

# Evaluation of built environment programmes accreditation in the 21st century education system in Nigeria: stakeholders' perspective

Andrew Ebekozen

*Department of Construction Management and Quantity Surveying,  
University of Johannesburg, Johannesburg, South Africa;  
Department of Quantity Surveying, Auchi Polytechnic, Auchi, Nigeria and  
Development Planning and Management, School of Social Sciences,  
Universiti Sains Malaysia, Gelugor, Malaysia, and*

Clinton Aigbavboa

*Department of Construction Management and Quantity Surveying,  
University of Johannesburg, Johannesburg, South Africa*

## Abstract

**Purpose** – The built environment is a complex sector that demands coordination and cooperation of stakeholders. Construction projects from the complex sector require skills, services, and integration of major disciplines in the built environment. Sustainability of the major disciplines' standards regarding the appropriateness of the built environment tertiary education cannot be over-emphasised in Nigeria. Studies concerning Nigeria's built environment programmes accreditation (BEPA) in the 21st-century education system are scarce. Thus, the study investigated the relevance and perceived factors hindering Nigeria's BEPA in the 21st-century education system. Also, the study proffered measures to improve Nigerian built environment tertiary education accreditation ranking.

**Design/methodology/approach** – Data were sourced from elite virtual interviews across Nigeria. The interviewees were knowledgeable about Nigeria's built environment programmes accreditation, and many of them have been directly or indirectly involved. The investigators utilised a thematic analysis for the collated data and enhanced it with secondary sources.

**Findings** – The study revealed that several Nigerian academia in the built environment lack fame in research, publication, and citations due to barriers in their workplace. It has hindered their global institution's accreditation and ranking standards. Findings identified inadequate basic infrastructure, obsolete curricula, lack of research novelty, lack of higher education institutions funding, inadequate staffing and lax upskilling and reskilling, and unethical practices "systematic corruption" as major factors hindering BEPA. Also, findings proffered measures to improve Nigeria's BEPA global ranking.

**Research limitations/implications** – The study is limited to the perceived barriers and measures to improve BEPA in the 21st-century in Nigeria via semi-structured virtual interviews. Future study is needed to validate the findings as highlighted in the thematic network.

---

© Andrew Ebekozen and Clinton Aigbavboa. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licences/by/4.0/legalcode>

Special thanks to the participants for providing scholarly contributions to enhance the findings of this paper. Also, the authors appreciate the comments, suggestions, and recommendations provided by the anonymous reviewers, which collectively helped hone and strengthen the quality of this manuscript during the blind peer-review process.

**Funding:** This work was supported by Faculty of Engineering and the Built Environment and CIDB Centre of Excellence (05-35-061890), University of Johannesburg, South Africa.



**Practical implications** – The paper confirms that the BEPA requires innovative and multidisciplinary measures to improve the global ranking of these programmes and, by extension, the higher education institutions ranking globally. The paper would stir major stakeholders and advance the built environment programmes quality accreditation regarding international best practices and maintain the minimum standards.

**Originality/value** – The paper comprehensively analyses the perceived factors and proffered measures to improve Nigeria's BEPA in the 21st-century via a thematic network. The outcome intends to improve the global ranking and stir stakeholders to reposition and showcase Nigeria's built environment programmes to the world.

**Keywords** Accreditation, Built environment programmes (BEP), Nigeria, Stakeholders, Teaching

**Paper type** Research paper

## 1. Introduction

Quality and standard of higher education institution programmes have been gaining attention from stakeholders, especially the government and management of higher institutions. The higher education globalisation and employability of graduates have facilitated the need for skilled personnel by industry in the rapidly changing world (Fernandes and Singh, 2021). To ensure an academic standard and good quality in higher institutions, nations across the globe introduced accreditation exercises. The authors affirmed that the essence is to provide sound minimum academic quality assurance systems for programmes. Accrediting higher education programmes could bring increase sustainability and quality of modules/courses learning (Lejeune and Vas, 2009; Lejeune, 2011; Chang *et al.*, 2016; Lagrosen, 2017). Niemela *et al.* (2014) affirmed that an accreditation seal might increase the reputation of the programmes. The outcome will assist students' enrollment and enhance the graduate status for a better chance to secure a job. Thus, accreditation has become pertinent because the built environment programmes are crucial given the continuous investment in infrastructure and their role (Ebekozen *et al.*, 2021). Infrastructure could advance people's economic growth and national prosperity.

Exploring how the Nigerian built environment programmes are accredited to ensure that graduates are employable in the industry. For the built environment programmes accreditation (BEPA) to be successful, challenges need to be addressed. One of the study's motivations is to address the perceived factors and proffered measures to improve BEPA in the 21st-century education system. Insufficient funding, inefficient utilisation of scarce resources, inadequate skills to meet 21st-century industry, and weak strategic planning were identified as challenges (The Economist Intelligence Unit, 2019). Fernandes and Singh (2021) found faulty curriculum design and a high staff-student ratio contribute to low education quality. Higher education institution accreditation is a legitimacy-enhancing institution (Ahrens and Khalifa, 2015). Thus, higher education institutions choose to comply with the minimum standards of the regulatory agencies or professional bodies to claim accrediting agencies/bodies in their public communications. The emphasis on accreditation is on quality assurance and sustainability through standard bureaucratic mechanisms. Becerik-Gerber and Kensek (2010) opined that the 21st-century built environment industry demands that professionals be trained to apply multidisciplinary solutions to complex issues. In line with Manthe and Smallwood (2007), the study adopted architecture, civil engineering, construction management, project management, and quantity surveying as the built environment disciplines.

Regarding accreditation in Nigeria, a few studies such as Alani and Iusanya (2008), Asiyai (2015), Ademiluyi and Okwuanaso (2018), and Odia and Odia (2020) have been conducted but not regarding the BEPA. Programmes accreditation challenges with higher institutions are not peculiar with Nigeria's built environment programmes. The measures adopted globally to improve the global ranking accreditation include modularisation of course content (Eksteen, 1999) and compliance with institutional norms (Ahrens and Khalifa, 2015). Also used are a review of the construction education curriculum (Akinshipe and Aigbavboa, 2018), education for sustainable development (Mula *et al.*, 2017; Biasutti *et al.*, 2018; Fiselier *et al.*, 2018), digital transformational change (Underwood and Shelbourn, 2021),

and green infrastructure teaching in curricula (Frank *et al.*, 2021). Others are institutional values and ethics, industry-academia – research lab collaborations, improving international students' enrollment (Fernandes and Singh, 2021), and developing a framework to detect and prevent accreditation fraud (De Souza-Daw and Ross, 2021). Whether these measures have been considered by the Nigerian Government accreditation agencies and professional bodies for possible implementation is uncertain. If not, they are worth investigating so that the built environment graduates would align with the 21-st century industry needs and become more employable globally. Employability of the built environment graduates has been challenged, and many perceived outdated curricula as one of the major factors (Manthe and Smallwood, 2007; Ebekozen *et al.*, 2021).

