FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

THE MARRIAGE BETWEEN TVET AND JOB CREATION: LET NO ONE PUT ASUNDER

BY:

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NCE(Technical) B.Ed.Tech. (ABU Zaria), M.Ed.Tech. (UNN), PhD. (UNN)

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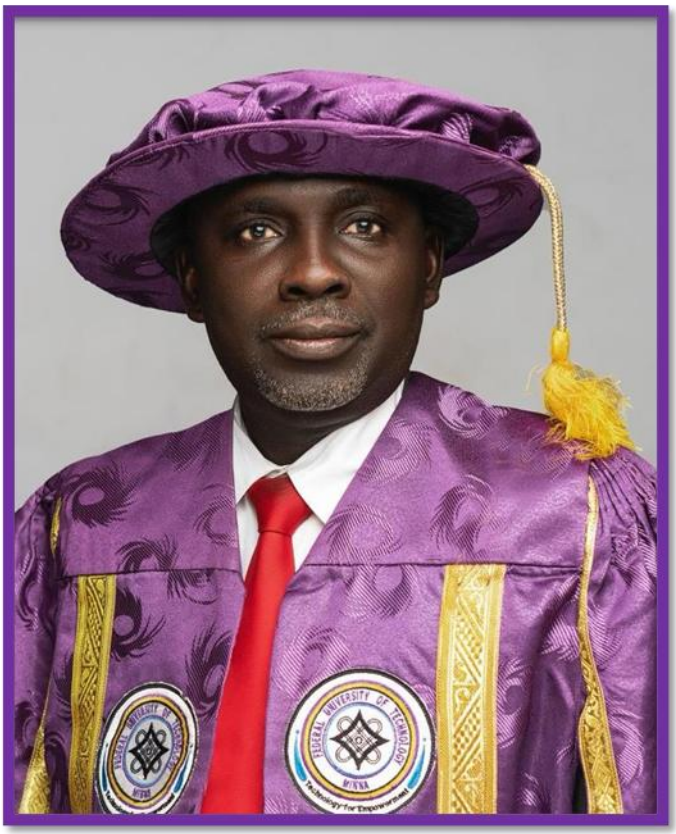

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1.0 PREAMBLE

It is with a grateful heart to God and a deep sense of humility that I stand here today to deliver the 131st Inaugural Lecture of this great citadel of learning, Federal University of Technology, Minna. An Inaugural Lecture is an auspicious occasion in a university to acknowledge the appointment of an academic staff to the rank of a full Professor. It provides professors with the opportunity to share the impact of their research and breakthroughs on the society.

My elevation to the rank of Professor of this great University took effect from October 1, 2020, and I feel elated, that I have the singular privilege of presenting this Inaugural Lecture titled: The Marriage between TVET and Job Creation: Let No One put Asunder.

The Vice Chancellor Sir, the outline of presentation of this lecture is as follows:

i. Contextualization and Historical foundation of the marriage between TVET and Job creation in Nigeria
ii. The current state of the marriage: a diagnostic assessment
iii. Understanding the anatomy of the relationship
iv. Challenges threatening the sacred union
v. My research contributions to strengthening the TVET-job creation union
vi. Rekindling the Romance: Innovative strategies for strengthening the union
vii. The future vision: A thriving marriage
viii. Conclusion
ix. Recommendations for Stakeholders
x. Acknowledgements

2.0 CONTEXTUALIZING THE MARRIAGE METAPHOR

TVET is an acronym that stands for: Technical and Vocational Education and Training. It is the type of education and training that provides knowledge and skills for employment and sustainable livelihoods (UNESCO-UNEVOC, 2023). Job Creation on the other hand is a process of generating employment opportunities that offers sustainable incomes and contribute to economic growth. The topic of the current lecture (The Marriage Between TVET and Job Creation: Let

No One Put Asunder) is based on the divine word and declaration of God concerning marriage. We are reminded in the Gospel of Matthew 19: 6 that, What God has joined together, let no one put asunder. Similarly, the relationship between TVET and the creation of employment is not a mere marriage. It is a consecrated union--prescribed by heavenly wisdom as well as by growth. Consequently, TVET and job creation represent a critical partnership for socioeconomic development in Nigeria. It is a marriage that must be protected. See Figure.1.

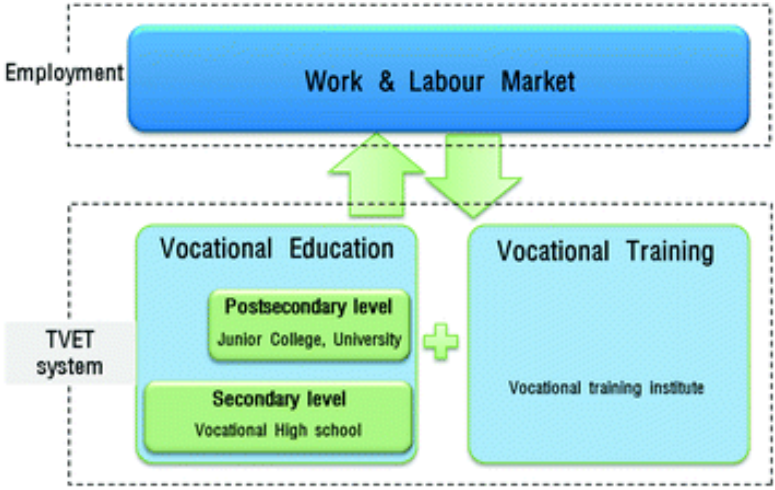

Figure 1: TVET-Job Creation union

Marriage, in its simplest form is a union of two entities becoming partners towards achieving common goals. The union makes them more powerful and more purposeful. Similarly, TVET and job creation have to be perceived as two inseparable partners. Lack of employment opportunities means that TVET will end up being sterile and the graduates of this process will have no avenue to express their skills; and in the absence of firm TVET, the job creation process is weak and creates employment without the skilled workforce to keep it going.

This union is not a choice, it is a necessity in Nigeria. With a population of more than 220 million, our people are largely young with millions of them joining the labour market annually. Youths, when not gainfully employed either in the public or private sector of the economy, become very vulnerable to criminality such as kidnapping, rape, armed robbery and many other social vices which are now menace to the society (Nwachukwu and Nwamuo, 2010).

This urgency is identified in the National Development Plan (2021-2025), which focuses on providing ambitious targets to create 21 million full-time jobs by 2025 (Federal Government of Nigeria, 2021). The Plan however is also clear that such jobs should be productive and sustainable rather than transitory and casual. The same is echoed in the job diagnostic of the World Bank (2020) on Nigeria, where the organization states that Nigeria needs more productive jobs.

Based on the foregoing, TVET attests its divine relevance. TVET is not only able to provide certificates to trainees; it provides competencies, creativity, and flexibility when devised to satisfy the requirements of the labour market. This is the reason why the World Bank (2019) emphasizes the need to connect the skills development with the employability and competitiveness. This belief is also the cause of the decent work country programme (2023-2027) of the International Labour Organization (ILO), which puts TVET and skills training at the centre of the way to decent jobs in Nigeria (ILO, 2023).

Institutions such as the National Board for Technical Education (NBTE) have played a significant role in institutionalizing this marriage. NBTE has produced evidence on enrolment patterns and institutional development through its Digest of Statistics (2019) and the National Skills Qualifications Framework {NSQF} (2024) has made training both competence-based, industry-relevant, lifelong learning and supportive. This system facilitates the flow of vocational, technical and higher education whereby the skills acquired are in line with the national priorities. Essentially, NBTE is assuming the marriage counselor role, where it is fostering, and enhancing the relationship between the supply and the labour market demand of skills.

So, when I say that TVET and job creation are intertwined, I do not just make a rhetoric flourish. I am repeating the wisdom of the Scripture, the vision of national policy, and the evidences of international research. Indeed, that which God and development strategy have united, let no one divides.

2.2 The Historical Foundation of the Union

2.2.1 Evolution of Technical and Vocational Education and Training (TVET) in Nigeria

TVET in Nigeria can be traced back to the colonial era when technical education was established with the sole purpose of providing administrative and infrastructural demands of the colonial government. Some of the first formal attempts to produce skilled manpower were institutions such as the Yaba Higher College in 1934. These early efforts however were limited in their scope as they focused on clerical and simple technical support and not the overall training of industrial support. The colonial policy did not involve producing a strong middle group of workers but provision of low- end skilled labour to keep the colonial economy running (Okorie,2001).

Nigeria realized the strategic value of TVET as an industrial growth and socio-economic transforming factor with its independence in 1960. The 1960s to 1980s was the time of the policy change as the successive education plans and government white papers reflected. These developments included the formation of polytechnics, technical colleges and the National Board of Technical Education (1977). These institutions were mandated with the responsibility of increasing the accessibility of technical training, and harmonizing the curricula and national manpower requirements to produce graduates who can develop the nation.

