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# 23

## Status of Multimedia Awareness and Utilization among Science Teacher Educators in Some Universities in South Eastern Nigeria

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### ABSTRACT

This study investigated the status of multimedia awareness and utilization among science teacher educators in some universities in South Eastern Nigeria. A descriptive survey research design was adopted for the study. A total of 300 science teacher educators from 9 universities in South Eastern Nigeria formed the sample for the study. This was selected using stratified random sampling technique across gender and area of specialization. The instrument for data collection was tagged multimedia awareness and utilization questionnaire developed by the researchers and validated by 2 experts in educational technology and 1 expert from computer science both from University of Uyo and 2 experts from measurement and evaluation from University of Nigeria, Nsukka. 5 research questions guided the study. Data collected were analysed using frequencies and percentages; while the two hypotheses were tested with chi-square. The findings of the study showed that majority of science teacher educators are not aware of the instructional media not to talk of utilizing them. Based on the findings, it was recommended that science teacher educators be brought into awareness of multimedia by their institutions of learning and be properly trained on its utilization to enhance the teaching-learning process for maximal intellectual and skill benefits.

**Key words:** status, multimedia, awareness, utilization, potentialities, creative knowledge, interactive.

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### INTRODUCTION

The importance of instructional media utilization in the attainment of educational objectives at all levels of education has long been recognized. Multimedia are dynamic instructional and learning materials that offer a variety of real world and interactive learning experiences to the learner. It enhances skills development and creativity significantly especially with new technological devices. Multimedia as an instructional media involves a combination of many types of medium like text, audio, still images animation, video and interactivity content forms that are organized around a single topic. Multimedia describes electronic media devices used to store and experience multimedia content. Instructional media generally which are self supporting devices are channels through which messages, information, ideas and knowledge are conveyed and disseminated. Multimedia can equally be referred to as tools that store and transmit information for facilitating effective and efficient communication in the teaching-learning process [3, 6].

Multimedia awareness in the context of this paper is all about finding the extent/level of knowledge and understanding of multimedia possessed by science teacher educators. This is because this group of teachers train the prospective teachers. If awareness of multimedia is properly created and utilized, science teacher educators will be able to discover their unique abilities, creative skills and potentialities and be better equipped to handle lesson delivery especially in this information age. Due to evolution of globalization and information technology, changes in the Nigerian school curriculum for the development of intellectual and creative potentials have become imperative. The wind of globalization and rapid spread of electronic communications calls for transformation and re-structuring of the nation's school curriculum at all levels to ensure its parity with the current global trends. There is therefore, urgent need for changes in instructional methods and materials especially in the sciences that are very experimental for acquisition of creative knowledge and skills for the electronic age.

Multimedia are interactive technologies in the teaching-learning process that suits the current trend globally. Multimedia instruction occupies a prominent position in many countries' educational planning and delivery in the knowledge-based society today. Regrettably, Nigeria, is yet to fully join the race in the globalizing world with respect to multimedia usage. Dubbing of old notes and talk-chalk approach are still in vogue at all levels of our educational systems as teachers do not use multimedia instructional approach with reasons ranging from non- accessibility of these materials to teachers, lack of needed skills to manipulate the gadgets for learning, financial constraints, lack of resourcefulness and above all, proactive inhibition on the part of teachers who find it difficult to accept teaching in a technology-based environment [5].

The purpose of teacher education as stated in the Nigerian National Policy on Education [4] is to provide trainees with both intellectual and professional knowledge and skills that will enable teachers adapt to a changing world of work. Science teacher educators in the nations' tertiary institutions of learning are a very important target group expected to provide the trainees with the knowledge and skills for adaptation to a changing world of work. Hence, Nigerian science teacher educators should not only be aware of the interactive technological devices of the information age that should be used in the teaching-learning processes but should be competent on the technical-know how and usage of most of these devices.

