

ADOPTION AND UTILIZATION OF CURRENT EDUCATIONAL TECHNOLOGIES BY TEACHER EDUCATORS IN A TEACHER EDUCATION INSTITUTION IN NIGERIA

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Abstract Current Educational Technologies (CETs) are being integrated in the teacher education programme to enable effective and qualitative instructional delivery in the 21st century classrooms. This study is a descriptive survey which examined the adoption level and of teacher educators' category in the use of CETs in their instructional delivery. It also ascertains the extent of utilization the existing CETs in the College and to determine the factors impacting on the utilization of the CETs. The study used [1] level of technology adoption and [2] adoption level of diffusion of innovation theory category to determine the category of 184 teacher educators from Alvan Ikoku College of Education Owerri, Nigeria. The research instrument used was a 27- item questionnaire developed and validated by the researchers. The instrument was a five point Likert scale which enabled respondents to select from strongly agree, agree, undecided, disagree and strongly disagree to express their technology adoption and usage in teaching and learning. Findings revealed low adoption level of CETs by teacher educators on the level of paradigm shift. The largest proportion (30.5%) of the teacher educators fall within the category of late adopters. The CETs were not fully utilized and the teacher educators identified availability, staff training/support among the factors impacting on effective utilization of CETs in their instructional delivery. It was concluded that this state of affairs does not augur well for the production of technology savvy teachers for the 21st century classrooms hence recommendations were made.

Index Terms— Current educational technologies, adoption level, utilization, teacher educators, Nigeria

I. INTRODUCTION

Currently, technology integration has contributed to shift in the definition and function of educational technology, and also in the resources utilized for teaching and learning giving rise to the term “Current Educational Technologies” (CETs). Educational technology changes with technological development hence most educational technologies of the 19th and 20th centuries are outdated in the 21st century classroom. Technological resources like computers, tablets and mobile devices integrated into classroom settings for the purpose of education are more often referred to as “current educational technologies” [3]. In this context, current educational technologies are multimedia, hypermedia and telecommunication resources that are utilized in designing instruction and learning. Their integration into teaching and learning has been canvassed by scholars so as to make room for effective learning ([4], [5]). Alvan Ikoku College of Education is one of the foremost teacher education institutions in Nigeria. The institution was established as advanced teachers' college in 1963, with the assistance of UNESCO to cater for middle teaching manpower need of states in the eastern region of Nigeria. The college was later renamed Alvan Ikoku College of education in 1973 by the government of the then East Central State of Nigeria. In the year 2007, it was taken over by the federal government of Nigeria [6]. The college has just been upgraded to a university in May 2015. With over 50 years of existence, the institution has come a long way in teacher production. It is responsible for the production of most of the

teachers in the Nigerian education system and a leader in ICT integration in learning.

II. LITERATURE REVIEW

Many countries of the world are conscious of the important roles current technologies can play in their education system hence the heavy spending of governments in their acquisition. Nigeria as a developing nation has made the use of these technologies imperative in her educational policy [7]. Sequel to the afore mentioned, countries have set up standards for ICT into learning. For example, among the Maryland teacher technology standards is integrating technology into the curriculum and instruction with the outcomes as design, implement and assess learning experiences that incorporates use of technology in a curriculum - related instructional activity to support understanding, inquiry, problem solving communication and/or collaboration [8]. Premised on the foregoing, there is need for teacher educators in teacher education programmes in Nigeria to adopt these technologies in order to challenge student - teachers and in-service teachers to learn to use technology-based resources in their teaching practices. The student teachers will most probably learn to integrate and use technology in their teaching practice if they have observed the teacher educators effectively doing so during their training programmes ([9]; [10]). This will also enable them to develop technology-based classroom activities towards achieving the indicators of the above identified standards and outcomes which are:

- ❖ Assess students' learning or instructional needs to identify the appropriate technology for instruction.
- ❖ Evaluate technology material and media to determine their most appropriate instructional use.
- ❖ Select and apply research-based practices for integrating technology into instruction.
- ❖ Use appropriate instructional strategies for integrating technology into instruction
- ❖ Select and use appropriate technology to support content-specific student learning outcomes
- ❖ Develop an appropriate assessment for measuring student outcomes through the use of technology
- ❖ Manage a technology enhanced environment to maximize student learning [8].