This era was referred to as the golden age of TVET. Polytechnic and technical colleges sprang up, and created qualified technicians, craftsmen and middle-level manpower, who were absorbed easily in manufacturing, construction, power and transport industries. Polytechnic education had a high status and technical education was

viewed by most families as a safe route to secure jobs and promotion. TVET graduates were even considered as the powerhouse behind the industrial development of Nigeria, especially in the oil boom years, whereby the infrastructure projects required mass number of trained hands.

However, towards the end of the 1980s and the early 1990s the manufacturing sector started to deteriorate, and inconsistencies in policies started to undermine the goals of TVET institutions in Nigeria. These institutions became dull due to underfunding, lack of maintenance of workshops and laboratories, and lack of linkages to industries. The lesson of the history is that should TVET be properly supported it would have played a major role in the socio-economic development of Nigeria (Okoro,1993).

2.2.2 International best practices of TVET-employment nexus

The experience of other countries proves that TVET is a driving force of national change when it is organized correctly and integrated into the industry. The dual education system in Germany is one of the best emulated models (UNESCO-UNEVOC, 2023). It is a combination of both classroom training and in-company training where the graduating students are guaranteed to have both theoretical knowledge and workplace skills. Such tight liaison of the vocational schools and industries will ensure the employability and fortify the economy. The success of this model is a success story that can be traced in Germany with the remarkably low rate of youth unemployment in the country, with more than 50 percent of the youths embracing the dual track system.

Another useful case study is the transformation of Singapore that had been a resource-poor island in the 1960s into a global centre of innovation and high-skilled jobs. Of course, Singapore has repositioned vocational training as a career option, not a final option, through TVET. Massive investment in contemporary infrastructures, continuous curriculum reshaping to suit the trends in the labour market, and good government-industry collaborations have opened TVET graduates to strategic positions in their society (Kung, 2024). The current economic

growth of Singapore is based on skills-based competitiveness of the labour force.

The vocational miracle in South Korea is a good example of how a war-torn nation can be transformed into a world industrial giant in just one generation with a strategic focus on developing the human capital base. South Korea incorporated vocational education in national development strategies so that at any point of the industrial development there would be an equivalent number of skilled labour. The outcome is a highly talented human resource which is able to keep the Korea industries competitive globally in electronics, automobiles and shipbuilding. In the case of Nigeria, the morals are explicit: long-term investment and industrialization are non-negotiable. TVET itself cannot be effective, except it is part of a system that prioritizes skills as the foundation of development.

2.2.3 The original promise

The initial intention of TVET in Nigeria, as it was in other industrializing societies, was to be a vehicle to the prosperity of the middle classes. TVET was one thing that would enable individuals to bridge the gap between poverty and economic stability by equipping them with employable skills that were practical. In the 1960s and 1970s, technical education was regarded as the surest entry into the ladder of upward mobility in families because graduates were sure to get good employment, help build the nation, and have a befitting social status. TVET is all about economic empowerment. In addition to employment, skills training enables people have the capacity to generate jobs by becoming entrepreneurs. Electricians, welders, mechanics and other skilled artisans not only get an opportunity to work but also create an opening for others. Such a multiplier effect makes the local economies stronger and less reliant on government jobs.

Besides, TVET is a form of social contract between education and employment. It does not rely on an academic route heavily, as its validity lies in its vow to provide skills that can be applied directly to labour market needs. In its operational good health, TVET provides

the youth with the comfort that their sacrifice of time and hard work would not be in vain-jobs, income, dignity and inclusion. In Nigeria today, unfortunately such promise has been undermined in policy neglect, bias in the society towards vocational careers and poor links to industries (Adesina, 2025). However, history and world experience, have been able to validate the fact that once this union between TVET and job creation is cultivated, it can transform generations into prosperity.

3.0 THE CURRENT STATE OF THE MARRIAGE: A DIAGNOSTIC ASSESSMENT

3.1 Employment Landscape in Nigeria (2024–2025)

Nigeria is grappling with a serious skills gap, with over 53 million youth aged 15–35 either unemployed or underemployed (National Bureau of Statistics [NBS], 2023). The mismatch between academic outputs and labour market demands has highlighted the critical gap in structured vocational pathways. The World Bank estimates that over 70% of Nigerian youth in rural and urban areas engage in informal and apprenticeship-based skill acquisition, yet these skills remain largely unrecognized and uncertified. According to Premium Times (2025), approximately 600,000 to 700,000 students graduate annually from federal, state and private universities in Nigeria without adequate employable skills. This is not unconnected with the reason why Arise News (2026) estimated that Nigeria poverty and unemployment rate could reach 62% and 5.3% in 2026 respectively.

There has been a major concern on the alignment of the Nigerian labour market demands to TVET. Going further memory lane, the youth unemployment rate as indicated by the Nigeria Labour Force Survey (Q2 2024) has improved, with the unemployment rate of 6.5, which is an improvement on the unemployment rate of 8.4 in Q1 2024 (National Bureau of Statistics [NBS], 2024). This movement seems on the surface to show an improvement on the joblessness issue. But behind this statistical optimism is an underlying problem that shows structural disjuncture between the skills that youths have and the skills that are required by employers. According to Adesina (2025), employers

working in manufacturing, ICT and construction industry continue to find it hard to fill technical job positions despite many young people in Nigeria being either underemployed or unemployed. This paradox relates to a problem of skills mismatch, in which the graduates of TVET frequently do not possess any type of specialized skills demanded by the workings of modern industries. The problem is magnified by lack of exposure in the workplace during training, which contradicts Prosser and Quigley's (1949) theory that emphasized that TVET will be efficient in proportion as the environment in which the learner is trained should be a replica of the environment in which he must subsequently work. Lack of opportunity to be an apprentice and old curricula which are not in line with current trends in the labour market are other issues of concern.

The study on skills mismatch in Nigeria labour market also demonstrates that although the Nigerian economy is diversifying, most of the labour force is still concentrated in low- productivity work in the informal sector, with petty trading, commercial transport, and artisanal services being the most prevalent (Okwudili and Kabir, 2022). Although the informal sector offers the safety net to millions of people, the predominance of this sector indicates the low capacity of formal TVET to absorb and empower young labour force into high paying and sustainable jobs. This has far reaching consequences to TVET. Unless the sector is able to adjust to the realities of the labour market, there is risk of dysfunction in the marriage that exists between TVET and job creation. To be successful, TVET needs to create more graduates, but it should be able to make them the right blend of technical, entrepreneurial and digital skills that will make them competitive in the 21st century economy.

The Technical and Vocational Education and Training (TVET) programme when executed properly, is expected to have a positive impact on the Nigerian economy in several ways:

1. Reducing Unemployment: By equipping Nigerians with practical skills, TVET can increase employability and reduce unemployment rates, particularly among youths.

2. Boosting Entrepreneurship: TVET can empower individuals to start their own businesses, thereby contributing to economic growth and development.
3. Addressing Skills Gap: The programme can bridge the skills gap in critical sectors, making Nigeria more attractive for investments.
4. Increasing Economic Diversification: By promoting vocational skills, TVET can help reduce dependence on white-collar jobs and contribute to a more diversified economy.
5. Enhancing Economic Growth: With a skilled workforce, Nigeria can experience sustained economic growth, driven by innovation, entrepreneurship, and increased productivity.

Overall, the TVET programme has the potential to positively impact Nigeria's economy by providing a skilled workforce, promoting entrepreneurship, and contributing to economic diversification and growth.

3.2 The Indicators of Performance of TVET

The fact that TVET enrolment has increased drastically in recent years is one of the encouraging signs. According to government statistics, in 2025, the number of enrolled students increased by a remarkable 287.76%, which is evidence of greater focus on policy on skills development and the fact that more young Nigerians are beginning to realize that vocational education is a promising way to job creation and independence (Daily Post, 2025a). This spurt reflects a shift in attitude especially among parents and students towards appreciating practical and technical education instead of exclusively traditional academic degrees.

Just because there is a lot of it does not necessarily mean it is of quality. The 2025 National Common Entrance Examination (NCCE) outcome showed that the number of individuals scoring above 50 marks was only 39%, which shows that there is still the question of the quality of teaching, learning facilities, and student preparedness of the situations (Daily Post, 2025b). This leads to concerns on whether the enrollment is being increased dramatically with equal investment in

infrastructure, teacher training, and modern equipment. In addition to the results of examination, employability is a serious yardstick of measuring TVET effectiveness. Positively, as suggested by government reports, 60 percent of TVET graduates are employed or self-employed, which is at least a sign of improvement on the labour absorption ability (Nigeria Education News, 2025), though this number should be viewed with reservations. Most of the people in the category of the self-employed are engaged in subsistence economic activities in the informal sector, which may not yield social mobility and success.

Moreover, lack of infrastructure is still limiting the results of TVET. Lots of technical colleges use outdated equipment, do not have digital training laboratories and work in the facilities that are not reflected in the real industry. These issues decrease the practicality orientation of the training programmes and increase the gap between school training and the expectation in the workplace. What is produced is a graduate population that, although enthusiastic, is not well equipped to satisfy the needs of the growing and changing economy of Nigeria. On a whole, the enrolment figures and the rates of graduate absorption are quite promising, but considering the quality indices, the infrastructure issues, and the lack of a solution to the problems of employability, the underlying performance indicators point to gaps in the system. This is subject to an intended fortification of the union between TVET and the labour market by reforms, investment and stakeholder's cooperation.