The use of multimedia as an instructional approach helps to reduce learning difficulties and improves teaching and students' performance in their academic work. Multimedia instructional approach will equally help science teacher educators competence, utilization and skill acquisition at manipulating technological devices for the information age. Unfortunately, some literature evidence posit that Nigerians generally and Nigerian teachers in particular are lacking in ICT skills utilization, application and knowledge [1, 2]. Considering the fact that the aim of every teacher is to effectively communicate his information to the learner and the need to prepare children for today and beyond to cope with the challenges of a changing technological and scientific world, it becomes very expedient that science educators be encouraged to use multimedia in delivering and making their lessons effective. This usage highly depends on the extent of awareness among other factors. It is against this background that the researchers want to look at the status of awareness and utilization of multimedia among science teacher educators in Nigerian Universities. In doing this, the following objectives that helped to give direction to the study were formulated. These include (i) To find out the status of multimedia awareness among science teacher educators; (ii) To find out the status of multimedia utilization among science teacher educators; (iii) To find out the influence of science teacher educators' areas of specialization on multimedia awareness and utilization; (iv) To find out the influence of science teacher educators gender on multimedia awareness and utilization; and (v) To find out the training needs of science teacher educators for proper awareness and utilization.

### **Research Questions**

1. What is the status of multimedia awareness among science teacher educators in Nigerian universities?
2. What is the status of multimedia utilization among science teacher educators in Nigerian universities?

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3. What influence does science teacher educator area of specialization have on multimedia awareness and utilization?
4. What influence does science teacher educators gender have on multimedia awareness and utilization?
5. What are the training needs of science teacher educators on multimedia awareness and utilization?

**Research Hypothesis****Hypothesis 1**

There is no significant difference among chemistry, physics, biology and basic science and technology teacher educators on multimedia utilization at  $p < 0.05$ , level of significance.

**Hypothesis 2**

There is no significant difference between male and female science teacher educators on multimedia utilization at  $p < 0.05$  level of significance.

**MATERIALS AND METHODS**

A descriptive survey research design was employed for the study. All the science teacher educators from 9 universities in South Eastern Nigeria formed the population of the study. A total of 306 science teacher educators were selected using proportionate stratified random sampling technique across gender and area of specialization which included chemistry, physics, biology and integrated science now basic science and technology formed the sample for the study. The instrument for data collection was multimedia awareness and utilization questionnaire (MAUQ) developed by the researchers and validated by experts in educational technology, computer education and measurement and evaluation. This was distributed by the researchers and collected back the same day. A total of 300 questionnaires were collected back. Data collected were analysed using frequencies and percentages while the two hypotheses were tested using chi-square at  $p < 0.05$  level of significance. 40 percentage is the benchmark for consideration as a pass mark.

**Data Analysis**

The research questions were answered using frequencies and percentages. The null hypotheses were tested at 0.05 level of significance using chi-square. The results of the data collected were as shown in Tables below.

**RESULTS AND DISCUSSION****Research Question 1**

What is the status of multimedia awareness among science teacher educators in Nigerian universities? From Table I above it is shown that science teacher educators are very much aware of prints and audio type of media and not the others. On worksheets and boards for instance, the frequency of the responses is 300 each which is 100%. The percentage marks on the others are still above 40 which is taken as a pass mark. The worst of the five types of media was on computer as a type of media which is one of the popular new technological devices. The percentage scores on awareness were all below 40 which is taken as the standard. On regalia type of media, it can be deduced that science teachers are aware of half of realia shown and are not aware of the other half.

**Research Question 2**

What is the status of multimedia utilization among science teacher educators in Nigerian Universities? From Table 2 above on utilization of multimedia by the science teacher educators, it was shown that on prints instructional media, only one of the items had a standard percentage of 70% and none on Audio. Three items had percentage scores of between 49 and 52. There was none on realia and computer. In other words, there is poor utilization of multimedia by science teacher educators.

**Research Question 3**

What influence does science teacher educators area of specialization have on multimedia utilization? Data on Table 3 show that the percentage scores of chemistry, physics, biology and basic science and technology teacher educators on utilization of instructional media are all below 40 which is the

pass mark. This is the same for prints, audio, visuals and computer instructional media. It was only on Realia type of instructional media that biology and basic science and technology teacher educators had a pass mark of 59% and 49% respectively on real objects and then 45% each on models. The percentage scores on excursion and field work on utilization were all below 40.

#### **Research Question 4**

What influence does science teacher educator gender have on multimedia utilization? From Table 4 above, it is shown that male science teacher educators had above 40% in 4 out of 5 types of print as against 3 out of 5 of their female counterpart. On utilization, the male science teacher educators had a percentage score of 43 on textbooks and pamphlets only. The percentage score of both gender on all others were below 40%. On audio type of instructional media, the percentage scores of male and female science teacher educators were all below 40 on utilization. On visuals, the male had 40% on televisions while all others were below 40% utilization for both gender. On realia, the story is equally the same. There was no percentage score that was up to 40 in utilization. It was on computer assisted instructions under computer as a type of media that the males got 51% as against 20% of their female counterparts. The story remained the same for others on utilization.

