

AN ASSESSMENT OF IMPLEMENTATION OF NATIONAL COMPUTER EDUCATION CURRICULUM IN NIGERIAN PRIMARY SCHOOLS

Taiwo Ogunpeju Adefunke (Ph.D)

Department of Curriculum and Instruction,
Federal College of Education (Special), Oyo, Nigeria
+2348037810397, taiwopeju43@yahoo.com

Taiwo Sunday Ayodele (Ph.D)

Department of Curriculum and Instruction,
Federal College of Education (Special), Oyo, Nigeria
+2348037810392, sunayotaiwo@yahoo.com

Adeniyi Emmanuel Olufemi (Ph.D)

Department of Educational Foundation,
Federal College of Education (Special), Oyo, Nigeria
+2348060837811, femifemi81@gmail.com

Abstract: This study assessed the implementation of national computer education curriculum in Nigeria primary schools. Data were collected by means of 4 points Likert Scale questionnaire from 200 primary school computer teachers (116 males and 84 females) in 12 local government areas in Oyo state, Nigeria. Cronbach's alpha internal consistency coefficient of the Computer Education Curriculum Implementation Questionnaire (CECIQ) was 0.86. Descriptive statistics and t-test were used for analyzing data. The results revealed that there was no significant difference in the level of awareness of computer education curriculum by the private and public computer education teachers. Similarly, the result also revealed that there was no significant difference in the computer competence of male and female teachers in Nigeria primary schools. However, there was significant difference in the availability of computer hardware and software in the public and private schools. The study discusses the findings and makes some recommendations.

Keywords: Assessment, Implementation, Computer Education, Curriculum

Introduction

Primary education is regarded as the bedrock of the entire educational system in Nigeria (FRN, 2004). It is at the heart of the concept of basic education. Primary education develops the basic cognitive, social skills and knowledge required for living (Oduolowu, 1998). In fact a carefully conceived and implemented primary school system is the steering point for natural development and sound economic growth. Therefore, the critical significance of primary education with respect to the entire education system makes it "key to the success or failure of the whole system" (FRN, 2004). Then, it becomes important that the curriculum and instruction to accommodate and keep alive all the elements of primary education with respect to its goals, subject matters, teaching and learning methods, human and material resources as well as its assessment and evaluation requirements would not only be foundational and robust but has to be operative, dynamic, and utility oriented.

The potential benefits of computer education cannot be underestimated in the contemporary world. There is plethora of established findings on the instructional value of computer, particularly in advanced countries (Yusuf, 2005). Its use has extended information processing capabilities, which are influencing organisations of all types and sizes bringing about changes in institutional goals, relations and operations. Moreover, in recent time, information and communication technologies (ICTS) have become key tools and had a revolutionary impact on how we see the world and how we live in it (Dabesaki, 2005). Therefore preparing students for online learning and ICTs knowledge begins with the basic computer competency. For these reasons and in order to move with the space of changes and development in the contemporary world, Nigeria through the National Policy on Education (FRN, 1998, 2004) included computer education as one of the subjects to be taught in primary schools. For the accomplishment of this goal, the Nigerian Educational Research and Development Council (NERDC) in 2002 developed the National Computer Education Curriculum for Primary Schools. Today's schools are compelled to provide students with technology competency skills that will allow them to supplant their learning through online sources and succeed in an ever-increasing technological workplace. But, the achievement of any educational policy depends greatly on its implementation. This is why the process of curriculum making/development is never complete until it gets to

implementation (Kolawole, 2006). Therefore, the worth of a curriculum can only be appreciated when it is implemented. Various research evidences have often shown difference among the official or (intended) curriculum, the taught (implemented) curriculum and the assessed (achieved) curriculum. That is in some cases what is carefully documented as a curriculum differs markedly from what actually takes place in the school environment (Olorundare, 1990; Kolawole 2006; and Taiwo, 2002) and the performance (product) of the students.

Much as the intended/planned curriculum sets out the objectives to be achieved and equally the means of achieving them, there is always a gap between the planned (intended) curriculum and the implemented (actual) curriculum as a result of intervening variables. Based on this background this study investigated the implementation of the National Computer Education Curriculum in selected primary schools in Oyo, Nigeria.

