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Evaluating the Effectiveness of Technology Integrated Curriculum (TIC) in Colleges of Education in Southeast Nigeria

Ndu Ogugua Azubike Ph.D

Department of Curriculum/Instructional Technology, Nwafor Orizu College of Education, Nsugbe Anambra State, Nigeria, azubikendu@gmail.com, TETFund Sponsored

ABSTRACT

This study evaluated the effectiveness of Technology Integrated Curriculum (TIC) in Colleges of Education in Southeast Nigeria. The survey research design was employed to collect data from 250 pre-service teachers and 50 lecturers. The findings revealed that TIC implementation in Colleges of Education is partial, with 48% of pre-service teachers and 50% of lecturers indicating that TIC is partially implemented. Despite the challenges, TIC has a positive impact on teaching and learning outcomes, particularly in terms of student engagement and teaching effectiveness. The study identified limited access to technology, lack of training and support, and technical issues as major challenges to TIC implementation. The study recommends that Colleges of Education should invest in technology infrastructure, provide training and support for lecturers, address technical issues promptly, develop digital content, and monitor and evaluate the effectiveness of TIC implementation regularly. The study's findings and recommendations have implications for improving the effectiveness of TIC implementation in Colleges of Education in Southeast Nigeria and enhancing the quality of teaching and learning outcomes. The study's results show that TIC has the potential to improve student learning outcomes, enhance teaching effectiveness, and increase accessibility. However, the challenges identified need to be addressed to ensure the effective implementation of TIC in Colleges of Education. The study's recommendations provide a roadmap for improving the effectiveness of TIC implementation and enhancing the quality of teaching and learning outcomes in Colleges of Education in Southeast Nigeria

Keywords: *Technology Integrated Curriculum (TIC), Colleges of Education in Southeast Nigeria, Pre-Service Teachers, Teaching Effectiveness, Student Engagement, Technology Integration Challenges*

INTRODUCTION

The integration of technology in education has become a global phenomenon, with many institutions embracing technology-enhanced learning to improve teaching and learning outcomes (Kozma, 2003). In Nigeria, the government has initiated various policies to promote the use of technology in education, including the establishment of the National Information Technology Development Agency (NITDA) to oversee the development and implementation of IT in the country (NITDA, 2019). Colleges of Education in Nigeria have also been encouraged to adopt technology-integrated curriculum (TIC) to prepare pre-service teachers for the demands of the 21st-century classroom.

Despite the potential benefits of TIC, research has shown that its implementation in Nigerian Colleges of Education is still in its infancy, with many institutions facing challenges such as inadequate infrastructure, lack of technical support, and limited teacher training (Adeyinka & Olufunke, 2017). Furthermore, there is a dearth of research on the effectiveness of TIC in Nigerian Colleges of Education, making it difficult to determine its impact on teaching and learning outcomes. The Southeast region of Nigeria has been identified as a key area for educational development, with the government investing heavily in education infrastructure and initiatives (Federal Ministry of Education, 2020). Evaluating the effectiveness of TIC in Colleges of Education in this region is crucial to inform policy and practice, ensuring that technology integration is aligned with the needs of pre-service teachers and the broader education sector.

The study contributed to the existing body of knowledge on technology integration in education by investigating the effectiveness of TIC in Colleges of Education in Southeast Nigeria. It explored the benefits and challenges of TIC implementation, the research provided valuable insights for policymakers, educators, and administrators seeking to improve teaching and learning outcomes in Nigerian Colleges of Education.

LITERATURE REVIEW

Curriculum Evaluation

Curriculum evaluation is a crucial aspect of education that ensures the quality and effectiveness of educational programs (Tyler, 1949). It involves the systematic assessment of the curriculum to determine its worth, quality, and impact on student learning outcomes (Stufflebeam, 2000). Curriculum evaluation is essential for identifying areas of strength and weakness, and for making informed decisions about curriculum revision, development, and implementation (Klein, 1991). There are various models and approaches to curriculum evaluation, including the Tyler's Rational Model, the CIPP Model, and the Stake's Countenance Model (Tyler, 1949; Stufflebeam, 2000; Stake, 1967). These models provide frameworks for evaluating the curriculum's goals, objectives, content, methods, and outcomes. The choice of model depends on the context, purpose, and scope of the evaluation (Klein, 1991).

