

## Accreditation of Engineering Technology Programmes in the Nigerian Polytechnics and similar tertiary Institutions

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### ABSTRACT

This paper examines the current state of accreditation of engineering technology programmes in the tertiary Technical and Vocational Education and Training (TVET) institutions in Nigeria and also proffers a new direction to perform accreditation process in the future. The study found that both public and private Polytechnics and similar tertiary institutions are offering a total of fifty four (54) engineering technology programmes. It was also found that National Diploma in Electrical/Electronic Engineering Technology was the most preferred programme offered by the Polytechnics in Nigeria. It is suggested that private institutions in Nigeria should be supported by individuals, communities, associations, government agencies and all stakeholders in the TVET sector in order to offer diversified and more engineering technology programmes so as to produce middle and high levels skilled manpower for the Nigerian economy. This will forestall turn out of monolithic block of professionals in Electrical/Electronic Engineering Technology and encourage rather homogenous training of skilled manpower in the Polytechnics for Nigeria's heterogeneous economy

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## **INTRODUCTION**

Accreditation involves external evaluation and review of the quality of programmes and/or institutions with the aim of protecting the public interest (Obadara & Alaka, 2013; Anugom, 2016). In Nigeria, accreditation is carried out by governmental agencies legally empowered for this mandate. The Nigerian accreditation scheme is decentralized to cover all the post-secondary or tertiary education Institutions such as Universities, Polytechnics, Monotechnics, Specialized and Enterprise Institutions. These institutions are owned by either different tiers of government or private entities. There are three key government agencies involved in the accreditation of programmes among the tertiary institutions in Nigeria. These are: National Universities Commission (NUC); National Commission for Colleges of Education (NCCE); and National Board for Technical Education (NBTE). While NUC oversees the activities of Universities and degree awarding Institutions in Nigeria, NCCE supervises Colleges of Education in Nigeria and NBTE mainly regulates all Technical and Vocational Education and Training (TVET) Institutions outside Universities that train and produce middle level and skilled technical manpower (Ukala & Ohia, 2018). For more than four decades, NBTE has been evaluating increasing number of programmes in diverse disciplines and specialties such as agricultural technology, health technology, engineering technology, environmental design and technology, management sciences, financial management, applied arts, applied and pure sciences among others.

Accreditation in Nigeria is regarded to be a reliable and trustworthy regulator of the quality of the administration of institution and its programmes. It is the primary means by which students and the public are aware and assured of good quality (Ogunode & Adah, 2022). Accreditation compares the quality of a programme offered in an Institution with the approved or established standards. Thus, accreditation needs to be guided by rules, regulations and accepted quality assurance indices (Falade, 2009). Accredited status when granted to a programme or an Institution eliminates any suspicion about the authenticity or genuineness of the Institution. It shows that at least the minimum standards have been met by the institution and there is evidence of adequacy of resources to run the programmes it offers. Public Polytechnics in Nigeria who have been granted accreditation have access to tertiary education fund (TETFund), while both private and public institutions benefit from diverse supports from other agencies or philanthropists. In addition, students attending institutions with accredited programmes are considered for State Government bursaries and other scholarship awards by foundations and endowments.

Furthermore, accreditation is very helpful to Nigerian students who wished to study outside the country. They enjoy and have opportunities to further their studies at foreign Institutions. The credits they have earned can be transferred either to a local or foreign Institution (Gerber, Sinha, Van Der Merwe & Kam, 2012). It is one of the important criteria that foreign institutions or qualification evaluation agencies consider before processing admission related requests from Nigerian students. Accreditation status of an Institution and its programmes are important to the employers when selecting prospective

employees to work in their organisations. In addition, they are also concerned about supporting or sponsoring their staff to pursue further studies in only accredited Institutions.

Several studies on accreditation visits to Universities in Nigeria are widely discussed in this literature. For instance, Agboola and Elinwa (2013) analysed enrollments into engineering and architectural programmes and the impact on accreditation of these programmes. The study found that most public universities in Nigeria enrolled beyond their carrying capacities which are generating serious concerns about the quality of programmes offered by these Institutions. Ozurumba and Ebuara (2014) examined the relationship between accreditation and curriculum contents, minimum academic standards, assurance of community that graduates are employable and quality improvement of programme of studies among five Nigerian Universities. It was shown that accreditation of universities has contributed to the quality of programmes in these Institutions and improved their rankings as well. Mmeka and Nwogu (2014) studied the instruments and procedures for accreditation of academic programmes in the Nigerian Universities. The study found that the respondents were aware of the quality assurance instruments developed by NUC for accreditation and continuation of the established procedures for NUC accreditation would solve future issues or disagreement with the outcome of accreditation visits by concerned Institutions.

