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Proposed Model for a New Polytechnic Educational System in Nigeria

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Assertions for the quest for a new polytechnic educational system in Nigeria have been various posited by researchers and administrators but not much has been achieved in this regard. The main objective of this technical paper is to propose a sustainable model for a new polytechnic educational system in Nigeria. Research methods adopted included both qualitative and quantitative. Sources of data included both review of related literature as well as administration of questionnaire. The research concluded with a model proposing a synergy among Technical Colleges, Polytechnics/Colleges of Technology and establishment of Technical Universities as well as collaboration between the proposed Nigerian Polytechnic Commission (NPC) and National University Commission (NUC) in the control and administration of Polytechnic Education in the country. The model also recommends that National Diploma, Higher National Diploma, Bachelor of Technology and Post graduate programmes be offered in the new Polytechnic structure.

Keywords: Proposed model, New Polytechnic Structure, NBTE/NPC, NUC.

Introduction:

Nigeria's polytechnic educational system has long been a critical component of the nation's higher education framework, designed to equip students with technical and vocational skills essential for economic development (Sanubi & Akpotu, 2015). Despite various assertions and proposals for a reformed polytechnic educational system in Nigeria, there has been little progress in achieving substantial change. The polytechnic sector continues to face challenges related to governance, funding, societal perception, and relevance to industry needs (Otache, 2022). Studies by Bello et al. (2022) and Kalagbor (2024) show edexisting administrative framework under National Board for Technical Education (NBTE) to be ineffective in ensuring that polytechnics fulfill their technical and vocational education mandates. Furthermore, the underutilization of highly qualified academic staff, coupled with the lack of postgraduate opportunities in polytechnics, has resulted in a significant waste of human resources. The problem is exacerbated by a lack of strategic direction and a sustainable model that aligns polytechnic education with the evolving demands of industry and society (Agha et al., 2020). Despite numerous attempts at reform, the system continues to suffer from inefficiencies and a lack of innovation, leaving Nigeria's polytechnic graduates ill-prepared to contribute meaningfully to the country's socio-economic growth (Kayode & Markus, 2024). The disparity in recognition and status between polytechnic and university graduates further aggravates the issue, leading to diminished interest in polytechnic education and a devaluation of its potential contributions.

There is a need to address these challenges by proposing a new, sustainable model for

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polytechnic education that not only strengthens the role of polytechnics but also ensures their alignment with national development goals. Given the pressing need for a more robust and future-oriented polytechnic education system, this technical paper aims to propose a sustainable model that addresses these challenges.

Differences between the Mandates of Polytechnic and University in Nigeria

In Nigeria, Polytechnic and University have distinct mandates. Polytechnic mandate includes focus on practical, vocational, and technical education; provide middle-level manpower training; emphasize skills development in specific industries (e.g. Engineering, technology) offer National Diploma (ND), Higher National Diploma (HND) programmes; and focus on entrepreneurship, self-employed industry need (Adebayo & Oyedeji, 2018)

Whereas, University mandate includes focus on theoretical, academic and research-oriented education; provide high level manpower training; emphasize intellectual and critical thinking skills; offer Bachelor's, Master's and Doctoral Degree; and focus on advancing knowledge, innovation and Community service.

The key differences manifest in the following (Adebayo & Oyedeji, 2018; FME, 2022):

- Curriculum focus: Polytechnic (practical) Versus University (Theoretical)
- Programme duration: Polytechnic (2-3 years) Versus University (4-5 years)
- Degree offering: Polytechnic ND and HND) Versus University (Bachelor's; Master's and Ph.D)
- Admission requirement: Polytechnic (SSCE, JAMB and Post JAMB Screening) Versus University (SSCE, JAMB, Post JAMB Screening). The slight difference is in JAMB cut-off marks.
- Career focus: Polytechnic (Industry-Specific) Versus University (broader career option)

From historical context, Polytechnics are established to address middle-level Manpower needs while Universities focus on producing high-level professionals

National Board for Technical Education (NBTE) regulates Polytechnic while National University Commission (NUC) regulates Universities.

However, from current development, some Polytechnics now offer Degree programmes in collaboration with Universities. Also, Universities are now expanding Vocational and Technical Programmes. Furthermore, both Polytechnics and Universities now emphasize on entrepreneurship, innovation and industry partnerships

Understanding these differences is crucial for policymakers, educators and students to optimise Nigerian Education system.

From the foregoing, the position of this paper is to propose a link between Technical Colleges with the Polytechnics. Also, there is dire need for the establishment of Technical Universities which shall also be linked with the Polytechnic sector in order to widening the scope of Technical and Vocational Education and Training in Nigeria.. There should be a link between the Polytechnic and Technical University to enhance job mobility.