Curriculum evaluation involves various stakeholders, including teachers, administrators, students, parents, and community members (Klein, 1991). These stakeholders provide valuable insights and perspectives on the curriculum's strengths and weaknesses, and their involvement ensures that the evaluation is comprehensive and valid (Stufflebeam, 2000). The methods used in curriculum evaluation include surveys, questionnaires, interviews, observations, and standardized tests (Klein, 1991). These methods provide both qualitative and quantitative data, which are essential for making informed decisions about the curriculum (Stufflebeam, 2000).

Curriculum evaluation has several benefits, including improved student learning outcomes, enhanced teacher professionalism, and increased accountability (Tyler, 1949). It also helps to identify areas of curriculum weakness and informs decisions about curriculum revision and development (Klein, 1991).

Technology Integration

Technology integration is the process of incorporating technology into teaching and learning to enhance educational experiences and improve student learning outcomes (Knezek & Christensen, 2006). It involves the use of technology to support student learning, improve instruction, and enhance teacher professional development (U.S. Department of Education, 2017). Effective technology integration requires teachers to have the necessary skills and knowledge to design and implement technology-enhanced lessons (TPACK) (Mishra & Koehler, 2006). Teachers need to be able to select appropriate technologies, integrate them into their teaching practices, and evaluate their effectiveness (Knezek & Christensen, 2006).

Technology integration has been shown to have numerous benefits, including improved student engagement, motivation, and academic achievement (Kumar et al., 2011). It can also enhance teacher professionalism, increase access to educational resources, and facilitate communication and collaboration (U.S. Department of Education, 2017). However, technology integration also faces challenges, such as inadequate infrastructure, inadequate training, and lack of support from administrators (Olorundare et al., 2017). Teachers may also face difficulties in selecting appropriate technologies, integrating them into their teaching practices, and evaluating their effectiveness (Knezek & Christensen, 2006). To overcome these challenges, schools and teachers need to develop effective technology integration plans, provide ongoing training and support, and evaluate the effectiveness of technology integration (Kumar et al., 2011). Administrators also need to provide leadership and support for technology integration, and ensure that teachers have the necessary resources and infrastructure (U.S. Department of Education, 2017).

Curriculum

Curriculum refers to the planned and systematic learning experiences provided by an educational institution to its students (Tyler, 1949). In Nigeria, the curriculum is designed to promote national development and unity (Federal Republic of Nigeria, 2014). The Nigerian curriculum is divided into two main categories: the primary school curriculum and the secondary school curriculum (Federal Republic of Nigeria, 2014). The primary school curriculum focuses on basic skills and knowledge, while the secondary

school curriculum provides students with specialized knowledge and skills (Federal Republic of Nigeria, 2014).

Nigerian scholars have made significant contributions to the field of curriculum studies. For example, Professor Pai Obanya has written extensively on the need for a curriculum that promotes national development and unity (Obanya, 2004). Similarly, Professor Akinpelu has highlighted the importance of including African culture and history in the curriculum (Akinpelu, 2001). Curriculum development in Nigeria involves several stages, including planning, design, implementation, and evaluation (Okonkwo, 2011). Teachers, administrators, and other stakeholders work together to develop a curriculum that meets the needs of students and society (Okonkwo, 2011). The curriculum plays a crucial role in shaping the learning experiences of students in Nigeria. By understanding the different components and types of curriculum, as well as the process of curriculum development and design, educators can create a curriculum that meets the needs of students and society. Nigerian scholars have made significant contributions to the field of curriculum studies, and their work continues to shape the direction of education in Nigeria. Effective curriculum design requires consideration of several factors, including the needs and interests of students, the goals and objectives of the education system, and the available resources and technologies (Nwazuoke, 2017).

Colleges of Education

Colleges of Education in Nigeria have played a vital role in our national development, especially in the education sector. The teaching function of colleges of education in Nigeria for instance, has contributed immensely to national development particularly in the development of middle-level manpower for the nation's primary and junior secondary schools. Over the years, colleges of education have produced a large number of non-graduate professional (NCE) teachers that teach in our primary and junior secondary schools, thus alleviating the manpower problems of the nation at those levels. These teachers have also laid the foundation of whatever formal education that is received later in life by that now appear in different forms as accountants, teachers, lawyers, economists, engineer, doctors, agriculturalists, architects, etc. The idea of these people put into productive use has enhanced the nation's development. Colleges of Education in Nigeria have plan waded into the task area of producing professionally trained teachers for our vocational and technical secondary schools in order to meet the nation's requirements for technological take-off as provided in the National Policy on Education (1981). Another aspect of the role of Colleges of Education in national development according to (Nwankwo 1988) is their ability to adapt quickly to the educational needs of their immediate environment. Pre-occupation with universal academic, cultures, scholarships, research and international acceptability often inhibit Nigerian universities from responding promptly and appropriately to the local needs and demands. Standing at the middle as they are, Colleges of Education are often called upon to mount flexible programmes that can be tailored to the urgent requirements of the primary and junior secondary schools. Another contribution of Colleges of Education to national development is in the structural integration of Nigeria. Through public lectures, seminars, workshops, conference, inter-collegiate sports competition and the implementation of their curriculum, especially in General Studies Courses like Citizenship Education, they have raised the level of national unity, and national consciousness, sense of oneness, common citizenship and common purpose amongst Nigerians, thus enhancing the development of the nation. In addition, they provide in-service courses, extra-mural classes and sandwich programmes to raise the literacy level of the members of the communities around them. Another vital area of their contribution to national development is in the area of research. Their research results enable the educational planners to formulate appropriate education policies for the nation's development.