3.3 Signs of Marital Strain

The marriage between TVET and job creation, like any other union, has started to develop some strains. Among the most visible problems is the lack of alignment between the industry's needs and training programmes. In a study by Eze (2021), it was revealed that most of the curricula in Nigerian TVET remain in line with the industrial dynamics of the 1980s, as the training focus on manual operations and low-level technical skills, whereas modern industries are demanding high-level competence in automation, robotics, green technologies and digital skills. The result of this disconnect is graduates who are qualified on paper but seemingly unsuitable to face the real world.

Intimately connected is the continuation of obsolete curriculums and equipment. According to a recent report by NBTE (2025), it was noted that more than 60 percent of colleges in the technical sector still use outdated training equipment with many being donated several decades ago. The machines that are being used to train students are often outdated in industries and hence the students are trained experts in something that is not in use in modern industries. This scenario leads to the paradox of graduates of TVET institutions becoming the ardent ones, yet failing to fit in to the new workplaces.

The other strain comes from minimal industry-academia cooperation. In those nations with a well-developed TVET, like Germany or Singapore, training institutions collaborate closely with employers to co-design curricula, offer apprenticeships and renovate learning sites. The marriage of such partnerships in Nigeria, however, is still immature. Employers of labour are rarely consulted during development of curriculum and the structured internship placements are not regular. Therefore, reducing the exposure of students to the realities of industry (Adebayo and Lawal, 2024). To make matters worse, there is continued stigmatization of vocational education. Even after governmental campaigns, a significant number of Nigerians regard TVET as a secondhand option that students may choose in case they failed to get an opportunity at the university (Nwachukwu, 2024). Such prejudice against the society does not only influence the quality of enrolment but also lowers the morale of students, and makes the high performers who are young not to want to venture into technical routes.

Lastly, the problem of funding shortcomings still makes the system tensed. According to the Education Sector Financing Report (2025), only less than 10 percent of the education funds are allocated towards technical and vocational education in Nigeria, which is significantly lower than the recommended amount by UNESCO (World Bank, 2025). This underinvestment is what has led to the deterioration of infrastructure, inadequacy of trained teachers and incompetent research potential of TVET institutions. The lack of proper funding will lead to further instability of the marriage.

3.4 Government Initiatives and Interventions

Nonetheless, these difficulties have not stopped the government efforts that have taken place in the recent years of renewed resolve to rescue and bolster the TVET-employment union. One of such initiatives is the Federal Ministry of Education TVET Initiative 2025, which aims to transform technical colleges programmes and create a better connection between technical institutions and industry players (Federal Ministry of Education, 2025). At the heart of this programme is an ambitious initiative to train 5 million Nigerian youths with industry-relevant skills by 2030 through tuition-free training, stipends and industry partnerships where each would receive a N22,500 monthly stipend in the process of training. The policy objectives are not only to increase access but also reduce financial barriers that scare away many youths to join the TVET programmes. The second initiative is the NSQF. According to NBTE operational manual for NSQF, 2024, the Nigerian Skills Qualifications Framework (NSQF) is a system that helps develop, classify, and recognize the skills, knowledge, and competencies gain, no matter where or how they learn them. It provides a clear structure for comparability different qualifications and allows individuals to progress from one skill level to another.

The NSQF serves as the foundation for the National Skills Qualifications (NSQ) system in Nigeria. It aims to promote lifelong learning and ensure quality assurance and recognition in Technical and Vocational Education and Training (TVET). Its key objectives include: reducing the difficulty in selecting skilled workers for industries, creating pathways from informal training to formal TVET programmes, and closing the gap between what TVET graduates learn and the skills employers need. The NSQF is structured into nine levels, with each level representing a higher degree of complexity, responsibility, and expertise. These levels help individuals to progress from basic to expert skills, making the framework flexible, inclusive, and industry-driven. The levels are shown in figure.2.

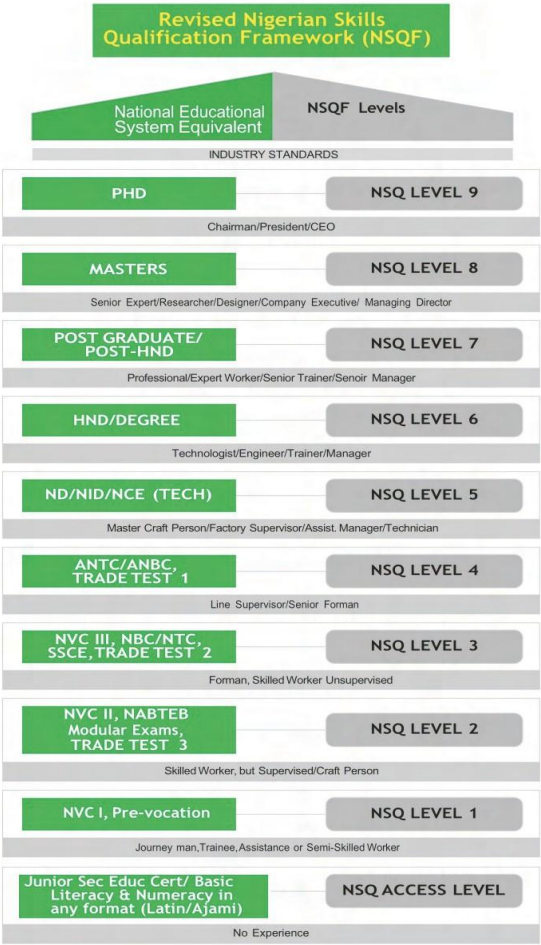

Figure 2: NSQ LEVELS
Source: NSQ Operational Manual

A critical component of the National Skills Qualifications Scheme is its rigorous and transparent assessment methods. These are designed to ensure that certifications awarded under the scheme accurately reflect the competencies and readiness of the practitioners to perform at the required levels.

Practical Assessments: Methods like Direct Observation, Examining work product, Reflective Statements of Learners, Professional Discussions, Case Studies, Project, etc are employed
Theoretical Assessments: Complementing practical assessments methods like Assignments, Questioning, Personal Learner's Statements, etc test the underpinning knowledge necessary for competent practice.
Formative and Summative Assessments: This includes periodic evaluations throughout the training period, allowing for ongoing feedback and incremental improvement. Continuous assessment helps identify areas where practitioners need further development and ensures a well-rounded competence by the time of final assessment and certification.
Recognition of Prior Learning (RPL): For seasoned practitioners, the RPL pathway acknowledges the skills and knowledge they have acquired through experience. This method allows them to gain certification without undergoing redundant training, making the scheme more efficient and accessible.

The other initiative is the increased focus on Open and Distance Learning (ODL) platforms of TVET. NBTE has partnered with the National Open University of Nigeria (NOUN) to introduce pilot programmes that enable students living in rural and underserved areas to receive vocational education on blended-learning platforms (Akinwale, 2025). This strategy spreads the net further so that there is no restriction to the acquisition of skills to urban centres only. NBTE reforms have also brought new competence-based curricula, industry certification systems and digital accreditation systems to enhance accountability and credibility of Nigerian TVET qualifications at the regulatory level (NBTE, 2025). The reforms also focus on lifelong learning and graduates can therefore upgrade their skills without necessarily having to begin their academic lives anew. Together, the specified interventions are an indicator that the government is acknowledging the fact that the relationship between TVET and job creation is too crucial to overlook. However, as Nwachukwu (2024) also makes it clear, the actual test is not policy design but implementation fidelity, that is; whether initiatives go beyond

announcements to actual changes in the classroom, workshop, and employment markets throughout the country.

Surprisingly, companies in Nigeria struggled to fill hundreds of roles because many applicants did not yet have the skills required for globally competitive jobs. One of these reasons being the education system. The education system seems to value paper qualifications more than practical skills. This raises a very important question: How can a country with millions of job seekers still have positions employers cannot easily fill?. This is due to the fact that the economy is changing faster than many education systems were originally designed. This is a serious issue of concern. Even industrial leaders like Aliko Dangote have also emphasized that Nigeria's growth will depend on a workforce with stronger technical and practical capabilities. For a long time now, having a certificate was often seen as the ultimate. But today, employers are increasingly focused on something more practical: Can you build? Can you repair? Can you code? Can you analyze? Can you solve real problems? In other words, what matters more and more is not only what you know, but what you can do. That is why Technical and Vocational Education and Training (TVET) is receiving renewed national attention. Under the Nigerian Education Sector and Renewal Initiative, the Federal Ministry of Education introduced an 80-20 practical-to-theory model to make training far more hands-on. And so far, the programme has attracted over 1.3 million applicants, matched over 160,000 trainees to more than 1,700 accredited centers, and even enrolled well over 72,000 learners with verified biometrics. This is not about replacing university education; it is about ensuring more Nigerians leave school with skills that the labour market can immediately use. These skills go far beyond technology. They include software development, welding, mechatronics, electrical installation, industrial maintenance, and many of the technical roles that keep modern economies running. So, the world of work is rewarding practical capability, and our education system must adapt to meet that reality.