Anugom (2016) investigated the correlation between the programme accreditation and level of funding, physical facilities and staffing of Nigerian universities. The study concludes that there are significant relationship between the dependent variables and programme accreditation. The study advised NUC to engage independent agencies to monitor accreditation teams to avoid bias and nepotism. Ukala and Ohia (2018) conducted a study among staff of public Universities in Rivers State, Nigeria. The result of the research study showed that accreditation exercise impacted moderately on curriculum harmonization, provision of staff offices, libraries and institutional environment but has minimal impact on the provision of laboratory and workshop equipment. The study further identified poor funding, lack of institutional database and commitment by Proprietors of Universities in Rivers States as challenges of accreditation exercises. Falade (2009) considered the accreditation of engineering programmes in the Nigerian Universities undertaken by NUC and COREN. He further outlined the three different levels of quality assurance for engineering programmes in Nigerian Universities. These are internal quality assurance by the senior faculty members and external examiners; NUC accreditation; and COREN accreditation. In a study by Ogunode and Samuel (2022), the challenges that confront accreditation of programmes in the Nigerian public Universities were discussed. Among these challenges are inadequate funding, shortage of infrastructural facilities, corruption, insecurity, inadequate academic staff and poor preparation for accreditation visits. The authors suggested adequate funding of public institutions to prepare sufficiently for programme accreditation.

From the foregoing it is obvious that little or no study has been done on accreditation in other segments of higher education in Nigeria. This paper thus analyses the accreditation process of engineering technology programmes in Nigeria leading to award of National Diploma (ND) and Higher National Diploma (HND) qualifications to diplomates to practice as Technicians and Technologists in their various engineering disciplines, respectively. The criteria for accreditation of engineering technology programmes are discussed in the study. The importance of joint accreditation of engineering technology programmes by Council for the Regulation of Engineering in Nigeria (COREN) and NBTE are highlighted. The various engineering technology programmes currently offered by the Nigerian Polytechnics and other tertiary TVET institutions were identified. Finally, the need to apply web-based accreditation system as future alternative to the manual accreditation which is prone to errors and delay was proposed. This is a future direction to perform accreditation of programmes by the regulatory bodies. It is expected that this study would be helpful to all the stakeholders in the Polytechnics and Technological institutions to establish and nurture more engineering technology programmes.

## **ACCREDITATION OF ENGINEERING TECHNOLOGY PROGRAMMES IN NIGERIA**

### **NBTE as the accreditation agency**

National Board for Technical Education (NBTE) is a public (government-owned) organisation, established in 1977 to advise Federal Government on national policies for the training of middle-level and skilled manpower in Nigeria as well as coordination of these policies. Its main responsibility is to coordinate all aspects of technical and vocational training and education (TVET) falling outside university education in Nigeria. All activities of the Board are coordinated from its Headquarters Secretariat Complex located at Plot B, Bida Road, Kaduna Nigeria. NBTE also has a liaison office at Abuja and a Centre of Excellence for TVET at Ungwar-Rimi, Kaduna to support other important administrative and regulatory functions of the Board. It also has a zonal office in each of the six geo-political zones of the country to provide effective services regarding the mandates of the Board to individuals, groups, organisations or institutions irrespective of their locations in Nigeria and promote skills development at the grass-root level.

### **Structure of Engineering Technology programmes in Nigeria**

The engineering technology programmes offered in the Nigerian Polytechnics and other TVET Institutions are in two-tiers, namely National Diploma (ND) and Higher National Diploma (HND). The National Diploma (ND) programmes are aimed at producing technicians with adequate knowledge and skills for entry into lifelong career in the industry, academic institutions and public service. After completion of the programmes, the diplomates should have attitudes, skills and knowledge to be self-employed, gain employment or undertake further studies leading to higher qualifications. The minimum duration of the full time ND programmes is four semesters (two academic sessions) while part-time ND programmes is six semesters (three

academic sessions) in order to have sufficient time to adequately cover the practical components of the programme. A distinct curriculum is required to train students to earn ND qualifications after the completion of the programmes. The minimum entry requirements for all engineering technology programmes at ND level include: Unified Tertiary Matriculation Examinations (UTME) results and Senior Secondary School Certificate (SSCE) or its equivalent with at least credit passes in five subjects at not more than two sittings. These subjects include Mathematics, English Language, Physics, Chemistry and one other relevant subject (National Board for Technical Education, 2021).

Furthermore, HND engineering technology programmes are designed to produce Technologists with technical skills to perform supervisory and managerial roles in public or private organisations. The programmes equip students with attitude, knowledge and skills that will enable them to work with engineers, technicians and craftsmen to handle engineering projects, practice their professions and undertake post-graduate studies. The minimum duration of full time HND programmes is four semesters (two academic sessions) while part-time HND programme is six semesters (three academic sessions). The part-time HND programme also allows matured candidates to further their studies. Graduates of part-time HND programmes are excluded from the compulsory National Youth Service Scheme (NYSC) in Nigeria irrespective of their age. A separate curriculum is required to train students to earn the HND qualifications. The minimum entry requirements for all engineering technology programmes at HND level is a minimum of ND in the same programme or related engineering technology programme subject to NBTE recommendations or approval, one year post-ND industrial training (or two years for a pass grade) and the minimum of five credit passes in relevant subjects as recommended for the corresponding ND programmes (National Board for Technical Education, 2021).

