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Innovating Printing Education in Nigeria: A TVET University Model for Sustainable Digital Transformation

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Abstract

Nigeria's printing industry is constrained by a widening skills gap and a promotion system that privileges university degrees over the Higher National Diplomas (HNDs) which remains the highest formal qualification in printing technology. This structural limitation restricts career progression, undermines workforce motivation, and contributes to talent attrition. This study investigates how an innovative, degree-awarding TVET university model serves as a catalyst for both workforce development and institutional repositioning within the sector. Methodologically, the study employs a literature review that reveals findings in three key aspects. One is the assessment of the relevance of the HND printing qualification in the present dispensation. Two, insights into the opportunities and pitfalls of transitioning vocational institutions into degree-granting universities based on previous experiences in the UK, Kenya, Ghana, and Germany. Lastly, a TVET university model tailored to Nigeria's printing industry. From a brand management perspective, the paper recommends the need for this model to be positioned not merely as a functional training system, but as a national brand of technical excellence. The study argues for a branding strategy grounded in academic rigor, digital innovation, and industry collaboration to elevate TVET institution's credibility and attract talent, partnerships, and investment. Its findings offer a blueprint for policymakers, educators, and industry stakeholders seeking to reposition Nigeria's printing education for relevance, sustainability, and global competitiveness.

Keywords: TVET University, Polytechnic Conversion, Printing Workforce, Brand Management, Digital Transformation, Nigeria

Introduction

Nigeria's printing industry stands at a critical crossroads, grappling with a widening skills gap exacerbated by an outdated qualification hierarchy that privileges university degrees over Higher National Diplomas (HNDs). In a

recent report on the career challenges for HND printing technology graduates in Nigeria, Afolabi (2024) observes that while HND programs emphasize practical skills and technical knowledge that ordinarily should be of immense value to technological progress in the printing industry, the HND qualification has become a source of stifled career progression for printing professionals, demoralized the workforce, and fueled talent migration to other sectors. Afolabi's stance finds support in a number of studies that document the discrimination between polytechnic and university graduates in Nigerian public and private sectors, such Omokaro and Akpojaro (2022), and Stephen (2015). Also highlighted in these studies are the unfavourable differential government policies on employment and placement criteria for HND and university-degree holders, especially in the public sector.

Succour came, soothing festering wounds, when, in March 2025, the current minister of education in Nigeria, Dr. Maruf Tunji Alausa announced plans to introduce TVET universities in the country. As elucidated by the minister, "our plan is to establish one TVET university in each of our six geopolitical zones, providing more opportunities for Nigerians across the country to acquire the skills needed for better career progression and job opportunities (Alausa, 2025). Furthermore, Alausa noted that FME is working with the Presidency to transform Yaba Tech from a college into a TVET university to train more Nigerians in the areas of TVET. However, there have been vehement criticism and opposition to this proposition.

For instance, Daily Trust (2025) contends that transforming polytechnics into universities shifts the focus from practical, hands-on training to a more theoretical approach, thereby eroding the institutions' unique role in producing skilled technical manpower essential for Nigeria's industrialization and economic diversification. The publication advocates for strengthening polytechnic institutions to enhance their capacity to produce highly skilled professionals and innovators, rather than converting them into universities.

While this paper agrees with critics on retaining polytechnics and polytechnic education in Nigeria, it is argued that the proposed TVET university model, if well planned and implemented, will not lead to the death of technical education in the country. Rather, a degree-awarding Technical and Vocational Education and Training (TVET) university model would address wide-range challenges faced by HND graduates in fields such as the printing industry. As argued by Afolabi (2024), in the context of the printing industry in Nigeria,

the HND qualification has run its full course, and thus in dire need of reforms that reflect the current realities.

In view of the foresaid, this paper is situated against the backdrop that the Higher National Diploma (HND) in printing technology is an outdated qualification, with the TVET university model offering a new lease of life through repositioning and rebranding. The paper seeks to: (1) explore the limitations of Nigeria's current HND Printing Technology qualification and justify the urgent need for reform, including the conversion of select polytechnics into degree-awarding TVET universities, (2) extract lessons from international case studies (UK, Kenya, Ghana, and Germany) on the conversion of polytechnics to universities, identifying best practices adaptable to Nigeria's context, and (3) design a purpose-built, degree-awarding Nigerian TVET model for printing education that aligns with industry demands, technological advancements, and global best practices. The study's findings aim to provide policymakers with actionable solutions to future-proof Nigeria's printing industry through education reform.

Methodology

This study employs a qualitative exploratory approach to examine the prospects of a TVET university model for advancing printing education in Nigeria. It draws on document analysis of recent policy pronouncements, stakeholder responses, and secondary sources addressing the polytechnic-to-university conversion debate and career challenges faced by HND graduates. A conceptual model was developed through thematic analysis and comparative review.