The study intends to examine the relevance and perceived factors hindering BEPA in Nigeria's 21st-century education system in Nigeria. Also, the study proposed measures to improve BEPA in the 21st-century education system. The outcome intends to improve the global ranking and stir stakeholders to reposition and showcase the built environment programmes to the world. It is one of the motivations for the study. The investigators will fill the emerged theoretical gap through the following:

- (1) To evaluate the relevance of BEPA's in the 21st-century education system.
- (2) To investigate the perceived factors hindering BEPA in the 21st-century education system.
- (3) To proffer measures to improve Nigerian built environment tertiary education accreditation ranking and employable graduates.

## 2. Literature review

### 2.1 Built environment programmes accreditation (BEPA)

Academic programmes accreditation is a mechanism by supervisory agencies/bodies to ensure sustainable quality assurance and maintain minimum standards. Miles *et al.* (2015) avowed that higher education institution providers see accreditation as criteria for a credible and competitive quality educational institution. In Nigeria, the National Universities Commission (NUC) and the National Board for Technical Education (NBTE) are the two major regulatory agencies for the built environment programmes in higher education institutions. The NUC is the government regulatory agency to accredit universities (public and private) and academic programmes (Adeoti, 2015; Odia and Odia, 2020). This includes ensuring proper monitoring and sanction where necessary. For the NBTE, three types of accreditations are recognised. They have programme approval, initial accreditation, and re-accreditation exercise (Ademiluyi and Okwuanaso, 2018). The NUC and NBTE play their roles in combination with some selected professional regulatory bodies that evaluate and accredit the professional contents of the programmes. Examples are the Council of Registered Engineering in Nigeria (COREN), Quantity Surveyors Registration Board of Nigeria (QSRBN), Architects Registration Council of Nigeria (ARCON), among others within the built environment programmes. De Souza-Daw and Ross (2021) asserted that government and professional body regulators evaluate higher education institution provider policies through minimum standards and audit policies to ensure it is implemented. Hoare and Goad (2021) affirmed that the perception of accreditation as an opportunity for learning and improvement or a threat depends on the viewpoint of the evaluator and other factors. The major criteria employed to carry out the accreditation exercise include funding, library facilities, staffing, academic content, physical facilities, and employers' rating of programmes. For academic content, this includes vision and goal of the programme, standard of tests and examinations, academic

regulations, curriculum content, practical work project, etc. Staffing includes quality and quantity of teaching and non-teaching employees and development programmes.

Alani and Ilusanya (2008) affirmed that for any programme to be wholly accredited, it should score a minimum of 70% and also expected to score 70% in the core criteria (library, staffing, physical facilities, and academic content). To make accreditation competitive, regulatory agencies such as the NUC organise ranking of universities across the country (Odia and Odia, 2020). In 2021, the University of Ibadan was ranked first among 113 universities using 12 indicators. This includes the total number of full-time students, efficiency, contribution to knowledge economy, Google scholar index, students and staff ratio, and the number of international students. Others were all citation per capital, programmes with full-time accreditation, percentage of international staff, among others (Okere, 2021). But the performance of Nigerian universities globally is not encouraging, with one university (University of Ibadan) within the first 500 rankings and two universities (University of Lagos and Covenant University) within 501–600, according to Times Higher Education World University Rankings (2022) (Erezi, 2021). It is the most diverse university rankings to date with a table based on 13 calibrated performance indicators that measure an institution's performance across teaching (learning environment), research (volume, income, and reputation), citations (research influence), industry income (knowledge transfer), and international outlook (students, staff, research) (THE, 2021). It reveals that Nigerian universities are not doing well in the global ranking. Thus, the need to reposition and showcase the built environment programmes. This is one of the motivations for the study via BEPA and, by extension, to other programmes within Nigeria.

## 2.2 Factors hindering BEPA

Globally, challenges are facing academic programmes in higher institutions during accreditation exercises. These barriers have directly or indirectly contributed to education quality deterioration. The focus on accreditation has increased because of the demand from the industry regarding unemployable graduates being graduated from higher education institutions (Asiyai, 2015; The Economist Intelligence Unit, 2019). The built environment programmes in Nigerian higher institutions are not exempted. The latter author identified insufficient funding, lax institutional leadership, and inefficient utilisation of scarce resources as possible factors that can decrease the quality of education in higher institutions. Koch and Fisher (1998) found flawed curriculum design, high staff-student ratio, and many redundant programmes to weaken higher institution education quality.

Schomaker (2015) identified inadequate financial resources, over-populated students ratio, corruption leading to poor governance, among others, as possible shortcomings being suffered by higher education institutions in the Middle East and Egypt. These shortcomings are potential threats to education quality. Asiyai (2015) identified the quality of lecturers/instructors engaged in teaching higher institution students, insufficient infrastructure and instructional facilities, and anti-learning institution environment as possible hindrances to a fruitful accreditation. Insufficient integration within the curricula and high costs for intensive training of academic staff were found as hindrances to higher institution education (Maina, 2018). Hoare and Goad (2021) identified bureaucracy in higher education institutions and lack of inclusive governance as barriers in North America higher institutions. De Souza-Daw and Ross (2021) found fraud in higher education, including during programmes accreditation exercises. These factors could hinder accreditation programmes, including the built environment programmes. In Nigeria, Ekung *et al* (2019) and Odia and Odia (2020) found refusal of the accreditation bodies to prioritise sustainability elements as one of the root causes of the dearth of sustainable construction modules in built environment academic curricula.

### *2.3 Measures to improve BEPA in the 21st-century education system*

Higher institutions administrators work around the clock to ensure their institutions improve academic quality and accreditation. This includes ranking criteria for meeting world quality standards. This has become germane because of agitation that the skill of fresh graduates of higher institutions are unable to meet the industry's needs ([The Economist Intelligence Unit, 2019](#)). [Eksteen \(1999\)](#) identified mechanisms such as the modularisation of course content to promote mobility. The concept of green infrastructure teaching in curricula has gained more attention from mid-1990s to date in many developed countries ([Frank et al., 2021](#)). The authors argued that the inclusion in the built environment curricula would promote green infrastructure implementation, a component of construction sustainability. In [India, Fernandes and Singh \(2021\)](#) suggested ways to overcome hindrances and improve global ranking via teaching, learning, and curriculum designing, high-impact research and citations, and industry-academia – research lab collaborations. Others are institutional values and ethics, institutional quality assurance, and improving international students' enrollment.

