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RESEARCH ARTICLE

ENHANCEMENT OF TECHNOLOGIES IN THE TRAINING OF EARLY CHILDHOOD CARE AND EDUCATION PRE-SERVICE TEACHERS

Adebesin Solomon Taiwo, Morondiya Morenike Oluwatoyin and Ashimolowo Ademuyiwa Saheed

1. Department of Early Childhood Care and Education and Primary Education Studies College of Professional and Specialized Education (COSPED) Lagos State University of Education.

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Abstract

This study explored the place of technologies in the training of Early Childhood Care and Education (ECCE) pre service teachers for sustain able global educational development. The ECCE lecturers are seen as the primary assets in the development of technological knowledge and skills of ECCE pre-service teachers. This qualitative research study was guided by participatory action research design. Qualitative data were generated using observation which gives researchers first hand experien ce and focus group discussions which allowed the researchers to probe further and gain insight into the study. The participants and research site were selected using purposive and convenience sampling. Twenty (20) early childhood education lecturers were purposively selected as sample for the study. Similarly, the study equally recognizes and ackno wledges the significance of technological innovation to dispel any misconception in the training ECCE pre service teachers. Recommenda tions were made to integrate the use of technologies in the training of pr e service teachers,including enhancement of Pedagogical Knowledge (PK) and Technological Pedagogical Knowledge (TPK) of ECCE lecturers through constant and continuous professional development and capacity building programme to facilitate the training of pre service teachers for effective utilisation of availabletechnological resources during teaching and learning of children in the classroom.

Introduction:-

The early childhood education period is a remarkable stage where basic skills are inculcated and cognitive abilities are developed through meaningful interactions (Okoroafor et al., 2022; Yusuf, Abdulkareem, and Popoola, 2023). This period is so crucial for growth and development as it provides learners with the opportunity to interact with the environment and precipitate in meaningful experiences that will foster sustainable development (Oppong Frimpong, 2021).Jacob and Olakunle (2022) reiterate further that education plays a crucial role in the development of any society, adding that early childhood education is a vitalperiod for the holistic development of the learners. This implies that the early childhood education period is a stage of transformation that provides the basis for future development and achievement of learners. From all indications it is clear that early childhood education plays a

Corresponding Author: -Adebesin Solomon Taiwo
Address: -Department of Early Childhood Care and Education and Primary Education Studies College of Professional and Specialized Education (COSPED) Lagos State University of Education.

crucial role in child's development and compensates for differences in children's cognitive abilities before entering into primary schools (Kurent and Avsec, 2023).Meanwhile, it is interesting to note that, the place of technological integration in teaching and learning process for enhancement and sustainability of global educational development cannot be overemphasised. This is because the integration of innovative pedagogical technologies is concerned with the use of twenty first century teaching aids that includes open access to online resources, interactive computer programme which makes teaching and learning process more meaningful and exciting (Tsoli,2023). Similarly, Sales, Santos, de Castro, and Coelho, (2021) assert that technology in the 21st century plays a crucial role as a tool in helping the pre-service teachers in effective delivery of lesson. Meanwhile, teaching and learning is fun in early childhood education and as they play with technological devices, their literacy and numeracy skills are enhanced for better performance (Rogowsky et al., 2018). Thus, the integration of technologies in the training of pre-service has numerous benefits as it foster creativity, stimulate real teaching scenario and provide personalized learning experiences (Naida, Berezovska, Bulgakova, Kravets and Savchenkova, 2024).

Along similar lines, modern scholars believe that emphasizing the use of technologies during the training of pre-service teachers is a way of preparing them to meet the challenges of the nearest future and also to promote effective and quality education for early childhood education learners (Rogowsky, Terwilliger, Young, and Kribbs, (2018).To qualify this argument, in line with the importance of technologies, the Federal Republic of Nigeria also reiterates on the vital roles of technologies in the cognitive and social learning of early childhood care and education (NPE,2004). Moreover, it is interesting to note that, despite continued investment and the agitations for more investment in the educational system, it has been observed that enhancement of technology in the training of pre-service teachers is not well pronounced (Arigbabu, 2024). It is for this reason I concur with Akinrotimi and Olowe (2016) that the policy formulated on the integration technologies in early childhood education sectors also revealed that, there are records of noncompliance due to teacher'sincompetence to effectively utilised available technology during teaching and learning process. However, literature has proven thatthe pre-service teachers are not well exposed to the use of technologies during teaching and learning process which contradict Herro et.al., (2024) assertion that the inculcation of technology in the training of pre-service teacher will empower them and increase their teaching skills in their various classrooms.