Results and Discussion

The Case for Reforming HND Printing Technology

At the inception of printing in Nigeria in 1846, apprenticeship was the only form of training in the sector. However, by 1952 a formal form of education was introduced when the Yaba College of Technology was established in the department printing technology. Day-release courses in printing technology were offered in the early days of the department. From 1953 to the sixties, the department trained students for junior diploma and certificate programs, leading to the award of City and Guides Certificate, London. The Certificate courses were later replaced by a two-year National Diploma Certificate in

1977. This was followed by the approval of the Higher National Diploma Programme in 1978. With the commencement of the programme in 1979, the first set of Higher National Diploma students graduated from Yaba College of Technology in 1981 (Yabatech, 2022).

The HND qualification is often seen as a gateway to practical knowledge and skills (Whapshott et al., 1993), but the HND/BSc dichotomy remains a barrier in the career progression of HND graduates (Mimiola, 2024). In Nigeria, Afolabi (2024) reports that HND printing technology graduates often receive a shorter career path due to limited polytechnics and discriminatory practices in the labour force. Those who pursue postgraduate diplomas face challenges in obtaining relevant master's programs and economic constraints. These constraints limit the career growth of many HND printing technology graduates, even in government-owned organizations. In some cases, graduates have had to reroute their career paths, resulting in significant costs and resources.

An academic program like the HND printing technology qualification can be considered a product designed to meet the manpower needs of industries (Mukerji & Tripathi, 2004). As argued by Kuzior et al. (2021), in the contemporary world, educational institutions operate in a competitive "educational market" where programs must be designed, packaged, and promoted like commercial products. Along a similar line, Afolabi (2024) argues that strident calls for the scrapping of the HND qualification in Nigeria is a sign of a decline in the qualification's product life cycle. The HND qualification is in the decline stage (as shown in Figure 1), which is manifested by declining enrollment and graduation rates, loss of recognition, and value among employers and students. He suggests that marketing specialists should repackage and rebrand HND programs to modernize them, align them with industry trends, and improve their recognition and acceptance.

Furthermore, Afolabi (2024) suggests that introducing a skill-based B.Tech degree is a strategic approach to renew the HND qualification in Nigeria. This would strengthen theoretical knowledge without compromising hands-on learning and practical skills, winning the hearts of employers who value competencies and skills over paper qualifications.

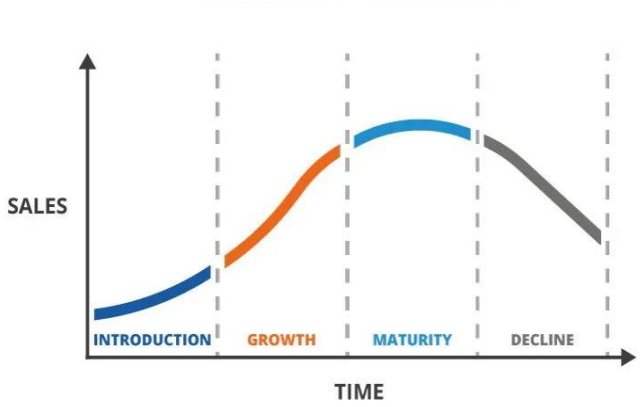

Figure 1: The Product Life Cycle

Upgrading Polytechnics: Lessons from other Countries

The proposed shift from HND to B.Tech aligns Nigeria with Germany and other countries that have upgraded their polytechnics to offer practical degree programs with internships and industry experience. An overview of international experiences with Polytechnic-to-University conversion follows subsequently.

United Kingdom: The 1992 *Further and Higher Education Act* led to the conversion polytechnics universities in UK's education system. The goals were to remove the binary divide between vocational and academic education, expand access, and promote social mobility (Jameson, 2024). While it significantly widened participation, challenges remain, including persistent stigma around vocational education, funding disparities, and concerns over research capacity compared to traditional universities (Jameson, 2024).

Germany: Germany maintains a dual higher education model that distinguishes between research-focused *Universitäten* and professionally oriented *Fachhochschulen* (Universities of Applied Sciences). According to Geschwind and Broström (2020), many polytechnics in the country evolved into technical universities. This led to integrating research and expanding their academic scope to function as Universities of Applied Sciences. Strong industry ties and a respected vocational culture underpin the system's effectiveness, preserving institutional identity while ensuring labor market relevance (Osel, 2012).

Ghana: Beginning in 2016, Ghana initiated the conversion of polytechnics into technical universities to strengthen its TVET system and address youth unemployment (Newman, 2020). However, the transition has faced hurdles, including infrastructure deficits, limited faculty qualifications, and ambiguity in institutional identity (Akanpaadgi & Mumuni, 2021). In particular, critics complain about risking the loss of the practical focus that TVET was designed to uphold (Dwomoh & Luguterah, 2020).

