TEACHER PROFICIENCY IN THE APPLICATION OF MULTIMEDIA IN EARLY CHILDHOOD EDUCATION OF NCE AWARDING INSTITUTIONS IN PLATEAU AND NASARAWA STATES

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Abstract
This study was on teacher proficiency in the application of multimedia in early childhood education in NCE awarding institutions in Plateau and Nasarawa States, Nigeria. The objectives were to determine the Multimedia Based Learning Instructions (MULBLI) facilities, determine the level of teacher proficiency in MULBLI and identify the impediments to the effective Deployment of MULBLI in the study area. The study was carried out in the Early Childhood Education departments of the NCE awarding institutions in Plateau and Nasarawa States. The total of 250 questionnaires was administered to relevant teaching staff in ECE departments, and a total of 219 were received and used in the analyses after putting off incomplete ones. The general response rate after data screening was 87.6 percent. Descriptive statistics based on mean ranking was used to determine the results. Research question 1 was on the level of MULBLI facilities, and the major level is Computer Equipment/Printers, while the least level was reported in Closed circuit television (CCTV) and Cable satellite facilities respectively. Question 2 was to determine the level of teacher proficiency in the application of MULBLI. The results indicated the highest ranked as Computer Equipment/Printers, while the lowest are Loudspeaker/Amplifiers/Microphone, Editing/dubbing machine, Floodlights, Closed Circuit Television (CCTV) and Cable satellite facilities respectively. Question 3 was on the impediments in the deployment of MULBLI. Inadequate multimedia facilities ranked high, lack of multimedia instructional applications, inadequate electricity supply, and lack of training among others ranked moderate. The findings show a high level of MUBLI facilities, high level of teacher proficiency in MUBLI and a moderate level of impediments in the deployment of MUBLI in the study area. Recommendations were made on how to enhance teacher proficiency as well as the deployment of multimedia facilities for effective teaching and learning.

Keywords: Multimedia, Education, Early Childhood Education, Teacher, Technology

Introduction

Multimedia is described as the combined use of sound, video and text to present an idea. (Run, 2020). He added that it is the use of different media to convey information. Ghoshal (2016) sees multimedia as something relating to an application, especially a computer that can combine such media into an integrated package. Baharul et al, (2014) asserts that multimedia combines hard and soft wares to make an idea or concept visible and audible. It is also the use of graphic gadgets and applications in facilitating ideas. In like manner, multimedia is a form of communication that uses a combination of different content forms, such as video footage, audio and still images.

Multimedia-based learning instruction (MULBLI) is a teaching and learning method which response to the children's actions by presenting contents such as texts, graphics, animation, video, audio etc. Multimedia has provided alternative from the traditional teaching/learning situation to more interactive methods by affording both teachers and pupils with interesting contents through the effective use of technology, (Yezerski & Birk, 2016). Learning environment is the big factor to adapt pupils with their learning system. Multimedia based learning instruction can help to create high quality learning environments especially for children through different media like texts, graphics, sound, video, animation etc. Obed and Linder, (2015) assert that traditional education is slowly moving away from pen-and-paper correspondence courses to a more interactive, integrated learning environment.

Multimedia based learning instruction has recently gained considerable attention, as particular forms of teaching with technology. Run, 2020 opined that "If someone is learning in a way that uses information and communication technologies, they are using multimedia learning. They could be a pre-school child playing an interactive game; or a group of pupils collaborating on a project with pupils in another country via the internet – it all counts as multimedia based learning instruction". Actually, due to the rudimental nature of the traditional learning method a new approach using technology known as multimedia based learning instruction (MULBLI) is apt. Its importance cannot be over-emphasised, as it provides direct approach to learning. Children assimilate this method of learning very easily and fast because it is entertaining and captivating and enhances and motivates children towards learning, (Yezerski & Birk, 2016).

Multimedia based learning instructions may be used to replace the traditional method of teaching with additional readings, electronic instructor notes and images of charts, graphs, or other handouts in one course. Indeed, teaching is the passion and relationship between the teacher and the student. Technology is seen as being possibly useful in supporting face-to-face teaching, enabling pupils to interact with learning materials.

Statement of the Problem

The poor working environments due to lack of modern teaching facilities has negatively affected instructions especially on children resulting in very minimal outcomes. Some of these outcomes are teachers' inability to teach the children well, and also, the children's lack of understanding in the classroom especially of complex concepts and methods.