4.0 UNDERSTANDING THE ANATOMY OF THE RELATIONSHIP

4.1 The Skills System Framework

The principal premise behind the relationship that exists between TVET and job creation is what scholars theorize as the skills system-dynamic interaction between supply, demand and support systems that define the degree to which vocational education can be translated into job-openings. The supply side has the responsibility of producing graduates who have competencies relevant to the industry through the TVET institutions, providers of private training and certification bodies. Although Nigeria has strengthened its technical colleges and polytechnics, the training quality is usually lower than the global one because of the outdated facilities and the lack of industry inclusion (Fagge *et al.,* 2020). Poor accreditation and lack of proper certification systems also diminish competence of the graduates in the local and international labour markets, hence restricting their professional mobility.

The final users of TVET graduates on the demand side are still the industries and employers. The demand-driven models in developed economies help in making sure that the industries have a role to play in shaping the curricula hence ensuring that the results of the training match the needs in the workplace. According to Okoye *et al*. (2015), when industrial demands are carefully balanced with vocational training, the graduates are easily transferred to productive job. In Nigeria, demand pull has however been haphazard with the employers complaining of skills mismatch in most sectors, especially in manufacturing, ICT, and construction. This alienation undermines the ability of TVET programmes to create employment.

The balancing mechanism of the system is the support system dimension which consists of government policies, funding mechanisms and quality assurance agencies. A well-structured policy can incorporate the demand and supply, whereas weak governance will establish dysfunctions in the system. Ayonmike (2016) emphasizes that the myths about TVET as inferior to the academic education continue to exist and

develop due to the failure of governments to provide the sector with the necessary funding and institutionalize effective monitoring frameworks. The absence of support structures makes the TVET-employment marriage weak resulting in poor outcomes. The circuit breaker in the skills system illustrates that jobs are not just created by training but represent a mutual interdependence between supply and demand and favourable policy conditions.

4.2 The Employment Creation Mechanism

The process by which TVET supports economic growth in employment is not limited to the direct employment of the graduates in the vacant positions. There are four significant pathways:

4.2.1 Face-to-face hiring by skills training

TVET offers practical skills through which an individual is directly trained on technical and service-oriented jobs. According to Saidu and Ajuji (2016), TVET is a sustainable option of absorbing the youths in productive sectors like construction, renewable energy and ICT in the light of the declining white-collar job market in Nigeria.

4.2.2 Small business development and entrepreneurship

Contrary to the conventional academic courses, TVET programmes focus on practical skills that are conducive to self-employment. As Wami (2024) notes, TVET graduates in Nigeria are starting to develop microenterprises: be it welding workshops or digital startups that earn them income and decrease the need to rely on salary. The small businesses like these are the support of local economy.

4.2.3 Integration of value chain and clustering of industries

TVET graduates are not only engaged in industries as employees but also get to set up complementary businesses that enhance value chains. Fatokun (2022) demonstrated this through the evidence of Ekiti State whereby, after graduates set up small businesses, they were able to grow the number of people employed by hiring apprentices, suppliers and subcontractors. This is the effect of clustering that creates industrial systems in which innovation and employment are mutually sustained.

4.2.4 Innovation and technology transfers

The practical orientation of TVET makes graduates ready in order to fit the world technologies to the local realities and develop new solutions to the issues of the Nigerian industries. Abubakar *et al.* (2023) believed that TVET programmes aim at entrepreneurship generate immediate jobs as well as spread technology faster, especially in agriculture, ICT and light industry. These processes make TVET look like something more than a wage employment machine; TVET becomes an entrepreneurial engine, an innovation machine and a job creation machine.

4.3 Economic Multiplier Effects

The correlation between TVET and employment is carried over to the rest of the economy, and the multiplier effects generated by these and other effects lead to the formation of the community development and national competitiveness. First, TVET graduates are becoming more job creators and less job seekers. They create business thereby causing demands of inputs to be met, create jobs to other people and also promote localized economies in the course of setting up businesses. Okoye *et al.* (2014) argued that this transformation improves global competitiveness since the availability of skilled workforce is a key issue in maintaining industrialization.

Second, the concentration of skilled labour creates the local economic development. Clusters of craftsmen, technicians and business owners lure investors, increase the levels of productivity and boost the local markets. Abubakar *et al.* (2023) also pointed out that entrepreneurship-based TVET ensures social inclusion through enabling marginalized groups to gain access to productive opportunities and in this way minimize inequality.

Third, TVET also leads to import substitution and export competitiveness. Production of goods locally by training graduates makes them less dependent on imported products and foreign knowledge. Edel (2020) explained this with the Build4Skills project, in which the integration of TVET in infrastructure projects creates both short-term employment and long-term capacity of the country in terms

of its national capacity. In the long run, these efforts improve the competitiveness of Nigeria exports, by making the country workforce competitive in terms of skilled industries in the global market. In the end, the multiplier effects in the economy make it clear that TVET is not only about personal employment, but the change in the economy. TVET proves to be a survival mechanism and a sustainable development tool as it builds entrepreneurship, increases industrial productivity and improves national competitiveness.

5.0 CHALLENGES THREATENING THE SACRED UNION

5.1 Systemic Challenges

Consistency of policy and poor implementation structures are the most endemic systemic problems of TVET in Nigeria. The new TVET policies and reforms have been implemented over the years as different administrations come into power, but most of them are not sustained, and as such they are disjointed and fail to deliver sustainable results. To illustrate, although there are various national policy documents on vocational training, their implementation usually fails because of lack of political will, duplication of role among agencies and poor monitoring systems (UNESCO, 2022). This policy disconnects causes confusion in the training institutions and makes the system less effective.

The problem of insufficient funding and distribution of resources is closely related to the problem of policy inconsistency. Although TVET is being identified as an important source of employability and industrial competitiveness in the world, its funding is still low in comparison to other education sectors in Nigeria. The lack of financial resources restricts the capacity of the institutions to invest in modern equipment and facilities maintenance or increase access by marginalized groups (NBTE, 2019). Consequently, most of the TVET institutions have old fashioned infrastructures, lack teaching resources and become too dependent on donor aid. This lack investment is a continuous cycle of bad performance that makes people lose trust in the industry.

The absence of effective quality assurance and standardization mechanisms is also another systemic problem. Even though the NBTE has tried to create accreditation and quality assurance standards, their implementation is still weak. Lots of programmes do not have standardized curricula that correspond to the needs of the industry and the skills registered by graduates are not in alignment with the competence needed by employers (Nwachukwu, 2024). Lack of robust regulatory control plays a vital role in creating a difference in standards of various institutions where some offer quality graduates and the others give poor training. Such discrepancy undermines the validity of TVET qualifications and the system becomes hard to believe by the employer.

Lastly, a little attention is paid to the Research and Development (R&D) in TVET. Most vocational institutions do not experience the resources and culture of research-based innovation as they are unlike in universities where academic research takes precedence. This disconnection is a barrier that prevents the TVET system to be dynamic in response to new technology, new demands in the labour market, as well as global competitiveness (Adams, 2007). Unless Nigeria invests in applied research, it may end up with graduates who are equipped with possible future jobs but lacks the ability to project the skills requirements in the future.

5.2 Institutional Challenges

The weak partnerships between the training institutions and industries are one of the biggest problems at the institutional level. Although TVET must be industry-led, in Nigeria, such collaborations are unsustainable and informal. Curriculum design, student assessment, and internship placement often do not involve industries, and thus graduates are not exposed to real-life situations (Okon, 2019). Lack of strong linkages also implies that the institutions have difficulties keeping up with improvements in technology at place of work that adds to the skills gap.

The other issue is the high level of outdated teaching practices and training technologies. Most teachers continue to depend so much on

theory-driven and classroom learning models as opposed to competency-based frameworks that focus on practical learning. This is augmented by the fact that outdated equipment is used that does not reflect the reality of the work world anymore making the students ill-equipped in the modern industrial world (Axmann *et al.,* 2015). Unless digital learning technologies and frequent curriculum updates are undertaken, it is likely that TVET in Nigeria will be sidelined due to the disruption of global technology.

The problem of lack of qualified teachers also undermines the institutional capacity. There is the lack of trained vocational teachers possessing not only pedagogical skills, but industry experiences. Professional growth is most of the time not an option to many instructors, and career prospects as a teacher of TVET is not appealing, which leads to low morale and high turnover (ILO, 2023).
Not only does this insufficiency curtail the quality of instruction, but also prevents innovativeness in institutions.

Finally, inadequate career guidance and counseling systems are other institutional weaknesses that are not properly addressed. The majority of the TVETs in Nigeria do not have a well-organized career service to assist students in recognizing their strengths and labour market opportunities or guide them in moving into entrepreneurship. This leads to the situation where many graduates are left in the system without any clear employment or self- sufficiency avenues (UNESCO, 2022). Enhancing career advice will be more effective to motivate students, lower the dropout rate, and increase perceptions of TVET as a career choice.