### **Accreditation process**

Institutions seeking accreditation for their approved engineering technology programme(s) are expected to take some necessary and important steps as specified by NBTE. Each of these steps is highlighted below:

- i. Completion of self-study questionnaires. This is the first step to be undertaken by the Department offering the programme(s) to be accredited. NBTE self-study questionnaires for accreditation has thirteen (13) sections (National Board for Education, 2013). The document contains such information as: general information about the Institution offering the programme, general information about the Department and programme to be accredited, history of the Department offering the programme, methodology for administering the activities of staff and students of the Department, general academic matters (such as programme goal and objectives, curriculum, admission, academic regulations, standard and quality of students' works, practical and project work, external moderator

reports), appraisal of the of all the resources for teaching the programme(s) (such as classrooms, laboratories, workshops, field facilities, library, studios and other training facilities), staffing (including core teaching, service, technical and administrative staff in the Department), Headship of the Department, and funding (both capital and recurrent)

- ii. The completed self-study questionnaires would be submitted to NBTE for evaluation before the next step is carried out.
- iii. Composition of the visitation team: A team would be constituted by NBTE for the engineering technology programme to be accredited. Experienced and qualified experts or scholars are drawn from the academic Institutions, relevant professional regulatory body and industry while at least one staff of NBTE is included in the team to serve as the coordinator. The representative of the professional body is by default the Chairman of the team. The head of Engineering Technology Division in NBTE serves as the leader for the accreditation team. After the team is constituted, the total cost of the visit is communicated to the Institution for payment to NBTE within a period of six (6) months.
- iv. On-site visit to the Institution: Team members are invited by NBTE to visit the Institution for the purpose of accrediting of the engineering technology programmes. The Board trusts the team to be fair, honest and professional in the discharge of this national assignment. The team members are usually peers of the teaching staff of the department being visited. The team is required to evaluate each programme based on the guidelines and minimum academic standards maintained by NBTE and to generate valid, reliable, current and sufficient evidences to guide their final recommendations.
- v. The self-study questionnaires would be provided to the team as soon as they arrive at the Institution. The visits are normally held for five days. The first day is for arrival of team members while the last day is for their departure from the Institution. The three days in between are for team members to hold plenary session, courtesy visit, facility tour, interactive sessions, evaluation of students' activities, group meetings and discussion, report writing and production, and exit interview or briefing. After the exit briefing, the evaluation report for each programme is submitted to the Management of the Institution for comments or response not later than two (2) weeks after the visit;
- vi. Decisions by NBTE: The team is expected to make recommendations to NBTE based on the contents of its report. The final recommendations should state whether the programme should be granted accreditation for five (5) years, granted interim accreditation for one (1) year or denied accreditation due to serious deficiencies bothering on absence of key physical facilities, staff members, and entrepreneurship/skills development centre. The final decisions of

the NBTE regarding the engineering technology programmes visited for accreditation are communicated to the Institution if there are no adverse comments or protest on the accreditation reports by the Institutions.

### **Criteria for Accreditation of engineering technology programmes**

The criteria for accrediting engineering technology programmes have been developed, reviewed and printed in the Programme Evaluation Form (National Board for Technical Education, 2022). Figure 1 shows the sections and various sub-sections of the Evaluation Form. The form is sectionalized into seven (7) broad headings, namely: academic matters; physical facilities; staffing; entrepreneurship development; funding; summary and recommendation. The first five sections consist of the criteria that are assessed by the team members during accreditation visits. The sixth section summarizes the strengths and weaknesses of the programme, while the last section is for the team to recommend to NBTE on the accreditation status to be given to the programme.

The criteria in the Programme Evaluation Form are briefly presented in Figure 1.

#### ***Academic matters***

- i. Goal and objectives of programme: The team examines the statements of the knowledge, skills and type of manpower to be produced by the programme and what they should be able to perform after graduation.
- ii. Programme Curriculum: The team assesses the conformity of the totality of experience, training and education given to the students by the Institution to be able practice their chosen disciplines with the NBTE minimum guide curriculum.
- iii. Admissions into programmes: The team determines the compliance of the Institution to the minimum entry requirements as stipulated by NBTE and quality of students at the point of admission.
- iv. Academic regulations: The team evaluates documents stating general information and rules regulating students' activities and behaviour on campus.
- v. Standard of tests and examinations with marking scheme: The team determines the quality of question papers based on the curriculum, marking guides and grading of answer scripts.
- vi. Interview with students: The team interacts with the students to determine the level of their understanding of the programme, learning environment and relationship with their lecturers and other fellow students.
- vii. Success/failure rate: The team computes the percentage of the students who have passed or failed each course in the programme.
- viii. Practical coverage and quality of reporting: The team examines the practical works carried out by the Department compared to the

- practical contents of the curriculum, assesses the practical manuals and adequacy of practical reports written by the students.
- ix. Projects: The team evaluates the quality of final year projects carried out by individual student or group of students,
  - x. Grading of practical/projects: The team determines the assessment or grading of the students' practical and projects by the staff in the Department.
  - xi. External moderation scheme: The team checks the quality control/assessment reports of the examinations and students' projects in the Department by experienced and qualified external examiners.
  - xii. Employers rating of diplomates: The team evaluates the feedback obtained from the diverse employers of the past diplomates of the engineering technology programme on the job or assessment of industry-based supervisors of the students on industrial attachment programme.