Lack of qualified teachers with relevant skills in digital technology, like multimedia tools in handling modern teaching facilities is also a thing of concern in the teaching – learning situation. Although, many teachers may have certain artistic skills, they do not effectively master the use of multimedia tools, gadgets, and software applications.

Impediments to the effective deployment of technology in teaching and learning abound in the classroom. Today, emphasis is shifting away from time consuming and regimental approach of instructions towards a more captivating and entertaining methods of sustaining attention, as children quickly assimilate through entertainment. For example, the scheduled contact hours may not be adequate to accommodate the curriculum designed for annual academic activities. Run, (2020) observed that these make the classroom situation static and dull without life.

Aim and objectives

The aim of this study was to assess the teacher proficiency in the application of Multimedia Based Learning Instructions (MULBLI) in early childhood departments of NCE awarding institutions Plateau and Nasarawa State, North-Central Nigeria.

The objectives of the study are to;

i. identify the level of Multimedia Based Learning Instructions (MULBLI) facilities provided in early childhood departments of the NCE awarding institutions Plateau and Nasarawa States.
ii. determine the level of teacher proficiency in the application of MULBLI facilities in the study area.
iii. identify the impediments to the effective deployment of MULBLI in the study area.

Research questions

i. What is the level of Multimedia Learning Instructions (MULBLI) facilities provided in the Early Childhood Departments in the NCE awarding Institutions in Plateau and Nasarawa States?
ii. What is the level of teacher proficiency in the application of MULBLI facilities in the study area?
iii. What are the impediments to the effective deployment of MULBLI in the study area?

Scope of the study

The study covered the NCE awarding institutions in Plateau and Nasarawa States, North-Central Nigeria offering early child education programmes. These are Plateau State College of Education Gindiri, Federal College of Education Pankshin and Jos ECWA Seminary, Jos. Others are Nasarawa State College of Education, Akwanga and Hill College of Education Gwanje. The study focused on multimedia facilities, teacher proficiency in the application of, MULBLI and impediments to the effective deployment of MULBLI in teaching and learning. The respondents to the research instruments were the relevant teachers in the early childhood education departments of the institutions mentioned above.

Concept of Early Childhood Education (ECE)

Early Childhood Education is a term that refers to educational programmes and strategies geared toward children from birth to the age of eight, (Alexander, 2016). This period is widely considered the most vulnerable and crucial stage of a person's life. Early childhood education often focuses on guiding children to learn through play. The term commonly refers to preschool or infant/childcare programmes. Early childhood has been defined as a period of life between 3 to 8 years of age. This is the period of greatest growth and development, when the brain develops most rapidly, almost at its fullest, (*Kroll,* 2021). It is a period when walking, talking, self-esteem, vision of the world and moral foundations are established.

It is generally believed that the child's early years constitute the period of most rapid and permanent learning. By age four, about 50 % of intellectual development potential of the child is already in place, (Baharul et al, 2014). Enhancing the quality of young children's lives is now a national and international priority, expressed through research and policy initiatives, programme development and advocacy. This therefore may explain the increasing global attention being giving to early childhood education. According to the National Policy on Education, 2024 given to a child in an educational institution prior to his entering primary school (NPE, 2024). This level includes the crèche, the nursery, and the kindergarten. This can also be called pre-primary education programme. Gero et al, (2014) stated that the years between birth and age five are the foundation upon which successful (or otherwise) lives are built.

Obed and Linder, (2015) affirms that the first five years is critical for a child's overall development and later life chances. Alexander, (2016) asserted that ECE is the term commonly used to describe

the formal teaching and care of young children by people other than their families or in settings outside of the home. Early childhood and education span the human life from birth to age eight. However, early childhood and education covers the period from birth to when a child starts school. Early Childhood Education, according to *Kroll, (*2021) is actually the first part of basic education and must be given priority and accorded appropriate workforce for effective service delivery. Busch (2017) posits that early childhood education (ECE) refers to a wide range of programmes, all aimed at the physical, cognitive and social development of children before they enter primary school, theoretically from birth to age 7 or 8years. Obed, and Linder, (2015) defined early childhood education as that which is designed to develop the habits, attitudes and skills needed for primary education, while Gero et al, (2014) maintain that the concept of early childhood education only covers the practice of early childhood education and learning of the child. Similarly, Hujala and Heikka, (2020) posits that early childhood education in Finland deals with the process of Care, Education and Teaching of the child to ensure that he or she effectively acquires basic skills to cope with the primary stage of schooling. UNESCO and UNICEF, (2012) further define the term early childhood education (ECE) as a range of processes and mechanisms that sustain, support and aid the holistic development of children, from birth to age 8.