### **3. Research method**

The research adopted a qualitative research design. This type of research design is rooted in interpretivism ([Chandra and Shang, 2019](#); [Jaafar et al., 2021](#)). The investigators utilised a phenomenological viewpoint. The concept "phenomenological" explains a phenomenon where a small group of people is interviewed ([Paley, 2016](#)). The study employed an elite semi-structured virtual interview method across the six Nigerian geo-political zones (South-South, South-West, South-East, North-West, North-Central, and North-East) to collect data from the interviewees. It aligns with [Schomaker \(2015\)](#), [Biasutti et al. \(2018\)](#), and [Blalock \(2020\)](#). [Schomaker \(2015\)](#) adopted a semi-structured interview approach to evaluate the current accreditation and quality assurance and measures to improve the quality of Egyptian higher education institutions. [Blalock \(2020\)](#) adopted interviews in a similar study investigating the role of accreditation in higher education institutions, emphasising the non-profit management system. The semi-structured interview allows fact-finding research ([Creswell and Creswell, 2018](#); [Ebekozien, 2020a, b](#); [Ibrahim et al., 2022](#)). Also, the study adopted a purposeful elite sampling method. This is supported by [Abdul-Azizi et al. \(2020\)](#), that adopted it for investigating issues connected with Malaysia's building surveying professional course. Apart from using the elite sampling approach to target prominent experts, the experts unravel the unseen issues and possible solutions to the research world's front-burner ([Tansey, 2007](#)).

The study used 40 participants, and saturation was achieved. They were academic staff, professional practitioners (quantity surveying, architecture, construction management, and civil engineering), higher institutions, government and professional regulatory agencies, and selected property developers, as presented in [Table 1](#). The experts have been engaged directly or indirectly in accreditation exercises. Each interview lasted approximately 45 minutes. The interviews were conducted between early September and December 2021. The study obscured the participants' identities and organisations. This aligned with the study's ethical policy. Before the main interview, the study sent an introductory letter to the interviewees who indicated an interest in participating. [Appendix](#) shows the covering letter and sample of the semi-structured interview questions.

The codes were generated manually via a thematic analysis. The researchers were the coders who narrated the participants' viewpoints regarding the phenomenon. It aligned with [Jaafar et al. \(2021\)](#). The authors utilised the same mechanism to develop the opening coding method for their work. The paper utilised two coding phases. It is in agreement with [Ebekozien and Aigbavboa \(2021\)](#). The first phase is called open coding ([Saldana, 2015](#)). The author avowed that categories are utilised to re-read the transcript and discover the major concepts in the second phase. Researcher reflexivity, triangulation, and member checking were used as the validity approaches ([Creswell and Creswell, 2018](#)). Also, the study adopted

Participant	Rank/Firm	Years of experience	Geopolitical zone/Location & participant code						Total
			SS	SW	SE	NW	NC	NE	
Built Environment Professionals in academics	Not below (NB) Lecturer 1 rank	NB 10 years	1-3	4-8	9-12	13-16	17-20	21	21
Built Environment Professionals in practice/ Professional bodies regulatory	Directors, Managing Partners, Partners	NB 25 years	22-23	24-25	26	27-28	29-30	-	9
Higher Institution	Academic planning unit/ division	NB 28 years	31	32	33	-	34	-	4
NUC/NBTE	NB Senior Staff	NB 15 years	-	-	-	-	35-36	-	2
Property Developers	Directors/ Operational Managers/ CEO, Managing Directors	NB 27 years	37	38	-	-	39-40	-	4
Cumulative per zone			7	9	6	6	11	1	40
Total									

**Note(s):** SS = South-South, SW = South-West, SE = South-East, NW = North-West, NC = North-Central, and NE = North-East

**Table 1.** Summary of interviewees' background

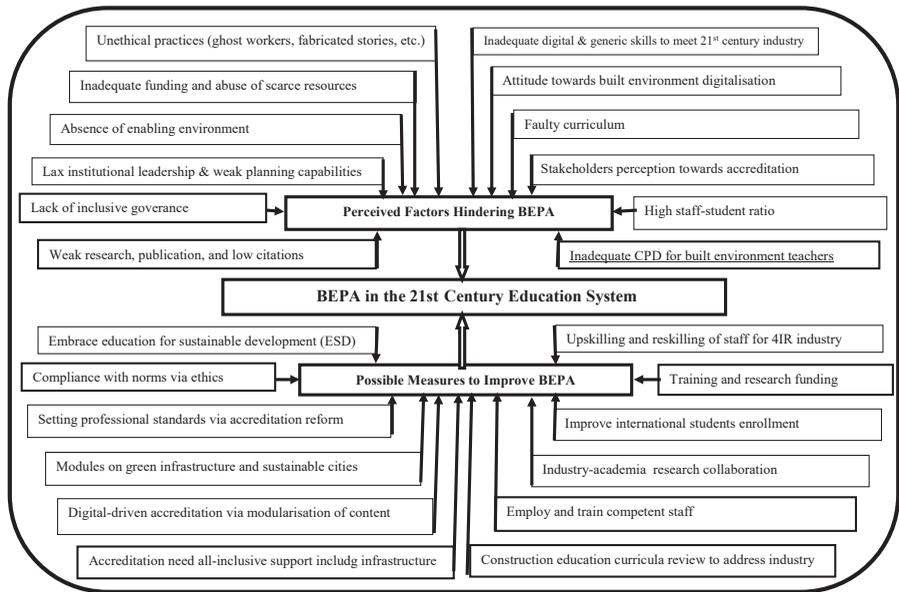
in vivo, themeing, and narrative techniques (Saldana, 2015). Sixty-five codes were generated and re-grouped into six categories. From the six categories, three themes emerged.

#### 4. Findings and discussion

This section presents the main findings and discussion of BEPA in the 21st-century education system in Nigeria. Figure 1 highlights the thematic network of perceived factors and possible measures to improve Nigerian built environment tertiary education accreditation ranking in the 21st-century education system. The paper's aim was achieved via three themes as follows:

##### 4.1 Theme one: relevance of BEPA's in the 21st-century education system

Examining the relevance of BEPA in the era of increasing unemployable graduates and skills gaps in the industry has become pertinent. The relevance of the built environment professionals in infrastructure development starts from the training phase in higher institutions. The participants across the board agree that for the built environment programmes to be more productive in the 21st century, the role of the BEPA cannot be over-emphasised. Findings agree with Niemela *et al.* (2014). It was found that the importance of accreditation was ranked first, followed by workload caused by the accreditation process. The third list was curriculum planning, among 16 management and teaching staff items. The significance is notably higher in both groups. The authors' first three items ranked were accreditation related-matters. Major findings across the six zones reveal that close monitoring and accreditation of higher education institution programmes will strengthen the standard and quality of the built environment programmes education system in the 21st-century. This outcome is in agreement with Alani and Ilusanya (2008). It was found that accreditation will enhance the quality of Nigeria's



**Figure 1.**  
Thematic network of  
BEPA in the 21st  
century education  
system

university education. Participant P7 says, “... if not for the last accreditation exercise in my department, the management of my institution was not willing to employ more qualified research-based teachers. If I have my way, accreditation should be conducted every two years. It may put some management of higher institutions on their feet to do the needful for an enabling environment to transfer knowledge and conduct research ...” The outcome may improve Nigerian-built environment tertiary education accreditation ranking in the 21st-century education system and other programmes in Nigeria’s universities.

