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Relationship between E-Learning Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria

Edoh CLETUS[1], Musa USMAN[2]
{edohcletus@mau.edu.ng[1], Musman902@hotmail.com[2]}

Department of Physical Sciences Education, Faculty of Education, ModibboAdama University, Yola, +2348066412064, +2349019657695[1],Department of Physical Sciences Education, Faculty of Education, ModibboAdama University, Yola, +2348035390088[2]

Abstract
This study examined the relationship between e-learning facilities and lecturers job productivity in Federal Colleges of Education in North Eastern Nigeria. Three research questions and three hypotheses guided the study. Correlational research design was adopted for this study. The population of this study is 805. The sample size for this study is 365. Multi-stage sampling procedure was adopted for the study. The instrument to be used for data collection is a self-structured questionnaire titled "E-Learning Facilities Questionnaire (ELFQ)" and Lecturers Job Productivity Questionnaire (LJPQ) with a total of 15-items. The items are structured on a five-point rating scale of VHL=Very High Level (4), HL=High Level (3), ML=Moderate Level (3), LL=Low Level (2) and VLL= Very Low Level. The reliability co-efficient of (ELFQ) and (LJPQ) yielded 0.84 and 0.86 respectively. Descriptive statistics of Mean and Standard Deviation were used in answering the three research questions raised for the study using real limits of numbers. Pearson Product Moment Correlation Co-efficient was used in testing hypotheses 1 and 2, while ANOVA of Multiple Regression Analysis was used in testing hypothesis 3 at 0.05 Alpha level of significance. Based on the analysis of data it was revealed that Multimedia Applications and Internet Facilitiesare significant predictors of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria, $F_{(1, 364)} = 33045.230$, $p < 0.05$. Since the p – value (0.000) is less than 0.05 alpha level, we can conclude that the null hypothesis should be rejected. This means that Multimedia Applications and Internet Facilitiessignificantly predict Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria. Based on the findings of the study, it was recommended among others that: Federal Government should ensure adequate provision of quality and up-to-date multimedia applications such as; video (screen-capture, Lecture Capture, talking head videos, animation, glass screen videos), slideshow/presentation and infographic as this could enhance lecturers job productivity in classrooms.

Keywords: E-Learning Facilities, Multimedia Applications, Internet Facilities, Lecturers Job Productivity, and Federal Colleges of Education.

1 Introduction

The introduction of Information Technology tools such as multimedia technologies and the internet in todays classrooms has greatly improved learning situations in tertiary institutions of learning as Information Technology has improved accessibility and quality of instructional delivery among lecturers and students. Thus, e-learning is a new paradigm shift in higher educational sector purposive geared towards advancing the knowledge base of the 21st Century learner. The beginning of 21st Century has heralded the educational technology that has facilitated e-learning among secondary and tertiary institutions in the developing countries. The influence of e-learning is increasingly dominating the current educational style as the influence of technology increases dominating our day to day activities worldwide [12]. As one of the major sectors of technological influence is education it is assumed the vanguard for developmental change of all countries in the contemporary world.

The Information Communication Technology (ICT) integrated learning is therefore highly recommended for facilitating individually constructed knowledge by supporting the lecturers professional development, the students benefit there after promoting organizational learning [12]. [12] revealed that knowledge is natural byproduct of an individual within the environment and context, which is supported by constructivist idea that learning is tends to be holistic. This is taking sense of the world by taking information from the environment. The author explain further that what a student does is more important than what the teacher does. [12] adds that students should depend on what they perceive, interpret and intend to do. So, the ICT integrated learning creates opportunities to facilitate such interaction of learning. This supports [5] idea that constructive learning environment will be enhanced if reinforced to play more task oriented activities like in the electronic supported learning. Lecturers are among the group of employees classified as knowledge workers whose job productivity uses mental faculty and involves the use of information, creativity and decision making [13].