Due to the rapid neural connections in brain development and growth that take place at this age bracket, the period is considered a critical window of opportunities for optimising children's development through the combined impact of education, care, health, nutrition, protection and stimulation. This also includes the support of family and community needed to promote children's healthy development. (Dalglish, Khalid, & McMahon, 2020) affirms that the early years are formative of children's long-term prospects. Children's physical growth is also very rapid during the early years, but physical maturation is a much more extended process compared with the changes taking place within the nervous system, (Chung & Krajcik, 2015). The earliest months of life are also the period of most rapid synapse formation constructing the dense networks of neural connectivity on which cortical activity depends.

Research into early brain development is significant in drawing attention to the pre-natal period and the very earliest months and years of life, and emphasising the crucial importance of adequate nutrition, responsive care and a supportive environment at a time of successive qualitative shifts in development. While early childhood policy development tends to give priority to the pre-primary years, evidence from developmental neuroscience argues for a more comprehensive early childhood education strategy, encompassing the welfare of children and families before birth. It appears that optimal human development can be achieved through a wide range of family setting, childcare practices and pedagogic approaches in the children's' world, (UNICEF, 2011). ".before many adults even realise what is happening, the brain cells of a new infant proliferate, synapses crackle and the patterns of a lifetime are established, choices made, and action taken on behalf of children during this critical period affect not only how a child develops but also how a country progresses."

Early Childhood Education summarily is seen as the first formal form of education given to children between the ages of 1 to 5years and learning is usually through play by the use of toys and games.
Early Childhood Education emerged as a field of study during the era of educational enlightenment in the eighteenth century, particularly in European countries with high literacy rates. It continued to grow through the nineteenth century as universal primary education became a norm in the Western world. Kwame, (2015) noted that in recent years, early childhood education has become a widespread public policy issue, as funding for preschool and pre-K is debated by municipal, states, and federal lawmakers of many European countries. Governing entities are also debating the central focus of early childhood education with focus on developmentally appropriate play versus strong academic preparation curriculum in reading, writing, and math, (Hanushek & Woessmann, 2015). The global priority placed on early childhood education is underscored with targets of the United Nations Sustainable Development Goal 4. As of 2023, however, "only around 4 in 10 children aged 3 and 4 attend early childhood education" around the world. Furthermore, levels of participation vary widely by region with, "around 2 in 3 children in Latin American and the Caribbean attending ECE

compared to just under half of children in South Asia and only 1 in 4 in sub-Saharan Africa" (Dalglish, Khalid, & McMahon, 2020).

Early Childhood Education is also a professional designation earned through a post-secondary education programme. For example, in Ontario, Canada, the designations ECE (Early Childhood Educator) and RECE (Registered Early Childhood Educator) may only be used by registered members of the College of Early Childhood Educators, which is made up of accredited child care professionals who are held accountable to the College's standards of practice. Research shows that early-childhood education has substantial positive short- and long-term effects on the children who attend such education, and that the costs are dwarfed by societal gains of the education programmes. There are numerous exponents who contributed immensely in the foundation and development of early childhood education; For example, early childhood education can be traced to the efforts of prominent European education experts like: John Amos Comenius (1590-1690), J. J. Rousseau (1782 – 1788), Johann Heinrich Pestalozzi (1748-1827) and Friedrich Froebel (1782-1751). These experts championed the right of children to early education. It is popularly believed that Friedrich Froebel who has been given a great deal of credit for his contributions to early childhood education is the founder of kindergarten. His beliefs is in how young children should be educated also impact today's classroom, *(Marope, & Kaga, 2015).*

Method of Data Analysis: The data collected was analysed using Statistical Package for Social Sciences (SPSS).