Sustaining and upgrading the quality of the built environment education is pertinent in the 21st-century. Participants P3, P13, P20, P24, P33, P39 and P40 opines that the built environment sector is dynamic. Thus, the teaching and practice of the related profession in the built environment should be dynamic. P24 says, “... construction design and materials are changing every day to embrace green infrastructure and adapt to climate change. Recently, many of my colleagues’ designs are tailored towards sustainable construction material usage, if the client can afford them ...” Construction technology of the late 90’s and early 20’s is different from what is obtainable now. Accreditation is key to incorporating these technologies into the curricula; if not, higher institutions may produce ‘quantity graduates’ against ‘quality built environment graduates’ (Participants P4, P21, P30 and 38). Participant P38 says, “... the Nigerian higher institutions need to align with international best practices of renowned higher institutions abroad that tailored their built environment programmes towards education for sustainable development ...” This should be complemented by regular review and reform to address the needs of the industry (Participant P4). Findings agree with Fernandes and Singh (2021). The authors asserted that higher education globalisation and employability of graduates had facilitated the need for skilled personnel as demanded by the industry.

#### 4.2 Theme two: perceived factors

Theme two presents perceived factors hindering BEPA in the 21st-century world of education system. Findings across the board agree that the emerged factors would hinder the

quality and standard of higher education in built environment programmes. And by extension, it affects the accreditation process negatively if not checked. The top layer of [Figure 1](#) presents the summarised perceived factors. One of the significant points which emerge from this theme is that government regulatory agencies (NUC and NBTE) and professional regulatory bodies (QSRBN, ARCON, COREN, etc.), within the built environment are perceived as the major contributors to the low ranking of built environment programmes and by extension, higher education institutions across Nigeria. Findings show lax compliance and enforcement to the criteria, compared to renowned world higher education institutions accreditation exercise. Participant P11 says, “. . . *research, publication, citations, international grant attraction, among others, are requirements for evaluation but the internal criteria ‘water down this aspect.’ We have cases of senior colleagues, even some Professors, without one published work in Scopus indexed journal paper . . . yet the programme(s) secured full accreditation . . .*” This is supported by the findings of [Odia and Odia \(2020\)](#), and found refusal of the accreditation bodies to prioritise certain things during the exercise. “. . . *many of the public universities and polytechnics provide ‘quantity graduates’ against ‘quality and employable graduates.’ Yet, majority of the higher institutions and programmes involved in this mass production are fully accredited by government regulatory agencies and professional regulatory bodies. A country where there are skills gaps and large unemployed graduates . . . I challenge you to visit some of these public higher institutions during lecture hours and see for yourself, especially civil engineering and architecture programmes. It may enhance your reporting . . .*” said Participant P1. Results agree with [Schomaker \(2015\)](#). It was found that overcrowding of students is a threat to the quality of higher education. The low global ranking is one of the consequences.

Inadequate basic infrastructure, obsolete curricula, lack of research novelty, lack of funding of higher education institutions, inadequate staffing and lax upskilling and reskilling, and unethical practices ‘systematic corruption’ emerged as the major factors hindering BEPA. “. . . *we have issues with research and access to international grants. How many Nigerian built environment scholars can attract international research grants compared to their counterparts in Ghana, South Africa, Malaysia, etc.? I feel that regulatory agencies need to upgrade the criteria for accreditation. It should be in line with the global best practices if our higher education institutions want to be ranked within the first 200 institutions . . .*” argued Participant P12. Findings reveal that “accreditation scamming” is rampant during accreditation with few exemptions. The scamming includes unethical practices to secure full accreditation, fabricated stories, borrowed instruments/equipment, ghost workers, among others, in a systematic approach. Findings reveal that the accreditation team is usually pressured (directly or indirectly) by the host higher institution via many outlets to ensure the outcome is positive even when the minimum requirement is yet fulfilled (Participants P2, P5, P12, P13, P23 and P30). This might have enhanced the flexibility in meeting accrediting criteria. The outcome agrees with [McKee et al. \(2005\)](#) findings that criteria set by accrediting (regulatory) agencies may dilute programmatic innovation for such programmes. Participant P15 alleges that many of the accreditation exercises involved are not free from negotiated corrupt related and ethical issues. Findings reveal that many factors can influence the integrity of the accreditation team. This includes alumni association connection, political/social influence (especially in the state- or privately-owned university), tribal issues. This is supported by [De Souza-Daw and Ross \(2021\)](#) findings that found fraudulent practices at every part of any policy and procedure during accreditation procedures. Educational fraud, especially regarding accreditation, has caused more harm than good. Findings agree with [Jankur et al. \(2019\)](#), and it was found that fraud in higher education institution practices has affected the value of livelihoods. [Schomaker \(2015\)](#) also found that governance issues might occur because of unethical practices within the higher education institution system. The outcome of such is poor higher education programmes quality.

Academics' participants agree that funding and basic infrastructure to meet the minimum criteria for programmes accreditation is always a huge challenge for higher education administrators (Vice Chancellors/Rectors). Few privately owned higher education institutions have Google Education, Brightspace, Moodle, Blackboard, and others for learning management? Some of my colleagues do not know anything about distance learning communication software products such as Teams, Zoom, Skype, and Adobe Connect, to name a few. We attempted to start the e-lecture during the pandemic in late 2020/2021 but failed because of staff inexperience in digitalisation (Participant P7). The desperation to secure full accreditation has resulted in the fabrication of stories (ghost workers on sabbatical/study leaves), renting of equipment from other schools, etc. Participant P2 says, "... *inadequate funding, absence of basic infrastructure, and the desperation to ensure that programmes secure full accreditation has enhanced 'systematic accreditation corruption.'* As a member of the accreditation committee for a resource inspection in one of the newly approved universities a few years ago, we discovered that majority of the alleged employed staff by the host university were engaged for just three days for the exercise. A preliminary Google search revealed that many of the claimed published articles were not published as alleged. So, for me, I'm not surprised regarding global ranking ...". Regarding the absence of an enabling environment, academia and regulatory agencies participants agree that inadequate continued professional development for the built environment teachers may have hindered green infrastructure skills and promoted single professional body practice sessions. The need for an interactive approach cannot be over-emphasised (The [Green Surge](#), 2017).

Participant P6 says, "... *we cannot go far with Nigeria's current construction education curricula. If any, there are few higher institutions that emphasise green infrastructure supported with sustainable development construction within the built environment curricula. How do you expect us to make an impact in research when the world is already talking about 5th industrial revolution (IR) technologies in construction application? We are still asking questions about how the 4th IR operates ...*". Participant P4 says, "... *The issue is all-inclusive, and the government takes the larger part. We should look beyond accreditation and explore the underlying issue. What happens to the National Policy on Education (NPE)? Nomadic education has failed, and now some herders have become bandits. The failure of the higher education institutions has created joblessness with a high level of unemployable graduates. The accreditation exercise is a component of the systematic failure and should not be expected to perform magic. The outcome is abundant skills gaps with high unemployment ...*". Findings reveal that many academia see accreditation exercise as a 'jamboree or tourism event.' Participant P11 says, "... *how many higher institutions offering built environment programmes do you think can meet the minimum standards required to be approved? They are a few if any. The issue of student-staff-ratio is there, functional library and current textbooks are there, research platform issue is there, and the issue of physical facilities. There will always be default but tolerated by the team. Inadequacy in research may be why some old scholars in the system do not have one published article in Scopus indexed paper ...*". One of the outcomes is the low ranking of Nigerian higher institutions by world ranking agencies such as the Times Higher Education ([THE](#), 2021).