#### **Research question 5**

What are the training needs of science teacher educators on the utilization of multimedia? From Table 5 above, it is seen that science teacher educators need training on the points enumerated except on knowledge of computer. The percentage frequencies of these points were all above 40 which is the standard score except on the knowledge of computer where their responses were within 35%.

#### **Hypothesis 1**

There is no significant difference among chemistry, physics, biology and basic science and technology teacher educators on multimedia utilization at 0.05 level of significance. From Table 6 above, the calculated value of chi-square of 1.000 is less than the critical value of 43.77 at 0.05 level of significance. The null hypothesis of no significant difference among chemistry, physics, biology and basic science and technology teacher educators on multimedia utilization therefore holds. There is, therefore, no significant difference among chemistry, physics, biology and basic science and technology teacher educators on multimedia utilization.

#### **Hypothesis 2**

There is no significant difference between male and female science teacher educators on multimedia utilization at 0.05 level of significance. From Table 7 above, the calculated chi-square value of .969 is less than the critical chi-square value of 40.11 at 0.05 level of significance. The null hypothesis of no significant difference between male and female science teacher educators therefore holds.

The results of this study have shown that science teacher educators in Nigerian universities are fairly aware of multimedia as instructional media but so rarely utilize them in teaching learning process. It was on prints type of multimedia that a good percentage of the science teacher educators were very much aware of and equally utilize. As for the other four types which included audio, visual, realia and computer types of multimedia, only very few of science teacher educators used them in teaching-learning process. This is in line with the findings of [5] who submitted that teachers at all levels of our educational system do not use multimedia instructional approach. This by implication means that science teachers in primary and post primary institutions do not have sound training on multimedia and so cannot utilize them. In other words, proper provision has not been made in the educational curriculum for the inclusion and use of multimedia in teaching learning process even in the present technology-based environment.

From the results on the training needs of science teacher educators, it can be concluded that apart from inaccessibility of these materials as observed by [5], that these teachers lack skills for the utilization of instructional media especially in the face of new technological devices. This is in agreement with [1] who submitted that the Nigerian teacher who is the key player in the drive to progress, and who ought to teach and direct the students is lacking in ICT skills and knowledge.

Furthermore, science teacher educators' gender and area of specialization have no significant influence on the utilization of multimedia in the teaching – learning process.

## CONCLUSION

Results of this study revealed that science teacher educators in Nigeria universities are not very much aware of multimedia not to talk of utilizing them. Considering the importance of multimedia in teaching-learning process especially in science, and the emergence of knowledge-based society in the 21st century with myriads of technological devices, it becomes very imperative that proper awareness of instructional media generally and multimedia in particular be created for proper utilization. On this note, it is recommended that a program be mapped out for science teacher educators at different departmental levels for multimedia awareness and utilization. In addition, training on different computer programmes should be extended to them since it is one of the most popularly used technological devices today. In addition, the school science curriculum at both primary and post-primary institutions should be reformed/re-tooled so as to accommodate proper utilization. Federal, state and local governments should encourage teachers and help in maintaining the standard of education by adequately funding education to help in the provision of teaching-learning materials for the teaching-learning process.

Table- 1: Frequencies and Percentages of responses of science teachers educators on multimedia awareness.

S.No.	Instructional Media	Yes	%	No	%
1.	Print				
	Textbook, pamphlet	210	(70)	90	(30)
	Work sheets workbook	96	(32)	204	(68)
	Maps, charts, photographs and posters	91	(30)	209	(70)
	Newspapers, journals, periodicals and magazines	73	(24)	227	(76)
	Boards (chalkboards, flip chart)	52	(17)	248	(83)
2	Audio				
	Audio cassettes	80	(27)	220	(73)
	Discs (CDS)	105	(35)	195	(65)
	Video cassettes	83	(28)	217	(72)
	Radio Broadcasts	103	(34)	197	(66)
	Record Players	97	(32)	203	(68)
	Person's voice	55	(18)	245	(82)
3	Visuals				
	Television	147	(49)	153	(51)
	All types of prints	135	(45)	165	(55)
	Slides	75	(25)	225	(75)
	Opaque projectors	-	(-)	-	-
	Overhead projectors	-	(-)	-	-
	Films	-	(-)	-	-
	Film stripes	23	(8)	277	(92)
	Video discs	155	(52)	145	(48)
4	Realia				
	Real objects – specimen	48	(16)	252	(84)
	Models	104	(35)	196	(65)