Field survey results

The totals of 250 units of questionnaires were administered to relevant teaching staff of early child education departments in the NCE awarding institutions of Plateau and Nasarawa States of Nigeria. The 250 teaching staff are both the lecturers teaching the NCE undergraduates and the teachers teaching the pupils at the early childhood units in the ECE departments of the institutions. Also, the number was chosen to cover all the teaching staff in the ECE departments because they are not many. A total number of two hundred and twenty-seven (227) questionnaires with a 90.08 % response were retrieved. A total of 219 were used in the analyses after putting off incomplete ones. The general response rate after data screening was 87.6%.

Reliability Results

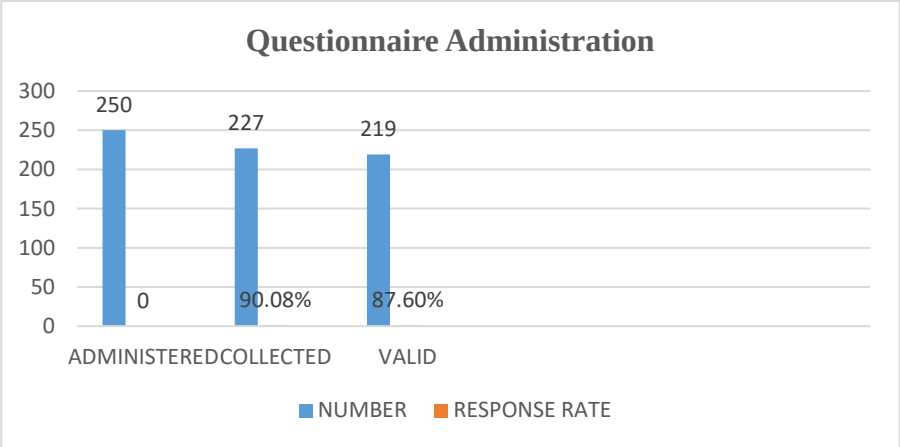

Fig. 1 Number and percentage of questionnaires administered

The reliability of the constructs was analysed by finding Cronbach's alpha as recommended by Pallant (2011). The reliability test for the field records confirmed that the Cronbach's alphas acquired for each of the constructs are above the minimum recommended of 0.7 in Pallant (2011).
A normality test was done in the examination to meet the presumption of regression and correlation proposed by Pallant, (2001). Figure 3 shows the Kurtosis with the highest value of 1.990 and

Skewness with the lowest value of -.002, indicating that the results were within the acceptable range of +/ - 2 as suggested in George and Mallery (2010).

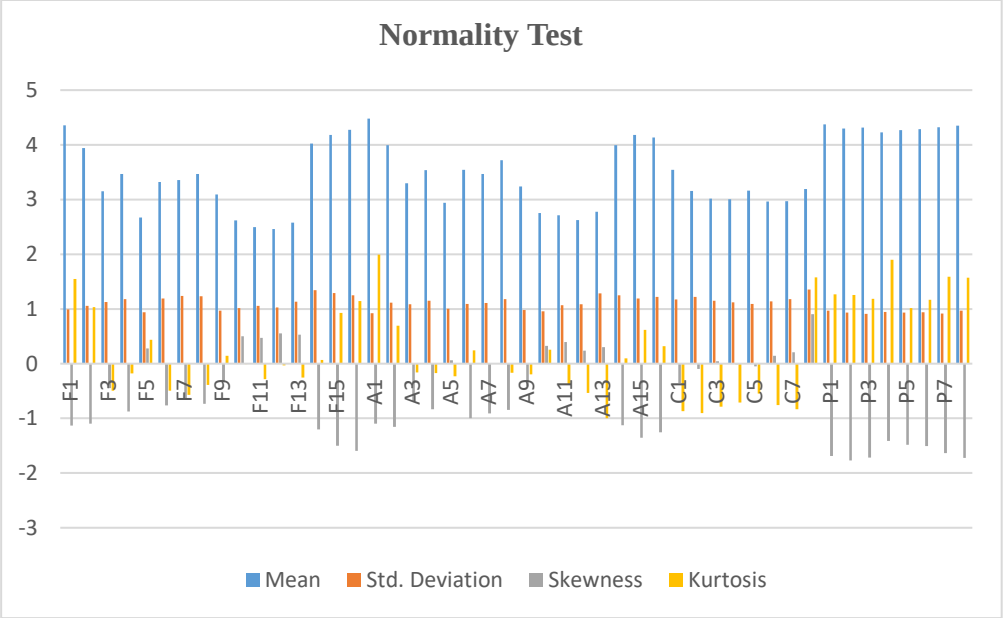

Fig. 2 Mean and Standard Deviation of Normality Test

The results showed that majority of the respondents were within the age of 30 to 60 years with a higher percentage of 66.2%. Concerning educational qualification, most of them have the first degree which indicated a higher percentage of 42.0%. Also, concerning the years of experience, most of them have experience of 5 to 10 years with a percentage of 54.8%.