#### 4.3 Theme three: possible measures to improve BEPA

Theme three presents the proposed measures to improve Nigerian built environment tertiary education accreditation ranking in the 21st-century education system. Findings across the board agree that multi-disciplinary mechanisms through all-inclusive support are needed to improve the global ranking of Nigeria's built environment programmes in higher education institutions and, by extension, other academic programmes. The bottom layer of [Figure 1](#) presents the summarised proposed measures. Education for sustainable development (ESD), compliance with institutional norms through ethics, recruitment and digital training of staff, review of construction education curricula, available and accessible funding for genuine

research via industry-academia collaboration, and provision of basic infrastructure emerged across the board as the major proposed measures to improve the ranking of built environment programmes. Findings show that major stakeholders need to support the process for accreditation of academic programmes to succeed. This includes the teachers/instructors, government, professional bodies, and research sponsor organisations. Participants P7, P12, P15, P23, P33, P37, and P40 suggest setting professional standards via accreditation criteria reform to improve the ranking of higher education institutions across the country. The reform should capture the expectations from the teachers and students in line with the best global practices. This agrees with [Darling-Hammond et al. \(2019\)](#) and emphasised that standards-setting for teachers and teacher educators cannot be overstated. The authors stated that accreditation should be given the necessary attention. It is one of the mechanisms for quality-control for any profession, including the built environment professions.

Participant P20 says, “... *higher education providers need to provide the platform for industry-academia research collaboration to yield good research output. High-impact publications can be fruitful if innovative research is conducted. Citations and publications by researchers are critical components of the global ranking. These are components of the tools used for assessing intellectualism, research excellence, academic prowess, and impact in the 21st-century...*” Findings agree with [Fernandes and Singh \(2021\)](#). The author discovered that research collaboration between the industry and higher education institutions would inculcate in students/teachers the desired skills and knowledge to ensure employability/transfer knowledge. One of the outputs will be novelty research to generate quality publications and high-impact citations for teachers.

Regarding education for sustainable development (ESD), the participants across the board agree that the built environment curricula should be repositioned to meet the industry needs. Participant P35 says, “... *the curricula need drastic reform. The reform can be tailored towards digital upskilling and reskilling. It will prepare the students for digital and generic skills, and embrace 4IR technologies applications...*” Findings agree with [Biasutti et al. \(2018\)](#), and it was suggested that there should be a positive attitude towards meta-cognitive mechanisms and goal-oriented methods. It will enhance curriculum planning and stir the teachers to review their teaching mechanisms in the 21st-century. There will be a need to enhance professional development for the academic staff in collaboration with the industry-based ESD approach. The ESD is simply a new pedagogical viewpoint in higher education programmes focusing on interdisciplinary and students via digital skills, critical thinking, and future-oriented skills ([Biasutti and Frate, 2017](#); [Fiselier et al., 2018](#)). Also, curricula review needs to be driven towards rethinking course/module assessments and academic integrity to address the industry demands via digitalisation and supported with innovative research.

Globally, 21st-century accreditation requires 4th industrial revolution technologies and generic skills. These skills enhance the job performance to be more productive and should be integrated into the built environment curricula (Participants P3, P25, P29, and P32). Participant P29 says, “... *for new graduates to acquire these skills, such as analytical thinking and innovation, complex problem solving, active learning and learning strategies, among others, the students need to be taught how to apply them when necessary...*” Findings agree with [Kamaruzaman et al. \(2019\)](#), and it was found that 4IR skills are now associated with construction engineering disciplines. In addition to professional and generic skills, Participant P26 says, “... *non-government organisations on construction sustainability, climate change, and other related groups should lobby higher institutions regulatory bodies (NUC and NBTE) and professional institutions within the built environment professions. The lobby can yield the integration of green infrastructure and sustainable cities as compulsory modules/courses for built environment programmes...*” The outcome is in agreement with [Xing et al. \(2017\)](#). It was found that government policies play an important role in shaping green actions.

Regarding digital-driven accreditation, findings show that courses/modules taught in higher education institutions should integrate a level of relevant digital competencies. Participant P29 says, “... the higher education institutions regulatory agencies and professional bodies need to ensure that courses are digital-related as a component of their accreditation criteria ...” Concerning interactive mechanism, Participant P31 says, “... the interactive mechanism should be encouraged within the built environment programmes via a transformational change to facilitate the built environment evolving into the 21st century and the future. The outcome will yield non-threatening learning environments for inter-programmes and cumulate to interdisciplinary practice ...” Findings agree with Cook and Chatterjee (2015) and Lennon *et al.* (2016). This is also supported by the findings of Underwood and Shelbourn (2021) that the built environment continued success will demand an evolved reskilling/upskilling to create a digitally enabled process and collaborative behaviour within the professionals. Cook and Chatterjee (2015) recommended that the need for increasing interdisciplinary working in the built environment cannot be overstated. Lennon *et al.* (2016) found that interactive approaches such as interactive workshops would protect professional boundaries.

## 5. Contribution to theory and practice

This section presents the BEPA in the 21st-century world of education system contribution to theory and practice. Few related studies have been conducted about Nigeria’s accreditation. This includes Alani and Ilusanya (2008), Asiyai (2015), Ademiluyi and Okwuanaso (2018), and Odia and Odia (2020) but not regarding BEPA. Past studies’ findings were not well articulated regarding potential measures to improve the global ranking of Nigeria’s BEPA in the 21st-century education system. Also, the study investigated the perceived factors and proposed potential measures to improve Nigerian built environment tertiary education accreditation ranking in the 21st-century. It intends to improve the employability of the built environment graduates and meet the demands of the 21st-century industry.

The research established that BEPA in Nigeria had been confronted with many challenges. Thus, it might have contributed to the low global ranking of higher education institutions. The study revealed that accreditation requires all-inclusive support (infrastructure provision, research funding, compliance with institutional norms, etc.) and an interactive approach that is supported with industry-academia research collaboration. The collaboration will bridge the skill gaps and enhance the built environment graduates’ employability in the 21st-century industry. The emerging thematic network of the major findings, as shown in Figure 1, is part of the paper’s theoretical contributions. From a theoretical viewpoint, the study investigated the perceived factors and proffered potential measures to improve Nigerian built environment tertiary education accreditation ranking in the 21st-century. Theoretically, the paper’s outcome intends to improve the global ranking and stir stakeholders to reposition and showcase built environment programmes to the world. This is one of the motivations for the study. Also, concepts such as “education for sustainable development,” “ethics in accreditation,” “digital upskilling and reskilling to secure high ranking in global accreditation,” among others, are variables that emerged in Nigeria’s context and formed part of the study’s theoretical contribution.