[11] identifies three levels of adoption and five layers in the scenario of adoption as rated by many experts discussing technology adoption. The three levels are personal productivity aids, enrichment add-in and paradigm shifts and the five levels of adopter according to "Diffusion of innovation" theory of Rogers [2] are innovators, early adopters, early majority, late majority and the die-hards or laggards. [12] posit that Rogers' innovation-diffusion theory (2003) later re-classified adopter categories into two main groups of early adopters consisting of innovators, early adopters and early majority and late adopters to consist of late majority and Laggards. [11] posits that technology adoption into higher education according to [13] operated at the levels of personal productivity aids and

enrichment add-ins. Much has not been done as regards the third level of technology adoption to which is "the paradigm shift" in most developing countries including Nigeria. Researchers agree that teachers in Nigeria are yet to cue in as regards the use of the 21st century digital communication resources for instructional delivery ([14]; [15]). [16] refers to the 21st century learners as learners who tend to be more flexible and fluent in the use of technology resources. Consequently, [16] and [15] posit that where teachers and teacher educators do not integrate technology into teaching and learning process, their jobs are no longer credible due to the fact that they are dealing with digital natives.

In relation to adoption of technology as enrichment add-in, [17] postulate that teachers who use power point do not use it interactively rather, it serves as reinforces to the traditional approach where teachers dominate the classroom as he/she talks throughout the slide presentation thereby boring the learners. In the same vein, scholars like [18] and [19] aver that the use of interactive white board can neither change the teachers teaching method if the teacher does not show the willingness to suit students learning needs and styles which tilt towards ensuring that learners participate actively and collaboratively in the 21st century learning environment. Interactive white boards which can easily be integrated can still allow teachers to employ the normal practices (teacher-dominated) and the normal classroom interaction pattern (learner passivity) unless the teacher changes his/her belief about what teaching and learning should be according to this 21st century context.

Effective integration of technology into the classroom activities changes both the roles of the teacher and the learners [20]. Teachers become facilitators of learning, learning becomes technology-driven where interaction and collaboration are ensured, with dynamic assessment and learners participate actively, communicate effectively and construct new knowledge as they become deeply involved in generating ideas. If technology is however not integrated seamlessly into curriculum, such a learning environment may not be attractive to the 21st century learners who are technology savvy. [20] thus concludes that education without technology is old fashioned because learners are passive and such education is formal, instructor-centred and time dependent.

Given the fact that the teachers role have changed due to the present need of the learner, teacher educators in Nigeria require to ensure that their products are trained using the current technological processes and resources for them to meet up with the 21st century learning skills and expectations as regards the integration of current educational technologies. [21] argues that the key to how ICTs are used is the teacher, notwithstanding the quantity and quality of technology available in the classroom. According to Kadel, the teacher must have the competence and right attitude towards technology. [22] identify the following as some major competences required of ICT competent teachers:

- ❖ Making personal use of ICTs

- ❖ Mastery of a range of educational paradigms that make use of ICTs
- ❖ Making use of ICTs as minds tools
- ❖ Use ICT as tools for teaching
- ❖ Master a range of assessment paradigms which involves the use of ICTs and understanding the dimension of the use of ICT for teaching and learning.

According to [23] the three ICTs competency standard for teachers ICTs integration are technology literacy, knowledge deepening and knowledge creation. Technology literacy enables one to acquire technology skills as to learn effectively and efficiently using technology resource, the second which is knowledge deepening requires learners to acquire an in-depth content knowledge of the school subjects as it relates to their real-world experiences and thirdly, knowledge creation that allows students collaborate with citizens and workforce they encounter, to create the new knowledge using technology-tools to bring more harmony and prosperity to the society.