### ***Physical facilities***

- i) Classrooms and Lecture Theatres/Halls: The team observes and reports on the quality of space, furnishing, maintenance and use factor of the classrooms.
- ii) Studios/Drawing Rooms: The team inspects and determines the adequacy of space, furnishing, drawing instruments and use factor of the drawing studio.
- iii) Laboratories: The team inspects and evaluates the adequacy of space, quality and quantities of equipment, furnishing, utility services and use factor of the required laboratories.
- iv) Workshops/Field Facilities: The team inspects and assesses the adequacy of spaces, quality and quantities of equipment, furnishing, utility services and use factor of the required workshops as well as outdoor or field facilities.
- v) Office accommodations: The team inspects and reports on the availability and number, furnishing and utility conditions of the office accommodations for the staff of the Department.
- vi) Library: The team assessed the quality and quantities of printed materials, e-resources and utility services in the main library.

### ***Staffing***

- i. Core Lecturers and Instructors: The team assesses the number, quality and disposition of the existing core teaching staff with a minimum of first degree or HND in relevant disciplines.
- ii. Service Lecturers and instructors: The team checks and ascertains the quality of the teaching staff from relevant academic departments.
- iii. Technologists and Technicians: The team evaluates the number and quality of the technical staff with relevant engineering qualifications to man the laboratories and workshops and other relevant training facilities.

- iv. Administrative staff: The team examines the number and quality of the existing non-academic staff providing secretarial and clerical services in the Department.
- v. Administration of Department: The team evaluates the academic and professional qualifications, rank, leadership abilities and competencies of the Head of Department.
- vi. Staff development: The team assesses the degree of support given to the staff to attend relevant courses, conferences, workshops, postgraduate studies and industrial training.

#### ***Entrepreneurship Development***

- i. Entrepreneurship Centre: The team assesses the adequacy of training rooms, offices, display rooms and utilities services in the entrepreneurship development centre.
- ii. Entrepreneurship Curriculum: The team examines the curriculum and training manuals implemented at the entrepreneurship development centre by facilitators or master trainers.
- iii. Entrepreneurship Projects: The team evaluates the quality of projects carried out by the students at the entrepreneurship development centre as well as their marketability and reporting of the students' projects.

#### ***Funding***

Funding for consumables and imprest: The team evaluates the regularity of staff salaries, imprest, funding for training consumables and other expenses outside capital funding. This is critically evaluated during accreditation of institutions or Institutional administration by NBTE.

#### ***Financing Accreditation Visits***

In Nigeria, accreditation exercises are not voluntary services unlike other countries (Eaton, 2015). They are regarded as national assignments. Team members are fairly and reasonably compensated at Government approved rates. The cost implications of accreditation visits for engineering technology programmes in Nigeria were formerly shared between the host Institutions and NBTE.