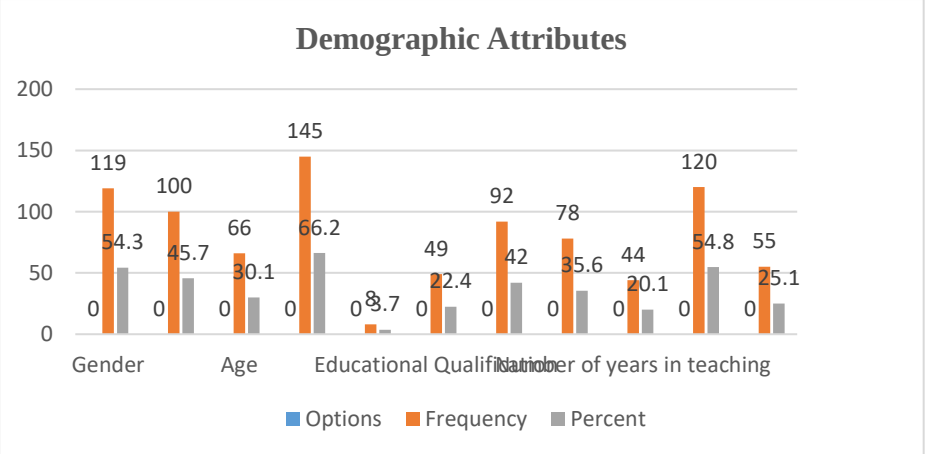

Fig. 3 Frequency and Percentage of Respondents

Decision Rule

A 5-point Likert scale was employed, with distinct variables having comparable or different scale descriptions. Despite the description differences, the concept has a uniform mean ranking scale. As a result, the ranks were numbered from one (1) to five (5), with one (1) being the lowest and five (5) being the highest. Based on the work of Ramli et al (2017), this study altered the mean score decision interval from which the following interval decisions were deduced. (1-1.80) = Very low (1.81-2.60) = Low (2.61-3.40) = Moderate (3.41-4.20) = High (4.21-5.0) Very high.

Descriptive statistics based on mean ranking were carried out to identify the level of MULBLI facilities provided, teacher proficiency in the application of MULBLI as well as the impediments in the deployment of MULBLI in the NCE awarding institutions in Plateau and Nasarawa States. Hence, the results showed the ranking, mean, and standard deviation for each item in figures 5 , fi 6 and 7 below.

Data Presentation and Analysis

Research question 1: The level of MULBLI facilities provided in the ECE Departments of the NCE awarding institutions in Plateau and Nasarawa States, Nigeria.