Concerning the paper’s practical implication, the study confirms that Nigeria’s BEPA’s relevance in the 21st-century education system cannot be over-emphasised. It will improve the global ranking of built environment programmes and enhance the job opportunity of the graduates with a focus on the 21st-century industry’s needs. Embracing education for sustainable development and accreditation reform in line with global best practices will improve the quality of the built environment graduates and their employability in the industry. For the teachers, digital reskilling and upskilling in the 21st-century should be components of

the institutional norms and policy for higher education institution administrators in Nigeria. The paper intends to stir built environment higher education institution stakeholders, especially government and professional regulatory agencies, to upgrade their criteria for accreditation to global best practice before approving higher education institutions offering built environment programmes. Moreso, stakeholders should take advantage of the potential measures from this research to improve Nigerian built environment tertiary education accreditation ranking in the 21st-century. The paper may facilitate developing a unified minimum curricula framework to increase the world ranking of built environment programmes across higher education institutions. Other developing countries with a similar challenge of low world ranking may adopt measures suggested from this study and acclimate.

## 6. Limitations and areas for future study

The paper covered Nigeria with a good representation of the six geo-political zones. It was conducted via a virtual interview approach because of the pandemic guidelines to prevent the further spread of the virus. Forty participants indicated interest and were engaged with saturation evidence. The limited sample size does not harmfully impact the study's results. Thus, future study is required to validate the results. Also, a quantitative or mixed methods approach may be adopted for wider coverage in future research.

## 7. Conclusion and recommendations

This research provided evidence concerning BEPA's assessment in ranking, perceived factors, and proffered measures to improve Nigerian built environment tertiary education accreditation ranking. The findings show that the relevance of BEPA in the era of increasing unemployable graduates and skills gaps in the industry is pertinent. The poor evaluation has affected the programmes ranking globally. The paper identified 12 major perceived factors hindering BEPA in Nigeria. Measures were proposed from the major stakeholders' perspective to improve the global ranking of Nigeria's built environment programmes accreditation. This intends to reposition the built environment programmes and improve the employability of the graduates in the 21st-century industry. From the research, possible measures were suggested to improve BEPA in the 21st-century world of education system via the following major recommendations:

- (1) The paper recommends multidisciplinary mechanisms through all-inclusive support. This should include the provision of basic infrastructure and accessible funding for genuine research via industry-academia collaboration.
- (2) The study suggests that the built environment higher education institution stakeholders, especially government and professional regulatory agencies (i.e. NUC, NBTE, QSRBN, ARCON, COREN, etc.), should upgrade their criteria for accreditation to global best practice. They should ensure that requesting higher education institution meets the minimum requirements before approving.
- (3) Also, the paper recommends that the built environment programmes embrace education for sustainable development (ESD) and module/course on green infrastructure and sustainable cities via review of curricula. It should be supported with institutional norms and ethics in line with the best global practices.
- (4) The study suggests that future BEPA should be digital-driven, starting from the modularisation of course content. This approach would improve the digitalisation of the built environment and enhance the embracing of 4IR technologies in teaching and learning.

- (5) Also, apart from the proposed digitalisation of modules/courses in the built environment programmes, the study recommends that 21st-century old and new academia should be integrated via reskilling, upskilling, and digital training. The students should be integrated with skills such as goals achievement, mental flexibility, critical thinking, self-awareness, and self-management to match the demand of the 21st-century industry.

## References

- Abdul-Aziz, A.R., Suresh, S. and Renukappa, S. (2020), "The conundrum of professionalising building surveying in Malaysia", *International Journal of Building Pathology and Adaptation*, Vol. 38 No. 5, pp. 621-634.
- Ademiluyi, L.F. and Okwuanaso, S.I. (2018), "Influence of National Board for Technical Education accreditation on the quality of administration and leadership of polytechnic office technology and management programmes", *Nigerian Journal of Business Education (NIGJBED)*, Vol. 1 No. 2, pp. 387-396.
- Adeoti, E. (2015), "The role of the National Universities Commission (NUC) in the development of university education in Nigeria: reflections and projections", *Advances in Social Sciences Research Journal*, Vol. 2 No. 3, pp. 116-130.
- Ahrens, T. and Khalifa, R. (2015), "The impact of regulation on management control: compliance as a strategic response to institutional logics of university accreditation", *Qualitative Research in Accounting and Management*, Vol. 12 No. 2, pp. 106-126, doi: [10.1108/QRAM-04-2015-0041](https://doi.org/10.1108/QRAM-04-2015-0041).
- Akinshipe, O. and Aigbavboa, C. (2018), "Preparedness of built environment students on sustainability and green building issues: how are South Africa higher education institutions faring?", *Proceedings at Sustainability and Green Building Issues*, doi: [10.18744/CONF.2018031](https://doi.org/10.18744/CONF.2018031).
- Alani, A.R. and Ilusanya, G. (2008), "Accreditation outcomes, quality of and access to university education in Nigeria", *Quality Assurance in Education*, Vol. 16 No. 3, pp. 301-312, doi: [10.1108/09684880810886295](https://doi.org/10.1108/09684880810886295).
- Asiyai, R.I. (2015), "Improving quality higher education in Nigeria: the roles of stakeholders", *International Journal of Higher Education*, Vol. 4 No. 1, pp. 61-70.
- Becerik-Gerber, B. and Kensek, K. (2010), "Building information modeling in architecture, engineering, and construction: emerging research directions and trends", *Journal of Professional Issues in Engineering Education and Practice*, Vol. 136 No. 3, pp. 139-147.
- Biasutti, M. and Frate, S. (2017), "A validity and reliability study of the attitudes toward sustainable development scale", *Environmental Education Research*, Vol. 23 No. 2, pp. 214-230.
- Biasutti, M., Makrakis, V., Concina, E. and Frate, S. (2018), "Educating academic staff to reorient curricula in ESD", *International Journal of Sustainability in Higher Education*, Vol. 19 No. 1, pp. 179-196, doi: [10.1108/IJSHE-11-2016-0214](https://doi.org/10.1108/IJSHE-11-2016-0214).
- Blalock, E. (2020), "The role of accreditation in establishing academic legitimacy in graduate level non-profit management education", *Studies in Graduate and Postdoctoral Education*, Vol. 11 No. 1, pp. 1-16, doi: [10.1108/SGPE-04-2019-0044](https://doi.org/10.1108/SGPE-04-2019-0044).
- Chandra, Y. and Shang, L. (2019), *Qualitative Research Using R: A Systematic Approach*, Springer Nature Singapore Pte, Singapore.
- Chang, Y.S., Lin, K.J. and Tu, T.W. (2016), "The impact of AACSB accreditation on business school students in Taiwan", *The Asia-Pacific Education Researcher*, Vol. 25 No. 4, pp. 615-625.
- Cook, D. and Chatterjee, P. (2015), *Our Changing World: Let's Be Ready*, Academic Press, London.
- Creswell, W.J. and Creswell, D.J. (2018), *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th ed., Sage, London.
- Darling-Hammond, L., Wise, A.E. and Klein, S.P. (2019), *A License to Teach: Building a Profession for 21st-Century Schools*, Routledge, New York.