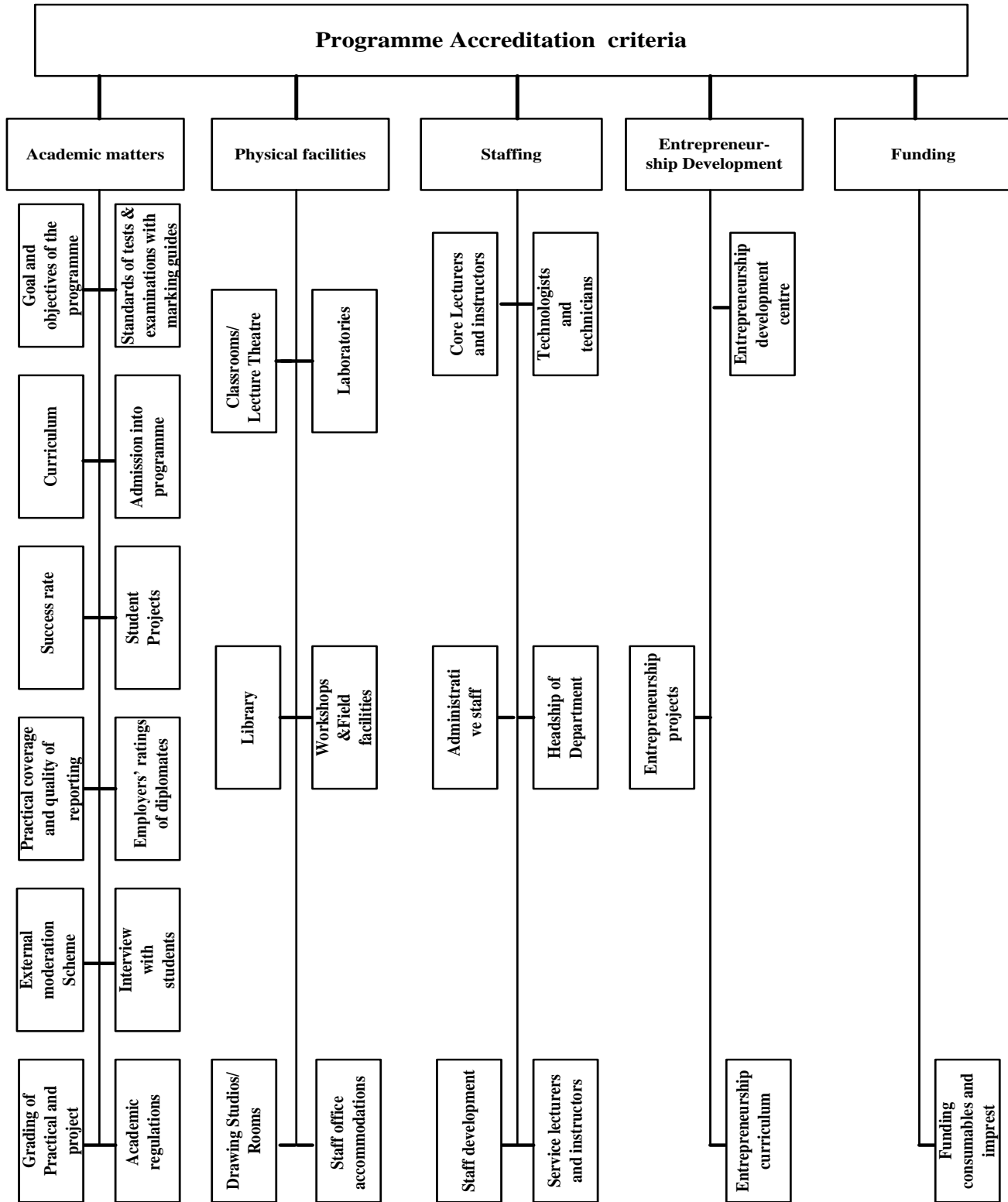


Figure 1. Programme

The former cost structure involved the host Institution(s) to provide and arrange for hotel accommodations, feeding, logistics and other related or sundry expenses during the visit while NBTE paid the honoraria and transport allowances of the team members engaged for the accreditation exercises.

Then, it was easy for NBTE to arrange for accreditation visits to Institutions within the six (6) geo-political zones offering engineering technology programmes alongside other programmes. Furthermore, when the schedule of visitations is prepared for a particular year and approved by NBTE Management with cash backing, the accreditation visit would commence based on the approved schedule from one geo-political zone to another. Institutions are usually given sufficient notice in addition to publications in national dailies to prepare for the visits. Any Institution that sought for postponement of accreditation visit without convincing reasons would be penalized and made to take up the full responsibility of bearing the total cost of the visit.

However, the current practice is similar to what professional registration bodies are doing. Accreditation of engineering technology programmes are fully funded by Institutions when their programmes are due. NBTE determines and computes the fees to be paid by the Institutions for the programmes to be accredited. After payment into the treasury single account (TSA) using the electronic payment platform and confirmation of payment by NBTE, the dates for the visits are fixed as may be agreed by both parties.

Accreditation takes places on a quinquennial cycle. The initial grant of approval for a programme to commence is not an indication of indefinite accreditation status as some proprietors of Institutions may think or believe. It is a continuous and periodic process that should be undertaken by NBTE in collaboration with the relevant professional body(s).

### **NBTE collaboration with Council for the Regulation of Engineering in Nigeria (COREN)**

The Board has memorandum of understanding (MOU) with COREN to jointly carry out accreditation of engineering technology programmes in the Polytechnics and similar TVET institutions in Nigeria. The MOU has eliminated the burden of separate and multiple accreditation of engineering technology programmes on these Institutions. The relationship between them started more than two decades ago and both parties have been working together to ensure that the quality and standards of the engineering technology programmes are not compromised.

As a condition in the MOU, COREN nominates one of its registered members to serve as the Chairman of the team visiting any engineering technology programme(s). The COREN representative works with other professionals and NBTE staff to evaluate various aspects of the programme to be accredited. The report(s) is produced using the NBTE Accreditation Evaluation Form. After the accreditation visits, the reports are submitted to NBTE and COREN for further action. The final decisions on the visit as approved by the NBTE Management Committee or Governing Board is

communicated to COREN for noting and updating of their records in order to register graduates from accredited programmes as engineering technicians and technologists.

### **STATISTICAL ANALYSIS OF ENGINEERING TECHNOLOGY PROGRAMMES OFFERED BY NIGERIAN POLYTECHNICS AND SIMILAR TERTIARY INSTITUTIONS**

Currently, there are one hundred and seventy two (172) Polytechnics and similar tertiary Institutions in Nigeria offering engineering technology programmes and more Institutions are being established. NBTE currently gives approval to run fifty four (54) different engineering technology programmes in the Nigeria Polytechnics and similar Institutions as shown in Appendix.

Apart from ND Biomedical, ND and HND Electrical/Electronic, ND Civil, and ND and HND Computer Engineering Technology programmes offered by both private and public Institutions, the rest of the engineering technology programmes are offered only by public institutions. Generally, majority of Institutions consider most of the engineering technology programmes to be very capital intensive, requiring purpose-built facilities where students would be trained, and costly consumables and materials to conduct adequate practical works. They are also concerned about the low number of students' enrolment into the engineering technology programmes (compared to Management programmes) which may hinder them from recouping their investment within a reasonable period of time.

Among all the engineering technology programmes in Nigeria, the five topmost programmes offered by these Institutions are: ND Electrical/Electronic Engineering Technology; ND Computer Engineering Technology; HND Electrical/Electronics (Electronics/Telecommunications); ND Civil Engineering Technology; and ND Mechanical Engineering Technology.

Figure 2 shows that ND Electrical/Electronic Engineering technology is the most preferred programme among the TVET Institutions. Presently, there are one hundred and fifteen two (152) Polytechnics and technological Institutions that are currently offering the programme. That is, 87% of these Institutions are offering the programme. This is expected because one of the NBTE guidelines for operating Polytechnics or similar tertiary Institution requires that at least one of the three traditional or core engineering programmes, namely Electrical, Mechanical and Civil must be mounted by a new Institution at the point of approval while the other engineering technology programmes could be established subsequently. Thus, all Nigerian Polytechnics must offer at least one engineering technology programme.