Statement of the Problem

Computer literacy is gaining vast popularity in recent year globally, and become an important part of most organisations and businesses. Computer began to be placed in schools in the early 1980s in some advanced countries and several researchers suggest that ICT will be an important part of education for the next generation too (Bransford, Brown, & Cocking, 2000). Regardless of how one feels about it, computer education has become a factor in the lives of average literate Nigerians. This is because, to be computer literate implies getting familiar with computer terminologies, basic concept, working mechanism and potential uses and benefit to manipulate and control computer machines to solve diverse problems. (Adewoye, 2003). The benefits and impacts of computer and information technology on the individuals and the society make computer education studies to be an essential part of the education system of a functioning society like Nigeria (Yusuf, 2005). While the implementation of computer education succeed in advance countries in the Western World and in some of the third world countries (Watson, 1999; Sicilia, 2005; Zhang & Aikman, 2007). The impacts have not been felt as expected in Nigeria situation since its inception in the school curricular.

Adewoye, (2003) consequently, noted as the student grow, it is pertinent that they advance in their academic and intellectual milieu, and they will be in one way or the other, expected to work with computer tomorrow only if computer education is successfully implemented as a study from the lower level of the Nigeria education system today. Previous research raises several concerns about pupils' use of ICT in schools, including limited access to computer. A study on micro-computer use in public and private primary school showed that many schools have only limited numbers computer, by implication computer teaching in such schools terminated at the identification level. The study reported pupils loss of enthusiasm in the computer lesson which is always theoretical based. The recent review of literature by Adeogun (2010), found that there was limited use and unsatisfactory teaching of computer education in primary schools. This research, therefore examined the implementation of National Computer Education Curriculum in Nigerian primary, in order to determine whether there is gap between the intended and the actual curriculum.

Research Hypotheses

The following three null hypotheses were tested in the study.

1. There is no significant difference in the public and private school teachers' awareness of National Computer Education Curriculum.
2. There is no significant difference between male and females teachers' competency in implementing National Computer Education Curriculum.
3. There is no significant difference in the availability of computer software and hardware of private and public schools.

Review of Literature

Several studies argue that the use of new technologies in the classroom is essential for providing opportunities for students to learn to operate in an information age. It is evident, as Yelland (2001) argued that traditional educational environments do not seem to be suitable for preparing learners to function or be productive in the workplaces of today's society. According to her, organisations that do not incorporate the use of new technologies in schools cannot seriously claim to prepare their students for life in the twenty-first century. This argument is supported by Grimms, (2000) and Ozden (2007) when they pointed out that "by teaching ICT skills in primary schools the pupils are prepared to face future developments based on proper understanding". Many researchers and theorists assert that the use of computers can help pupils to become knowledgeable, reduce the amount of direct instruction given to them, and give teachers an opportunity to help those pupils with particular needs (Shamatha, Peressini & Mneymanis, 2004; and Romeo, 2006).

Moreover, Advanced and developing countries have also attested to the fact that ICT is a central focus for the educational policies, for use and integration in our school curriculum Adebayo (2008) noted that it could be observed that this modern age, is the age of information explosion in which an average individual wants to explore the information system. Thus, the ability for accurate acquisition, utilization, communication and retrieval of relevant and accurate information has become an important attribute for better teaching-learning process in our school setting.

Based on these reasons, Nigeria like many other countries around the world has over the years sought to improve its education system by introducing reforms and making plans based on the education needs of the country. Hence, the Federal Government of Nigeria in joining the computer education vogue came up with a computer education policy in 1988, which contained specific objectives for computer education in Nigeria Schools (FME, 1988). To support this move, The National Policy on Education (FRN, 2004, Revised) included computer education as one of subjects to be taught at the primary level being the foundation of all levels of education.

Research evidence shows that the teaching of the subject at inception especially at the primary school level are based on some unapproved documents or compilation of topics that lacked pedagogical basis and structure (Oyeniyi, 2006 and Obanisola, 2008). But in 2002, The Nigeria Educational Research and Development Council (NERDC) developed the National Computer Education Curriculum for Primary Schools. This Curriculum was the first deliberate attempt to rationally provide guidance to the teachers on what should constitute the computer literacy concepts and skills to be acquired at that level. According to Ajagun (2008), the curriculum which was structured to be the foundation for the computer studies in Junior and Senior Secondary Schools has the following objectives.

- Using the computer to acquire basic skills such as accessing and editing files at the operating system level and using the keyboard;
- using the computer to facilitate learning; and,
- develop rudimentary skills on the use of computer for text writing, computation and data entry activities (NERDC, 2002).