Additionally, the document provided yardstick for teachers in using technology based methods, teachers professional development in technology integration embraces proficiency in:

- ❖ Use of word processing, presentation, graphics, record keeping software packages and digital resources to support instruction and record management.
- ❖ Create and use an e-mail account for correspondence, common social networking communication and web-based collaboration technologies to help students collaborate, access information and communication external experts and
- ❖ Use a search engine to access web or ICT resource to enhance productivity and acquisition of subject matter and pedagogical knowledge.

Based on the above competency standards, it is obvious that teacher educators have major roles to play in using current educational technologies to ensure a shift from teacher-centred pedagogies to learner-centred pedagogies.

They are therefore expected to design instruction and learning that are technology-driven bearing in mind that they can only give what they have. These could only be possible if their adoption level and category of technology utilization are for paradigm shift and innovativeness.

Researchers have tried to investigate ascertain the level of utilization of ICT by academic staff in tertiary institutions in Nigeria. Results from these investigations have shown that there is a mixed report. For example [24] discovered a very low level of ICT utilization in a South Eastern Nigeria University. Similarly, [25] report low level ICT utilization by academic staff in universities in Akwa Ibom and Cross River states, Nigeria. [26] on the other hand reported that academic staff in a university in western Nigeria sufficiently uses ICT in performing their duties. These research reports do not yet give a clear trend on the level of utilization as it may differ from

person to person and from institution to institution depending on the variations on enabling environments of the institutions.

However, many investigators have reported litany of problems facing the use of ICTs (current educational technologies) in Nigeria educational system ([27]; [28]; [29]; [30]; [31]; [32]; [33]). The researchers have discovered many factors that are hindrances to effective acceptance and subsequent adoption and utilization of ICT in the learning environment. These obstacles include technophobia [28], availability of relevant ICT resources in schools ([34]; [35]; [36]), training on pedagogical use of technology in learning ([37], [36]) and a host of others. The impact of these factors on utilization of ICT in teaching and learning is that their presence or absence in a learning environment can increase or decrease adoption level and subsequent utilization as the case may be.

A. Statement of the Problem

Fundamentally, Current educational technologies (CETs) are to contribute immensely towards addressing the challenges facing instructional and learning design in this 21st century as regards to technology utilization. For this to take place effectively in the learning environment there is need for a paradigm shift in pedagogical and methodological issues. The paradigm shift in pedagogical and methodological issues in the learning environment is to be spearheaded by teacher educators. Unfortunately, teacher education in Nigeria is experiencing a lot of drawbacks in technology integration occasioned by numerous factors which could only be solved if actually teacher educators should accept the innovations that technology-using activities have introduced into the system and adopt technology integration to the fullest. The technophobic nature and proactive inhibition of some teacher educators have contributed to an extent, their refusal to allow current educational technologies adoption especially the level of paradigm shift which according to [1] is referred to as where faculty and their institution reconfigure teaching and learning activities to take full advantage of new technology to be employed in the teaching and learning process. The above stated problems have a lot of implications on teacher education programmes in Nigeria because if the teacher education programme is faulty, the other levels of education will be affected adversely; little wonder [38] describes the most deplorable quality of products of Nigerian Universities and other tertiary institutions due to poor infrastructure and inadequacy in the teaching and learning facilities, (CETs inclusive).

B. Purpose of the Study

The general purpose of the study was to determine the teacher educators' current educational technology adoption levels and utilization in teacher education programmes in Alvan Ikoku College of Education, Owerri, Nigeria. Specifically, the study sought to:

1. Find out the adoption level of teacher educators of current educational technologies (CETs) in teacher education programme
2. To determine the teacher educators adoption category of the CETs in teacher education programme.
3. To ascertain the extent teacher educators utilize CETs in teacher education teaching / learning process.
4. To find out the factors impacting on teacher educators' utilization of CETs in their teaching / learning process.

C. Research Questions

The following research questions were posed to direct the study.

1. What is the teacher educators' adoption level of current educational technologies in teacher education programmes?
2. What is the teacher educators' adoption category of current educational technologies in teacher education programmes?
3. To what extent do the teacher educators' utilize the available CETs in the College for teaching and learning?
4. What are the factors impacting on the teacher educators' utilization of the CETs in the teacher education programmes?