Recent manpower studies have shown that there is a need for well-trained technical manpower in the following sectors: Transportation, construction, oil and gas, energy, telecommunication and ICT, financial technology, manufacturing, healthcare and solid minerals (Favara, Appasamy & Garcia, 2015). It is therefore necessary and important to point out that more Polytechnics and similar tertiary Institutions need to deploy more resources to commence the following engineering technology programmes at both ND and HND levels:

- i. Biomedical Engineering Technology;

- ii. Chemical Engineering Technology;
- iii. Mechatronics Engineering Technology;
- iv. Mineral and Petroleum Resources Engineering;
- v. Petroleum and Gas processing Engineering Technology;
- vi. Petroleum Engineering Technology;
- vii. Railway Engineering Technology;
- viii. Renewable Energy.

The situation whereby less than 10% of the Nigerian Polytechnics and similar Institutions are running these programmes is not desirable and encouraging to develop indigenous skill-sets required by the economy to be among the top twenty (20) economies in the world.

Furthermore, it is important to note that curricula have been developed for the following engineering technology programmes but no Institution in Nigeria is offering them for now. They are:

- i. ND Cement Engineering Technology;
- ii. ND Pipeline Engineering Technology;
- iii. HND Railway Engineering Technology;
- iv. HND Naval Architecture;
- v. HND Renewable Energy.

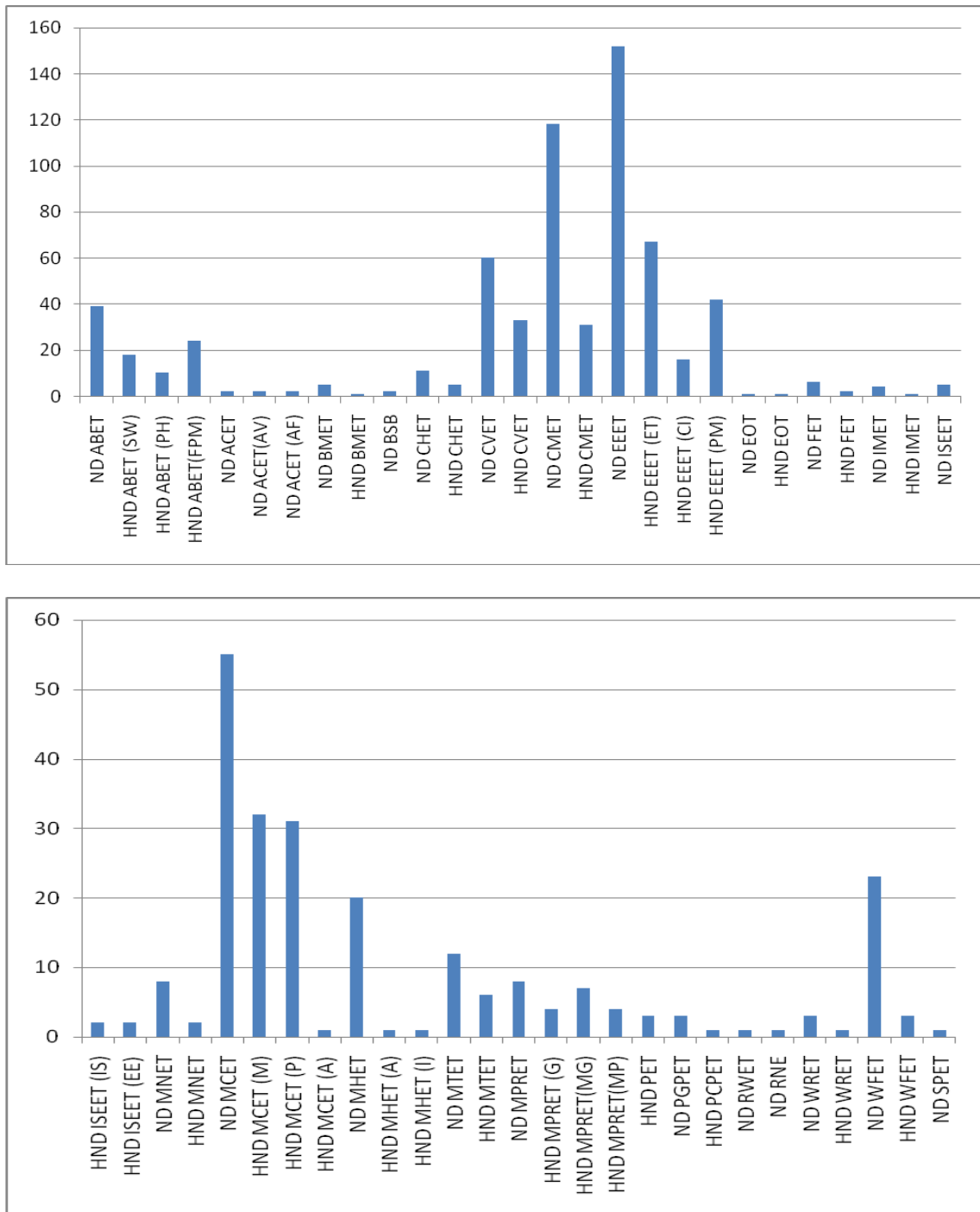
It is envisaged that Polytechnics will focus their resources to run these new engineering technology programmes to address the concerns and discoveries reported in Favara, Appasamy & Garcia (2015).