The curriculum which is thematic and child-centred is carefully structured around two vital ICT constructs of: system components, function and uses and application – which comprises of six themes to cover the six years of primary education. It is also stipulated in the curriculum that during the first three years the pupils will explore a variety of computers, computer components (hardware and software) their care, storage, functions and uses. It is expected that through this the student will acquire rudimentary processing skills (such as writing and editing), and the use of keyboard for data entry and computation. These skills are further strengthened and reinforced in upper primaries (4 – 6) as the pupils explore the application of the computer in everyday life.

Taiwo, (2008) pointed out that the implementation process of a public policy is usually more tasking than the process of conceptualization, formulation and articulation. She explained further that, this is as a result of the fact that certain assumptions made at the stage of formulation are confronted with stark realities during implementation. Meanwhile, Jegede & Owolabi (2003) in Yusuf (2005) noted that the introduction of computer education into schools in Nigeria has consisted mainly of buying a few computers and some software. These are added to existing educational technology facilities in schools with little in the traditional operation of the school being affected by the presence of computers. This argument is supported by Adegoke (2006), who pointed out that few computer supplied to some primary schools for implementation of the National curriculum were kept in the offices while teachers brought them out once in a while for the teaching of the subject.

A study on micro-computer use in primary schools (Jackson, Fletcher, & Messer, 1988) showed that on average a pupil used a computer for only about 10 minutes a week. These 10 minutes were often shared time with other students. This study reported pupils lost enthusiasm using computer. This in line with the finding of Becker, 2005 who discovered that there was limited use and unsatisfactory teaching of computer in primary schools. Thomas 2006 submitted that one primary school in five uses computer less frequently than once a week, and the pupils in such cases experience limited teaching of computer instruction and little time to apply learnt skills to other work. These findings opposed the findings of Jackson, (2008) which confirmed that access to computer in the school greatly affects pupils' confidence and fluency in handling equipment and software from a young age. It can thus be deduced that the full potential of computers is yet to be exploited within the Nigerian school system. This therefore necessitated the need to assess the state of implementation of the National Computer Education Curriculum in Nigerian primary schools.

Teachers are indispensable to successful computer education. Successful implementation of computer education can only be assured through teachers who have acquired necessary knowledge and skills. That is teacher needed to become sufficiently competent to make personal use of computers, to make use of information and communication technology as a mind tool, to become masters of a range of educational paradigms that use ICT, and also to become sufficiently competent to make use of ICT as a tool for teaching (Krischner & Davis, 2003).

But contrarily, Newhouse (2002) found that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices. Albion (1999) in Yusuf (2005) has noted that teachers' competence and self-efficacy in their capacity to work effectively with computers is a significant factor in determining their patterns of implementing the curriculum for the benefit of the pupils.

Milner (1988) opined that educational opportunities are being missed because most teachers do not know how to use the computer nor can they teach students about the impact of computers on society. Supporting this view, (Summers, 1990, and Kirshner, & Selinger, 2003) submitted that in some cases pupils are more adept at using necessary tools for acquiring and transmitting knowledge than teachers. It is also discovered by Adegoke (2006) that teachers' incompetency and lack of confidence in the use of computer greatly influenced the implementation of computer education in primary schools. Adebayo (2008) submitted that absence of trained teachers in computer science to teach students practical aspects of computer and non-availability of computer and allied tools in school have been militating against actual implementation of computer education curriculum.

Furthermore, recent research in Turkey found that the main problem with the implementation of computer institution in science was the insufficient amount of in-service training programs for the teachers (Ozden, 2007) and Toprakci (2006) concluded that limited teacher training in the use of ICT in Turkish schools is an obstacle. These claims by researchers on the relationship of teachers' competency and implementation of the computer education curriculum need to be further substantiated through research.

The effect of teachers' gender in the teaching learning process is still a major point of debate among educators. Gender influence is also of importance in research on computer education. This is because gender differences, with lower female participation, are widely documented for both science and technology and particularly for computer education (Davis, Klawe Nyhus, & Sullivan, 2003). Culley (1988) also submitted that, not only are specialist computer teachers more likely to be male than female, but also teachers of other subjects who use the computer as a learning tool are more likely to be men than women. The larger-scale international IEA – conducted study on the use of computer in primary and secondary education, reprinted that it is not only important in itself that women teachers be involved in computer education but the presence of female role models with sufficient skills, competent and positive attitude is also important in stimulating the participation of girls. Men dominate computer use in the schools in these studies. Most studies found no differences between the computer competence of female and male teachers (Jamssen, Plomp 1993, Gordon, 1993). Robertson et al (1995) also found that male teachers considered themselves to be more competent than the female teachers with regard to computer skills.