	Excursions	81 (27)	219 (73)
	Field work	27 (9)	273 (91)
5	Computer		
	Computer assisted instruction	21 (7)	279 (93)
	Sensors	6 (2)	294 (98)
	Power point	69 (23)	231 (77)
	Computer conference	3 (1)	297 (99)
	Hypermedia	1 (0)	299 (100)
	Teleconference	3 (1)	297 (99)
	Softwares	61 (20)	239 (80)

Table- 2: Frequencies and percentage of responses of science teacher educators on multimedia utilization

S.No.	Instructional Media	Yes		No	
		Frequency	%	Frequency	%
1.	Print				
	Textbook, pamphlet	292	(97)	8	(3)
	Work sheets workbook	300	(100)	-	-
	Maps, charts, photographs and posters	170	(57)	130	(43)
	Newspapers, journals, periodicals and magazines	235	(78)	65	(22)
	Boards (chalkboards, flip chart)	300	(100)	0	(0)
2	Audio				
	Audio cassettes	93	(31)	207	(69)
	Discs (CDS)	158	(53)	142	(47)
	Video cassettes	105	(35)	195	(65)
	Radio Broadcasts	281	(94)	19	(6)
	Record Players	136	(45)	164	(55)
	Person's voice	166	(55)	134	(45)
3	Visuals				
	Television	214	(71)	86	(29)
	All types of prints	183	(61)	117	(39)
	Slides	104	(35)	196	(65)
	Opaque projectors	6	(2)	294	(98)
	Overhead projectors	4	(1)	296	(99)
	Films	13	(4)	287	(96)
	Film stripes	113	(38)	187	(62)
	Video discs	179	(60)	121	(40)
4	Realia				
	Real objects – specimen	174	(58)	126	(42)
	Models	164	(55)	136	(45)
	Excursions	98	(33)	202	(67)
	Field work	68	(23)	232	(77)
5	Computer				
	Computer assisted instruction	98	(33)	202	(67)
	Sensors	24	(8)	276	(92)

Power point	88	(29)	212	(71)
Computer conference	6	(2)	294	(98)
Hypermedia	24	(8)	276	(92)
Teleconference	9	(3)	291	(97)
Softwares	61	(20)	239	(80)

Table-3: Percentages of responses of Chemistry, Physics, Biology and Basic Science and technology teacher educators on multimedia utilization.

S.No.	Instructional media	Utilization			
		Chemistry	Biology	Physics	Basic Science & Technology
1	Print				
	Textbook, pamphlet	47(16)	53(18)	51(17)	59(60)
	Work sheets workbook	23(8)	20(7)	27(9)	26(9)
	Maps, charts, photographs and posters	17(6)	24(8)	23(8)	27(9)
	Newspapers, journals, periodicals and magazines	16(5)	19(6)	18(6)	20(7)
	Boards (chalkboards, flip chart)	300(100)	13(4)	13(0)	15(5)
2	Audio				
	Audio cassettes	17(6)	22(7)	21(7)	20(7)
	Discs (CDS)	23(8)	28(9)	25(8)	29(10)
	Video cassettes	19(16)	22(7)	22(7)	20(7)
	Radio Broadcasts	27(9)	28(9)	25(8)	23(8)
	Records Players	23(8)	21(7)	29(10)	24(8)
3	Person's voice	12(4)	13(4)	13(4)	17(6)
	Visuals				
	Television	39(13)	33(11)	41(14)	34(11)
	All types of prints	30(10)	28(9)	38(13)	39(13)
	Slides	17(6)	18(6)	21(7)	19(6)
	Opaque projectors	-	-	-	-
	Overhead projectors	-	-	-	-
	Films	-	-	-	-
4.	Film stripes	6(2)	5(2)	7(2)	5(2)
	Video discs	37(12)	33(11)	46(15)	39(13)
	Realia				
5.	Real objects – specimen	10(3)	11(4)	15(5)	13(4)
	Models	26(9)	21(7)	28(9)	29(10)
	Excursions	19(6)	17(6)	22(7)	23(8)
	Field work	5(2)	7(2)	8(3)	7(2)
5.	Computer				
	Computer assisted instruction	6(2)	4(1)	5(2)	6(2)
	Sensors	1(0)	1(0)	2(1)	2(1)