#### **WEB BASED ACCREDITATION SYSTEM**

The future direction for accreditation of engineering technology programmes in Nigeria is to adopt and implement web-based solution. This is intended to complement or on the long-run serve as alternative to manual process of managing accreditation of engineering technology programmes. It is a platform that would allow both NBTE staff and designated nodal officers of Institutions running approved ND and HND engineering technology programmes to start or complete the accreditation process. This is proposed to include a central database where the accreditation documents of the engineering technology programmes are stored for easy access and retrieval by authorized agents of NBTE. It will have a secured user management control through which access to the system is controlled. The platform or portal would be designed for the administrators and users using a web-based user interface. The portal will allow authorized staff of the Institution to initiate the accreditation process by uploading the self study questionnaires (SSQs) for the programme(s) to be accredited. The system would automatically send alerts and emails to the authorized NBTE staff as soon as completed SSQs have been submitted. After submission, the submitted SSQs would be downloaded or assessed online by the NBTE staff.

Having satisfied that the programme is due and ready for accreditation, the cost of the visitation would be communicated through the platform to the Institution. The Institution proceeds through the platform to make payment for

the visit in favour of NBTE using the treasury single account or electronic payment system. In addition, the Institution would have options of proposing at least two different dates for the visit.



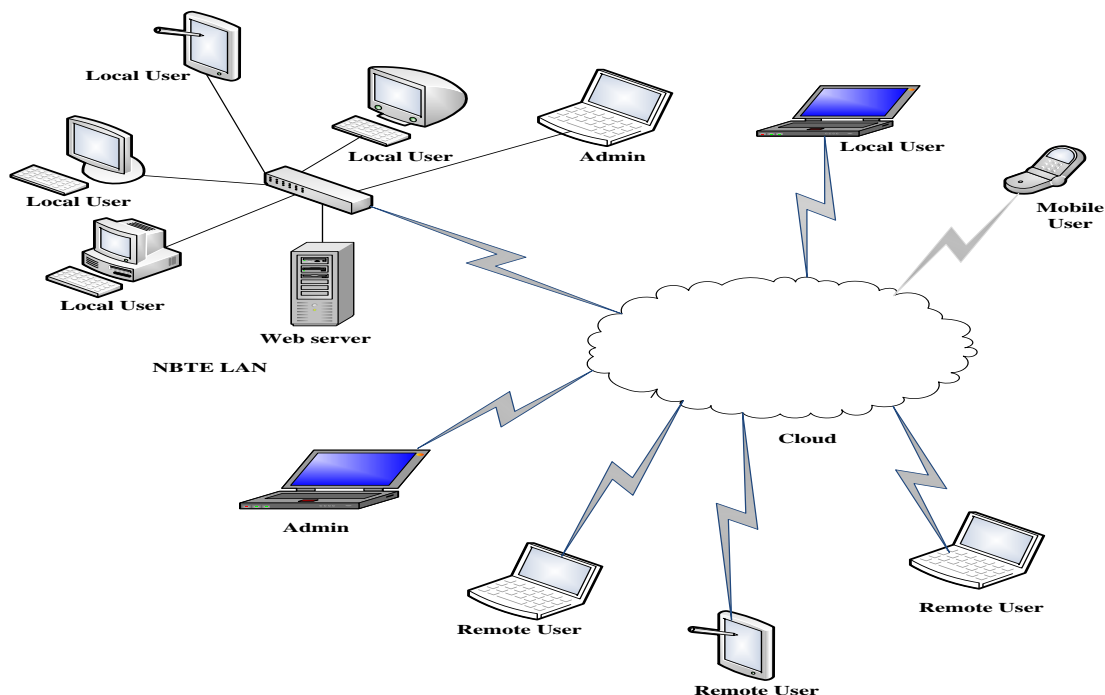
**Fig 2. Bar charts showing engineering technology programmes offered by Nigerian Polytechnics and similar Institutions**

After confirmation of payment, approved date of the visit, number of team members and documents to be provided before the arrival of the team would be communicated through the platform to the Institution.

During the on-site visit by the accreditation team, the NBTE team would use the portal to write their reports using the accreditation evaluation form

designed to work both in offline and on-line modes. The reports can be printed and submitted for the Institution to respond to the contents of the reports. When the reports are submitted by the NBTE staff coordinating the programmes on the portal, the reports get to the Director, heading the Department of Polytechnics Programmes for approval or amendments within a time frame of twenty four (24) hours. After amendment and approval by the Director, the summary of the reports and final recommendations are forwarded to the Executive Secretary through the portal. The Executive Secretary on behalf of the Governing Board or Management Committee could decide to review or approve the recommendations for the programmes within a period of seventy two (72) hours. Based on his approval, the portal generates email that would communicate the outcomes of the accreditation visit to the Institution accordingly.