Several empirical studies have investigated the uses and integration of ICT(s) into the teaching and learning of both primary and secondary schools. Little effort has been made to investigate the implementation of the national computer education curriculum, even the little effort was concentrated in the unity schools and federal government colleges in Nigeria. This study therefore assessed the implementation of National Computer Education Curriculum in Nigerian Primary Schools.

Research Methodology

Research Design

The research design adopted for this study was descriptive one. This was considered appropriate by the researcher to give systematic description of the implementation of the National Primary School Computer Education Curriculum.

Sample

The target population comprised of all qualified computer teachers in private and public schools in Oyo State, Nigeria where the study was conducted. A multi-stage sampling technique was used to select schools and respondents for the study. Through simple random sampling four (4) local governments were selected in each of the three (3) Senatorial districts in Oyo State, making a total of twelve (12) local governments. In all the schools in the twelve (12) local government areas, purposive random sampling was used to select two hundred and thirty-two (232) qualified computer teachers which consist of 136 males and 96 female. From this sample, 130 computer teachers were from the public schools while the remaining 102 were from the private schools.

Instrumentation

A questionnaire designed by the researcher was used to gather data on the study. The instrument consists of two sections. The section one request the respondents' demographic information like name of the school, ownership of the school, class taught, sex, experiences, qualification etc.

The second section contains the items. These are 15 in number, but sub-divided into three sections (a) awareness of computer education curriculum by the teacher, (b) competency in using computer (c) availability of computer software and hardware for effective implementation of the curriculum. The respondents were to choose from strongly agree (4), agree (3), disagree (2) and strongly disagree (1). To ascertain the reliability of the instrument after modification, it was administered on 50 respondents which were not part of the sample using test-retest method. The reliability co-efficient through a Cronbach alpha yielded $r = 0.86$.

Procedure for Data Collection

All the 232 censured teachers were administered with the survey questionnaire in their respective schools with the permission granted by the various authorities of the schools. The entire respondents were informed about the date and time of the exercise in advance. A total of 6 weeks was used to cover all the schools where the respondents were selected. Although a total of 232 questionnaire copies were distributed, only 200 – 100 each from public and private schools were valid for the analysis.

Procedure for Data Analysis

Data collected on the study were analysed using frequency count, percentages and t-test.

Results

The results of the analysis are presented in the tables below:

Hypothesis 1: There is no significant difference in the public and private school teachers' awareness of National Primary School Computer Education Curriculum.

The result is presented in Table 1a and 1b.

S/N	ITEMS	SA	A	D	SD
1.	Your school teaches computer education to its pupils	133 66.8%	47 23.5%	18 9%	2 1%
2.	The federal government has produced a computer education curriculum for primary school	140 70%	49 24.5%	11 5.5%	- 0%
3.	Your school have copy/copies of the National Primary Computer Education Curriculum	43 21.5%	37 18.5%	78 39%	42 21%
4.	Teachers base their teaching of this subject on this curriculum	54 27%	96 48%	44 22%	6 3%

Table 1a: Level of Teachers' Awareness of National Primary Computer Education Curriculum

Table 1a shows that 180 (90%) of the teachers who took part in the study indicate that they teach computer education to their pupils in the schools. The table also shows that 189 (94.5%) attested that federal government has produced a computer education curriculum for primary schools. Only 80 (40%) of the teacher indicate that they have copy of the curriculum in the schools. Although 150 (75%) base their teaching of the subject on the existing curriculum. A personal interaction of researcher with some of the teachers revealed that some of them photocopied the portion of curriculum needed for their teaching in most cases.

LEVEL OF AWARENESS OF COMPUTER EDUCATION TEACHING	N	MEAN	STD. DEV.	CRIT-T	CAL-T	DF	P
Private Schools	100	141.2800	2.0941				
Public Schools	100	14.34000	2.7422	1.96	.74	198	.862

Table 1b: Comparison of Computer Teachers Awareness in Private and Public School

Table 1b above shows that the public schools computer teachers obtained higher mean score ($x = 14.3400$) than their private schools counterparts $x = 14.2800$ in their level of awareness, giving a mean difference of (0.06). However, the mean difference is not significant (Crit-t = 1.96, Cal. T = .184, df = 198, $P > .05$ level of significance. There was no significant difference in their level of awareness. Thus the null hypothesis is accepted.

Hypothesis 2: There is no significant difference between males and females teachers' competence in implementing National Primary Computer Education Curriculum. The result is presented in Table 2a and 2b.

