more to address the barriers of “Financial difficulty”; “Rapid technology advancement”; and “Inappropriate skills and inadequate training by academic institutions of higher learning and professional institutions”. This will assist in bridging the gap between academic knowledge and professional practice. It is also important for both academic institutions of higher learning and professional institutions to develop a framework that will enhance the inclusion of academic activities and professional practice in the educational curriculum applying the drivers identified in this study as a basis. Since it has been revealed that the current level of skills and competencies offered by the graduates of built-environment professions in construction firms in Abuja is moderately significant, major stakeholders should invest more to enhance the important roles of professional bodies, identified in this study, in ensuring that the gap between academic knowledge and professional practice in the graduates of built environment professions is adequately filled.

In the light of the limitations of time and financial constraints faced by this study, to key areas have been suggested for further research. Firstly, research should be conducted to assess the roles of relevant stakeholders in the development of skills and competencies offered by built environment graduates in construction firms in Nigeria. Secondly, the impact of activities of labour pressure groups on the development of skills and competencies offered by built environment graduates in construction firms in Nigeria should be looked into.

The study has made the following significant contributions to the body of knowledge:

- i. The study discovered that the drivers for development of skills and competencies for built environment graduates in construction firms in Abuja are significant and the most important drivers are individual resources; labour market opportunities; and labour market structure are the most significant drivers (MIS = 4.56 – 4.85).
- ii. The study also throws to light the fact that financial difficulty (MIS = 4.85) and Rapid technology advancement (MIS = 4.61) are the most significant barriers to the development of skills and competencies for built environment graduates in construction firms in Abuja.
- iii. It was also shown that Verbal and written communication (basic skills) (MIS = 4.80) and Entrepreneurship and managerial competencies (MIS = 4.71) are the most significant level of skills and competencies by built environment graduates in construction firms in Abuja.
- iv. The study also brought to the understanding of professional associations that their most important roles in the development of skills and competencies of built environment graduates in construction firms in Abuja are: using course accreditation processes to ensure that University programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach (MIS = 4.76); and explicitly identifying employability skills in all university and polytechnic curriculum (MIS = 4.61).
- v. The study also revealed to the academic institutions and the Government that the most effective strategies for improving the skills and competencies of built environment

graduates in construction firms in Abuja are Curriculum must be relevant with industrial needs (MIS = 4.90; Graduates need to change their attitudes and personalities to be competitive (MIS = 4.66); and Government must be committed to assisting with employability skills training programs and minimize unemployment (MIS = 4.52).

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APPENDIX

RESEARCH QUESTIONNAIRE COVER LETTER

Department of Quantity Surveying,
School of Environmental Technology,
Federal University of Technology,
P.M.B. 65, Minna, Niger State.

Date:

Dear Participant,

RESEACH QUESTIONNAIRE: Assessment of Skills and Competencies Offered by Built Environment Graduates.

My name is **UMAR, Aniefon Suleiman** a Master's Degree student of Quantity Surveying, Department of Quantity Surveying, School of Environmental Technology, Federal University of Technology Minna, Niger State. I am conducting research on *''Assessment of Skills and Competencies Offered by Built Environment Graduates in Construction firms in Abuja''*.

Your participation in filling the attached questionnaire will be crucial to the successful conclusion of this research. Please note that all information provided will be used for academic purposes only, and no personal identity information is required. Therefore, you do not need to include your name or telephone number in your response.

If you have questions or observations at any time about the survey or procedures, please make use of the contact information below:

Thank you very much for your support.

Name:	UMAR, Aniefon Suleiman	Dr. A. A. Shittu.
Position:	Researcher	Supervisor
Contact information:	+234- 080-3588- 0079	

QUESTIONNAIRE SURVEY

ASSESSMENT OF SKILLS AND COMPETENCIES OFFERED BY BUILT ENVIRONMENT GRADUATES IN CONSTRUCTION FIRMS IN ABUJA

Section A: Demographic information on respondents

Please provide information about the respondent as requested by selecting one of the options provided. Thank you.

A	Age of respondent	1	Less than 25 years	
		2	25 – 35 years	
		3	36 – 45 years	
		4	More than 45 years	
B	Gender of respondent	1	Female	
		2	Male	
C	Profession of respondent	1	Architect	
		2	Engineer	
		3	Quantity surveyors	
		4	Estate valuer	
		5	Land surveyors	
D	Education attainments	1	OND/NCE	
		2	HND/BSc	
		3	MSc	
		4	PhD	
E	Work experience of respondent	1	Less than 5 years	
		2	5 – 15 years	
		3	16 – 25 years	
		4	More than 25 years	

1. Kindly identified the type of skill a graduate (new entrant) of the built environment professional should possessed?

- i. Academic or Cognitive Skills (a) Yes (b) No (c) Not necessary
- ii. Generic or Specific Skills (a) Yes (b) No (c) Not necessary
- iii. Technical Skills (a) Yes (b) No (c) Not necessary
- iv. Soft-Skills (a) Yes (b) No (c) Not necessary
- v. Employability Skills(a) Yes (b) No (c) Not necessary

