

Effective Utilization of Information and Communication Technology in Teacher Education: A Mechanism for National Development

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DOI: <https://doi.org/10.62154/qjhcer.2025.018.010703>

Abstract

In this 21st century, integrated, contextual approaches to education have been shown to significantly help students to achieve academic excellence, acquire skills to significantly help students achieve academic excellence, acquire career skills and develop character by connecting students with what is obtainable in other parts of the world. Thus, information and communication technology has been looked upon as a viable tool for upliftment of the standard of education in any nation. Therefore, this paper sees the need for effective utilization of information and communication technology in teacher education for national development and thus the paper contains the following information; the meaning of teacher education and its objectives, teacher education and national development; information and communication technology, utilization of ICT in teacher education for national development some challenges of ICT utilization in education, benefits of ICT in teaching and learning, conclusion and recommendations.

Keywords: Utilization, ICT, Teacher Education, National Development.

Introduction

Technology is greatly having an impact on every aspect of modern life in this 21st century. Computer controls our telephone routine and the engines in our cars. Skillful use of information and communication technology supports the development of skills such as higher order skills, adaptability and collaboration that are essential to success in this our rapidly changing age. Information and communication technology allows teachers to better serve diverse learning styles for meaningful learning, as teachers can not represent all the styles in traditional classroom environment. However, with the flexibility and help of information and communication technology, teachers can design learning environment in which students can manage and construct their own sustainable representation of knowledge in their minds.

In this 21st century, the use of variety of teaching activities in the classroom should include information and communication technology whenever appropriate technology can be used not only as an information management tool, but also as a means of reaching students of diverse backgrounds. Use of information technology can help teachers relate to today's students who are media aware. It also assists teachers in helping students make

connections with the wider world. The emergence of information and communication technology makes it compelling to properly utilize it in teacher education for national development.

Teacher Education and Objectives

Teacher education is referred to as “all the formal and non-formal activities and experiences that help to qualify a person to assume responsibilities as a member of the education profession so as to discharge his/her responsibilities more effectively. In the definition proffered by Teacher Registration Council of Nigeria (TRCN, 2002)”, teacher education refers to the structure, institution and processes by which men and women are prepared in schools for the purpose of imparting mastery, skills and favourable attitudes. Teacher education is a form of training which is carefully designed to prepare and groom those who teachers, will teach or will provide relevant professional service to the schools and colleges. Teacher education is also a set of educational activities and experiences designed to equip a prospective teacher with the skills, competences, mastery and disposition which will help to develop his personality as well as making him a competent teacher (NPE, 2013).

Objectives of Teacher Education

The federal government of Nigeria recognizes the value of teacher education/training in the country's education enterprises, so it was featured prominently in the National Policy on Education as one of the pivotal actions of the nation's education system. This recognition was laudable even as teacher education is set to achieve the following objectives:

- i. To produce highly motivated, conscious and efficient classroom teachers for all the levels of Nigeria education system.
- ii. To encourage further the spirit of inquiry and creativity.
- iii. To help teachers fit into the social life of the community and society at large and enhance their commitment to national objectives.
- iv. To produce teachers with the intellectual and professional background adequate for their assignment and make the adapt task to any changing situations not only in the life of their country, but th wider world.
- v. To enhance teachers' commitment on the teaching profession. Other aims of teacher education are to help teachers to study the child and know his needs, natural potentialities and tools of learning he utilizes and also to know how to encourage the child to grow physically and mentally, how to develop moral sense and social consciousness. Child psychology and principles of education and teaching therefore forms an important element of the teacher training programmes.

On completion of their training, teacher are to be;

- a. Effective and useful members of their communities,
- b. Loyal citizens of the nation,
- c. People of good moral conduct,

- d. Mastery able, progressing and effective teachers who will inspire learners and challenge them to learn,
- e. Assisting the child to adapt to the environment as well as development of skills useful to the learner and their environment, (National Policy on Education, 2013).

Teacher Education and National Development

Education is a very important instrument for achieving national development. It is through the process of education that mastery is generated for the transformation and advancement of both the individual and the society at large. It is thus the building block for social, economic and industrial development of any nation. The level of sophistication attained by various countries as regards poverty reduction, self-reliance, scientific, economic and technological development cannot be deprived from the gigantic strides made in the educational system and indeed the level of competency and effectiveness of the teachers who are the translators of educational policies, Obadara (2011).