S/N	ITEMS	SA	A	D	SD
1.	I can operate the computer	56 28%	106 53%	31 15.5%	07 3.5%
2.	I can use a variety of software program (word processing, data base, spreadsheet etc.)	52 26%	61 30.5%	62 31%	25 12.5%
3.	I can identify and explain basic computer components	122 61%	52 26%	04 2%	22 11%
4.	I can solve general software and hardware problems.	45 22.5%	37 18.5%	76 38%	42 21%
5.	I can use computer to access the internet	135 68%	48 24%	12 6%	04 2%
6.	I can use computer to create graphics	44 22%	06 3%	54 27%	96 48%

Table 2a: Competence of Males and Females Teachers in Implementing the Curriculum

Table 2a shows that 162 (81%) of the teacher can operate computer successfully, 174 (87%) of them can also identify and explain basic computer components. It also revealed from the result that 87(43.5%) indicated insufficient knowledge of using variety of computer software, 118 (59%) cannot solve general software and hardware problems, and 150 (75%) cannot use the computer to create graphics. This results shows that while majority of computer teachers in primary school were well vast in basic computer knowledge almost half of them were deficiency in advance computer operations.

KNOWLEDGE AND SKILLS	N	MEAN	STD. DEV.	CRIT-T	CAL-T	DF	P
Female Teachers (F)	84	7.0900	1.3933				
Male Teachers (M)	116	7.5200	1.8173	1.96	1.878	198	.062

Table 2b: Comparison of the teacher competence (knowledge and skills) of males and females teachers

Table 2b shows that the male teachers obtained higher score ($x = 7.5200$) in the competence level than their female counterpart ($X = 7.0900$), giving a mean difference of (0.43). But, the mean difference is not significant (Crit-t = 1.96, Cal-t = 1.878, df = 198, $P > .05$ level of significance). This means that there was no significant difference between the level of competence of males and females teachers. Therefore the null hypothesis is accepted.

Hypothesis 3: H_0 : There is no significant difference in the availability of Computer Software and Hardware of Private and Public Schools. The result is presented in Table 3a and 3b.

S/N	ITEMS	SA	A	D	SD
1.	My school have enough computer for teaching the students	8 4%	33 16.5%	95 47.5%	64 32.0%
2.	School allowed the pupils to operate the computer's	132 66%	47 23.5%	18 9%	3 1.5%
3.	Your school periodically received materials/technical support for the school computer education program from the government or from NGO	20 10%	30 15%	94 47%	56 28%
4.	Every teacher in the school have personal computer	43 21.5%	37 18.5%	78 39%	42 21%
5.	Different software and hardware were available at all time in my school	7 3.5%	17 8.5%	112 56%	64 32.0%

Table 3a: Availability of Computer and Software and Hardware of Private and Public Schools

Result in table 3a shows that many schools did not have enough computers for the teaching of the subject, likewise only 80(40%) of these teachers have personal computers. Majority of the teachers allowed their students to operate the limited number of computer in their possession. Moreover, only 50 respondents agreed that they received support from the government while 24(12%) indicated that different software and hardware were available at all time in their schools.

AVAILABILITY OF COMPUTER SOFTWARE AND HARDWARE	N	MEAN	STD. DEV.	CRIT-T	CAL-T	DF	P
Private Schools	100	5.8600	2.0939				
Public Schools	100	5.2300	1.4485	1.96	2.474	198	.014

Table 3b: Comparison of the availability of computer Software and Hardware of Public and Private schools

Table 3b reveals that there was a significant difference in the availability of computer software and hardware in public and private schools. From the table (Crit-t = 1.96, Cal - t = 2.474, df = 198 < .05 level of significance. It is shown that private schools were better equipped than the public schools in the study.

Discussion of Findings

In any Curriculum Implementation, level of awareness of all the stakeholders involved cannot be underestimated. This is because it can make or mar the achievement of the said curriculum. As can be seen in the results 90% of the respondents indicated that they teach computer in their school and that federal government of Nigeria has produced computer education curriculum. Also 75% base their teaching of the subject on the existing curriculum. The result also revealed that there is no significant difference in the level of awareness of public and private teachers. The reason for this is that both private and public schools in Nigeria are operating the same curriculum and they are being supervised by the same supervisory bodies in order to ensure uniformity in the knowledge received by the generality of the students. This result supports the finding of Jekanola, 2003 who submitted that there is no significant difference in the usability of the curriculum by the private and public school teachers.