5.3 Social and Cultural Disinhibitions.

One of the greatest challenges against the promotion of TVET in Nigeria is the stigma that has been lingering on vocational education. Although there has been increased appreciation of skills as an economic growth driver, vocational training is still regarded by many families as a course of action to be adopted by individuals who failed to perform in the traditional academic careers. Such a social conception supports the

notion that TVET is a second-best option that does not help young individuals feel motivated when they can get quicker access to jobs and entrepreneurship through such initiatives (Adewale *et al.,* 2018).

This challenge is then intensified by the fact that white-collar careers are highly favoured. Fathers and mothers usually push their children to choose such areas of work as law, medicine, or banking. Nevertheless, the facts about the Nigerian labour market indicate that technical and practical skills are more sought after, especially in areas such as ICT, renewable energy and construction (UNESCO, 2022). This cultural bias is not only causing an overproduction of university graduates but also leads to the lack of skilled employees in technical sectors (National Bureau of Statistics, 2024).

Peer and parental influence is also of critical importance. Parents can force children to attend university regardless of their interests and capabilities whereas peers prefer to celebrate university admission as a sign of the ultimate success. Consequently, vocational education is viewed as a kind of a last resort, which demeans the self-esteem of the youngsters who would otherwise be exceptional in the technical disciplines (Adewale *et al.,* 2018). There is gender stereotype which are an additional burden of barriers to the society. Females are often not encouraged to work in male-dominated professional areas like welding, auto-mechanics, or electrical installation due to the stereotypes about gender roles. Such stereotypes maintain inequality and restrain women in high technical demand sectors thus, ending up wasting a large percentage of human resource talent. The literature emphasizes that gender inequality should be resolved in the context of TVET in order to create a sustainable development, which will be impossible without a targeted policy of gender sensitivity and awareness (Ilokanulo *et al.,* 2021).

5.4 Economic and Market Challenges

TVET graduates are faced with enormous obstacles by economic realities. The informal sector domination is one of the most important challenges as many artisans and talented employees work in the

informal sector not having certification or any standard recognition. This non-validation allows them to have limited access to better paid jobs in the formal economy or to have access to opportunities in government contracts and labour markets abroad (Adams, 2007; Hofmann *et al.,* 2022). Start-up capital is also another hurdle. Most of the graduates who have technical skills cannot start businesses due to the unwillingness of financial institutions to provide loans on the basis of young entrepreneurs as they do not have collateral or credit history. Despite the existing microfinance programmes, their coverage is rather narrow and programmes sponsored by the government are also limited due to bureaucracy and absence of transparency (Odiche, 2023). Such financial challenges stifle entrepreneurial potential of TVET graduates and diminish the economic effects of vocational training.

The situation is further worsened by the fact that the market has become saturated in conventional trades like tailoring, hairdressing and the simple repair of motor vehicles. Having a surplus of practitioners in such areas, there is a limitation of the income opportunities and reduced profits. Unless there is a conscious drive to encourage developing technologies like renewable energy, robotics, sophisticated ICT and automation, most graduates of TVET face it as a risk of underemployment, even after acquiring practical skills (Small and Medium Enterprises Development Agency of Nigeria and National Bureau of Statistics, 2019).

Lastly, the demand for skills is being transformed by global competition and technological disruption in a manner that cannot be matched in the Nigerian TVET systems. A lot of the curricula used in most countries especially in Nigeria are outdated and do not correspond to the needs of the modern labour market. Consequently, graduates end up being digitally illiterate and lack flexibility and highly skilled technical abilities which they cannot utilize in an economy that is globalized (Nwachukwu, 2024). The employability of graduates of TVET institutions in Nigeria will remain low unless the institutions adopt innovation, international benchmarking, and frequent review of curriculum (UNESCO, 2022).

6.0 EVIDENCE FROM THE FIELD:MY RESEARCH CONTRIBUTIONS TO STRENGTHENING THE TVET-JOB CREATION UNION

My discussion on the way forward on this marriage is based on empirical data of my research over a period of more than twenty years. My efforts, together with that of my distinguished colleagues and students, have been systematic in the ways we have diagnosed the very issues that we are facing today. My work, which includes, but is not limited to, experimental research, curriculum design, policy research, and published textbooks, offers a holistic evidence-based foundation in three intertwined spheres that are necessary in the TVET-Job creation marriage.

6.1 Revolutionizing Pedagogy: Evidence-Based Methods for Effective Skill Transfer

Pedagogical innovativeness has been established as necessary in the production of competent graduates fit to be employed in the industry as seen in a published work by **Raymond, Atsumbe and Jebba (2018)** on the Comparative Effects of Synchronous and Asynchronous Instructional Approaches on Students' Achievements and Interests in Electrical Engineering**.** The study which deployed a quasi-experimental research design was carried out among 190 students. It was discovered that asynchronous instruction approach had higher achievement gain (+6.10 points) and interest gain (+6.81 points) than synchronous approach. This piece of work developed and validated instruments such as Electrical Technical Competency Achievement Test (ETCAT) and Electrical Technical Interest Inventory (ETII) for technical education assessment and evidence-based framework for implementing asynchronous instruction in resource-constrained environments.

In Comparative Effects of Cognitive and Traditional Task Analysis-Based Instructional Guides on Students' Skills Achievement in Electronics Work, **Raymond and Ogbuanya (2015)** found a 40.91% mean gain in troubleshooting skills through Cognitive Task Analysis (CTA), while Traditional Task Analysis (TTA) had 33.13% mean gain in the same study. Most importantly, male students gained more

(44.33%), while female students also gained significantly (38.18%) through CTA. This established that a combination of mental models and procedural steps is essential in improving problem-solving skills. CTA is more effective for teaching complex tasks such as troubleshooting because it integrates mental models with practical steps. While males performed better, CTA benefits both genders significantly.

It was demonstrated in another article titled: "Effect of Intelligent Tutor in Enhancing Think-Pair-Share in Learning of Light Emitting Diode Television Troubleshooting" by **Hassan and Raymond** (2019) that using an Intelligent Tutor (IT) with Think-Pair-Share (TPS), cooperative learning resulted in a 46.4% skill increase, which was significantly greater than the skill increase achieved by using Traditional Workshop Practices with TPS (32.4%). This confirmed that Intelligent Tutors enables self-paced, visual and feedback-rich learning while TPS ensures peer collaboration and practice.

The work of **Raymond and Hassan (2018)** titled: "Effect of Simulation Technique on Students' Performance in Television Camera Systems Operation in Technical Colleges in Nigeria", found out that simulation technique is more effective than conventional method for teaching complex technical operations with a mean gain of 47.7%. This confirmed that simulation-trained graduates are better prepared for broadcast media, electronics servicing and digital imaging industries.

In another study on Correlation Between Five Personality Dimensions and Creative Behaviours of Electrical and Electronics Teachers in Nigerian Technical Colleges, **Raymond, Uduafemhe, Alome and Ogumah (2018)** found a very high positive correlation ($r = 0.89$) between teacher personality (particularly, Extraversion, $r=0.947$) and creative teaching behaviour. This gave an evidence-based approach to understanding teacher effectiveness in technical skills transfer. This establishes personality as a key predictor of teaching creativity in technical education.

In "Innovative Teaching Methods Adopted by Electrical and Electronic Trade Teachers," **Raymond and Hassan (2016c)** used the Diffusion of

Innovation Theory created by Rogers to reveal that poor adoption of innovative teaching methods contribute to graduate unemployability. The study also discovered that there was a significant gap in the implementation of innovative teaching methods by electrical and electronic trade teachers (mean scores of 2.99). This demonstrated institutional gap between research recommendations and classroom practice.

More so, in another study by **Raymond and Maxwell (2018)** titled: "Enhancing Electronics Technology Students Learning Experience and Satisfaction: The Role of Computer Simulation Software Packages", it was revealed that computer simulations significantly improved students' learning experience by providing interactive and repeatable practice opportunities. It was also established that blended-learning (traditional + simulation) resulted in a higher student satisfaction rate of 75%, as compared to 40% of the students in lecture-based teaching. This turned out to be the economic argument of simulated software as an inexpensive substitute to physical laboratories which were underfunded.

In Emotional Intelligence and Instructional Performance of Electrical Installation and Maintenance Work Teachers in Niger State, **Raymond and Hassan (2015)** established that Emotional Stability (61%) and Managing Relations (60%) were the best predictors of instructional performance. This was a case to incorporate Emotional Intelligence (EI) training in the teacher professional development of TVET.

6.2 Designing Dynamic Curricula: Aligning Training with Market Realities and Future Skills

My efforts have actively led to closing the curriculum-industry gap by creating new and standardized content in new and weak sectors in technical fields.