Lecturer productivity is a measure of how efficiently a given set of resources either improvised by the lecturer or provided by the school authority is utilized judiciously by lecturer to achieve predetermined set of objectives within the school system. Thus, educational productivity is the ratio between the contributions made by education to general development and the cost of education. Job productivity has been described in various ways by different educators. For instance Mohanta (2010) defined productivity as the ability to combine skillfully the right behaviour towards the achievement of organizational goals and objectives. [4] Defined teachers' job productivity as the duties performed by a teacher at a particular period in the school system in achieving set organisational aims, goals and objectives. It is also the

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ability to combine relevant inputs for the enhancement of teaching and learning processes. Quality in higher education can be achieved through ensuring lecturer's increased productivity by provision of quality and conducive work environment [4]. There are links between educational programs and Information Communication Technology facilities.

Technology can impact on learning through a presentation, the use of information utilising devices, use of educational modules and the use of online reference books and electronic diaries. However, the use of e-learning as a teaching methodology has witnessed massive adoption in developed countries where several institutions see e-learning activities as a means to grow and improve their institutions [6]. Furthermore, the way and manner in which the methods of teaching are changing in the 21st century are alarming. The integration of technologies as a way of life due to the emergence of the internet has also changed how teaching is conducted in HEIs especially in developed economies [8]. Today, the combination of e-Learning strategy and traditional face-to-face learning strategy (blended learning technique) has been embraced. While this technique or method caters specifically for individual needs of the learner compared to the conventional classroom teaching approach because the students may have unique learning styles, this approach is not prominent in Nigeria. Early developments in e-learning focused on computer assisted learning, where part or all of the learning content is delivered digitally. More recently the pedagogical dimension of e-learning has become prominent. E-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. E- learning can be viewed as computer assisted learning, and as pedagogy for student-centered and collaborative learning [7].

E-learning as a sub-system within Information and Communication Technology (ICT), is the electronic process which enhances the delivery and administration of learning opportunities and support via computer, networked and web-based technology to help individual performance and development. The basic principle of e-learning is connectivity – the process by which computers are networked to share information which can connect people. This is provided for by what is often called the e-learning landscape or architecture, which refers to the hardware, software and connectivity components required to facilitate learning [5]. E-learning technology has the potential to transform how and when learners learn. Learning will become more integrated with work and will use shorter, more modular, just-in-time delivery systems. E-learning delivers contents through electronic Information and Communications Technologies (ICTs), [5].

E-learning is defined as digitally permitted and technology-facilitated learning devices that use a digital camera, personal computers (PCs), digital videos, tablets, projector; OHP, software, operating systems which aid in the interaction of students and teachers [14;7]. It includes other applications that support learning from a distance or face to face with the help of PC [16]. E-learning has moved from learning from the conventional method to contemporary driven, synergistic, customized and adaptable learning method involving learners', facilitators and instructors [8]. According to the authors, the use of these facilities involves various methods which include systematic feedback system, computer-based operation network, video conferencing and audio conferencing, internet facilities, multimedia applications, worldwide websites and computer assisted instruction. This delivery method increases the possibilities for how, where and when learners can engage in lifelong learning. This study focused only on multimedia applications and Internet Facilities. Multimedia applications support verbal instruction with the use of static and dynamic images in form of visualization technology for better expression and comprehension in classrooms.

Multimedia application is interactive software that combines several types of media at once in order to convey information to its end user (audience) [11]. Different types of media that can be used in today's lecture theatre include; text images (photographs, illustrations), audio (music, sounds), animation, slideshow or presentation, diagrams, infographic, video (screen-capture, Lecture Capture, talking head videos, animation, glass screen videos). Multimedia is utilized in education to create popular reference books like encyclopedias and guidebooks as well as computer-based training courses (often referred to as CBTs). Text, pictures, music, and animation are all used in CBTs. Multimedia is a combination of more than one media type such as text (alphabetic or numeric), symbols, images, pictures, audio, video, and animations usually with the aid of technology for the purpose of enhancing understanding or memorization [10]. Multimedia technology has some characteristics like integration, diversity, and interaction that enable college lecturers to communicate information or ideas with digital and print elements to her target audience (the students). The digital and print elements in this context refer to multimedia-based applications or tools used for the purpose of delivering information to students for better understanding of abstract concepts, thereby making teaching and learning experiences more interesting. [2] revealed that apart from text and images, existing tools were found to have multimedia components such as audio, video, animation and 3-D. [2] revealed that the majority of the multimedia solutions deployed for teaching and learning target the solution to the pedagogical content of the subject of interest and the user audience of the solution while the success of the different multimedia tools that have been used on the various target groups and subjects can be attributed to the availability of internet technologies and components embedded in their development for ease of utilization.

