

IMPLEMENTATION OF NATIONAL BOARD FOR TECHNICAL EDUCATION CURRICULUM IN SCIENCE AND TECHNICAL COLLEGES IN NIGERIA

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Introduction

Technical and vocational education and training (TVET) in Nigeria is overseen by the National Board for Technical Education (NBTE), which is responsible for developing, regulating and accrediting curriculum for polytechnic, monotechnic and technical colleges. The NBTE curriculum aims to equip students with the requisite knowledge and skills for the labour market, thereby addressing the nation's demand for skilled technicians and craftsmen.

Skilled, competent and productive workforce produced by technical colleges is essential for socio-economic, technological and industrial development of our nation (Eze, Mojekwu, Omeje, & Igwe, 2021). Federal Government of Nigeria (2019) stated that the objectives of TVET are to;

- Provide trained manpower in the applied sciences, technology and business, particularly at craft, advanced craft and technical levels.
- Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development
- Give training and impart necessary skills to individuals for self-reliance.

These laudable objectives can only be achieved when the government has full commitment towards NBTE curriculum implementation in TVET. The economy of the nation is suffering partly because of the challenges to effective implementation of NBTE curriculum in TVET programme across the nation.

Curriculum implementation in the teaching and learning process should cover the three domains of educational objectives – cognitive, affective and psycho-motor which requires instructional materials and competent instructors in suitable infrastructural facilities with modern equipment and tools that are effectively managed and monitored all through the entire process of implementation.

This presentation is geared towards reviewing a brief on NBTE and its functions, NBTE curriculum implementation in science and technical colleges in Nigeria and core challenges that militate against effective implementation of the curriculum in various science and technical colleges across the nation with its impact on students' performance and employability after graduation. Finally, its detrimental implications on the nation's lack of skilled workforce, reduced productivity and poor economic development will be addressed with suggested way forward.

Brief on National Board for Technical Education and Functions

The National Board for Technical Education (NBTE) is an organ of the Federal Ministry of Education which is charged with the responsibility of regulating Technical and Vocational Education and Training (TVET) institutions in Nigeria. The Board was created by an Act of Parliament (Act No. 9 of 11 January 1977) as a response to the Federal Government of Nigeria realization of the need to develop a critical man-power base to execute the nation's National Development Plans initiated in the 1970s.

During the third National Development Plan (1975-1980), government had identified acute shortage of technical manpower as a major constraint towards the execution of the development

plan. In response to this, government in 1972 established the then National Science and Technology Development Agency, which later became Federal Ministry of Science and Technology, which set up a Working Committee on Scientific and Technical Manpower and Science Education.

The Committee produced a report on Middle-Level Technical Manpower and their training, which recommended among others, the creation of the National Board for Technical Education to be charged with the implementation of its recommendations. It was against this background that the Federal Government established the NBTE by Act No. 9 of 11 January 1977. Also, in August 1985 and January 1993 respectively, the Federal Government enacted Act 16, Education (National Minimum Standards and Establishment of Institutions) Act and Act 9, Education (National Minimum Standards and Establishment of Institutions) Amendment Act. With these acts, the functions of the Board were created and extended to include accreditation of academic programmes of all Technical and Vocational Education (TVE) institutions.

Functions of National Board for Technical Education

The functions of the Board as contained in its enabling Act No.9 of 1977 and the amendments (Act No. 6 of 1985, and No. 9 of 1993) are as follows:

- a. To advise the Federal government on and co-ordinate all aspects of technical and vocational education falling outside the universities and make recommendations on the national policy necessary for the training of technicians, craftsmen and other middle level skilled manpower.
- b. To determine, after consultation with the National Manpower Board, the Industrial Training Fund and such other bodies as it considers appropriate, the skilled and middle-level manpower needs of the country in the industrial commercial and other relevant fields for the purpose of planning, training facilities and in particular, to prepare periodic masterplan for the balanced and coordinated development of Polytechnics and such plans shall include:
 - i. The general programmes to be pursued by polytechnics in order to maximize the use of available facilities and avoid unnecessary duplication while ensuring that they are adequate to the manpower needs of the country; and
 - ii. Recommendations for the establishment and location of new polytechnics as and when considered necessary.
- c. To inquire into and advise the Federal Government on the financial needs, both recurrent and capital, of polytechnics and other technical institutions to enable them to meet the objectives of producing the trained manpower needs of the country;
- d. To receive block grants from the Federal Government and allocate them to polytechnics in accordance with such formula as may be laid down by the Federal Executive Council.
- e. To act as the agency for channelling all external aid to polytechnics in Nigeria.
- f. To advise on and take steps to harmonise entry requirements and duration of courses in technical institutions.
- g. To lay down standards of skill to be attained and to continually review such standards as necessitated by technological and national needs.
- h. To review methods of assessment of students and trainees and to develop a scheme of national certification for technicians, craftsmen, and other skilled personnel in collaboration with ministries and organizations having technical training programmes.
- i. To periodically review the terms and conditions of service of personnel in polytechnics and to make recommendations there on to the Federal Government.
- j. To collate, analyse and publish information relating to technical and vocational education.
- k. To consider any matter pertaining to technical or technological education as may be referred to it from time to time by the Minister.
- l. To carry out such other activities as are conducive to the discharge of its functions.

NBTE Curriculum Implementation in Science and Technical Colleges in Nigeria

It is the responsibility of NBTE to develop and oversee the implementation of curricula in science and technical colleges in Nigeria. The NBTE implements the curriculum in so many ways including: Curriculum development, Accreditation and Quality assurance, Teacher training and Professional development, Monitoring and evaluation, partnership with industry, use of technology, and student support services.

NBTE develops curricula that is comprehensive for various science and technical programmes through need assessment, expert collaboration and approval process.

It goes ahead to conduct regular accreditation exercises to ensure that science and technical institutions meet the required standards by facility inspections, checking staff qualifications and programme evaluation.

To ensure effective curriculum delivery, NBTE organizes workshops and seminars to update teachers on teaching methods. It also provides opportunities for teachers to enhance their skills and knowledge through continues professional development.

NBTE employs robust system for monitoring and evaluating curriculum implementation through feedback mechanism, periodic assessment of adherence to the curriculum and updating the curricula based on feedback and changes required by industry.

For NBTE to ensure the relevance of the science and technical college curriculum it collaborates with industries through industrial training for students to gain hands on experience. It also has the services of industry advisory board to assist on curriculum content and relevance.

Furthermore, NBTE encourages use of technology in curriculum delivery by providing E-Learning Platforms and Digital Resources. It also provides student support services through guidance and counseling and extra-curricular activities by encouraging participation in science and technology clubs and competitions

Challenges to NBTE Curriculum Implementation in Nigeria

The implementation of NBTE curriculum in science and technical colleges in Nigeria is faced with numerous challenges that is jeopardizing the actualization of its objectives. Adekoya (2004) asserted that for Nigerian youths to be employed they should be trained in the needed skills and attitude for the workplace. For this to be attained the curriculum should be effectively implemented. It is impossible to effectively implement NBTE curriculum with limited funding. Inadequate funding raises a lot of other implications on the part of successful TVET programme.

Eze (2022), Adamu & Olawepo (2021) World Bank (2021), Omolaye (2019), Igwe (2013), Igwe and Ibeneme (2006) articulated the challenges of implementation of NBTE curriculum in TVET institutions in Nigeria as follows.

1. Funding constraints
2. Shortage of qualified workforce
3. Infrastructure deficits
4. Curriculum relevance and flexibility
5. Public perception and awareness
6. Students' enrolment and retention
7. Industrial collaboration
8. Absence of appropriate Board for science and technical colleges

These challenging factors have over the years militated against the development, implementation and sustainability of TVET programmes in Nigeria. The implementation of NBTE curriculum in TVET is capital intensive and requires constant monitoring and upgrading to meet the rapid technological development globally. It has been observed that in most technical institutions in Nigeria, infrastructure is in deplorable condition. Some of the buildings are dilapidated, unsafe and unusable. Inadequate classrooms and other spaces, epileptic power supply which adversely affect the training programmes and quality of graduates.