Kenya: Driven by the *TVET Act of 2013,* Kenya's elevation of polytechnics to technical universities was driven by the need to align education with national development goals (Vision 2030) and expand tertiary education access (BusinessDaily, 2012). Despite improved institutional recognition, challenges such as inadequate funding, limited industry engagement, and unclear mandates have been reported as undermining the intended technical orientation of these institutions (Erima, 2021; Kihaki, 2025).

There are a number of lessons that can be gleaned from the transformation of polytechnics into universities. Across the UK, Germany, Ghana, and Kenya, this study reveals that upgrading institutional status alone does not ensure meaningful change. In Ghana and Kenya, for example, reforms have often lacked the necessary investment in infrastructure, faculty development, and curriculum modernization, resulting in limited impact. In contrast, Germany's dual system, anchored in clear sectoral roles and strong industry ties, demonstrates how maintaining institutional differentiation, rather than merely collapsing vocational and academic routes, can enhance both quality and relevance. Lastly, while UK's 1992 reforms expanded access to higher education, there are still unresolved issues of prestige, funding disparities, and mission ambiguity among polytechnics converted to universities.

Analysis shows that technical universities in Ghana and Kenya are reportedly struggling with unclear mandates, weak links to industry, and societal biases that undermine the status of vocational education (BusinessDaily, 2012; Nunyonameh, 2016). On the contrary, in Germany, the strong identity of Universities of Applied Sciences and their widespread acceptance in German industries show that vocational pathways can thrive with the right policy and public support. On the whole, it could be concluded that the success of reforms, such as converting polytechnics to universities, depends not just on structural change, but on sustained funding, policy coherence, and cultural

reorientation to ensure that technical and vocational institutions are held in high esteem and effectively integrated into national development strategies.

Advancing Printing Education in Nigeria: A TVET University Model

According to Cai and Kosaka (2024), the core strength of Technical and Vocational Education and Training (TVET) lies in its flexibility, work-integrated learning approach, and direct alignment with labor market needs. Unlike traditional academic models, TVET emphasizes practical, hands-on training that develops professional competence for specific occupations. This makes it highly suitable for technical fields like printing. TVET approaches, Cai and Kosaka (2024) aver, ensure students gain not only theoretical knowledge but also real-world skills through structured collaboration between schools and industries. These approaches are in sync with the demands of the printing sector, which requires up-to-date technical expertise, equipment handling, and process innovation.

Without doubt, the design of an effective Technical and Vocational Education and Training (TVET) curriculum for high-tech fields such as printing requires a balance between industry relevance, technological adaptability, and pedagogical innovation. Previous research underscores the necessity of transformative vocational education that goes beyond technical skill acquisition to incorporate human-centered competencies such as problem-solving and adaptability (Lewis, 1994). This approach ensures graduates are not only proficient in operating modern printing technologies but also capable of navigating workplace challenges in a rapidly evolving sector.

Moreso, recent studies emphasize the critical role of digital integration in TVET curricula, particularly for high-tech industries like printing and graphic arts. Thelma et al. (2024) argue that effective curriculum development must leverage blended and mobile learning models, including simulations and adaptive learning tools, to enhance engagement and flexibility. In the context of printing education, this entails embedding digital workflows, prepress automation, and Industry 4.0 technologies such as AI-driven color management and IoT-enabled press monitoring (Hassan et al., 2021). A modular and competency-based structure is also recommended to facilitate continuous updates in response to technological advancements (Hassan et al., 2021).

Besides, global best practices highlight the importance of industry-aligned, practical training in printing education. For instance, in Turkey, Marmara University's printing curriculum integrates STEM fundamentals with advanced digital printing technologies, supplemented by a full-semester industry internship to bridge theoretical knowledge and real-world application (Marmara University, 2023). Similarly, Ahmendagar Jilha Maratha Vidya Prasarak Samaj's College in India runs a Bachelor of Vocation (B.Voc.) program which adopts a multi-exit certification system. The institution's curriculum has 60% of training dedicated to hands-on skill development in offset, digital, and packaging printing (AJMP'S College, 2020). These models demonstrate that combining academic rigor with workplace immersion enhances employability and ensures alignment with labor market demands.

Combining insights from the key literature reviewed in this paper provides the opportunity to propose a TVET degree model for curriculum development in printing. As displayed in Figure 1, the 4-pillar TVET model offers a blueprint for the repositioning and modernization of printing education in Nigeria. The first pillar highlights the need for a skills-based curriculum, one that combines traditional printing techniques with digital technologies. Such a curriculum, not only prioritizes digitalization in printing but also emphasizes sustainability in print production activities. The second pillar emphasizes the imperative for academia-industry collaboration. The goal is to ensure that students garner real-world experience through well-conceptualized and implemented industry-relevant courses, coordinated compulsory internships, and industry-recognized certifications. Working in sync, the two pillars hold the promise of bridging the gap between classroom learning and industry requirements for roles.