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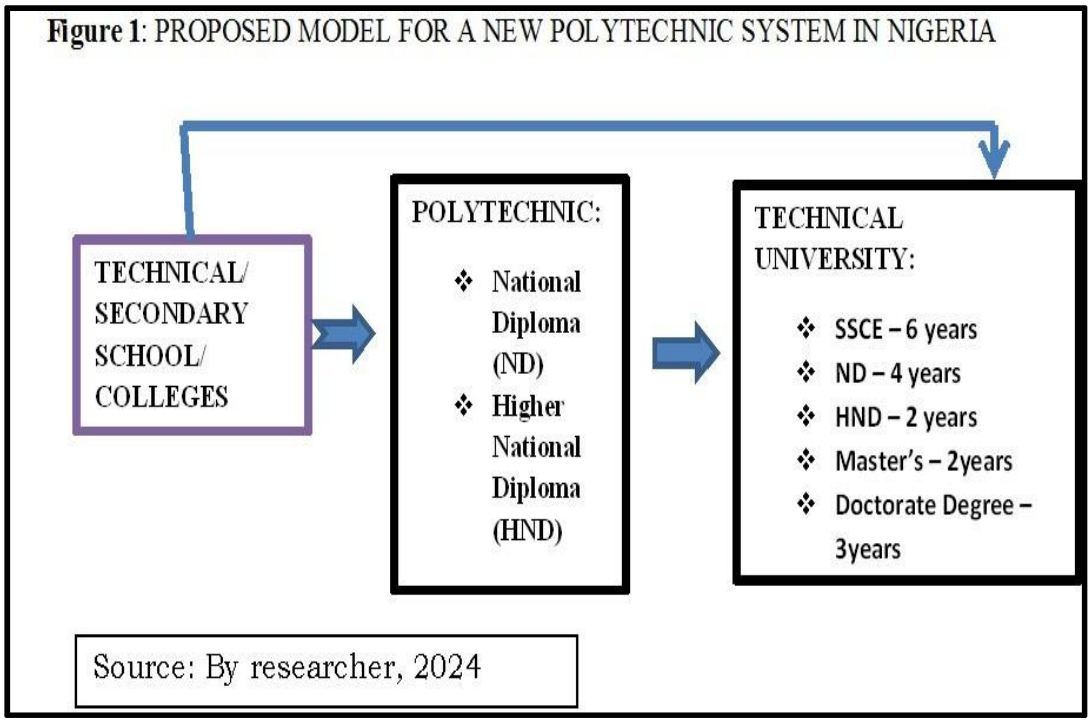

From Figure 1, the proposed Model for an improved Polytechnic Education system in Nigeria dwells on the need to create a link between Technical/Secondary Colleges, Polytechnic and Technical University. National Polytechnic Commission (NPC) is expected to collaborate with the respective professional bodies backed up with enabling statute in the control and regulation of the entire process. The mandate of the entire process is to promote TVET. To lecture at any stage of the educational strata there must be evidence of acquisition of TVET education. Technical University is to be empowered to offer Bachelor's, Master's and Doctorate in the respective profession

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Table 1: Analysis of The Challenges of Polytechnic Education In Nigeria

S/N	LIST OF PROBLEMS	SOURCE(S)/AUTHOR(S)										
		Dung-Gwom (2014)	Ukpai (2013)	Otache (2019)	Oloyo (2015)	Olajide (2015)	Okoloch a (2012)	Iketegbe (2020)	Petirin, et.al (2021)	Obasi (2011)	Egwu,et .al (2020)	Ranking in %tage
1	Poor quality delivery	✓			✓	✓				✓	✓	50%
2	Poor funding	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100%
3	Poor Staffing	✓	✓	✓			✓	✓		✓		60%
4	Employability of Graduates	✓						✓	✓	✓		40%
5	Obsolete and delayed infrastructure	✓	✓		✓		✓		✓	✓		60%
6	Absence of Polytechnic Commission		✓	✓		✓	✓	✓	✓		✓	70%
7	Volatile Student Unionism/cultism		✓							✓		20%
8	Political interference		✓		✓			✓				30%
9	Misconception of Polytechnic mandate			✓		✓		✓	✓	✓	✓	60%
10	Poor practical orientation		✓	✓	✓	✓		✓		✓		60%
11	Admission Entry Requirement			✓				✓	✓	✓	✓	50%
12	Discrimination of Poly Students/graduates		✓	✓	✓		✓	✓	✓	✓	✓	80%
13	Relatively shorter career ladder									✓		!0%
14	Low tempo of research				✓		✓	✓		✓		40%
15	Low ICT/skill acquisition content			✓	✓	✓	✓		✓	✓		60%
16	Weak Institution							✓		✓		20%
17	Poor Accreditation status		✓		✓	✓	✓				✓	50%
18	Poor Polytechnic-industry linkage		✓	✓	✓		✓		✓	✓	✓	70%
19	Inadequate curriculum stru.				✓	✓		✓		✓		40%
20	Academic student duration			✓			✓				✓	30%