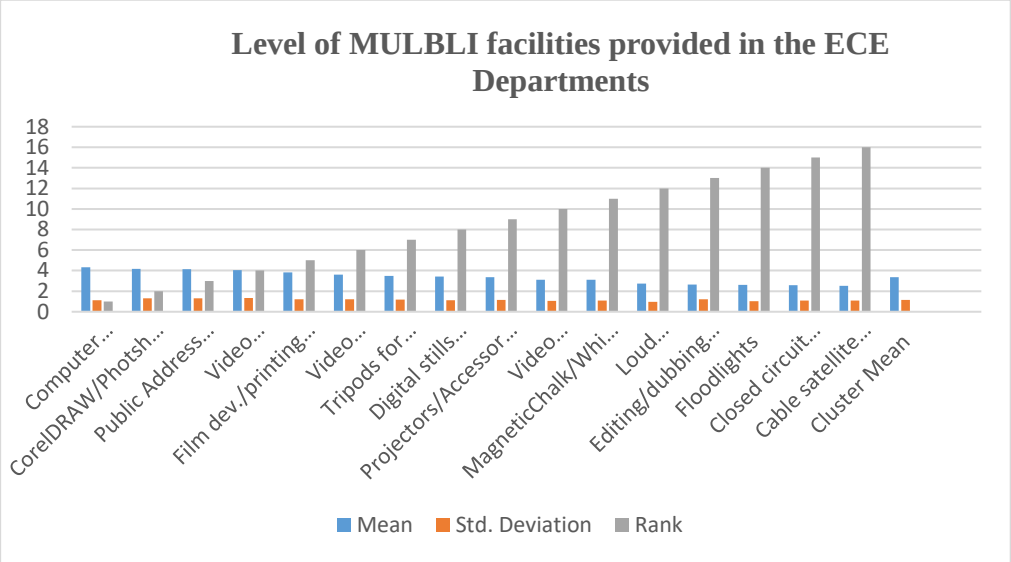

Fig. 4 Level of MULBLI facilities provided in the ECE Departments

The figure 4 above showed the results of the level of MULBLI facilities provided in the ECE Departments of the NCE awarding institutions of learning in Plateau and Nasarawa States, Nigeria. The major level of MULBLI readiness of the institutions in the study area was in Computer Equipment/Printers, with the highest mean value of (M = 4.3149, std. deviation = 1.12263) ranked first as Very high, followed by CorelDraw/Photoshop, Public Address System/Accessories and Video player/recorder with their high mean value of (M = 4.1721, std. deviation = 1.31443), (M = 4.1295, std. deviation = 1.31748) and (M = 4.0548, std. deviation = 1.32952) ranked High at 2nd to 4th respectively. The moderate level of MUBLI readiness was reported in Film development/printing equipment, Video Camera/Accessories, and Tripods for Video/Still Cameras, with means of (M = 2.7245, std. deviation = .95956), (M = 2.6362, std. deviation = 1.22692), and (M = 2.6239, std. deviation = 1.02360). The least level was reported in Closed-circuit television (CCTV) and Cable satellite facilities with their Low mean values of (M = 2.5952, std. deviation = 1.09565) and (M = 2.5327, std. deviation = 1.07219) ranked at 15th to 16th, respectively.

Research question 2: The level of teacher proficiency the application of MULBLI in the in the ECE Departments of the NCE awarding institutions of learning in Plateau and Nasarawa States.