Internet could mean interrelated network of networks. It is useful for academics because it allows colleagues to connect with themselves around the globe and at same time provides access to interactive forum with the aid of some network resources. Internet is defined as means through which users source information across places and keep up-to-date on issues of interest [3]. According to [15], internet is universal communication grid that disseminates information with the aid of computer in wide area networks. [1] also describe the use of internet as a universal experience that allows operators to localize and share massive collection of data required to facilitate their duties. According to [15] the internet is seen as an electronic library that provides and displays large amount of information through various sources. The internet

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has no doubt, provided the means by which researchers and teachers access useful information that they need for teaching and research. As noted, stable internet connectivity and computer is necessary for electronic learning [3]. Internet reliability could be seen as critical hindrance to integration of e-learning into education system of developing countries, especially in Nigeria who is the 'Giant of Africa'. [15] Revealed that lecturers recognized that the use of e-learning facilities could enhance their job effectiveness. However, the author further revealed that majority of them does not often use electronic board. Further, result by the author showed that lecturers' use of e-learning facilities significantly influence their job effectiveness. The author suggested that lecturers should use e-learning facilities for increased productivity in carrying out their academic work.

To access/exchange large amount of data such as software, audio clips, video clips, and text files, other documents, etc., lecturers and students need stable internet services. Some of the commonly used internet services within the school system are: Communication Services (to exchange data/information among individuals or organizations via; Internet Relay Chat, VoIP (Voice over Internet Protocol), describes how to make and receive phone calls over the internet, List Server (LISTSERV): delivers a group of email recipients' content-specific emails, E-Mail: Used to send electronic mail via the internet, User Network (USENET): hosts newsgroups and message boards on certain topics, and it is mostly run by volunteers, Telnet: it's used to connect to a remote computer that's connected to the internet, Video Conferencing: Video conferencing systems allow two or more people who are generally in different locations to connect live and visually. Live video conferencing services are necessary for simulating face-to-face talks over the internet. Information Retrieval Services (procedure for gaining access to information/data stored on the Internet through Net surfing or browsing), File Transfer (exchange of data files across computer systems via gopher, FTP (File Transfer Protocol) and Archie), World Wide Web Services, Web Services, Directory Services, Automatic Network Address Configuration, Network Management Services, Time Services, Usenet, News-Group and E-commerce.

The introduction of new multimedia technologies and the Internet in teaching-learning relationship has been seen as a means to improve accessibility, efficiency and quality of learning by facilitating access to information resources and services as well as remote exchanges and collaboration. Nonetheless, by the middle of the 20th century the growth in technology and applications even in the field of education has been unavoidable to be overlooked. It has been found that students in higher educational institutions that engaged in E-Learning, generally performed better than those in face-to-face courses. [9] found that students who participate in online/ E-Learning achieve better grades than students who studied traditional approach. As result of this finding E- learning is growing very fast and become popular and that is why many higher educational institutions are adopting to virtual learning system.

The use of new multimedia technologies and the Internet in learning is seen as a means to improve accessibility, efficiency and quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration. E-learning has become a new paradigm and philosophy in education with a mission to serve as a development platform for present-day society based on knowledge. For example, online instruction has the potential to provide opportunities for reflective and integrating learning outcomes in the 21st century classrooms. This approach provides the students with enhanced speedy adaptive personalized e-learning because it is a general term used to refer to computer-enhanced learning. It may involves the use of mobile technologies such as personal digital assistants and MP3/MP4 player and includes the use of web-based teaching materials and hypermedia in general, as rooms or web-sites, discussion boards, collaborative software, e-mail, blogs, wikis, text chart, computer aided assistant, educational animation, simulation, games, learning management software et cetera.

It is evident that the concept of e-learning is considered to be very attractive as a new learning model whose effect will be a positive one to the development of education in developing countries especially Nigeria, with all its potentialities. Although, not much effort is taken for its implementation, present-day research of e-learning in Nigeria shows that having e-learning on the educational agenda in Nigeria still face a lot of challenges. This study is informed by the deplorable state of educational system in Nigeria due to the inadequate teaching –learning facilities and infrastructures, especially in public higher institutions as observed by the researchers. Most public colleges in Nigeria have audio-visual learning materials that are hardly utilized as a result of incessant power outages and lecturers computer self-efficacy.