Every educational system at all levels depends heavily on teachers. Teachers are highly essential for successful operation of the educational system and also important tool for every development. Without competent teachers to work in a school, educational facilities will be too difficult to be utilised. Darling (2000), asserts that, the nation interested in development should have to look into the preparation and qualification of teachers as some of the forces that makes the teachers competent.

Information and Communication Technology

Information grammatically consists of facts or details about a situation, person or events. Information technology on the other hand is regarded as the study or use of electronic processes for storing information and making it available for users. Information technology on the other hand is regarded as the study or use of electronic processes for storing information and making it available for users. Information technology can also be looked at as a catch phrase used to describe a range of technologies for gathering, retrieving, processing, analyzing and transmitting information from everywhere, Nzew, (2009). In another definition of information and communication technology, Ataur (2014), sees it as a diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information. Wodi (2009) sees information and communication technology as a catch phrase used to describe a range of technology for gathering, retrieving, processing, analyzing and transmitting information from everywhere. On the other hand, information and communication technology is regarded as the study of use of electronic processes for storing information and making it available for users.

Utilization of ICT in Teacher Education for National Development

Information and communication technology in teacher education is the wholesome integration of modern telecommunication (Lee, & Yuen, 2017). Particularly the internet into education system. The integration of Information and Communication Technology (ICT) in

teacher education has become increasingly crucial for fostering national development (Bista, 2022). The utilization of ICT in teacher education enhances the skills and competencies of educators, which in turn positively impacts the quality of education and contributes to the overall progress of a nation (Jairak, & Rakphan, 2020). According to UNESCO (2021), the following are the significance of incorporating ICT into teacher education and its role in promoting national development.

ICT in Teacher Education: Enhancing Pedagogy and Skills Development - Integrating ICT into teacher education programs equips educators with modern teaching methodologies, enhances content delivery, and promotes interactive learning. Teachers trained in ICT can incorporate multimedia resources, online collaboration tools, and digital assessments, leading to more engaging and effective teaching practices. The acquisition of digital literacy skills also enables teachers to adapt to evolving educational technologies.

Improving Student Learning Outcomes - When teachers are well-versed in ICT, they can create student-centered learning environments, tailor instruction to individual needs, and facilitate personalized learning experiences. Students exposed to technology-integrated teaching are better prepared for the digital era, developing critical thinking, problem-solving, and communication skills necessary for their future roles as active citizens.

Fostering Lifelong Learning - ICT-equipped teachers become role models for lifelong learning, as they continuously update their skills and adapt to emerging technologies. This culture of continuous professional development among teachers positively influences students, encouraging them to value lifelong learning and remain adaptable in an ever-changing world.

Addressing Inclusivity and Equity - ICT in teacher education can bridge gaps in educational access by offering online courses and resources that can reach educators in remote or underserved areas. This ensures equitable access to quality education and professional development opportunities, contributing to the inclusivity agenda for national development.

The utilization of ICT in teacher education holds the promise of shaping a skilled and empowered teaching workforce that contributes significantly to national development by nurturing capable and responsible citizens equipped for the challenges of the 21st century.

Some Challenges of Information and Communication Technology Utilization in Education

While the integration of Information and Communication Technology (ICT) in education offers numerous benefits, there are several challenges that educators, institutions, and policymakers must address to ensure its effective implementation (UNESCO, 2019). These challenges can impact the quality of education, student outcomes, and the overall success of ICT integration (Khan & Qureshi, 2019). Here are some common challenges:

1. **Digital Divide:** The digital divide refers to the unequal access to technology and the internet. Students from low-income families or remote areas may lack access to

necessary devices and reliable internet connectivity, hindering their ability to fully participate in online learning and access digital resources.