In a study by **Doma, Raymond, Usman and Owodunni (2025**) titled: "Solar Power System Course Contents for Inclusion in the Minimum Standards of Nigeria Certificate in Education (NCE) in Electrical and Electronics Technology" a mixed-method research design was used to

develop the first formal NCE-based curriculum in solar technology. Contents such as preparing installation sites, wiring, installing panels, batteries, charge controllers, surge protectors and conducting maintenance among others were developed for inclusion in the minimum standards.

In another study titled: "New Television Camera Systems Operation and Maintenance Contents for Training Radio, Television and Electronics Work Students in Nigeria", **Uduafemhe and Raymond (2019)** applied a Research and Development model in developing 32 new curriculum modules on robotic and computerized camera systems. This was the update of a national syllabus that had not been revised since 2001 leaving graduates relevant to the current digital broadcasting industry.

Furthermore, in a work tilted: "Development of Training Manual for Maintenance of Radio and Digital Versatile Disc Player Mechanical Sub-System for Electronics Craftsmen", **Ajunwa, Raymond, Usman, and Owodunni (2019)** used Wheeler curriculum model to create standardized training, which converts the informal and tacit artisan knowledge into formal training that can be certified. This directly responds to the minimization of e-waste and quality of service of the informal repair industry.

Textbook Contributions: My contributions to TVET field extend beyond research frameworks to include comprehensive textbook resources that directly address skills acquisition needs in Nigerian institutions. These scholarly works which are foundational textbooks for skills development represent substantial contributions to the body of knowledge in technical education. **Raymond, Bukar and Hassan (2020)** in a book titled: "Introduction to Electronic Maintenance and Repairs" brought key innovations in pedagogical principles which has resulted in improvement in electronics troubleshooting skills, increase in equipment maintenance competency and higher employment rate among graduates in electronics sector. Similarly, **Raymond and Hassan (2016a)** published a textbook titled: "Basic Electronic

Measuring Instruments: Principles and Practice". This specialized textbook fills a critical gap in measurement and instrumentation education, essential for quality control in technical fields. These are the texts that are currently being used in institutions in Nigeria and thousands of students are benefitting from them each year.

6.3 TVET Instructors Professional Developments: Building Capacity, Fostering Inclusion, and Enabling Partnerships

The health of an environment that supports the marriage, the teachers, the policies, the partnerships and the social contract, which are the foundations of TVET, are what determine the resilience of the marriage.

In a study by **Raymond and Hassan (2016)** on occupational stress and management strategies among technology education teachers in higher institutions, quantitative analysis and theoretical frameworks (Transactional Theory of Stress and Effort-Reward Imbalance Theory) was used to understand stress patterns and effective coping mechanisms. It was found out that epileptic power supply (Mean: 4.39/5) and inadequate management of ill-equipped workshops (Mean: 4.05) were the most prevalent stressors by the study. Adequate reward for teaching efforts (Mean: 4.59) was recommended as effective stress management strategies. This gave a guide to the systemic interventions to enhance teacher welfare and retention.

In another study, **Raymond and Abutu (2015)** on the "Needed Improvement in Work-Based Learning Programme for Quality Occupational Training" provided the diagnosis of lack of organization of curriculum, effective supervision, and strong industry-institution connections into WBL programmes. Learner-centred framework was proposed by the study for integrating best practices in pedagogy and criterion-referenced assessment.

Raymond, Ajunwa and Mohammed (2019) in a study titled: "Needed Innovative Practices among Public Private Partnership Stakeholders in Technical and Vocational Education for Enhancing Skill Training of the Underprivileged" revealed innovative practices for enhancing access to

technical and vocational skill training and resource mobilization. It was observed that implementation of PPP was at low level, with weak political will and risk aversion, which is very crucial to mention that the partnership design was not involving teachers, a significant omission to ensure sustainability. Enhanced public-private collaboration in education is an innovation that offer a sustainable pathway to economic empowerment for Nigeria's underprivileged youth while meeting the nation's skilled workforce demands.

In Implementation of Public Private Partnerships in Technical and Vocational Education in Nigeria, **Atsumbe, Raymond, Owodunni and Bargu (2017)** observed that PPP remains the most viable path to sustainable TVET funding and infrastructure in Nigeria. Given the numerous challenges bedeviling TVET in Nigeria, PPPs are recognized as a potential pathway to mobilize resources, expertise and infrastructure for education. The study however, found that the extent of PPPs Implementation in TVET is moderately low in terms of provision of facilities, funding and human capital development among others. The study also discovered that low extent of implementation of PPP was due to challenges such as lack of political will on the part of public agencies to fully implement PPP and fear of risk of failure on the part of the private sector.

In Skills Acquisition by Youth with Disabilities: The Need for Vocational Rehabilitation Services, **Raymond, Atsumbe and Hassan (2019)** went beyond the charity to prescribe an empowerment model based on skills. The study outlined particular service requirements, including prosthetic equipment and visual aids as well as the assistance of finding employment opportunities, and this serves as a practical roadmap of the inclusive policy in TVET.

In an article titled: Electronics Troubleshooting Skills Acquisition: A Panacea to Youth Restiveness in Nigeria, **Raymond and Hassan (2016b)** re-examined TVET as a national security and social cohesiveness strategy. The study revealed that skills acquisition that is market-driven is direct conversion of the potential of idle youth into

economic life which is an alternative way of curbing insecurity that is reactive and thus sustainable.

Raymond (2007) in "Constraints affecting electronics servicing of roadside technicians in Minna Metropolis" and **Maigida and Raymond (2014)** in "Training for Skill Acquisition: An Antidote for Effective Poverty Reduction in Nigeria" revealed that skills training was directly linked to poverty elimination and economic empowerment, emphasizing the idea of a shift to focus on wage-employment to entrepreneurship and self-reliance.

Atsumbe, Raymond, Enoch and Duhu (2012) investigated the "Availability and Utilization of e-Learning Infrastructures in Federal University of Technology, Minna". The authors addressed enablers of TVET system to consider both digital and physical infrastructures. The study revealed that there was a serious gap between ICT availability and pedagogical applications.

Syntactically, this is a holistic literature that lays an empirical ground on the resurgence of the TVET sector in Nigeria. It demonstrates that to effectively increase the integration of TVET and job creation, a three-pronged, concerted effort needs to be made: to reform pedagogy with evidence-based, technology-enhanced practices; to unceasingly modernize the curricula to suit current and future industry needs; and to reinforce the entire TVET system by supporting the teachers and providing inclusive policies and authentic and well-organized partnerships. They are not just recommendations, but the conclusions that have been made based on the data that were collected in our workshops, classes, and communities. They map out an evidence-based way ahead in the TVET-Job creation union.

7.0 REKINDLING THE ROMANCE: INNOVATIVE STRATEGIES FOR STRENGTHENING THE UNION

7.1 Policy and Governance Reforms

Policy and governance reforms can be considered as one of the best strategies to empower TVET in Nigeria. A national skill development plan is required because it should coordinate various stakeholders and align TVET with the needs of the labour market. The present-day disjointed policies have resulted in redundancy and inefficiency in programme provision (UNESCO, 2022). The roles of federal ministries, state agencies, industry partners, and development organizations would be harmonized through a comprehensive approach to make sure that the system is coherent (Nwachukwu, 2024).

The other reform that is much needed is the incorporation of industry-led training standards and training curricula. Most of the curricula in the Nigerian TVET are obsolete and do not match the new demands of global industries which are mainly in renewable energy, ICT and advanced manufacturing (Okon, 2019). Standards set by the industry would make training more responsive to the real workplace needs, as well as increase the level of confidence among the employers regarding the abilities of graduates (Axmann *et al.,* 2015).

TVET institutions could also be encouraged to improve their performance based on the funding. Instead of funding institutions based on the number of people they enroll; they might obtain extra funding in cases where it is needed when they have integrated outcomes like graduate employability, effective relationships with the industry, and innovation in delivery (NBTE, 2019). In a number of Sub-Saharan African situations, this results-based financing model has been successful since it led to accountability and better performance of the institutions (Adams, 2007).

Lastly, the TVET governance reforms in Nigeria have to take into consideration the skills-based immigration and mobility policies as well. Policies that encourage the process of certifications of Nigerian

qualifications in foreign countries and inviting qualified professionals into the nation can boost the international competitiveness with increase in global competition of technical skills (Hofmann *et al.,* 2022). The free movement arrangements with regional blocks like ECOWAS also enable the Nigerian TVET graduates to be connected to the cross-border jobs, and this would increase the returns on the training investments (UNESCO, 2022).

7.2 Institutional Transformation

Another foundation to the fortification of the system is the transformation of TVET institutions themselves. The Centre of Excellence model of specialized skills is just one potential solution, which puts resources in the selected institutions with a focus on niche areas, including green energy, robotics or digital technologies (UNESCO, 2022). This model guarantees the level of expertise, innovativeness and serves as a standard to other institutions to follow.

Another critical area is the setting up of the Public-Private Partnerships (PPPs) in delivery of TVET. Involvement of industry via PPPs guarantees that training of learners will be up-to-date with current technologies and practice as well as making available more funds and infrastructure. Practical experience as regard the engagement of industries in the skills training of learners in Nigeria shows reduction in skill gap (Okon, 2019).