Shortage of qualified instructors to implement the curriculum is another major challenge to effective implementation of the curriculum. Many teachers lack the required training and professional development opportunities to stay current with the rapid industrial and technological advancements. This is closely related to the curriculum which often are not in tandem with the needs of the industries or not meeting international standards. The negative effect of this rigidity may result in graduates not being equipped with the right skills and attitudes to be gainfully employed or end up being underemployed in the labour market.

Poor public conception and misconceptions about science and technical colleges have discouraged many parents and students from studying programmes in TVET. Depreciating enrolment and retention of students is threatening the sustainability and attainment of the goals of the NBTE curriculum. This further reduces the number of skilled graduates entering the workforce undermining the overall success of TVET system.

The skill gap between the industries and technical institutions is attributable to weak collaboration which affects students' practical training experience and industrial exposures to better prepare them to fit into and adequately provide the required skills by industries and businesses.

Another critical challenge to the implementation of NBTE curriculum in science and technical colleges in Nigeria is absence of appropriate board to manage science and technical colleges. State boards for science and technical colleges are vital for ensuring that they are effectively administered and aligned with national standards and local needs. Some states have created their boards while some are yet to. The absence of a state board for technical colleges can significantly impact the quality, relevance and effectiveness of technical and vocational education. It could lead to a decline in technical education standards, poorly equipped graduates and production of workforce that does not meet the needs of local national industries.

The Way Forward

To ensure effective and successful NBTE curriculum implementation in TVET system there should be a collaborative effort by stakeholders consistently engaging in monitoring and evaluating the entire process and a follow-up on the graduates to properly fit in and meet the needs of industries and labour market both nationally and internationally. According to Department of Higher Education Training Republic of South Africa (2015), monitoring has an internal focus on the efficiency of programme implementation. Monitoring is an ongoing process with relevant activities that leads to the envisaged output and actualization of the set goals. Quality and standards in TVET programme could be maintained through regular inspection and continuous supervision of instructions of educational services as laid down in national policy on education FRN (2019).

The Federal government should increase funding for technical education and encourage private sector investment through tax incentives and public-private partnerships. The technical institutions should also strive to seek and secure alternative sources of funding such as grants, donations and partnership with industries.

Enhancing the infrastructure in science and technical colleges, substantial investment should be made in buildings and equipping modern laboratories, workshops and classrooms with state-of-the-art facilities. Furthermore, there should be a maintenance plan to ensure that infrastructure remain in good condition over time.

The quality of teachers will determine the quality of products and graduates from technical colleges. Therefore, it becomes necessary to periodically engage in training and re-training programmes. This continuous professional development could be in form of workshops, internships and industrial training programmes to keep teachers updated with the latest technological advancements. The teachers should be encouraged to go for higher certifications which will enhance their exposure, experience and expertise.

The curriculum relevance and up datedness is key to offering the needed training in colleges thereby facilitating their employments in industries to enhance productivity and economic development. This is achievable by strengthening industry collaboration with technical institutions.

Establishing advisory boards with the stakeholders to provide inputs on curriculum development and updates. Also, flexibility in allowing for rapid adjustments to course contents will be helpful. States that have not created their boards for technical colleges should hasten to do so as to reap the full benefit of having experts in technical education manage the system.

Conclusion

The implementation of the NBTE curriculum in science and technical colleges is crucial for Nigeria's educational and economic development. While appreciable progress has been made, the current existing challenges needs the collaborative efforts of all stakeholders to enhance the quality and effectiveness of science and technical colleges' programmes for the actualization of its goals and eventually contribute to national growth and economic development. Also, worthy of note is the fact that the colleges that effectively implemented NBTE curriculum recorded improvement in students' performance and high employability in the labour market. They are better prepared to become self-reliant after graduation and create employment opportunities for youths thereby increasing the nation's productivity and bringing to barest minimum the crime rate in the society.

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