- De Souza-Daw, T. and Ross, R. (2021), "Fraud in higher education: a system for detection and prevention", *Journal of Engineering, Design and Technology*, Vol. ahead-of-print No. ahead-of-print, doi: [10.1108/JEDT-12-2020-0504](https://doi.org/10.1108/JEDT-12-2020-0504).
- Ebekezien, A. (2020a), "Corrupt acts in the Nigerian construction industry: is the ruling party fighting corruption?", *Journal of Contemporary African Studies*, Vol. 38 No. 3, pp. 348-365, doi: [10.1080/02589001.2020.1758304](https://doi.org/10.1080/02589001.2020.1758304).
- Ebekezien, A. (2020b), "A qualitative approach to investigate low-cost housing policy provision in Edo State, Nigeria", *International Planning Studies*, pp. 1-18, doi: [10.1080/13563475.2020.1779671](https://doi.org/10.1080/13563475.2020.1779671).
- Ebekezien, A. and Aigbavboa, C. (2021), "COVID-19 recovery for the Nigerian construction sites: the role of the fourth industrial revolution technologies", *Sustainable Cities and Society*, doi: [10.1016/j.scs.2021.102803](https://doi.org/10.1016/j.scs.2021.102803).
- Ebekezien, A., Aigbavboa, C., Thwala, W.D., Aigbedion, M. and Ogbaini, I.F. (2021), "An appraisal of generic skills for Nigerian built environment professionals in workplace: the unexplored approach", *Journal of Engineering, Design and Technology*, doi: [10.1108/JEDT-09-2021-0453](https://doi.org/10.1108/JEDT-09-2021-0453).
- Eksteen, B. (1999), "Construction management education for the 21st century: a South African perspective", in Hughes, W. (Ed.), *15th Annual ARCOM Conference, 15-17 September*, Liverpool John Moores University. Association of Researchers in Construction Management, Vol. 1, pp. 43-52.
- Ekung, S., Adewuyi, T. and Oтали, M. (2019), "Factors impeding the integration of sustainability elements in built environment academic curricula", *International Journal of Built Environment and Sustainability*, Vol. 6 No. 3, pp. 21-32.
- Erezi, D. (2021), "UI, UNILAG, covenant listed in world best university ranking", *The Guardian*, available at: <https://guardian.ng/news/ui-unilag-covenant-listed-in-world-best-university-ranking/#:~:text=Times%20Higher%20Education%20World%20University%20Rankings%20ranked%20the,University%2C%20Ota%2C%20Ogun%20State%20third%20position%20%28601-800%29%2C%20respectively>.
- Fernandes, O.J. and Singh, B. (2021), "Accreditation and ranking of higher education institutions (HEIs): review, observations and recommendations for the Indian higher education system", *The TQM Journal*, doi: [10.1108/TQM/04-2021-0115](https://doi.org/10.1108/TQM/04-2021-0115).
- Fiselier, E.S., Longhurst, J.W.S. and Gough, G.K. (2018), "Exploring the current position of ESD in UK higher education institutions", *International Journal of Sustainability in Higher Education*, Vol. 19 No. 2, pp. 393-412, doi: [10.1108/IJSHE-06-2017-0084](https://doi.org/10.1108/IJSHE-06-2017-0084).
- Frank, A., Flynn, A., Hacking, N. and Silver, C. (2021), "More than open space! The case for green infrastructure teaching in planning curricula", *Urban Planning*, Vol. 6 No. 1, pp. 63-74.
- Green Surge, The (2017), *Green Infrastructure and Urban Biodiversity for Sustainable Urban Development and the Green Economy (Final Project Report)*, CORDIS/Publications Office of the European Union, Luxembourg, available at: <https://cordis.europa.eu/project/id/603567/reporting>.
- Hoare, A. and Goad, P. (2021), "The quality continuum: perceptions of institutional accreditation", *Quality Assurance in Education*, doi: [10.1108/QAE-08-2021-0135](https://doi.org/10.1108/QAE-08-2021-0135).
- Ibrahim, F.S., Ebekezien, A., Khan, P., Aigbedion, M., Ogbaini, I.F. and Amadi, G. (2022), "Appraising fourth industrial revolution technologies' role in the construction sector: how prepared is the construction consultants?", *Facilities*. doi: [10.1108/F-09-2021-0086](https://doi.org/10.1108/F-09-2021-0086).
- Jaafar, M., Ebekezien, A. and Mohamad, D. (2021), "Community participation in environmental sustainability: a case study of proposed Penang Hill Biosphere Reserve, Malaysia", *Journal of Facilities Management*. doi: [10.1108/JEM-03-2021-0033](https://doi.org/10.1108/JEM-03-2021-0033).
- Jankur, N., Tafiya, S.D. and Danbab, A.S. (2019), "Corrupt practices: threat to quality education in Nigeria", *Journal of Social Sciences*, Vol. 5 No. 1, pp. 265-273.
- Kamaruzaman, F.M., Hamid, R., Mutalib, A.A. and Rasul, M.S. (2019), "Conceptual framework for the development of 4IR skills for engineering graduates", *Global Journal of Engineering Education*, Vol. 21 No. 1, pp. 54-61.