The study also shows that majority of computer teachers were well vast in basic computer knowledge while almost half were deficient in advance computer operations. This is in agreement with report of Asan, (2003) whose analysis of teachers' knowledge of computer technologies revealed low levels of technical knowledge; she also discovered that, the use of computer and related technologies had not been a routine part of the teachers' educational environment. This attest to the reason why Adegoke (2006) opined that teachers' incompetency and lack of confidence in the use of computer will definitely influenced the implementation of the curriculum. This also confirms the submission of (Summers 1990; and Kirschner and Selinger, 2003) that pupils are more adept at using necessary technology tools for acquiring and transmitting knowledge than teachers. The result further shows that there was no significant difference between the level of competence of male and female teachers. The result is contradicted to the results of other researchers' studies conducted in early years (Woodrow, 1992; Butler, 2000; and Ocaik and Akdemir, 2008) who found out that male teachers expressed greater knowledge about computer than female teachers.

The availability of computer software and Hardware among private and public schools, the results shows that many schools did not have enough computers for the teaching of the subject. Likewise only 40% of these teachers have personal computer. Moreover, 75% of the respondents indicated that they did received support from the government while 88% of them pointed it out that computer software and Hardware were not available in their schools. This confirms the report Aduwa – Ogiegbaen and Iyamu, (2005) that primary and secondary schools in Nigeria are not given adequate funds to provide furniture, laboratories and adequate classroom let alone being given adequate funds for higher tech-equipment (Computer) and internet connectivity. Further investigation in this study reveals that there is a significant difference in availability of computer software and hardware in public private schools. It shown that private schools were better equipped than the public school in the study. The reason for this is that diversion of government grants and aids meant for educational agencies to other ministries.

Conclusion and Recommendation

Nigeria has been able to recognize the benefits and impacts of information and communication technology on individuals and the society by making computer education studies to be an essential part of the education system; and therefore committed to its practice and implementation, especially in the context of achieving quality education.

This study assessed the implementation of computer education curriculum in Nigeria primary schools to determine the extent to which the objectives of the curriculum have been met. The result of the study revealed that majority of Nigerian computer teachers were well versed in basic computer knowledge while almost half of the teachers sampled were deficient in advanced computer operations; and this has negative implications for the effective implementation of the curriculum. This study has implications for curriculum planners that adequate human and material resources are needed for effective implementation of computer education curriculum in primary schools. Similarly, computer compulsory in-service training opportunity should be provided for all teachers in order to upgrade their knowledge and skills competence in information and communication technology.

It is recommended that government should provide computer laboratories in all primary schools with requisite computer infrastructure and services. Teaching learning environment and administration of primary education should be restricted to be computer-driven. Constant review of computer education curriculum should be carried out periodically to accommodate emerging societal needs and global trends. Federal government should increase budgetary provision for ICT and incorporate variety of measures to ensure judicious use of the allocations.

The study has limitations because the data was collected from twelve local governments out of thirty-three local governments in Oyo state, the findings may have limited generalizability. The study did not investigate the moderating influence of teaching experience and age on computer competence among primary school teachers. Future studies should consider those factors and further research with large samples should be conducted.

Ogunpeju, Adefunke Taiwo [Ph.D], Department of Curriculum and Instruction, Federal College of Education (Special), PMB 1089, Oyo, Nigeria, is a Senior Lecturer in the Department of Curriculum and Instruction where she teaches courses in Principle and Method of Teaching and Curriculum. Her area of specialization is Curriculum and Instruction and Social Studies. She received a Ph.D. in Curriculum and Instruction from the University of Ibadan in 2013.

Sunday Ayodele Taiwo [Ph.D], Department of Curriculum and Instruction, Federal College of Education (Special), PMB 1089, Oyo, Nigeria, is a Chief Lecturer in the Department of Curriculum and Instruction where he teaches courses in Educational Technology. Since receiving his Ph.D. in 2003 from the University of Ilorin his primary interest has been and still is investigating the use of technology for effective and efficient instruction. He has been the Head of department and coordinator of Centre for Educational Technology; He is currently the Dean, School of Education of the same college.

Emmanuel Olufemi Adeniyi [Ph.D], Department of Educational Foundations, Federal College of Education (Special), PMB 1089, Oyo, Nigeria, is currently the Provost of the College. He was once a Dean and Deputy Provost in Federal College of Education, Esiele, Abeokuta, Ogun state, Nigeria. He received a Ph.D. in Educational Management from the University of Ibadan, Nigeria. He has authored more than forty articles, chapter contributions and books in the field of Special Education and Educational Management.

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