



## The adequacy of NCE (Technical) curriculum content support for ICT-based academic activities at NCE awarding institutions in Nigeria

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### Abstract

In the digital era, the integration of Information and Communication Technology (ICT) into educational curricula has emerged as a critical factor for enhancing academic performance and preparing students for the demands of the modern workforce. This paper explores the effectiveness of the National Certificate in Education (NCE) Technical curriculum in Nigeria with respect to ICT-based academic activities. It delves into the curriculum's alignment with contemporary ICT standards, examining its capacity to support effective integration of technological tools and practices in technical education. Employing a mixed-methods approach, this study incorporates a thorough analysis of curriculum content, surveys of educators and students, and interviews with key stakeholders to assess the adequacy of the NCE Technical curriculum. The investigation seeks to uncover the extent to which the curriculum facilitates ICT integration, identifies the challenges faced by NCE-awarding institutions, and evaluates the overall impact on the quality of technical education. Through this comprehensive assessment, the paper aims to provide insights into the current state of ICT integration in Nigerian technical education and offer recommendations for enhancing curriculum effectiveness in the digital age.

**Keywords:** Technical curriculum, curriculum analysis, curriculum effectiveness, curriculum alignment, technical education quality

### Introduction

The National Certificate in Education (NCE) is a key qualification for teacher preparation in Nigeria, particularly in technical and vocational education. As educational institutions increasingly adopt ICT tools and methods, the relevance and adequacy of the NCE technical curriculum in supporting these advancements become critical. This paper investigates how well the NCE technical curriculum supports ICT-based academic activities and whether it prepares future educators to effectively integrate technology into their teaching practices.

The National Certificate in Education (NCE) Technical program in Nigeria aims to prepare future educators to teach technical subjects at secondary schools. As ICT becomes increasingly central to education, evaluating how well the NCE Technical curriculum supports ICT-based academic activities is crucial. This paper explores the current state of ICT integration within the curriculum, identifying strengths, weaknesses, and areas for improvement.

The advent of the digital era has necessitated a shift in educational paradigms to incorporate ICT across all levels of learning. In Nigeria, the National Certificate in Education (NCE) Technical program plays a critical role in preparing educators for technical subjects, which are foundational for Nigeria's industrial and technological advancement. This paper explores whether the current NCE Technical curriculum adequately supports ICT-based academic activities, focusing on curriculum content, implementation practices, and outcomes.

### 1. Objectives of the study

- To assess the integration of ICT components within the NCE technical curriculum.
- To evaluate the support structures provided for ICT-based academic activities.

- To identify gaps between curriculum content and the demands of contemporary ICT integration.
- To propose recommendations for enhancing the curriculum in line with ICT advancements.

### 2. Background to the study

#### 1.1. The national certificate in education (NCE) technical

The NCE Technical is a vocational qualification tailored to prepare educators for teaching technical subjects at the secondary school level. It aims to provide a comprehensive foundation in both the theoretical and practical aspects of technical education, ensuring that teachers are well-equipped to deliver quality instruction in areas such as engineering, technology, and vocational skills. As digital technologies advance rapidly, the need to integrate ICT into the NCE Technical curriculum has become increasingly apparent. While the NCE Technical program equips educators with essential technical knowledge and practical skills, adapting the curriculum to include ICT components is crucial for keeping pace with technological advancements. This integration will enhance the relevance of the training, better prepare educators for modern classrooms, and ensure that students receive a contemporary education aligned with industry standards (Afolabi & Olowokere, 2022) [3]. To effectively integrate ICT into the NCE Technical curriculum, the following steps must be taken: Regular updates to the curriculum are necessary to include contemporary ICT tools and methodologies. Providing professional development for educators in ICT to help them stay current with new technologies and pedagogical practices. Adequate resources, including hardware, software, and internet access, must be provided to support ICT integration.