With this web-based system hosted on the cloud, accreditation process is automated. It eliminates most of the manual activities which are prone to human errors, delays, inconsistencies, and inefficiencies (Akhter & Ibrahim, 2016). All documents are stored in a central database and could be accessed online based on the assigned rights to the users and administrators of the system. There would be a firewall to protect the files, applications and database in the system. The web-based accreditation system is shown in Figure 3. It has the users, web server and cloud.



**Fig. 3 Web Based Accreditation System**

All authorized users can access the system. The portal can be accessed through internet. The users or administrators are to log in to the portal hosted by the web server. However, the detailed analysis or design of the system is out of the scope of this study and may be carried out in future research studies.

## **CONCLUSION**

The Nigerian Polytechnics and similar TVET institutions have been training engineering technicians and technologists for local industry and even multinational corporations for about six decades. In order to monitor and ensure that the quality of training in these institutions are not compromised or lowered, accreditation was instituted by NBTE as is the process in other developed countries of the world. The accreditation of engineering technology programmes has been well established in Nigeria. This has become the benchmark through which stakeholders and general public evaluate the qualifications issued to diplomates after completion of an accredited programme. It has protected students and parents from wasting their hard-earned money and time in illegal institutions that offer fake or fraudulent certificates.

While the collaboration between NBTE and COREN has helped to achieve the objectives of accreditation of engineering technology programmes in Nigeria, there are still growing concerns or need for improvement in the quality of diplomates of engineering technology programmes produced by Polytechnics and similar Institutions. The major issues confronting accreditation of engineering technology programmes include inadequate funding, insecurity, inadequate infrastructure, facilities and utility services and corrupt practices among others. These need to be addressed to improve the quality of engineering technicians and technologists trained locally for the Nigerian and global labour markets.

## **ADVANCED RESEARCH**

This research still has limitations so further research needs to be carried out on this topic

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## **REFERENCES**

- Agboola, O. P., & Elinw, U. K. (2013). Accreditation of Engineering and Architectural Education in Nigeria: The Way Forward. *Procedia-Social and Behavioral Sciences*, 83, 836-840.
- Akhter, F., & Ibrahim, Y. (2016). Intelligent Accreditation System: A Survey of the Issues, Challenges, and Solution. *International Journal of Advanced Computer Science and Applications*, 7(1), 477-484.
- Anugom, F. O. (2016). Accreditation and Quality Assurance of Nigerian

Universities: The Management Imperative. *International Journal of Educational and Pedagogical Sciences*, 10(9), 3187-3191.

- Eaton, J. S. (2015). An Overview of US Accreditation. Revised November 2015. Council for Higher Education Accreditation.
- Falade, F. (2009). Quality Assurance and Accreditation of Engineering Programmes In Nigerian Universities. Retrieved from: <https://api-ir.unilag.edu.ng/server/api/core/bitstreams/e6a35051-c96c-4c85-96aa-a16c25707149/content>
- Favara, M., Appasamy, I., & Garcia, M. H. (2015). Nigeria: skills for competitiveness and employability. World Bank. Retrieved from: <https://openknowledge.worldbank.org/handle/10986/24>
- Gerber, A., Sinha, S., Van Der Merwe, A., & Kam, M. (2012). Accreditation of Academic Programmes in Computing in South Africa. In *Proceedings of the 2012 4th IEEE Software Engineering Colloquium (SE)* (pp. 7-10). IEEE, 7-10.
- Mmeka, I. E., & Nwogu, G. A. (2014). Instruments and Procedures for Academic Programmes Accreditation in Nigerian Universities. *International Journal of Education and Research* 2, 8, 503-512. Retrieved from: <http://www.ijern.com/journal/2014/August-2014/45.pdf>
- National Board for Technical Education (2013). Standards for Accreditation and Re-accreditation of Diploma Programmes in Polytechnics and Similar Post-Secondary Technical Institutions in Nigeria.
- National Board for Technical Education (2021). Directory of Accredited Programmes Offered in Polytechnics, Technical and Vocational Institutions in Nigeria Retrieved From: <https://net.nbte.gov.ng/directory>.
- National Board for Technical Education, (2022). Programme Evaluation Form For Institution Offering Programmes for which Accreditation/reaccreditation is Sought. Retrieved from: <https://net.nbte.gov.ng/sites/default/files/>
- Obadara, O. E., & Alaka, A. (2013). Accreditation and Quality Assurance in Nigerian Universities. *Journal of education and Practice*, 4(8), 34-41.
- Ogunode, N. J., & Adah, S. (2022). Accreditation of Academic Programs in Public Universities in Nigeria: Challenges and Way Forward. *Electronic Research Journal of Social Sciences and Humanities*, 4(2), 15-27.

- Ozurumba, C. N., & Ebuara, V. O. (2014). Relevance of Programmes Accreditation in Nigeria Universities for Quality Assurance. *Asia Pacific Journal of Education, Arts and Sciences*, 1(4). Retrieved from: <http://apjeas.apjmr.com/wp-content/uploads/2014/09/APJEAS-2014-1-059.pdf>.
- Ukala, C. C., & Ohia, A. N. (2018). Accreditation Exercise as a Quality Assurance Instrument in the Management of Universities in the Rivers of Nigeria: Prospects and Challenges. *ICERI 2018 Proceedings*, 2367-2373.