In Nigeria, the government emphasised on the importance of teachers' education by outlining specific objectives in National policy on education (FRN, 2013). The policy strides to foster a spirit of inquiry and creativity that will promote professional competencies for pre-service teachers. The teacher is the foundation and pillar for sustainable educational development as they constitute the most essential body of personnel within the educational system (Nousheen, Waseem, and Khan, 2020).Urbani, Roshandel, Michaels and Truesdell (2017) assert that pre-service teachers need to be provided with adequate skills on the use of technology during training in order to provide them with confidence to integrate 21st century skills into their teaching.Tusyanah, Oktarina, Kharismaputra, Suryanto, and Andik (2024) followed similar line of argument that pre-service teacher candidates are expected to be well equipped, skillful, and knowledgeable in the application of technologies in teaching and educational practice. This implies that tertiary institutions teachers must be competent in the use of technologies with adequate pedagogical practices for enhancement of skills development to enhance effective training for the pre-service teachers learning. It was observed that most lecturers still struggle with the use of technology which negate the effective training of pre-service teachers in the use of technology.

It is pertinent to note that the early childhood education pre-service teachers are those who are training to acquire the skills and abilities required for providing developmentally appropriate nurture, responsive care and educational experiences to young children. Because these set of teachers that are still in training, it could be much easy to influence them towards the development of relevant skills and abilities that are required for contributing to the development of educational system.

Theoretical Framework: -

The term theoretical framework is defined as a pool of interrelated concepts that may be used to direct research with the aim of predicting and explaining the outcomes of research. Technology Pedagogy Content knowledge (TPACK) is the theoretical framework adopted for this study, to comprehensively discuss the interaction and integration of technology pedagogy, and content knowledge. In the same vein, Ait Ali, Meniari, Filali, Morabite, Senhaji, and Khabbache (2023) assertthat TPACK framework is a unique method of Conceptualising categories of knowledges of knowledge required by teachers to achieve in educational practice This is because effective teaching is a function of good mastery of the subject matter.

Meanwhile, Mishra and Koehler (2006) further provide a concrete picture on TPACK and categorised it into seven stages which are as follows:

(i) Content knowledge (CK), which concerns with knowledge of the topic that is intended to be learned or taught.

(ii) Pedagogical knowledge (PK), which describes knowledge and methods about teaching and learning strategies;

(iii) Technological Pedagogical Content Knowledge whichis knowledge about standard technologies and operating system. It includes skills and required to operate as particular technology, the ability to learn and adapt to new technology (Koehler et al., 2014; Herring et al., 2016);

(iv) Pedagogical Content knowledge (PCK) that responds to the understanding and representation that the teacher makes of the specific teaching content, which includes knowing what teaching approaches fit content for its teachability and learnability;

(v) Technological content knowledge (TCK) that corresponds to the understanding and representation that the teacher makes about how a technology can enhance or limit a specific teaching content;

(vi) Technological Pedagogical knowledge (TPK) is the knowledge of existence and capabilities of various technologies as they are used in teaching and learning process. This includes understanding and representation that a teacher makes about how a technology influences the strategies used in his pedagogical action. For example, using the abilities to use appropriate technology and strategies that are suitable for a particular developmental of the children for better understanding (Park and Hargis, 2018);

(vii) Technological Pedagogical Content knowledge (TPACK) that arises from the integration of PCK, TCK and TPK and it goes beyond the three components, this knowledge corresponds to the understanding and representation that a teacher makes for a good teaching of content with technology. TPACK is the basis for good teaching with the use of technology and how technology will facilitate learning and solve problems confronting learners. This implies that the adoption of TPACK in this study promotes the enhancement of technologies in the training of pre-service teachers in Early Childhood Care and Education.