## 1.2. The NCE curriculum framework and ICT integration in education

The NCE curriculum framework provides a comprehensive blueprint for teacher training, emphasizing pedagogical strategies, subject knowledge, and educational principles. The integration of ICT into this framework is crucial for preparing teachers to meet modern educational needs, but its implementation and effectiveness can vary. Ongoing evaluation and refinement of ICT integration strategies are essential to ensure that technology effectively enhances teaching and learning outcomes.

The NCE curriculum serves as a critical document in shaping the educational preparation of future teachers. It sets forth the standards and content necessary for effective teacher training, encompassing a range of elements crucial for professional development. Effective pedagogical strategies are essential for fostering a supportive learning environment and facilitating student engagement and achievement (Wong, 2016) <sup>[15]</sup>. Mastery of subject-specific content ensures that teachers are well-prepared to deliver accurate and comprehensive instruction (Shulman, 1986) <sup>[13]</sup>, it incorporates foundational educational principles such as constructivism, differentiated instruction, and inclusive education (Brusilovsky & Millán, 2007) <sup>[6]</sup>. Research suggests that effective ICT integration involves not only the provision of technological tools but also training on how to use them pedagogically (Ertmer & Ottenbreit-Leftwich, 2010) <sup>[8]</sup>, there is also variability in how ICT is incorporated into teacher training programs. This variability can impact the readiness of teachers to utilize technology effectively in the classroom (Becta, 2008) <sup>[5]</sup>. However, the success of ICT integration often depends on factors such as the quality of training, availability of resources, and ongoing support for teachers (Higgins *et al.*, 2012) <sup>[9]</sup>.

ICT (Information and Communication Technology) in education encompasses the application of digital technologies to enrich various aspects of the educational experience. This integration includes a range of tools and resources designed to enhance teaching, learning, and administrative processes. The use of ICT in education offers significant benefits by enhancing teaching and learning processes, improving administrative efficiency, and better preparing students for the future. The thoughtful integration of digital technologies into educational practices can lead to more effective and engaging learning experiences, ultimately contributing to better educational outcomes and workforce readiness (UNESCO, 2016) <sup>[14]</sup>. Effective integration of ICT can significantly improve educational outcomes and prepare students for the demands of the modern job demands.

## 1.3. ICT integration challenges in Nigerian education

Integrating Information and Communication Technology (ICT) into education systems, particularly in developing countries like Nigeria, presents a variety of challenges that can significantly impact the effectiveness of educational programs, including technical curricula such as the National Certificate in Education (NCE). Several key issues have been identified through research and reports, these issues include lack of adequate infrastructures such as unreliable electricity supply, limited access to high-speed internet, and insufficient hardware and software resources. According to Olaniyan and Ojo (2008) <sup>[12]</sup>, these infrastructural deficits hinder the ability of educational institutions to fully integrate and utilize ICT tools; lack of essential resources such as computers, educational software, and digital learning materials which limits students' exposure to ICT

and undermines the goal of integrating technology into their learning experience. As noted by Awolaye *et al.* (2013) <sup>[4]</sup>, disparities in resource allocation exacerbate educational inequalities and hinder the overall effectiveness of ICT initiatives; Insufficient Training for Educators, Erstad (2012) <sup>[7]</sup> highlighted that many Nigerian teachers lack adequate training in ICT, which affects their ability to incorporate these tools into their instructional practices and Policy and Support Issues, according to Adeyemi (2010) <sup>[2]</sup>, lack of a coherent national strategy for ICT in education often results in fragmented and inconsistent applications of technology across schools. Understanding these challenges underscores the need for a comprehensive approach that addresses infrastructure deficiencies, ensures equitable resource distribution, provides targeted professional development for educators, and implements effective policy frameworks to support ICT integration in education.

## Methodology

A mixed-methods approach was employed to assess the adequacy of the NCE Technical curriculum content in supporting ICT-based activities. This included:

- **Curriculum Analysis:** Reviewing the current NCE Technical curriculum documents to evaluate the inclusion and integration of ICT components.
- **Surveys:** Distributing questionnaires to educators and students across several NCE-awarding institutions to gather opinions on the curriculum's effectiveness and support for ICT.
- **Interviews:** Conducting interviews with key stakeholders, including curriculum developers, educational administrators, and ICT experts, to gain insights into curriculum implementation and challenges.