Hence, traditionally, the main learning approach of biro, paper andchard copy files is still predominantly being practiced. A teacher determines what to teach, how to teach and thus, less concern about the students that is are at the receiving end. There are various learning approaches being put in place to compensate for the problems occasioned by this traditional learning paradigm. While e-learning has constantly been adopted and helped in the establishment of virtual universities in most western countries, only a few private colleges of education in Nigeria completely carry out their academic activities through e-learning [7]. Majority of lecturers find it difficult to use e-learning, while to some, it is still a dream because of poor and weak technological infrastructure. Therefore, the survival of tertiary educational institutions, especially public colleges of education in the 21st century will increasingly rely on various forms of electronic delivery system and communication facilities that are available in markets as requirements for educational flexibility. It is against this background that the researchers examined the relationship between E-learning facilities and lecturers job productivity in Federal Colleges of Education in North Eastern Nigeria.

1.1 Purpose of the study

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This study examined the relationship between E-learning facilities and lecturers job productivity in Federal Colleges of Education in North Eastern Nigeria. Specifically, the study sought to;

1. Examine the relationship between Multimedia Applications and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.
2. Examine the relationship between Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.
3. The level of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

1.2 Research Question

The following research questions guided the study.

1. What is the level of Multimedia Applications in Federal Colleges of Education in North Eastern Nigeria?
2. What is the level of Internet Facilities in Federal Colleges of Education in North Eastern Nigeria?
3. What is the level of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria?
4.

1.3 Statement of Hypotheses

The following null hypotheses were formulated to guide the study and were tested at 0.05 Alpha level of significance:

Ho_1: There is no significant relationship between Multimedia Applications and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

Ho_2There is no significant relationship between Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

Ho_3: There is no significant relationship between Multimedia Applications, Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

2 Methodology

Correlation research design was adopted for this study. The study area is North-Eastern Nigeria. The population of this study is 805. This comprise of 100 administrators (provost, registrar, dean and HODs) and 705 lecturers in three Federal Colleges of Education in North-Eastern Nigeria. The sample size for this study is 365. This sample size comprises of 45.34% of the entire population which is 805. Similarly, Nwana (1981) suggests that if the population is a few hundreds, a 40% or more samples will suffice. Multi-stage sampling procedure was adopted for the study. This includes purposive sampling, simple random sampling and proportionate stratified random sampling techniques. Purposive and simple random sampling techniques were used in selecting Federal Colleges of Education.

Federal Colleges of Education were purposively sampled to take care of the variable of ownership. At the second stage, purposive sampling technique was used to select administrators: Provost, Registrars, Deans and various Heads of Departments on three Federal College of Education. At third stage, proportionate stratified random sampling technique was used in selecting the lecturers. Lecturers were sampled proportionately in the following order; Federal College of Education, Yola, Adamawa State (130), Federal College of Education (Techical) Potiskum, Yobe State (87) and Federal College of Education (Technical), Gombe, Gombe State (148). The use of proportionate stratified random sampling technique is to avoid sampling bias. At the last stage, simple random sampling technique was used in selecting the three hundred and sixty-five (365) lecturers. Simple random sampling technique was used because it gave the respondents equal opportunity of being included in the study.

The instruments to be used for data collection are a self-structured questionnaire titled “E-Learning Facilities Questionnaire (ELFQ)” and Lecturers Job Productivity Questionnaire (LJPQ) with a total of 15-items. The items are structured on a five-point rating scale of VHL=Very High Level (4), HL=High Level (3), ML=Moderate Level (3), LL=Low Level (2) and VLL= Very Low Level. To ensure the validity of the instruments were submitted to three senior lecturers from the Department of Physical Sciences Education, Faculty of Education, ModibboAdama University, Yola for face and content validation. Data were collated and analyzed for reliability using Cronbach Alpha Statistic. Cronbach Alpha Statistics was used because it helped the researchers to determine the internal consistency of items of the instruments (The reliability co-efficient of (ELFQ) and (LJPQ) yielded 0.84 and 0.86 respectively. This total reliability coefficient of 0.84 and 0.86 was considered high enough and reliable to be used for the study.