Source: Researcher' compilation, 2024

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From Table 1 compiled through data mining, the most crucial challenges bedeviling polytechnic education in Nigeria range from poor funding (100%); discrimination of polytechnic students graduates (80%); poor Polytechnic-Industry Linkage (70%); absence of Polytechnic Commission (70%); Poor staffing (60%); obsolete and decayed infrastructure (60%); misconception of Polytechnic mandate (60%); poor practical orientation (60%); and low ICT/skill acquisition contents (50%) among others. The position of this paper is to join other researchers to appeal to Government and Its relevant agencies to do everything possible to subdue these challenges in order to improve and sustain technical and vocational education and training of which Polytechnic is meant to achieve

Methodology

Research Design

This study employed a mixed-methods approach, incorporating both qualitative and quantitative research methodologies to develop a comprehensive understanding of the current state of polytechnic education in Nigeria and to propose a sustainable model for its improvement. A thorough review of existing literature was conducted to gather background information, identify gaps in the current polytechnic educational system, and understand best practices from other countries. The literature review included academic journals, government reports, policy documents, and case studies related to technical and vocational education and training (TVET), polytechnic education, and higher education reform. This qualitative data provided the foundational knowledge necessary to design the proposed model and to ensure that it is both evidence-based and contextually relevant to Nigeria. A structured questionnaire was developed and administered to collect quantitative data from key stakeholders in the polytechnic education sector. The quantitative data collected from the questionnaires were analyzed using the Relative Important Indices (RII) to understand the current state of polytechnic education in Nigeria.

Sampling Techniques

A purposive sampling technique was employed to select participants for the study. This approach ensured that the sample included individuals who have direct experience with and knowledge of polytechnic education in Nigeria, thus providing relevant and informed responses. The sample included the Polytechnic staff with experience in teaching, curriculum development, and administrative roles within polytechnic institutions. The sample size of 120 respondents was captured in the study while also ensuring a diverse range of perspectives for qualitative insights. Only 84 valid questionnaires were retrieved from the respondents

Data Analysis

The quantitative data collected from the questionnaires were analyzed using the Relative Important Indices (RII) to understand the current state of polytechnic education in Nigeria. The mean was also calculated to summarize the data.

Table 2: Classification of respondents perceived impact based on RII

High (H) 0.8 < RII < 1.0
High-Medium (H-M) 0.6 < RII < 0.8
Medium (M) 0.4 < RII < 0.6
Medium-Low (M-L) 0.2 < RII < 0.4
Low (L) 0.0 < RII < 0.2
High (H) 0.8 < RII < 1.0

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Table 3: ANALYSIS AND RESULTS

ITEM		ACTUUAL SCORE	PERCENTAGE	Relative important indices	COMMENT
1	The performance of NBTE in playing Its Statutory roles is low	336	80	0.800	Strongly Supported
2	Polytechnic should focus more on skill acquisition and Technical Education	379	90.2	0.902	Strongly supported
3	Polytechnic should be upgraded rather than outright conversion to University in order to maintain Its original mandate	283	55.5	0.674	Lightly supported
4	NBTE should be replaced with Polytechnic Commission for better performance	351	83.6	0.836	Strongly Supported
5	Academic staff in the Polytechnic are grossly underutilised with good number of PHD holders without post graduate students	316	75.2	0.752	Strongly Supported
6	There is need to enact laws that will enforce it on Industries to contribute more to Polytechnic Education	339	80.7	0.807	Strongly Supported
7	Top-up Programmes makes mockery of Polytechnic Certificates (system)	296	70.5	0.705	Supported
8	In the case of upgrading, Polytechnic Lecturers should laterally change nomenclature from Chief Lecturer to Professor, in that order	219	52.1	0.521	Lightly Supported
9	Polytechnic research should be Practical based rather than bare peer Review	344	81.9	0.819	Strongly Supported
10	There is the need for Government to re-emphasize the mandates of the various levels of education, That is, NCE, Poly & University	313	74.5	0.745	Supported