D. Conceptual Framework

The basic theoretical framework of this study is based on [1] level of technology of adoption, personal productivity aids, enrichment add-in and paradigm shift levels and, [2] diffusion of innovation theory categories that identified five adoption categories in the use of technology thus; (Innovators, Early adopters, Early majority, Late majority and Laggards/die hard) served as the theoretical frame work for the study. According to [2] adopter categories have to do with the classification of members of a social system on the basis of innovativeness. Furthermore Rogers sees "innovativeness" as the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system". Innovators, [2] posits have complex technical knowledge and they are the gatekeepers of innovation from outside the school. Early adopters have leadership roles, they provide information about the innovation and they adopt innovations. Early majority deliberately adopt innovations though adoption of such innovation take them time and they are neither the first nor the last to adopt innovation. The late majority wait until most members must have adopted before they join and finally the laggards who always exhibit traditional views about innovativeness. It takes the laggards a longer period to accept innovation.

This study used the above frameworks in order to ascertain the level of technology adoption as well as the categorization of the teacher educators in Alvan Ikoku federal College of

Education Owerri according to their ease of adoption of current educational technologies in their teaching practice.

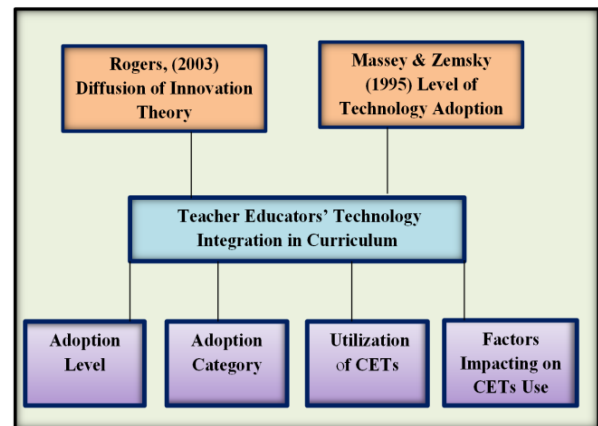


Figure 1: Conceptual Framework

The above frameworks were chosen because of their contributions to studies relating to technology use in the teaching and learning process. Furthermore, the Western Australian Government School Teachers evaluation of ICT knowledge and skill level (2001) conceptual frame work of school, teacher and application variables were adapted while discussing factors impacting on the utilization of the available CETs in the College where this study was carried out.

III. METHODOLOGY

The study is a descriptive survey involving 200 teacher educators purposively selected from School of Education, Alvan Ikoku College of Education Owerri, Nigeria. Alvan Ikoku is a Premier teacher Education institution in the South Eastern part of the country. Census sampling technique was used to choose the entire population of teacher educators in the School of Education of the College to serve as the sample size for the study. The census of the teacher educators in the school of education was taken in view of the fact that the school of education is at the fore when pedagogical innovation issues are concerned. Out of the 200 questionnaires administered on the respondents, only 184 were filled out correctly and therefore used for data analysis.

A 27- itemed teacher educators' CETs survey questionnaire adapted by the researchers from [11] technology adoption level, [2] diffusion of innovation categories and [39] school teachers ICT knowledge and skill conceptual framework of school, teacher and application variables served as the instrument used for the study. The instrument was a five point Likert scale which enabled respondents to select from strongly agree, agree, undecided, disagree and strongly disagree to express their technology adoption and usage in teaching and learning. To ensure the reliability of the instrument, 62 teacher educators from another Federal College of Education from the

South- South of the Country were used to pilot test the instrument. A reliability coefficient Cronbach Alpha of $r = 0.86$ was recorded indicating that the instrument was reliable and used on the 184 teacher educators meant for the study. Data collected were analysed using Microsoft Excel software while descriptive statistics such as frequency counts, percentages and means were used to answer the research questions.

IV. FINDINGS AND DISCUSSION

The findings of this study are presented and discussed according to research questions. The data are presented using tables and charts.