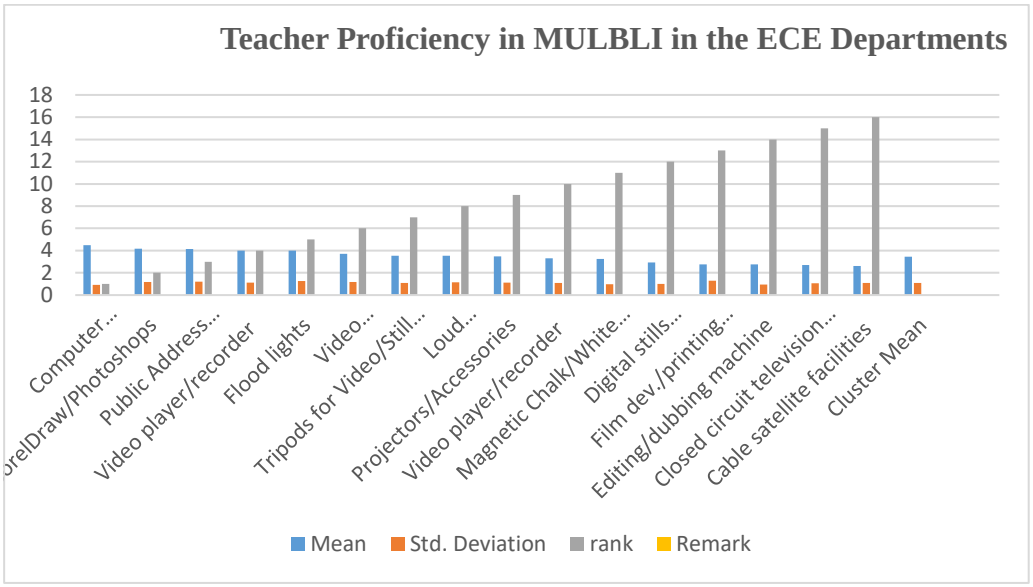

Fig. 5 Level of Staff Proficiency with MULBLI in the ECE Departments

Figure 5 above present the results of staff proficiency in the application of MULBLI in the study area. The results indicated the major level of staff proficiency in MULBLI in the study area were in Computer Centre, ranked very high with a mean value of (M = 4.4815, std. deviation = .92351). Computer Equipment/Printers and CorelDRAW/Photoshops with their mean values of (M = 4.1822, std. deviation = 1.18842), and (M = 4.1368, std. deviation = 1.21729) were ranked high at 2nd and 3rd respectively. The lowest teacher proficiency in MULBLI in the study area were in Digital stills camera/Accessories, Film development./printing equipment, Editing/dubbing machine, Closed circuit television (CCTV) and Cable satellite facilities with their mean values of (M = 2.9429, std. deviation = 1.00301), (M = 2.7746, std. deviation = 1.28360), (M = 2.7547, std. deviation = .95602), (M = 2.7136, std. deviation = 1.06558) and (M = 2.6238, std. deviation = 1.08636) ranked at 12st to 16rd respectively.

Research question 3: The impediments to the effective deployment of MULBLI in the ECE Departments of the NCE awarding institutions of learning in Plateau and Nasarawa States.

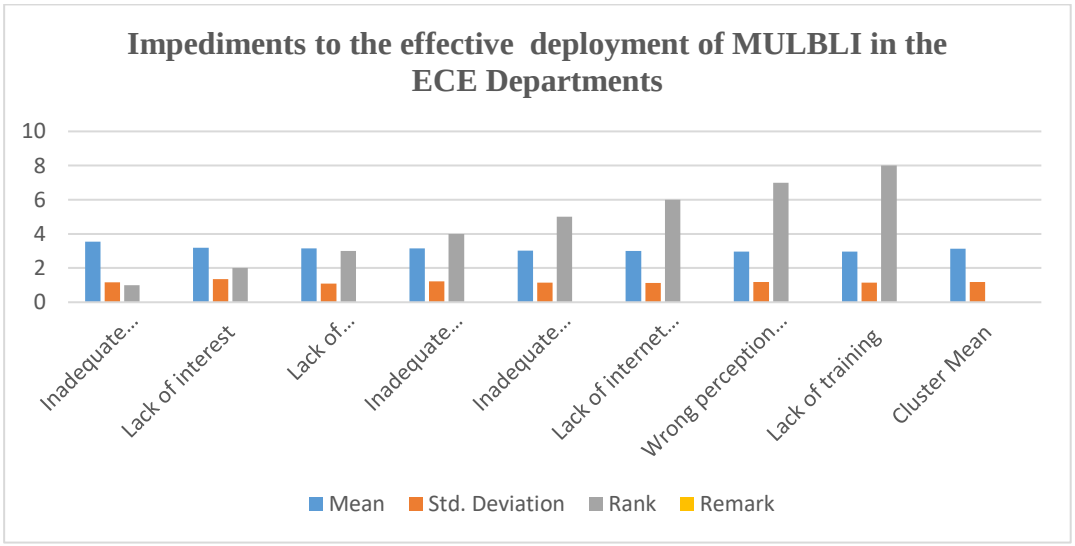

Fig. 6 Impediments to the effective deployments of MULBLI in the ECE Departments

Figure 6 above showed the results of impediments encountered in the deployment of MULBLI in the NCE awarding institutions in Plateau and Nasarawa States. The results indicated the major impediments encountered in the deployment of MULBLI in the study area is inadequate multimedia

facilities, ranked first and highest with a mean value of (M = 3.5459, std. deviation = 1.17175). Lack of interest and lack of multimedia instructional applications with their mean values of (M = 3.1905, std. deviation = 1.35522), and (M = 3.1602, std. deviation = 1.09149) were ranked at 2nd and 3rd respectively. The least impediments experienced in the application of MULBLI in the study area were Wrong perception and attitude and Lack of training with their mean values of (M = 2.9714, std. deviation = 1.17666), (M = 2.9665, std. deviation = 1.13890), ranked at 7th and 8th respectively.

Major Findings/Discussion

In this discussion, the research questions which guided the study were examined individually in the light of the major findings and published data.

What is the level of MUBLI facilities provided in Early Childhood Education (ECE) Departments of the NCE awarding institutions in the study area?