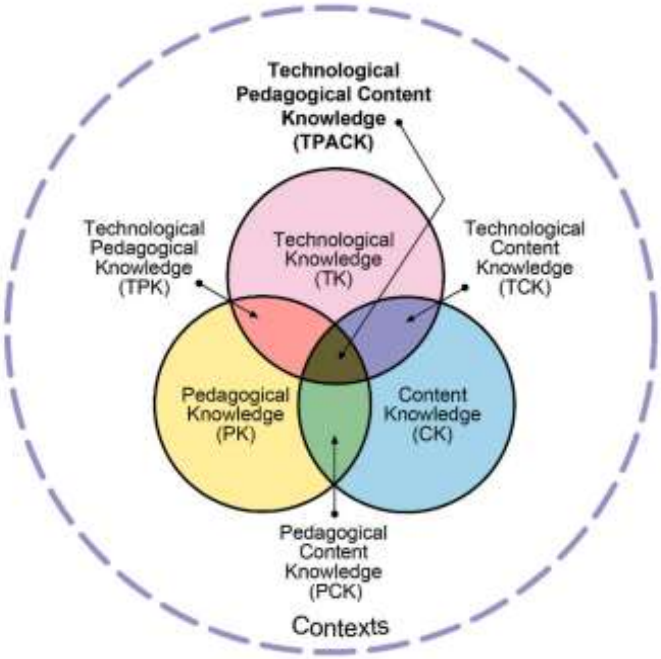

Figure 1: The TPACK Framework: Koehler and Mishra (2016)

Methodology: -

This article emerged from a qualitative study which was conducted in a tertiary institution precisely a University in Lagos State, Nigeria. This is because qualitative research encourages critical look into research as it emphasiseson better understanding of the research subjects (Pyo, Lee, Choi, Jang, and Ock, 2023). The study was rooted in Participatory Action Research (PAR) and embraced the values of critical paradigm as its worldview.Participatory Action Research is problem solving oriented and also an approach to research that prioritizes the value of experimental knowledge (Cornish, Breton, Moreno-Tabarez, Delgado, Rua, de-Graft Aikins, and Hodgetts, 2023).

Snapp, Kerr, Bybee-Finley, Chikowo, Dakishoni, Grabowski, and Kanyama-Phiri, (2023) assert that PAR builds and expands scientific process which also is devoted to ensuring that both the researcher and the researched remain as partners throughout the research process and that participants are gainfully involved in data generation process. The use of PAR is significant to this study as it proposes to bring about a positive change in the training of ECCE pre-service teachers. As such PAR has been proven to be a powerful approach that encourage collaborative engagement in the research process for both a researcher and the participants (Fahlberg ,2023).

Selection Of Participants: -

The participants were selected through purposive and convenient sampling method. The researchers consciously and deliberately selected the research site and ten participants were selected because they were easily accessible and convenient to the researchers. All the participants are beneficial to this study as they were able to share their experiences on the enhancement of technologies in the training of pre-service teachers in early childhood care and education.

Data Generation Method: -

This qualitative article used observation and focus group discussions to generate data. The use of observation method is very vital whenever the researchers want to document actual behaviour and practices that can evoke elicitation of quality active data(Hurst, 2023) Neo, Lim, Tan and Ong (2022) add that the uniqueness of a focus group discussion goes beyond generating essential and sensitive data - it also enhances the quality of data rooted in collaboration. The data generated are categorised into themes. Braun and Clarke (2021) note that thematic analysis provides for a more accessible form of analysis, and offers insight into how themes are identified in line with research questions, aim and stated objectives. The participants were able to discuss and argue with each other logically to produce in-depth information on enhancement of technologies in the training of pre-service teachers in early childhood education. Similarly, the focus group discussion method enabled participants to critically discuss issues and suggest solutions on how to promote the use of technologies in the training of pre-service teachers. The focus group discussion was divided into four phases as influenced by Participatory Action Research Design. The first phase was planning where the ECCE lecturers as co-researchers and the researchers started by discussing on the enhancement of technologies during training of pre-service teachers. The second phase was action phase, the third phase was observation stage and the last phase was reflection based on all the activities.The generated data were divided into two themes: Theme 1: Inadequate technologies to promote effective technological training of pre-service teachers and Theme 2: Lack of adequate support for lecturers' continuous professional development.

Trustworthiness of the study was enhanced by a pilot study, which eliminated ambiguities in data generation instrument. To enhance trustworthiness of data, the researchers used member checking of the data from focus group discussions.