2. **Infrastructure Limitations:** Insufficient technological infrastructure, including outdated hardware and inadequate network capabilities, can hinder the seamless integration of ICT in educational institutions. Slow internet speeds and technical glitches can disrupt online learning experiences.
3. **Teacher Training and Readiness:** Educators need training to effectively integrate ICT into their teaching methods. Many teachers may lack the necessary digital literacy skills and pedagogical knowledge to make the most of technology in the classroom.
4. **Quality Content and Resources:** A lack of high-quality digital content and resources can limit the effectiveness of ICT integration. Developing and curating relevant and engaging digital materials requires time, effort, and resources.
5. **Technological Obsolescence:** Rapid technological advancements can render educational technology tools obsolete quickly. Schools and institutions need to continuously update their technology to remain relevant and effective.
6. **Pedagogical Shifts:** Using ICT often requires a shift from traditional teaching methods to more student-centered and interactive approaches. Educators may struggle to adapt their teaching styles and develop new instructional strategies.
7. **Data Privacy and Security:** The collection and storage of student data through ICT systems raise concerns about privacy and security. Ensuring the confidentiality of student information and complying with data protection regulations is crucial.
8. **Overemphasis on Technology:** Overreliance on technology can lead to neglecting other important aspects of education, such as critical thinking, problem-solving, and social interaction skills.
9. **Equity and Inclusion:** Certain groups, such as students with disabilities, may face challenges in accessing and using ICT tools effectively. Ensuring that ICT integration is inclusive and accessible to all students is essential.
10. **Resistance to Change:** Some educators, students, and parents may resist the adoption of ICT in education due to fear of the unknown or a preference for traditional teaching methods.

Addressing these challenges requires collaboration among stakeholders, adequate funding, continuous professional development, and a commitment to ensuring that technology serves as an enabler of effective and inclusive education.

Benefits of Information and Communication Technology in Teaching and Learning

The integration of Information and Communication Technology (ICT) in teaching and learning has brought about transformative changes in educational practices, enhancing the learning experience for both students and educators (Li, 2020; Sener & Jandric, 2018; Hwang & Wu, 2014). Here are some key benefits of utilizing ICT in education:

1. **Enhanced Learning Engagement:** ICT tools, such as multimedia presentations, interactive simulations, and educational games, capture students' attention and make learning more engaging and interactive. This increased engagement can lead to improved retention of information.
2. **Personalized Learning:** ICT enables educators to tailor instruction to individual learning styles and paces. Adaptive learning platforms and personalized assignments cater to students' specific needs, promoting more effective learning outcomes.
3. **Access to Global Resources:** The internet provides access to a vast array of educational resources, including e-books, online libraries, and open educational resources (OERs). Students and educators can access up-to-date information from around the world.
4. **Collaboration and Communication:** ICT facilitates collaborative learning experiences through online discussion forums, group projects, and virtual teamwork. Students can interact with peers from diverse backgrounds, fostering cross-cultural understanding.
5. **Flexible Learning Environments:** Online learning platforms and blended learning models allow students to access educational content anytime and anywhere, accommodating different schedules and preferences.
6. **Active Learning and Critical Thinking:** ICT tools encourage active learning by allowing students to explore, analyze, and solve problems independently. Simulation software and virtual labs enable hands-on learning experiences.
7. **Instant Feedback and Assessment:** Online quizzes, interactive assignments, and automated grading systems provide instant feedback to students, helping them identify areas of improvement and reinforcing their learning.
8. **Real-World Application:** ICT tools bridge the gap between theoretical knowledge and real-world application. Simulations, virtual field trips, and case studies allow students to apply concepts in practical contexts.
9. **Professional Development for Educators:** Educators can access online courses, webinars, and forums to enhance their teaching skills, stay updated with educational trends, and network with peers globally.
10. **Inclusion and Accessibility:** ICT tools can be adapted to accommodate students with disabilities, making learning more inclusive. Text-to-speech software, screen readers, and captioned videos enhance accessibility.

The integration of ICT in teaching and learning offers a multitude of benefits that align with the evolving needs of education in the digital age. As technology continues to evolve, educators and institutions must harness these benefits to create engaging, effective, and inclusive learning experiences for all students.

Conclusion

In this 21st century, students require a particular set of values in order to make decisions and engage in life practice that reflects development. Information and communication technology emphasises critical thinking, problem solving, learning, leadership and communication skills. Effective utilization of ICT in teacher education will provide teachers and students with opportunities to make connections between themselves, their communities and the contemporary world.

Recommendations

- Teachers that are not computer literate should be encouraged to move with time in this ICT age.
- Regular training and retraining of teachers should continue by all stakeholders
- Power supply should be made adequate in both urban and rural schools
- Schools should be supplied with enough ICT facilities in both urban and rural areas
- Teachers should be given computers at affordable prices.

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