1. The performance of NBTE in playing Its Statutory roles is low

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{336}{5 \times 84}$$

$$RII = 0.800$$

2. Polytechnic should focus more on skill acquisition and Technical Education

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{379}{5 \times 84}$$

$$RII = 0.902$$

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3. **Polytechnic should be upgraded rather than outright conversion to University in order to maintain Its original mandate**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{283}{5 \times 84}$$

$$RII = 0.674$$

4. **NBTE should be replaced with Polytechnic Commission for better performance**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{351}{5 \times 84}$$

$$RII = 0.836$$

5. **Academic staff in the Polytechnic are grossly underutilized with good number of PHD holders without post graduate students**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{316}{5 \times 84}$$

$$RII = 0.752$$

6. **There is need to enact laws that will enforce it on Industries to contribute more to Polytechnic Education**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{339}{5 \times 84}$$

$$RII = 0.807$$

7. **Top-up Programmes makes mockery of Polytechnic Certificates (system)**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{296}{5 \times 84}$$

$$RII = 0.704$$

8. **In the case of upgrading, Polytechnic Lecturers should laterally change nomenclature from Chief Lecturer to Professor, in that order**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{219}{5 \times 84}$$

$$RII = 0.521$$

9. **Polytechnic research should be Practical based rather than bare peer Review**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{344}{5 \times 84}$$

$$RII = 0.819$$

10. **There is the need for Government to re-emphasize the mandates of the various levels of education, That is, NCE, Poly & University**

$$RII = \frac{\sum W}{A \times N}$$

$$RII = \frac{313}{5 \times 84}$$

$$RII = 0.745$$

Discussion:

The results of this study provided in Table 3revealed the key areas of concern and support for the reforms in the polytechnic educational system in Nigeria. The study found strong support (0.800) for the assertion that the National Board for Technical Education (NBTE) has not effectively fulfilled its responsibilities in overseeing polytechnic education. This ineffectiveness indicates a significant level of dissatisfaction with the current governance structure. Ukpai (2012) underscore the statutory role of NBTE as both external and internal; with the sole responsibility of coordinating polytechnic education management in Nigeria. The dissatisfaction with NBTE's governance

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structure aligns with findings from other studies in Nigeria and across Africa. Ghana, the Council for Technical and Vocational Education and Training (COTVET) faced similar criticisms, particularly regarding its ability to effectively coordinate and regulate polytechnic education (Darteh, 2021). In contrast, South Africa's Technical and Vocational Education and Training (TVET) colleges are managed under a more centralized framework by the Department of Higher Education and Training, which has been credited with providing more effective oversight and governance (Beharry-Ramraj, 2016).The inefficiency of the NBTE body in playing its role therefore led to the respondents supports on the call for a new regulatory body, such as a Polytechnic Commission, to take over the role of NBTE for better performance and more effective oversight (0.836).Polytechnic education in Nigeria is unique within the tertiary education, unlike universities and colleges of education, which are overseen by dedicated commissions, such as the National Universities Commission (NUC) and the National Commission for Colleges of Education (NCCOE). This structure has led to polytechnic issues being lumped together with other technical schools, including secondary schools, rather than being addressed at the tertiary level. The NBTE's broad responsibilities and civil service bottlenecks further hinder effective policy implementation and the development of polytechnic education. A strong consensus among respondents that polytechnics should prioritize their core mandate of skill acquisition and technical education (0.902) underscores the need for curricula that are aligned with industry requirements and focused on practical, hands-on training to ensure that graduates are well-prepared for the workforce. In Uganda, the introduction of the Competence-Based Education and Training (CBET) approach in polytechnics enhanced the focus on practical skills (Turyatemba, 2023).

The support for upgrading Polytechnic rather than outright conversion to University in order to maintain Its original mandate is moderate, with a relative importance index of 0.674, suggesting that while there is some backing for upgrading polytechnics, there is also concern that converting them into universities could dilute their focus on technical education. This indicates a preference for retaining the polytechnics' original mandate while enhancing their capabilities, rather than completely transforming them into university institutions. Moreso, it has become evident that large numbers of academic staff in the Polytechnic are grossly underutilised (0.752) with good number of PhD holders without post graduate students. The lack of postgraduate programs in polytechnics results in a significant waste of academic resources and expertise, suggesting a need to introduce such programs to fully leverage the capabilities of these institutions.

The need to enact laws that will enforce Nigeria industries to contribute more to Polytechnic Education was strongly supported (0.807) indicating that stronger partnerships between polytechnics and industries could help address funding challenges and ensure that polytechnic education is aligned with industry needs. with a relative importance index of 0.705 (71%), it become obvious that there is a serious concern about the negative impact of top-up programs on the value of polytechnic certificates obtained in Nigeria. The perception that these programs devalue polytechnic qualifications suggests a need to reassess the structure and implementation of top-up programs to protect the integrity of polytechnic education.