## 1. Findings and discussion

### 1.1. Curriculum content analysis

The analysis of the NCE Technical curriculum revealed that while there are some ICT components included, they are often superficial and lack depth. The curriculum predominantly covers basic ICT skills, with limited focus on advanced applications relevant to technical subjects (Ogunlade, 2023) <sup>[12]</sup>. Key areas such as software development, digital literacy, and advanced ICT applications are inadequately covered. The curriculum primarily focuses on basic ICT skills rather than integrating ICT into technical subject matter in a meaningful way. This limited coverage fails to address the full spectrum of ICT competencies required for effective teaching in today's digital environment.

### 1.2. Educator and student perspectives

Survey results indicate that both educators and students recognize the importance of ICT in technical education but feel that the current curriculum falls short. However, there is a consensus that the current curriculum does not provide sufficient support or training to fully leverage ICT tools. Educators reported a lack of professional development opportunities related to ICT integration, while students noted that their exposure to practical ICT applications was minimal. Educators reported a lack of adequate training and resources to effectively integrate ICT into their teaching practices (Abdullahi & Akinyemi, 2021) <sup>[1]</sup>. Students, on the other hand, expressed a desire for more hands-on ICT experiences and practical applications related to their technical studies.

### 1.3. Implementation challenges

Interviews with stakeholders, including educators, administrators, and industry experts, have illuminated several critical challenges impacting the integration of ICT in the NCE Technical curriculum. These challenges encompass inadequate infrastructure, limited access to modern ICT tools, and insufficient professional development for educators. These challenges collectively hinder the effective implementation of ICT-based activities within the current curriculum framework, as noted by Ojo & Oyediran (2022) <sup>[11]</sup>. To address these issues, a strategic approach is required. This includes investing in infrastructure upgrades, ensuring equitable access to modern ICT tools, and providing comprehensive professional development for educators. Tackling these challenges is essential for enhancing the overall effectiveness of ICT integration in technical education, thereby better preparing educators to navigate and teach in an increasingly digital world.

### Recommendations

#### Curriculum enhancement

To better support ICT-based academic activities, the following recommendations are proposed:

- **Curriculum Revision:** Update the NCE Technical curriculum to include comprehensive ICT modules that cover both basic and advanced topics relevant to technical education.
- **Integration of ICT:** Ensure that ICT is integrated throughout the curriculum, with a focus on how digital tools can enhance technical subjects.

#### Professional development.

- **Training Programs:** Regular and updated professional development programs should be provided for educators to ensure they are equipped with the latest ICT skills and teaching methodologies.
- **Resource Allocation:** Increased investment in ICT infrastructure and resources is necessary to support effective curriculum implementation.

#### Stakeholder collaboration

- **Partnerships:** Foster collaboration between educational institutions, ICT companies, and government bodies to support curriculum development and resource provision.
- **Feedback Mechanisms:** Establish mechanisms to gather feedback on the effectiveness of ICT integration and make necessary adjustments to the curriculum.

### Conclusion

The adequacy of the NCE Technical curriculum content in supporting ICT-based academic activities is currently limited by several factors, including insufficient curriculum content, inadequate educator training, and infrastructure challenges. Addressing these issues through curriculum revision, enhanced professional development, and improved resource allocation is crucial for aligning the NCE Technical program with the demands of the digital age and ensuring that future educators are well-prepared for the challenges of teaching technical subjects in an ICT-rich environment. To address the limitations of the NCE Technical curriculum, a comprehensive approach is needed.

This includes updating the curriculum to integrate current ICT tools and methodologies, providing targeted professional development for educators, and improving infrastructure such as computer access and internet reliability. By aligning the curriculum, educator skills, and resources with the demands of the digital age, the program can better support ICT-based teaching and ensure future educators are equipped to thrive in a technology-driven educational environment.

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