A. Research Question 1

What is the teacher – educators’ adoption level of current educational technologies (CETs) in their instructional delivery?

Data presented in figure 2 displays that 109 respondents (59.2%) of the three groups of teacher educators in the College fall within the category of user of current educational technologies as personal productivity aids. 67 respondents (36.4%) from the three groups fall within the Enrichment add-in category of users while only 8 respondents (4.3%) use current educational technologies for paradigm shift.

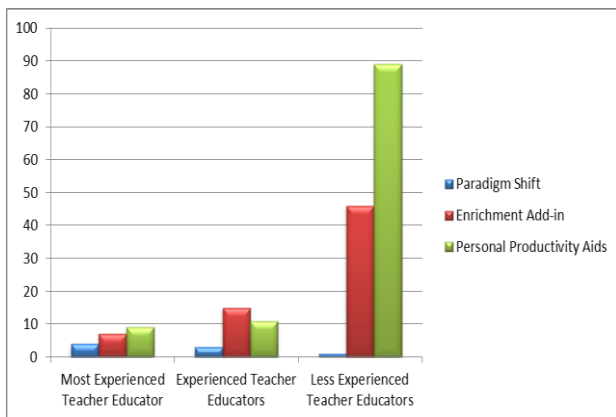


Figure 2: Alvan Ikoku Teacher Educators’ Adoption Level of the CETs

The few teacher educators who fall within the paradigm shift level indicated using CETs for teaching Curriculum Studies lectures while carrying out a study using wordle, asynchronous tools for teaching and learning using W- blog and Rubrics for class assessment. The finding negates the findings of [12] that reported university lecturers from the Southern Nigeria adopting new educational technology highly

in their instructional delivery. Their report however did not indicate whether the high adoption was in the level of personal productivity aids, enrichment add-ins or paradigm shift. The result is also in line with [13] that reported low adoption of technology for paradigm shift in higher education and high adoption of technology for personal productivity aids and enrichment add-ins. This is so because of what [40] stated that most teacher educators are yet to attend workshops and trainings on pedagogical applications of current educational technologies in the learning situation.

B. Research Question 2

What is the teacher educators’ adoption category of the current educational technologies (CETs) in their instructional delivery?

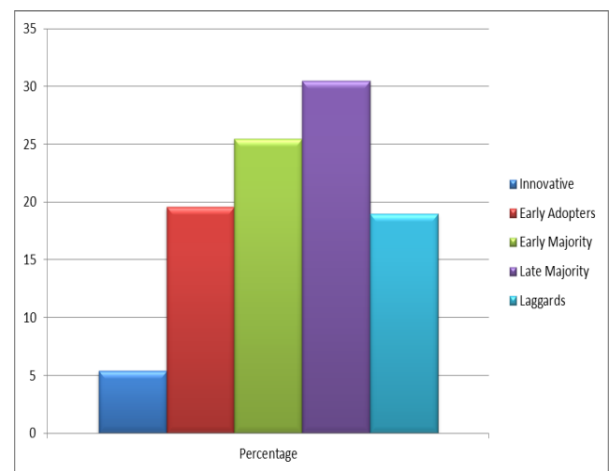


Figure 3: Alvan Ikoku Teacher Educators’ Adoption Category of Current Educational Technologies.

Data presented in figure 3 shows that the largest percentage (30.5%) of the teacher educators are late majority adopters followed by 25.5% of early majority adopters with only 5.4% at innovation category. The result is similar to the findings of [12] which revealed that university lecturers were of early majority adoption category of new technologies for effective service delivery in the undergraduate medical education in the Southern Nigeria based on [2] adoption category model. Alvan Ikoku Federal College of Education teacher educators fall mostly under the early majority and late majority categories in the use of CETs in their instructional delivery as the difference between the two categories is negligible.

C. Research Question 3

What is the extent of utilization of the available CETs in the College by teacher educators?