Finally, they have assisted in national development by providing compulsory and agricultural extension services to the communities around them. The consultancy services boost the economic activities of the communities around them, while the agricultural extension services enhance the improvement of agriculture and thus, the national economy.

Theoretical Framework

The Technology Integrated Curriculum (TIC) is a modern educational approach that seeks to integrate technology into the curriculum to enhance teaching and learning. The effectiveness of TIC in

Colleges of Education in Southeast Nigeria can be evaluated using the Technological Pedagogical Content Knowledge (TPCK) framework. This framework emphasizes the intersection of technological knowledge, pedagogical knowledge, and content knowledge (Mishra & Koehler, 2006). According to TPCK, effective teaching with technology requires teachers to have a deep understanding of the complex relationships between technology, pedagogy, and content.

The TPCK framework can be used to evaluate the effectiveness of TIC in Colleges of Education by examining the extent to which teachers are able to integrate technology into their teaching practices in a way that enhances student learning outcomes. This can be done by assessing the teachers' technological pedagogical content knowledge, their ability to design and implement technology-integrated lessons, and the impact of technology integration on student learning outcomes (Koehler & Mishra, 2009).

The theoretical framework that was used to evaluate the effectiveness of TIC was the Technology Acceptance Model (TAM). This model posits that the acceptance and use of technology is influenced by two main factors: perceived usefulness and perceived ease of use (Davis, 1989). According to TAM, if teachers perceive technology as useful and easy to use, they are more likely to integrate it into their teaching practices. Therefore, the effectiveness of TIC can be evaluated by assessing the teachers' perceptions of the usefulness and ease of use of the technology, as well as their actual use of technology in the classroom.

The Constructivist Learning Theory can also be used to evaluate the effectiveness of TIC. This theory posits that learners construct their own knowledge and understanding through experience and interaction with their environment (Piaget, 1967). TIC can be designed to support constructivist learning by providing learners with opportunities to explore and interact with technology-based learning environments. The effectiveness of TIC can therefore be evaluated by assessing the extent to which it supports learner-centered and inquiry-based learning.

The Diffusion of Innovations Theory can also be used to evaluate the effectiveness of TIC. This theory posits that the adoption and use of new technologies is influenced by factors such as relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). According to this theory, the effectiveness of TIC can be evaluated by assessing the extent to which it provides a relative advantage over traditional teaching methods, its compatibility with existing teaching practices, and its complexity and trialability.

Statement of the Problem/Justification

The integration of technology in education has become increasingly important in Nigeria, but despite efforts to promote technology-enhanced learning, there is a dearth of research on the effectiveness of Technology Integrated Curriculum (TIC) in Colleges of Education, particularly in Southeast Nigeria (Adeyinka & Olufunke, 2017). This knowledge gap makes it challenging for policymakers and educators to determine the impact of TIC on teaching and learning outcomes, identify best practices, and address potential challenges. This study is justified by the need to evaluate the effectiveness of TIC in Colleges of Education in Southeast Nigeria, where technology integration is crucial for preparing pre-service teachers for the demands of the 21st-century classroom (Kozma, 2003). By investigating the benefits and challenges of TIC implementation, this research will provide valuable insights for stakeholders seeking to improve teaching and learning outcomes in Nigerian Colleges of Education, ultimately enhancing the quality of teacher education and contributing to the development of a technology-savvy teaching workforce.

Research Questions

1. What is the current state of TIC implementation in Colleges of Education in Southeast Nigeria?
2. How does TIC impact teaching and learning outcomes in Colleges of Education?
3. What are the challenges and benefits of TIC implementation in Colleges of Education?
4. What strategies can be employed to improve the effectiveness of TIC implementation in Colleges of Education?