Based on the findings on question one above, general mean ranking shows 3.36 which is high, implying that the ECE departments in the study area have adequate MUBLI facilities. The finding reveals that most of the multimedia items are provided in most of the ECE departments in the study area, except for few items who ranked low. This finding agrees with Chinelo and Ayodeji, 2016, in their study on the effects of multimedia on primary pupils' academic performance and attitude in English Studies in Lagos State, Nigeria. They reported that most of the schools in their study area have sufficient supply of most multimedia facilities. Also, in their findings, it was reported that the use of multimedia in teaching and learning was of great advantage to the pupils as it avails them with modern instructional applications. This study however differs from the findings of Genc and Sahin (2020) in their study: Multimedia facilities in secondary schools: the Borno State experience. It was revealed that most of the schools do not have adequate multimedia facilities for instructions. This was because the multimedia facilities were generally not there or not provided, probably because the study was conducted at the heat of Boko haram insurgency where budgetary attention of the then Borno State government was not adequately given to education, or probably most of the facilities provided were destroyed or stolen because people were chased away from their inhabitants thereby abandoning their schools.

What is the level of teacher proficiency in the application of MULBLI in the ECE Departments in the study area?

The general mean ranking is 4.627 meaning that the level of staff proficiency in the application of MULBLI in the ECE departments in the study area is very high. This reveals that the teachers of the ECE departments in the study area are very knowledgeable in handling multimedia facilities and applications for instructions. The finding is in line with that of Falola and Jolayemi (2020). They studied: Impact of Multimedia Technology on the Teaching and Learning of Oral English in Osun State Secondary Schools, Nigeria. They reported that the teachers in Osun State are very familiar with and have been using technology for a long time since the transition from traditional teaching methods to modern methods has commenced. This has enhanced the teaching and learning of oral English in the State. They added that, the government of the state has been given premium to education in the State due to the sustainable increase in the education budget over the years. This became more interesting considering Patel's (2013), observation that the new era has assigned new challenges to modern teachers and that the use of multimedia technology in teaching has made it more interesting and productive. Gilakjani (2017), Ahmadi (2018) and Falola, and Jolayemi (2012), corroborate Chirag's views by noting that teaching has changed due to technology thereby becoming more interesting.

What are the impediments to the effective deployment of MULBLI in the ECE Departments in the study area?

Based on the overall mean ranking of 3.12, the challenges to the effective deployment of MULBLI in the NCE awarding institutions of learning in the study area were moderate. This means that most of the variables that may constitute hindrances to the smooth teaching and learning situation in the ECE departments have been moderately taken care of. This finding is however, in aberrance with

that of Abdulrahaman et al, (2020), their findings were contrary. They reported in their work: Multimedia tools in the teaching and learning processes: A systematic review, that most of the institutions with ECE departments in their study areas (Osun State) do not have adequate multimedia facilities and applications. They reported that attitudes and beliefs towards the use of technology in education, lack of teachers' confidence and resistance to change, lack of basic knowledge and ICT and multimedia skills, lack of technical, administrative and financial supports, lack of physical environment are some of the barriers identified in the various articles reviewed. These barriers affect the integration of multimedia in education.

Also, Muhammad et al, (2019) in their study titled: Factors militating against the use of multimedia/ICT in teaching and learning in public secondary schools in Kebbi State, Nigeria reported contrary to this study. They revealed that majority of the respondents within the selected schools said they do not have internet facilities in their schools. They added that most of their teachers do not use multimedia/ICT resources in their teachings. This was probably due to lack of electricity, internet facilities, lack of training of teachers and general look warm attitude of Kebbi State government towards public education. The above findings are supported in the existing literature as reported by Kurawa (2008), that inadequate material resources posed a serious challenge to science teachers because most of the schools are poorly equipped. In such a condition, teaching impedes knowledge and less development of the skills by the students.

Recommendations

The findings in the course of this study generally revealed positive outcomes based on the responses. There is however some areas that need adjustments that can help improve the teacher proficiency in the deployment of MULBLI to enhance the learning outcome and experience for children. It is therefore recommended that: government, institutions and well-meaning individuals should:

i. provide training and retraining for teachers on how to use these facilities effectively. The training can be through workshops, seminars, and online courses.
ii. create a culture of innovation and creativity that encourage teachers to use multimedia facilities in their teaching, and to share ideas and collaborations on projects create incentives for staff to improve their proficiency with animation by offering financial rewards, promotion opportunities, or other recognitions.
iii. address the issue of inadequate multimedia facilities.
iv. monitor the impact of their efforts to improve the deployment of MULBLI. This will help them to identify areas where further improvement is needed.

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