The findings presented in table 1.0 revealed low level of utilization of CETs by teacher educators in their instructional delivery except in the use of 4 items. Those items have mean utilization scores of 2.5 and above indicating that the items are being utilized. A cursory look at the 4 items shows that these CETs are actually used by the teacher educators for preparation of instructions and personal research and publications rather than being integrated into actual delivery of such instructions. Those CETs are personal properties of the teacher educators rather than institutional provisions for ICT integration in education.

This result is in tandem with [24] and [25] who reported that academic staff in universities in Nigeria utilizes current technologies to a low extent in instructional delivery.

Table 1.0 Teacher Educator's Utilization of CETs in Instructional Delivery

S _n	Item/Equipment	Mean	Comment
1	Printer	1.9	Not Utilized
2	Institutional Wi-Fi	1.0	Not Utilized
3	Digital Video Camera	1.3	Not Utilized
4	Digital Still Camera	1.1	Not Utilized
5	OMR machine	1.1	Not Utilized
6	Desktops	1.1	Not Utilized
7	Laptops	2.9	Utilized
8	Students' Desktops	1.4	Not Utilized
9	Computer Science Lab.	1.2	Not Utilized
10	Personal e-mail	2.7	Utilized
11	Technical Support Staff	1.0	Not Utilized
12	Digital projectors (Multimedia)	2.1	Not Utilized
13	Interactive Whiteboards	1.1	Not Utilized
14	Personal Modems	3.1	Utilized
15	ICT Unit Cybercafé	1.3	Not Utilized
16	Scanner	1.5	Not Utilized
17	Television	1.5	Not Utilized
18	Video Mixer	1.2	Not Utilized
19	Photocopiers	2.5	Utilized
	Grand Mean	1.61	Low utilization

This finding is however at variance with [26] who found that university lecturers highly use ICT in teaching and learning.

D. Research Question 4

What are the factors impacting on effective utilization of CETs in teacher education programmes?

From the result presented in table 2.0, teacher educators agreed that all the factors impact on their use of CETs in their instructional delivery with availability and training as the most

important factors impacting on the utilization of CETs in teaching and learning by teacher educators. Availability of CETs has been reported to be at a very low level by many researchers ([34]; [35]; [36]). Similarly, many research reports have stated that training is another factor that has great impact on use of CETs for effective instructional delivery ([37]; [36]).

Table 2.0 Factors impacting on the Utilization of CETs for instructional Delivery

S _n	Items	Mean	Decision
1	Improving the CETs knowledge, skills and acceptability of teacher educators.	2.8	Agreed
2	Infrastructural availability of both technical and technological resources.	3.0	Agreed
3	Exposing teacher educators on how to utilize CETs in their special areas through training.	3.0	Agreed
4	Improving on the school CETs capacity through making these resources accessible and available for both teacher educators and students-teachers.	2.8	Agreed
5	Supporting teacher educators' professional development through sponsorship to training and workshops.	2.9	Agreed
6	Ensuring that CETs are used to monitor, evaluate and report Student-teachers' learning.	2.9	Agreed

V. CONCLUSION

In conclusion, the adoption level of CETs for paradigm shift which is what is expected of teacher educators is at its low ebb. The low adoption level is also a function of low level utilization of CETs occasioned by numerous factors that present themselves as challenges to the full adoption of CETs in teacher education programmes. For a teacher education institution of Alvan status, to attain a high level of CETs adoption, there is need therefore for her teacher educators to be encouraged, adequately equipped and empowered to employ CETs more for paradigm shift rather than personal productivity aids and

enrichment add-in. The encouragement and equipment implies making adequate provision of CETs in all lecture halls, classrooms and academic staff offices and creating avenues for teacher educators to be trained and retrained in the pedagogical applications of same in learning situations. Essentially if they begin to use it in their instructional delivery, their category level will also improve. The study further recommends that teacher educators should be allowed access to the available CETs, rather than keeping them as facilities required and only used for the purpose of accreditation of educational programmes. Teacher educators in Nigeria should be supported and monitored at the same time for them to effectively and efficiently utilize the CETs in the teacher education programmes for them to be in line with the global best practices in the training of the 21st century teachers.

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