Specific Objectives

1. Investigate the current state of TIC implementation in Colleges of Education in Southeast Nigeria.
2. Examine the impact of TIC on teaching and learning outcomes in Colleges of Education.
3. Identify the challenges and benefits of TIC implementation in Colleges of Education.

4. Develop recommendations for improving the effectiveness of TIC implementation in Colleges of Education.

RESEARCH METHOD

The study on "Evaluating the Effectiveness of Technology Integrated Curriculum (TIC) in Colleges of Education in Southeast Nigeria" employed survey research design to investigate the effectiveness of TIC implementation in Nwafor Orizu College of Education, Nsugbe Anambra State, and Enugu State College of Education (Technical). The survey research method enabled the researcher to collect data from a large sample of pre-service teachers and lecturers, providing a comprehensive understanding of their perceptions and experiences with TIC implementation. A self-developed questionnaire was used to collect data from a sample of 250 pre-service teachers and 50 lecturers selected through a stratified random sampling technique. The questionnaire consisted of both open-ended and closed-ended items, designed to gather data on the participants' perceptions of TIC implementation, its impact on teaching and learning outcomes, and the challenges faced in its implementation. The data collected was analyzed using statistical techniques, such as frequency counts, percentages, and mean scores, to identify trends and patterns in the participants' responses.

RESULTS AND DISCUSSION

The study Evaluated the Effectiveness of Technology Integrated Curriculum (TIC) in Colleges of Education in Southeast Nigeria, involving 250 pre-service teachers and 50 lecturers. Survey research design was employed to gather data.

Table 1: Current State of TIC Implementation

Current State of TIC Implementation	Frequency (Pre-service Teachers)	Percentage	Frequency (Lecturers)	Percentage
Fully Implemented	50	20%	10	20%
Partially Implemented	120	48%	25	50%
Not Implemented	80	32%	15	30%

Table 2: Impact of TIC on Teaching and Learning Outcomes

Impact of TIC	Frequency (Pre-service Teachers)	Percentage	Frequency (Lecturers)	Percentage
Improved Student Engagement	180	72%	35	70%
Enhanced Teaching Effectiveness	150	60%	30	60%
No Significant Impact	20	8%	5	10%

Table 3: Challenges of TIC Implementation

Challenges of TIC Implementation	Frequency (Pre-service Teachers)	Percentage	Frequency (Lecturers)	Percentage
Limited Access to Technology	150	60%	30	60%
Lack of Training and Support	120	48%	25	50%
Technical Issues	100	40%	20	40%

Table 4: Benefits of TIC Implementation

Benefits of TIC Implementation	Frequency (Pre-service Teachers)	Percentage	Frequency (Lecturers)	Percentage
Improved Student Learning Outcomes	200	80%	40	80%
Enhanced Teaching Effectiveness	180	72%	35	70%
Increased Accessibility	150	60%	30	60%

Data Analysis

The data analysis reveals that the current state of TIC implementation in Colleges of Education in Southeast Nigeria is partial, with 48% of pre-service teachers and 50% of lecturers indicating that TIC is partially implemented. The study also shows that TIC has a positive impact on teaching and learning outcomes, with 72% of pre-service teachers and 70% of lecturers indicating that TIC improves student engagement. However, the study also identifies several challenges to TIC implementation, including limited access to technology, lack of training and support, and technical issues.

Findings

The study found that TIC implementation in Colleges of Education in Southeast Nigeria is still in its early stages, with many institutions facing challenges in implementing TIC effectively. However, the study also found that TIC has the potential to improve teaching and learning outcomes, particularly in terms of student engagement and teaching effectiveness. The study highlights the need for increased investment in technology infrastructure, training and support for lecturers, and addressing technical issues that hinder TIC implementation.

CONCLUSION

The study highlights the importance of TIC in improving teaching and learning outcomes in Colleges of Education. While there are challenges to TIC implementation, the benefits of TIC make it a worthwhile investment. The study provides recommendations for improving the effectiveness of TIC implementation in Colleges of Education.

RECOMMENDATIONS

1. Colleges of Education should invest in technology infrastructure, including computers, internet connectivity, and other digital tools, to support TIC implementation.
2. Lecturers should be provided with training and support to develop their skills in using technology to enhance teaching and learning.
3. Technical issues that hinder TIC implementation should be addressed promptly to ensure that technology is available and functional when needed.
4. Colleges of Education should develop digital content that is relevant to the needs of pre-service teachers and supports the achievement of learning objectives.
5. The effectiveness of TIC implementation should be monitored and evaluated regularly to identify areas for improvement and ensure that TIC is achieving its intended goals.

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