SECTION B: Barriers to the Development of Skills and Competencies offered by Built Environment Graduates in construction firms in Abuja

2. Kindly use this five-point scale to rate the barriers to the development of skills and competencies of built environment graduates: KEY: SE= Severe (5), SI= Significant (4), M = Moderate (3), MI= Minor (2) and IS = Insignificant (1)

	Barriers to the development of skills and competencies	5	4	3	2	1
		SE	SI	M	M	IS
1.	Demand for multi-skills approach					
2.	Demand for new skills					
3.	Lack of Educational Training					
4.	Rapid technology advancement					
5.	Inappropriate skills and inadequate training					
6.	Staff being new on the role					
7.	Poor educational system					
8.	Financial difficulty					

SECTION C: Drivers to the Development of Skills and Competencies offered by Built Environment graduates in construction firms in Abuja

3. Kindly use this five-point scale to rate the drivers to the development of skills and competencies offered by built environment graduates: KEY: SE= Severe (5), SI= Significant (4), M = Moderate (3), MI= Minor (2) and IS = Insignificant (1)

	Drivers to the development of skills and competencies	5	4	3	2	1
		SE	SI	M	M	IS
1.	Situational factors					
2.	Labour market structure					
3.	Labour market opportunities					
4.	Organisational factors					
5.	Individual resources					
6.	Knowledge and skills					
7.	Social capital					
8.	Attitudes					
9.	Demographics					
10.	Dispositions					

SECTION D: Current Level of Skills Offered by the Graduates of Built Environment Professions in the Nigerian construction industry

4. Kindly use this five-point scale to rate the current level of skills offered by graduates of built environment profession: KEY: SE= Severe (5), SI= Significant (4), M = Moderate (3), MI= Minor (2) and IS = Insignificant (1)

	Current level of skills offered by graduates of built environment profession	5	4	3	2	1
		SE	SI	M	M	IS
1.	Job readiness skill (related to job preparation process)					
2.	Teamwork and collaboration					
3.	Problem solving					
4.	Time management					
5.	Critical thinking skills					
6.	Decision-making					
7.	Verbal and written communication (basic skills)					
8.	Analytical and investigative abilities					
9.	Entrepreneurship and managerial competencies					
10.	Teamwork abilities					
11.	Computer know-hows					
12.	Time management capabilities					
13.	Drive and flexibility					
14.	Relevant employability skills					
15.	Classifications of degree					

16. Others -----

SECTION E: Most Important Roles of Professional Association in the Development of Skills and Competencies for Built Environment graduates in construction firms in Abuja

5. Kindly use this five-point scale to identify the most important roles of professional associations in the development of skills and competencies for built environment graduates: 5 (VI) = Very Important; 4 (I) = Important; 3 (FI) = Fairly Important; 2 (LI) = Less Important; 1 (LIS) =Least Important.

Most important roles of professional associations in the development of skills		5	4	3	2	1
		VI	I	FI	LI	LIS
1.	Explicitly identify employability skills in all university and polytechnic curriculum.					
2.	Improve and increase access to Work Integrated Learning (WIL).					
3.	To enhance teaching and assessment of employability skills.					
4.	To offer students self-assessment options for employability skills					
5.	To ensure that construction education continually satisfies the requirements of construction managers.					
6.	To explicitly report on employability skills demonstrated through Work Integrated Learning.					
7.	To encourage more effective integration of employability skills in student e-portfolios.					
8.	Making recommendations to the government and employers on issues that matter most for their professionals and profession.					
9.	Using course accreditation processes to ensure that university programme design focuses on the development of professionals rather than using a strictly curriculum-driven approach.					
10.	Developing professional skills both within and outside university studies.					

SECTION F: Measures for Enhancing the Skills and Competencies offered by Built Environment graduates

6. Kindly use this five-point scale to rank the measures for enhancing the skills and competencies offered by built environment graduates: 5 (VE) = Very Effective; 4 (E) = Effective; 3 (FE) = Fairly Effective; 2 (LE) = Less Effective; 1 (LSE) = Least Effective

	Measures for enhancing the skills and competencies	5	4	3	2	1
		VE	E	FE	LE	LSE
1.	Apprenticeship Training					
2.	The use of Constructivist Model					
3.	Retaining the Aging Workforce					
4.	Training and Retraining the Skilled Workforce					
5.	Introduction of Robots					
6.	Graduates change their attitudes and personalities to be competitive					
7.	Initiate appropriate training programs based on demands and needs					
8.	Focus more on skills development					
9.	Employer involvement in training programs and education					
10.	Industry must recognize training programs					
11.	Curriculum must be relevant with industrial Needs					
12.	Government must be committed in assisting employability skills training programs and minimize unemployment					

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