The need to adopt technology-assisted learning platforms is also necessary. Digital platforms are able to provide access to more people, lower the cost of delivery through inclusion of blended-learning, e-learning modules and simulation-based training (UNESCO, 2022). To provide an example, virtual reality applications could recreate physical reality in areas like the construction and health sectors, thus supplementing real-life training with minimum safety concerns (Axmann *et al.,* 2015). Finally, competence-based assessment and certification have to be emphasized. The existing systems tend to favour theoretical knowledge over practical skills (National Bureau of Statistics, 2024). Through competence-based models, learners will be

evaluated based on competencies, thus learners will leave school at industrial standards before joining the job market (Adams, 2007). It is also an effective method of identifying informally gained skills and incorporates much of the workers in the informal sector of Nigeria into the formal economy (Hofmann *et al.,* 2022).

7.3 Mechanisms of Industry Integration

A sustainable TVET system cannot survive in isolation but shall be connected or linked with industry. One of such linkage is institutionalization of compulsory industrial attachment programmes to all TVET learners. This would subject them to the real work conditions, enhance their employability, and make the training outcomes directly related to industry demands (Okon, 2019). The experience of countries with a well-developed system of apprenticeship shows an increased in period of industrial training and work-related difficulties dramatically reduces with the implementation of the system of attachment (Hofmann *et al.,* 2022).

Moreover, a joint training facility and mutual resources between industries and TVET institutions can also lead to the minimization of costs and increase in relevance. Rather than replicate infrastructure, industries can offer access to modern equipment and technology, whereas the institutions can offer their expertise in training. These types of co-investment are especially needed in Nigeria, where the number of public funds is still low (NBTE, 2019). Another mechanism of enhancing integration is the development of industry advisory boards to develop the curriculum. Employers, professional organizations, and educators form advisory boards that make sure that curricula are revised based on industry changes, global competitiveness demands, and local market forces (UNESCO, 2022). They are also used as forums of discussion between the training ecosystem and the employers to enable them predict the skills required in the new sectors.

Lastly, new programmes like guarantee schemes which deal with graduate placements can also help to entrench industry-institution relations. TVET graduates would also have the opportunity to get at

least temporary jobs once their training is over through contracts with companies, alleviating the fear of unemployment and providing industries with direct access to highly specialized workers (National Bureau of Statistics, 2024).

7.4 Innovation and Entrepreneurship System

TVET should also be a source of innovation and self-reliance besides training graduates to work. Entrepreneurship can also be developed through the setting up of TVET based incubation centre particularly in risen energy, agribusiness and ICT. Through these centres, graduates receive mentorship, tools and networks enabling them to tap technical skills into practical business models (UNESCO, 2022).

It is also important to create skills-to-startup conversion programmes. Entrepreneurship modules can be incorporated in the technical training and the learner is able to develop business planning skills, financial literacy and marketing skills in addition to their technical skills (Adams, 2007). This would limit the reliance on the formal jobs and promote the spirit of innovation-based businesses.

TVET graduates who intend to start businesses have access to finance as one of the greatest barriers. New microfinance programmes to TVET graduates would offer low-cost credit and credit support systems to the young entrepreneurs (Odiche, 2023). Past SME surveys indicate that a low startup capital is a continuous limitation to small business expansion in Nigeria (SMEDAN & NBS, 2019). Through the connection between microfinance institutions and TVET incubation centres, graduates would be better able to move out of training and directly establish businesses.

To motivate TVET students to be creative and solve problems, innovation problems and challenges need to be introduced. Such platforms enhance learners' ability to develop solutions to real- life challenges and promote partnership with industries and investors (UNESCO, 2022). Other areas demonstrate that innovation competitions not only enhance student motivation but also result in scalable ideas with business potentials (Ilokanulo *et al.,* 2021).

7.5 TVET Digital Transformation

Digital technologies which are transforming the way skills are attained, evaluated and accredited worldwide will determine the future of TVET. As with most other developing countries, Nigeria is in the dual challenge of trying to keep up with the digital innovations that take place all over the world, and customize them to its special socio-economic environment. The utilization of Virtual Reality (VR) and training based on simulation is one of the key frontiers whereby learners can get to practice technical tasks under safe and controlled conditions, and at a relatively low cost. In high-risk sectors, including engineering, construction, and health technologies, VR minimises accidents, but offers repeatable and immersive experiences (UNESCO, 2022). The simulation technologies are also applicable in reducing resource deficiencies as they represent an intense replacement of costly equipment and settings, and thus students in underfunded schools are able to experience training modules of the world level (Axmann *et al.,* 2015).

The quality of TVET delivery is further boosted by the inclusion of the Artificial Intelligence (AI) to deliver personalized learning. AI-based solutions have the potential to assess the learning patterns of students and tailor the learning content to their needs, thereby accommodating the learning pace and learning difficulties (National Bureau of Statistics, 2024). One of the benefits of this personalization is the reduction of the dropout rates, better command of skills, and lowering of the inefficiencies in teaching, especially in a setting when the number of qualified instructors is low (Nwachukwu, 2024).

The digital transformation is also spread to blockchain to certify and validate skills. The traditional paper-based certificates are susceptible to forgery and bureaucracy. Credentialing in a blockchain offers a means of verifying acquired skills in TVET programmes with security and impossibility of tampering and being recognized globally (UNESCO, 2022). The innovation increases the employability of graduates both locally and internationally as well as increase the level of trust between the employers and training institutions.

The other opportunity that is emerging is the use of the Internet of Things (IoT) in practice training. Devices with IoT capabilities have the potential to make workshops and laboratories a smart training setting, in which real-time data is gathered on tools, machines, and processes. These environments enable trainees to track efficiency, troubleshoot, and respond to new technologies of the industry 4.0 that is quickly transforming the global production systems (Hofmann *et al.,* 2022). Integrating IoT in the training process has enabled TVET institutions to keep up with the market competition in the technologically advanced labour market.

Taken together, all these digital innovations provide revolutionary opportunities in reforming TVET. Nevertheless, its successful implementation demands the investment into the digital infrastructure, creating the capacity of instructors, and robust policy alignment to provide fair access to urban and rural institutions (UNESCO, 2022). Digital transformation will not only modernize TVET in Nigeria but also make it the driving force of inclusive growth, global competitiveness and sustainable development, provided that it is implemented in a strategic way.

8.0 THE FUTURE VISION: A THRIVING MARRIAGE

8.1 Skilled Workforce Vision of Nigeria for 2035

By the year 2035, Nigeria plans to have an effective TVET ecosystem capable of providing 50 million skilled labour force in priority sectors and make the country a key centre of technical know- how in West Africa. This aspiration is consistent with the UNESCO (2022) request to countries to make TVET a driver of inclusive and sustainable development, particularly amidst global technological disruption. NBTE (2019) has already reported the critical gaps in workforce preparedness, and this vision aims to address them, enrolling more people, providing high- quality education, and updating training facilities.

One of the goals is to have a 70 percent rate of graduate employment within six months after training. This objective represents a kind of

demand-responsive system, where the curricula are co-created with the industry stakeholders and graduates have skills that can be immediately sold in the market (Okon, 2019). It also demands more labour market intelligence, constant revision of the workplace requirements, and greater connections between the institution and employers (Hofmann *et al.,* 2022).

The other foundation of the vision is the promotion of entrepreneurship, where 40 percent of the graduates of TVET are expected to be business founders. Incubation centres, startup financing opportunities, and mentorship schemes will be used to enhance the development of entrepreneurship in the context of TVET (Odiche, 2023). Not only will the creation of jobs be achieved because of such initiatives, but innovation-driven businesses in the new areas like renewable energy and ICT application will be encouraged as well.

Lastly, by the year 2035 Nigeria will be considered a technical skills hub in West Africa. This objective involves aligning training standards to regional standards, introducing internationally accepted certification regimes and enhancing inter-regional skills mobility (Adams, 2007). This would not only make Nigeria more competitive in the global arena but also integrative.

8.2 Sectoral Focus Areas

To realize this vision, TVET should focus on strategic areas of growth which will promote national growth and international competitiveness. Agro-processing and agriculture will stay in the centre. The industry remains under productive with the application of outdated practices and inadequate value addition despite its domination in the economy of Nigeria. Agriculture can also be turned into a high-employment export-oriented sector through TVET programmes on modern farming methods, mechanization, post-harvest processing, and agribusiness management (National Bureau of Statistics, 2024).

Another critical sector is the Information and Communication Technology (ICT). The youths of Nigeria, coupled with the fast digital transformation of the world economy, make ICT a strategic source of

both jobs and innovations. TVET can also increase training on software development, cybersecurity and digital entrepreneurship, which will provide youth with skills that are competitive in the global market (Nwachukwu, 2024).

The green technologies and renewable energy are important to sustainable development. As the world moves towards the need to go green and focus on low-carbon economies, as well as increasing energy demands, the training of solar technology, energy efficiency systems, and green construction technologies will offer future-proof jobs and solve the energy shortage in Nigeria (UNESCO, 2022).