Power point	16(50)	20(7)	17(6)	16(5)
Computer conference	-	1(0)	1(0)	1(0)
Hypermedia	1(0)	-	1(0)	1(0)
Teleconference	1(0)	-	1(0)	1(0)
Softwares	14(5)	12(4)	17(6)	18(6)

Table 4: Frequencies and Percentages of male and female science teacher educators responses on multimedia utilization

S.No.	Instructional Media	Utilization	
		Male (%)	Female (%)
1.	Print		
	Textbook, pamphlet	130 (43)	80 (27)
	Work sheets workbook	57 (19)	39 (13)
	Maps, charts, photographs and posters	53 (18)	38 (13)
	Newspapers, journals, periodicals and magazines	44 (15)	29 (10)
	Boards (chalkboards, flip chart)	32 (11)	20 (7)
2	Audio		
	Audio cassettes	45 (15)	35 (12)
	Discs (CDS)	66 (22)	39 (13)
	Video cassettes	50 (17)	33 (11)
	Radio Broadcasts	59 (20)	44 (15)
	Record Players	60 (20)	37 (12)
3	Person's voice	67 (22)	53 (18)
	Visuals		
	Television	84 (28)	63 (21)
	All types of prints	78 (26)	57 (19)
	Slides	53 (18)	22 (7)
	Opaque projectors	-	- (-)
	Overhead projectors	-	- (-)
	Films	4 (1)	1 (0)
	Film stripes	15 (5)	8 (3)
	Video discs	90 (30)	65 (22)
4	Realia		
	Real objects – specimen	30 (10)	19 (6)
	Models	65 (22)	39 (13)
	Excursions	48 (16)	33 (11)
	Field work	16 (5)	11 (4)
5	Computer		
	Computer assisted instruction	63 (21)	35 (12)
	Sensors	4 (1)	2 (1)
	Power point	44 (15)	25 (8)
	Computer conference	3 (1)	0 (-)
	Hypermedia	3 (1)	0 (-)
	Teleconference	3 (1)	2 (1)
Softwares	26 (9)	17 (7)	

Table-5: Frequencies and percentages of the responses on the training needs of science teacher educators.

Section A: Need training on Computer Literacy (A basic appreciation of how computer works)					
S.No.		Frequency	%	Frequency	%
1.	Knowledge of computer	105	(35)	195	(65)
2.	Appreciation of computer	166	(55)	134	(45)
3.	Application of computer	214	(71)	86	(29)
4.	Communication of computer	203	(68)	97	(32)
5.	Use of Internet	191	(64)	109	(36)
6.	Use of CD-ROM	177	(59)	123	(41)
7.	Use of variety of softwares	236	(79)	41	(14)
Section B: (A basic appreciation of how to use them) other technological devices					
8.	Manipulation of ICT facilities	213	(71)	87	(29)
9.	Handling of sensory softwares	245	(82)	55	(18)
10.	Simulation of virtual images	270	(90)	30	(10)
11.	Tracking techniques on information devices	194	(65)	106	(35)
12.	Production of software devices	195	(65)	105	(35)
13.	E-learning networking	214	(71)	86	(29)
14.	Internet network surfing	235	(78)	65	(22)

Table-6: Chi-square analysis of data on multimedia utilization by Chemistry, Physics, Biology and Basic Science Technology teacher educator.

	Value	df <sup>a</sup>	Asymp. Sig. <sup>b</sup> (2-sided)	X <sup>2</sup> crit <sup>c</sup>
Pearson Chi-Square	20.368a	78	1.000	43.77
Likelihood Ratio	22.440	78	1.000	
Linear-by-Linear Association	0.000	1	0.994	

<sup>a</sup>Degree of freedom; <sup>b</sup>Asymetric significance; <sup>c</sup>Tabulated chi-square

Table-7: Chi-square Analysis of Data on Multimedia Utilization by Male and Female Science Teacher Educators

	Value	df	Asymp. Sig. (2-sided)	X <sup>2</sup> crit
Pearson Chi-Square	15.051a	27	.969	40.11
Likelihood Ratio	17.365	27	.922	
Linear-by-Linear Association	0.486	1	.486	

<sup>a</sup>Degree of freedom; <sup>b</sup>Asymetric significance; <sup>c</sup>Tabulated chi-squar

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