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The need for upgrading Polytechnic Lecturers' nomenclature from Chief Lecturer to Professor, in that order received the lowest level of support, with a relative importance index of 0.521, indicating that respondents are not strongly in favor of changing the nomenclature of polytechnic lecturers. This suggests that any such changes should be carefully considered to avoid confusion or unintended consequences. However, there is strong support for the idea that polytechnic research should focus on practical applications, as indicated by a relative importance index of 0.819. This finding aligns with the core mission of polytechnics to provide technical and vocational education that is directly applicable to real-world challenges.

Finally, with a relative importance index of 0.745, respondents support the idea that the government should clearly define and re-emphasize the distinct roles and mandates of different educational institutions, including polytechnics. This clarity is essential for ensuring that each type of institution can effectively fulfill its role within the broader educational system.

Summary of Findings

Government at Federal and State levels should allow Polytechnic system to work like other serious economies like Canada, China, United Kingdom and Malaysia to mention a few by providing conducive environment for the system to strive through adequate funding and provision of infrastructure on campus, studio, workshops and laboratories.

Authorities in the system must strive to achieve the original mandate of the Polytechnic.

Government policies must enforce it on industries to support Polytechnic system in the areas of funding and skill acquisition.

Considering the quantum of Ph.D holders in the Polytechnic System in Nigeria, this study agrees with the general view that Polytechnics in Nigeria should be mandated to run Degree and post graduate programmes with due accreditation process

There is urgent need to organise a broad and elaborate Educational Summit where salient points relating to dichotomy among the various sectors of education in Nigeria

This study also recommends that there should be a link between Technical Colleges, Polytechnics and Universities of Technology. Within the space of time Government should establish Technical Universities that would be mandated to pursue TVET.

In line with the need to entrench skill acquisition, promotion in the polytechnic should not be solely based on peer-review but must also consider practical works executed and published

There is urgent need to restructure NBTE, the regulatory body, in order to meet the expected result. Establishment of the Polytechnic Commission has been suggested for better performance

The need for better training of academic staff in the Polytechnic system in the areas of skill acquisition and disposal.

Employment in the Polytechnic should be based on merit especially among the lecturers. Preference should be given to applicants with technical knowledge foundation.

In the area of skill acquisition, there should be synergy between the Polytechnic authorities and the Industries/companies in line with SIWES and One Year Industrial Training

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There is a suggestion/plea to change the Polytechnic lecturer nomenclature of Chief Lecturer to Professor in that order in line with global best practice

The need for a working/active link among Technical Colleges, Polytechnics and University of Technology and/or Technical University.

National Polytechnic Commission (NPC) and the professional Bodies should be made to regulate the curriculum of the Polytechnic and Technical University Education

Conclusion:

In conclusion, the findings of this study strongly support the need for significant reforms in the polytechnic educational system in Nigeria. The proposed model, which includes the establishment of a Polytechnic Commission, a focus on skill acquisition, and the introduction of postgraduate programs, has the potential to address the current challenges and enhance the role of polytechnics in national development.

Recommendation:

Based on the findings of this study, the following recommendations are further suggested to improve the polytechnic educational system in Nigeria:

- Establish a National Commission for Polytechnics to replace the current National Board for Technical Education (NBTE) in overseeing polytechnic education. This body should focus exclusively on the management, coordination, and development of polytechnics, ensuring that they receive the attention and resources necessary for effective governance.
- Revise polytechnic curricula to align more closely with industry needs, emphasizing practical, hands-on training and skill acquisition. Regular consultations with industry stakeholders should be institutionalized to keep curricula relevant and up-to-date.
- Develop and introduce postgraduate programs in polytechnics to better utilize the expertise of academic staff and to offer advanced technical education and research opportunities.
- Enact policies that mandate stronger partnerships between polytechnics and industries. These partnerships should involve industry contributions to funding, equipment, and curriculum development.
- Rather than converting polytechnics into universities, efforts should be made to enhance their capabilities while preserving their core mandate of providing technical and vocational education. Any upgrading should focus on improving infrastructure, faculty, and resources while retaining the polytechnic's original purpose.
- Re-evaluate the structure and implementation of top-up programs to ensure they do not devalue polytechnic certificates. Clear guidelines and standards should be established to protect the integrity of polytechnic qualifications.
- The government should clearly define and emphasize the distinct roles and mandates of universities, colleges of education, and polytechnics. This should be supported by legislative reforms and policy updates to ensure that each institution can effectively fulfill its purpose.

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