Another expansion area is healthcare technology and healthcare services. TVET organizations can increase the number of laboratory technicians, medical equipment operators, and digital health support personnel thus enhancing access to quality healthcare services among the underserved populations (Axmann *et al.,* 2015).

The potential of creative industries and cultural heritage is unexploited. There is already positive performance of film, music, and fashion industries in Nigeria, but there is no technical training in the production design, digital animation, and cultural heritage management (Adewale *et al.,* 2018). Increasing TVET in the regions would bolster cultural export by Nigeria and generate employment opportunities on a large scale.

8.3 Expected Outcomes

Provided there is an effective implementation, this dream will bring revolutionary results to the economy and society in Nigeria.

First, it will result in the decrease of youth unemployment and underemployment that are among the highest in sub-Saharan Africa (National Bureau of Statistics, 2024). TVET will ensure that the youths have the skills relevant to their industries, thus bridging the differences between supply and demand of labour in the industry, and accelerating the school-to-work transition period.

Second, the system will help in enhancing productivity and competitiveness. The industry will be a matter of trained and experienced workforce, and by standardizing training and competence-based testing, the Nigerian workforce is in a better position to achieve global standards (Nwachukwu, 2024).

Third, TVET shall lead to economic growth that is based on innovations. Through integrating entrepreneurship education and entrepreneurship startups, the graduates will be creators of the employment opportunities and not job seekers and will expand the range of domestic industries in the country and diversify GDP (Odiche, 2023).

Lastly, transformation of TVET will bring social cohesion and less inequality. The skills development will be used as an instrument of equity and national cohesion because Nigeria can empower women, rural and marginalized communities by providing them with easy and inclusive access to training (Ilokanulo *et al.,* 2021). This will make the fruits of economic growth to be shared broadly, thereby enhancing the social fabric.

9.0 CONCLUSION: TILL DEATH DO US PART

9.1 Re-establishing Sacred Relationship

Based on this lecture, it is clear that Technical and Vocational Education and Training (TVET) and employment creation are one. Their marriage is not by chance, but has a divine predisposition towards the desperate demands of our country. Nigeria should base her development on industrialization, innovation, and growth in an inclusive manner through this marriage. However, like all responsible relationships, it requires shared devotion and effort, that is, on the side of government, industry, institutions, communities and individuals.

9.2 The Pledge of a Brighter Future

With careful nurturing of this bond we will be rewarded. We will witness how lives have been changed because of skills development in which the youths will stop stumbling in despair as they take bold steps

towards productive lives. We will see well-to-do communities, not being dependent but through inventiveness and industry of its members. And we will recognize a competitive nation, admired not by its oil resources but by its quality human resources.

9.3 Final Charge

Based on the foregoing, let us listen to the immutable call: Let no man put asunder that which economic necessity has welded together. Marriage between TVET and job creation should not only be accepted but also developed, preserved, and glorified. It is herein the union that has the ability to rewrite the story of Nigeria. With our combined efforts, we can create a country where skills open doors, opportunities are multiplied and dreams are not put on hold but achieved.

As long as we stay alive, yes, till death be thy part, this covenant must not fade away--the future of Nigeria rests on it.

10.0 RECOMMENDATIONS FOR STAKEHOLDERS

10.1 For Government

Government should be in the forefront to rebrand TVET by ensuring more financial and policy commitments. The allocation of TVET to at least 15 percent of the education budget will guarantee proper infrastructure, up-to-date training facilities, and use of emerging technologies. An exclusive National Skills Development Fund ought to be established to consolidate resources of government, levies, and donor funds in order to support training and innovation. As a solution to the long-standing gap between institutions and industries TVET-Industry liaison offices must be put in place at federal and state levels to enable the communication, internships, and placement schemes. Moreover, the provision of tax breaks to companies investing in TVET (that is; in terms of equipment donations, training collaborations, or even employment of graduates) will be an incentive to increase the involvement of the private sector. Finally, the inclusion of vocational activities in all secondary schools in Nigeria is another right step that will ensure that every child in secondary school will be mandated to learn a trade so that at graduation, the child will not only have an

academic certificate but would have acquired skills in at least one trade area that will make him more employable and entrepreneurial.

10.2 Educational Institutions

TVET institutions need to be converted into contemporary centres of excellence. This starts by modernizing infrastructure and equipment to meet industry standards in key areas like ICT, renewable energy and healthcare technology. The redesign of programmes must be industry relevant and employer and sector input must be used to ensure that the graduates are provided with skills that will match the labour markets. Faculty improvement is also essential, teachers and trainers need to be introduced to new technologies, pedagogies, and industry practices via constant training, exchange programmes and certifications. There should also be sound monitoring and evaluation mechanisms where institutions monitor students' achievement, evaluation of the programmes and adjustment of the curriculum on the bases of response and labour market statistics.

10.3 For Private Sector

It is the role of the private sector to make sure that the outcomes of TVET are translated into actual jobs and business opportunities. The firms are advised to invest in common training centres with higher education institutions and share expertise and resources in order to provide industry-standard training. Increasing the number of internship and apprenticeship have the potential of exposing the students to practical experience and making them more employable. Curriculum development and review should also be the active role of businesses, as the information taught in schools must be highlighted by the needs of the industries and technologies that are changing. The private sector would be able to contribute to the demand of TVET graduates by embedding the same procurement policies of preferring locally trained artisans, technicians and service providers in the supply chains.

10.4 International Development Partners

The international partners will contribute to the speed of TVET transformation in Nigeria by drawing on their experience and resources. To begin with, they will facilitate the transfer of technology and exchange of knowledge which will expose institutions to modern equipment and international best practices. Second, it will utilize infrastructure development projects in conjunction with governments to construct sustainable training facilities that have state-of-the-art technology. The development partners should also support South-South cooperation where Nigeria is linked with other developing nations that have effectively restructured their TVET system to promote learning amongst others. Thus, quality assurance frameworks technical support will enhance accreditation, monitoring, and evaluation systems, and as a result, the Nigerian TVET programmes will be up to the international standard and graduates will be ready to compete with other nations.

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Brief Profile of the Inaugural Lecturer

Prof. E. Raymond was born on 2nd December, 1970 at Fukan-Kadara in Shiroro local government of Niger state, Nigeria. He attended primary school from 1976-1982 at Fukan-Gwari in the present Shiroro LGA. He went for his secondary education at Suleiman Barau Technical College from 1983-1988. In 1989 he proceeded to the Niger state College of education for NCE(Technical) programme and came out as the overall best graduating Student in 1992, he worked briefly with Niger state government as a secondary school teacher. In 1995 he gained admission to ABU Zaria, Kadpoly Campus for his degree programme and graduated in 1998 as the best graduating student in Electrical/Electronic Technology option. After graduation, he went for his National Youth Service Corps programme in 1999 at a village called Gelegele in Edo State. In 2002 he proceeded to University of Nigeria Nsukka for Master's degree and graduated in 2005. Professor Raymond was employed by Federal University of Technology, Minna in 2005, after which he went back to University of Nigeria Nsukka in 2009 for his PhD and graduated in 2013.

Professor Raymond has demonstrated remarkable progression through the academic ranks since joining the Federal University of Technology, Minna, in 2005 and became a full Professor of Industrial and Technology Education in 2020. He has over twenty (20) years of teaching and research experience at the Federal University of Technology, Minna, Nigeria. He teaches electrical and electronic technology, curriculum Development as well as Research Methods and Educational statistics. He has supervised over 20 Masters and more than 10 PhD theses and currently supervising several MTech and PhD thesis in Industrial and Technology Education Department.

Professor Raymond has held several administrative responsibilities such as: Exam officer undergraduate, Exam officer postgraduate, Postgraduate Coordinator, Chairman FUT Model Secondary School management board and Technical Teacher Training Programme (TTTP) Coordinator among others. When he was the Chairman, FUT Model

Secondary School, He developed a Five-Year strategic plan for the school which has resulted in making the school one of the best in JAMB and other National Examinations in Niger State. He is Presently the Special Technical Assistant to the Registrar/Chief Executive Officer, NABTEB where he is working closely with the Registrar to revamp TVET in Nigeria. He has published over 70 articles in reputed national and international journals. He has also published two textbooks entitled: "Basic Electronics Measuring Instruments: Principles and Practice" as well as "Introduction to Electronic Maintenance and Repairs". He has served as external examiner to many universities, he is also an editor and reviewer to many journals and conference proceedings.

He has received awards from different sectors and he is a member of the following key professional bodies: Technology Education Practitioners of Nigeria (TEPAN), Teachers Registration Council of Nigeria (TRCN), Nigeria Vocational Association (NVA), and the International Vocational Education and Training Association (IVETA). His areas of research include: Electrical and Electronics Technology, Industrial and Technology Education, Technical and Vocational Training and Curriculum Development, Teaching methods in TVET and Experimental studies. His hobbies include: reading, writing, and mentoring students. He is happily married and the marriage is blessed with four children.

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