The third pillar, innovation-driven pedagogy, integrates cutting-edge tools like VR simulations and AI training modules to enhance technical instruction. The fourth pillar, policy and infrastructure, provides the foundation for success through accredited programs and public-private funding. By aligning global best practices with Nigeria's specific challenges, this model creates a practical pathway for developing skilled professionals, entrepreneurs, and a competitive printing industry. The framework is designed to deliver measurable outcomes, from graduate employability to sector-wide innovation, taking its source from the following key derivatives from the literature:

1. Transformative vocational education must blend technical and human-centric skills (Lewis, 1994).

2. Blended learning and Industry 4.0 technologies are essential for modern printing education (Thelma et al., 2024; Hassan et al., 2021).

3. Global models (Turkey, India) demonstrate the success of internships, modular training, and multi-exit certifications (Marmara University, 2023; AJMP'S College, 2020).

These literature review insights provide a foundation for developing a Nigerian TVET degree model that aligns printing education with industry demands, digital advancements, and global best practices.

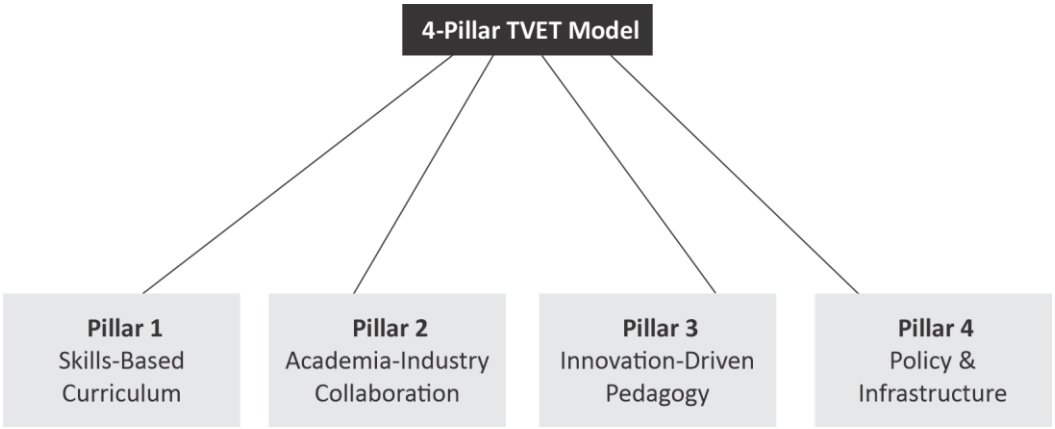

Figure 2: A 4-Pillar TVET Degree Model for Printing Technology

The 4-Pillar TVET degree model embodies the core issues that are critical to the planning and implementation of a new qualification that meets the needs and aspirations of the Nigerian printing industry in the digital era. The TVET degree qualification that is proposed should not be perceived as a mere white-washing of the HND qualification. Thus, it is crucial that it is positioned not merely as a functional training system, but as a national brand of technical excellence. Branding this educational framework is essential to position it as a high-value qualification, not an inferior degree from an inferior university. As recent trends suggest, educational institutions are not leaving their strategic communications to chance as they treat academic programs as branded commodities (Barnawi, 2022).

Conclusion and Recommendations

Nigeria's printing industry is at a pivotal moment, driven by rapid technological changes and evolving global demands that call for a modern, future-ready workforce. Yet, the current apex qualification in the field (the HND in Printing Technology) no longer meets the dynamic needs of the industry. In response, this paper proposes a 4-Pillar TVET Degree Model, anchored on a skills-based curriculum, strong industry collaboration, innovation-led pedagogy, and supportive policy infrastructure. This model offers a transformative framework to reposition printing education from a marginalized training pathway into a national symbol of technical excellence.

To achieve this, strategic communication is essential to reposition TVET degrees and counter misconceptions that they are inferior to traditional academic qualifications. When effectively implemented, this model will not only close the skills gap but also elevate Nigeria's profile as a leader in high-quality, innovation-driven printing education. Key recommendations include launching a national branding and awareness campaign, adopting a sustainable funding model, and investing in continuous staff development. Additional suggestions include establishing a PrintTech Advisory Council (comprising industry leaders, educators, and policymakers) to review curricula biannually in line with emerging technologies, monitor key performance indicators such as graduate entrepreneurship rates, and benchmark outcomes globally.

More than an educational reform, this model represents a socio-economic transformation. With bold branding and committed execution, Nigeria's TVET system can become a national asset, attract investment, and serve as a model for other African nations.

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