- Koch, J.V. and Fisher, J.L. (1998), "Higher education and total quality management", *Total Quality Management*, Vol. 9 No. 8, pp. 659-668, doi: [10.1080/0954412988136](https://doi.org/10.1080/0954412988136).
- Lagrosen, O.S. (2017), "Quality through accreditation", *International Journal of Quality and Services Sciences*, Vol. 9 Nos 3/4, pp. 469-483, doi: [10.1108/IJQSS-02-2017-0010](https://doi.org/10.1108/IJQSS-02-2017-0010).
- Lejeune, C. (2011), "Is continuous improvement through accreditation sustainable?", *Management Decision*, Vol. 49 No. 9, pp. 1535-1548, doi: [10.1108/00251741111173970](https://doi.org/10.1108/00251741111173970).
- Lejeune, C. and Vas, A. (2009), "Organisational culture and effectiveness in business schools: a test of the accreditation impact", *Journal of Management Development*, Vol. 28 No. 8, pp. 728-741, doi: [10.1108/02621710910985504](https://doi.org/10.1108/02621710910985504).
- Lennon, M., Scott, M., Collier, M. and Foley, K. (2016), "Developing green infrastructure 'thinking': devising and applying an interactive group-based methodology for practitioners", *Journal of Environmental Planning and Management*, Vol. 59 No. 5, pp. 843-865.
- Maina, J.J. (2018), "Barriers to effective use of CAD and BIM in architecture education in Nigeria", *International Journal of Built Environment and Sustainability*, Vol. 5 Nos. 3, pp. 12-20.
- Manthe, M. and Smallwood, J. (2007), "The appropriateness of built environment tertiary education: perspectives of academics and postgraduate students", *Journal of Engineering, Design and Technology*, Vol. 5 No. 2, pp. 102-119, doi: [10.1108/17260530710833167](https://doi.org/10.1108/17260530710833167).
- McKee, M.C., Mills, A.J. and Weatherbee, T. (2005), "Institutional field of dreams: exploring the AACSB and the new legitimacy of Canadian business schools", *Canadian Journal of Administrative Sciences*, Vol. 33 No. 4, pp. 1-5.
- Miles, M.P., McClure Franklin, G., Grimmer, M. and Heriot, K.C. (2015), "An exploratory study of the perceptions of AACSB international's 2013 accreditation standards", *Journal of International Education in Business*, Vol. 8 No. 1, pp. 2-17.
- Mula, I., Tilbury, D., Ryan, A., Mader, M., Dlouhá, J., Mader, C., Benayas, J., Dlouhý, J. and Alba, D. (2017), "Catalysing Change in Higher Education for Sustainable Development: a review of professional development initiatives for university educators", *International Journal of Sustainability in Higher Education*, Vol. 18 No. 5, pp. 798-820, doi: [10.1108/IJSHE-03-2017-0043](https://doi.org/10.1108/IJSHE-03-2017-0043).
- Niemela, H., Okkola, T., Nurkka, A., Kuisma, M. and Tuunila, R. (2014), "Is an accreditation seal worth the effort?" Observations of programme accreditations in Lappeenranta University of Technology, Finland", *Quality Assurance in Education*, Vol. 22 No. 3, pp. 226-239, doi: [10.1108/QAE-01-2013-0007](https://doi.org/10.1108/QAE-01-2013-0007).
- Odia, J.O. and Odia, A.A. (2020), "Accessibility to higher education in Nigeria: the pains, problems, and prospects", in *Accessibility and Diversity in Education: Breakthroughs in Research and Practice*, IGI Global, pp. 80-100.
- Okeke, C.C. (2021), "University of Ibadan emerges best university in NUC ranking", *Daily Trust*, available at: <https://dailytrust.com/university-of-ibadan-emerges-best-varsity-in-nuc-ranking>.
- Paley, J. (2016), *Phenomenology as Qualitative Research: A Critical Analysis of Meaning Attribution*, Routledge, Abingdon, Oxon.
- Saldana, J. (2015), *The Coding Manual for Qualitative Researchers*, 3rd revised ed., Sage, London, United Kingdom.
- Schomaker, R. (2015), "Accreditation and quality assurance in the Egyptian higher education system", *Quality Assurance in Education*, Vol. 23 No. 2, pp. 149-165, doi: [10.1108/QAE-08-2013-0034](https://doi.org/10.1108/QAE-08-2013-0034).
- Tansey, O. (2007), "Process tracing and elite interviewing: a case for non-probability sampling", *Political Science and Politics*, Vol. 40 No. 4, pp. 765-772.
- THE (2021), "World university ranking 2021", *Times Higher Education*, London, available at: <https://www.timeshighereducation.com/world-university-rankings/2021/world-ranking#!/page/0/length/25/sort>.
- The Economist Intelligence Unit (2019), "Worldwide educating for the future index 2019 from policy to practice", *The Economist*, available at: <https://educatingforthefuture.economist.com/the-worldwide-educating-for-the-future-index-2019/>.

Underwood, J. and Shelbourn, M. (2021), "Handbook of research on driving transformational change in the digital built environment", *Advances in Civil and Industrial Engineering (ACIE)*, Vol. 146 No. 87, pp. 136-100.

Xing, Y., Jones, P. and Donnison, I. (2017), "Characterisation of nature-based solutions for the built environment", *Sustainability*, Vol. 9 No. 1, pp. 149-160.

## Appendix

Dear Participant.

### Request for Short Virtual Interview

The built environment is a complex sector that demands coordination and co-operation of stakeholders. Construction projects from the complex sector require skills, services, and integration of major disciplines in the built environment. Sustainability of the major disciplines' standards regarding the appropriateness of the built environment tertiary education cannot be over-emphasised in Nigeria. Studies concerning Nigeria's built environment programmes accreditation (BEPA) in the 21st-century education system are scarce. Thus, the paper's title is **Evaluation of Built Environment Programmes Accreditation in the 21st Century Education System in Nigeria: Stakeholders' Perspective**. Specifically, the researchers' will achieve the stated aim through the following:

- (1) To evaluate the relevance of BEPA's in the 21st-century education system.
- (2) To investigate the perceived factors hindering BEPA in the 21st-century education system.
- (3) To proffer measures to improve Nigerian built environment tertiary education accreditation ranking and employable graduates.

Kindly note that the virtual interview questions will be within the stated objectives. Responses provided by you will be collated and analysed together with that of other interviewees. It will make up the value and contribution to achieving the success of this work. Information provided will be treated with the greatest secrecy.

Hence, your valuable time and other answers to the questions will be highly cherished.

With regards.

Yours faithfully.

(Research Coordinator)

### Basic questions for the participants

- (1) Please, for record purposes, what is your organisation's name and state located?
- (2) Please, what is your position in the organisation?
- (3) Can you tell us your years of work experience?
- (4) Please, are you knowledgeable regarding built environment programmes accreditation (BEPA) and the expectation in the 21st century?
- (5) If yes to question 4, from your perception, how can you describe the relevance of BEPA to the built environment sector?
- (6) As a stakeholder in the built environment sector, how can you evaluate the current BEPA across higher education institutions in Nigeria?
- (7) Do you think there are perceived factors hindering BEPA in the 21st-century education system?
- (8) If yes to question 7, what are the possible barriers?
- (9) If no to Question 7, why do you think so?

- (10) What is your take regarding the criteria for accreditation in Nigeria's built environment programmes compared to developed countries with high global ranking?
- (11) Do you think the government and professional regulatory agencies in charge of accreditation have compromised regarding standards?
- (12) If yes to Question 11, how?
- (13) If no to Question 11, why the poor global ranking?
- (14) Please, what role can key stakeholders (government, professional bodies, government accreditation bodies, higher institutions, and the industry) play to improve Nigerian built environment tertiary education accreditation ranking?

#### **About the authors**

Dr Andrew Ebekoziem is a Senior Research Associate/Post-Doctoral Research Fellow in the Department of Construction Management and Quantity Surveying, University of Johannesburg, Johannesburg, South Africa. He is the author/co-author of many peer-reviewed journal articles. Andrew Ebekoziem is the corresponding author and can be contacted at: [ebekoandy45@yahoo.com](mailto:ebekoandy45@yahoo.com)

Prof. Clinton Aigbavboa is a Professor in the Department of Construction Management and Quantity Surveying, University of Johannesburg, Johannesburg, South Africa. He is the author/co-author of many peer-reviewed journal articles.