Theme 1: Inadequate Technologies to Promote Effective Technological Training of Pre-Service Teachers: -

This section presented the findings emanating from the data on the enhancement of technologies in the training of preservice teachers in ECCE. The theme one above was the first theme that emerged from the findings of the study which responded to research question that stated that how do ECCE lecturers train pre-service teachers in the use of technologies in terms ofTechnological Pedagogical Content Knowledge (TPCK)?

As the participants brainstormed while engaging in FGDs, their articulations indicated that there are gross lack/inadequate technologies at the institution to train pre-service teachers in the use of technologies in Early Childhood Care and Education.

They remarked as follows:

"Our resource centres or laboratory are not equipped in a way to facilitate the use of Technologies during the training of pre-service teachers. This is because some of the gadget that are available are outdated and not functional to facilitate effective teaching in terms of Technological Pedagogical Content Knowledge.No overhead projector, the desktops are faulty and 98% of the students are without personal laptop. "The environment for training pre-service teachers isnot also conducive for effective teaching and learning that will facilitate the use technologies by the lecturers. There are inadequate technologies for the pre-service teachers to practice on their own and few available are not functioning very well for effective utilization by the students." The reason for poor integration of technology by lecturers some time is not intentional but as a result of insufficient technology integration in the ECCE curriculum" It should also be noted that computer programming that will promote the enhancement of technologies in the training of pre-service teachers during teaching are learning process are not available" The findings revealed that the participants will promote enhancement of technologies in thetraining of pre-service

teachers when the environment is well conducive for teaching and learning process. This implies that provision and availability of necessary technological materials to facilitate effective teaching and learning is highly essential. This is also in line with Herro et.al., (2024) assertion that the inculcation of technology in the training of pre-service teacher will empower them and increase their teaching skills in their various classrooms. Tusyanah, Oktarina, Kharismaputra, Suryanto, and Andik (2024) followed similar line of argument that pre-service teacher candidates are expected to be well equipped, skillful, and knowledgeable in the application of technologies in teaching and educational practice.

Theme 2. Lack of Adequate Support for Lecturers' Continuous Professional Development: -

There were many issues that arose during the focus group discussions. The participants exposed various challenges due to the lack of adequate support for lecturers' continuous professional development. Below are some of the excerpts evidenced from the focus group discussion. "Despite the positive impact of Tertiary Education Trust Fund (Tetfund) on sustainable development of educational system in Nigeria. There are no special funds for all lecturers on continuous professional development and where they are available only limited number of staffs could access the funds for regular development on their field." "Some lecturers are without Technological Content Knowledge (TCK) whish simply means you cannot train or impact the students on what you don't have or what you do not have the adequate knowledge of the operating system." "There is no special programme for training of lecturers on the use of technologies that will facilitate effective training of pre-service teachers through us." Meanwhile, the use of technology by the lecturers would further increase student interactions, understanding and better academic performance of students during the teaching and learning process, it would improve their performance during teaching practice and examination." "It must also be noted that most lecturers were not exposed to the use of technologies during our undergraduate programme that is why,all the lecturers have Content Knowledge (CK) but the technological Knowledge (TK) are lacking with majority of the lecturers, hence, the need for continuous professional development…."

The above evidence indicated that most of the lecturers in early childhood care and education supported the fact that students would participate more during teaching and learning when the lecturers are exposed to continuous professional development. It was further revealed by the participants that they struggled to train pre-service in the use of technology due to lack of professional development needed to be proficient. This is in line with Naida, Berezovska, Bulgakova, Kravets and Savchenkova, (2024) that the integration of technologies in the training of pre-service has numerous benefits as it foster creativity, stimulate real teaching scenario and provide personalized learning.

Concluding Remarks and Recommendations: -

Despite many challenges confronting lecturers in the enhancement of technologies in the training ECCE pre-service teachers, the desire to advance the use technologies in the course of training pre-service teachers was evident in their responses during the FGDs. The PAR methodology and critical analysis approach facilitated the understanding of lecturer's perceptions of the importance of technologies in the training of pre-service teachers. However, in order to invest in high-quality teacher education at the foundational level, the tertiary institution management should make provision for technological gadgets and equip resource centers and classrooms topromote Pedagogical Knowledge (PK) and Technological Pedagogical Knowledge (TPK) of ECCE lecturers through constant and effective capacity building programme to enhance professional development.

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