Three hundred and sixty-five (365) copies of the instruments were administered to the respondents by the researchers with the aid of six research assistants who are conversant with the study area. The direct delivery approach was to used to enable the researchers and research assistants to thoroughly explain the purpose of the study to the respondents and also, to ensure all completed questionnaire copies are retrieved on the spot. Descriptive statistics of Mean and Standard Deviation were used in answering the three research questions raised for the study using real limits of numbers. Pearson Product Moment Correlation Co-efficient was used in testing hypotheses 1 and 2, while ANOVA of Multiple Regression Analysis was used in testing hypothesis 3 at 0.05 level. The decision rule was that, if the p-value is less than the significance level ($\alpha = 0.05$), the null hypothesis would be rejected and alternative hypothesis accepted.

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2.1 Results

Three research questions were raised and answer using descriptive statistics of mean and standard deviation. Three hypotheses were also formulated and tested at 0.05 level of significance using PPMC and ANOVA of Multiple regression.

2.1.1 Research Question one

What is the level of Multimedia Applications in Federal Colleges of Education in North Eastern Nigeria?
To answer this research question, responses on the level to which Multimedia Applications are utilized in Federal Colleges of Education in North Eastern Nigeria were collected and analyzed as shown in Table 1.

Table 1: Mean and Standard Deviation of Level of Multimedia Applications in Federal Colleges of Education in North Eastern Nigeria

S/N	Items n=365	Mean	S. D	Remark
1	Use of text images (photographs, illustrations)	4.36	0.92	HL
2	Use of audio (music, sounds)	4.38	0.86	HL
3	Use of slideshow/presentation	4.49	0.95	HL
4	Use of video (screen-capture, Lecture Capture, talking head videos, animation, glass screen videos)	4.51	0.96	VHL
5	Use of infographic to improve cognition using graphics to enhance the human visual system's ability to see patterns/trends	4.15	0.93	HL
	Average Mean	**4.38**	**0.92**	**HL**

The average mean and standard deviation of the level of Multimedia Applications in Federal Colleges of Education in North Eastern Nigeria are shown in Table 1. In Federal Colleges of Education in North Eastern Nigeria, a high level of Multimedia Applications is indicated by an average mean score of 4.38 and standard deviation value of 0.92. This implies that lecturers use of video (screen-capture, Lecture Capture, talking head videos, animation, glass screen videos), slideshow/presentation and infographic to improve cognition using graphics to enhance the human visual system's ability to see patterns/trends to a high level.

2.1.2 Research Question Two

What is the level of Internet Facilities in Federal Colleges of Education in North Eastern Nigeria?
To answer this research question, responses on the level to which Internet Facilities are utilized in Federal Colleges of Education in North Eastern Nigeria were collected and analyzed as shown in Table 2.

Table 2 Mean and Standard Deviation of level of Internet Facilities in Federal Colleges of Education in North Eastern Nigeria

S/N	**Items** n=365	**Mean**	**S. D**	**Remark**
1	Use of Internet Relay Chat to exchange data/information among lecturers/students	4.52	0.96	VHL
2	Use of VoIP (Voice over Internet Protocol) to make/ receive phone calls over the internet	4.59	0.98	VHL
3	Use of live video conferencing services for simulating face-to-face talks with students over the internet	4.50	0.95	VHL
4	Use of User Network (USENET) to hosts newsgroups on certain topics	4.56	0.97	VHL
5	Use of Retrieval Services to gaining access to information/data stored on the Internet through Net surfing or browsing	4.73	1.03	VHL
	Average Mean	**4.58**	**0.98**	**VHL**

Result of analysis in Table 2 shows the mean and standard deviation of level of Internet Facilities in Federal Colleges of Education in North Eastern Nigeria. An average mean of 4.58 and standard deviation of 0.98 shows high level of Internet Facilities usage in Federal Colleges of Education in North Eastern Nigeria. This implies that College lecturers use; Retrieval Services to gaining access to information/data stored on the Internet through Net surfing or browsing, VoIP (Voice over Internet Protocol) to make/ receive phone calls over the internet and User Network (USENET) to hosts newsgroups on certain topics to a very high level.

2.1.3 Research Question Three

What is the level of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria?
To answer this research question, responses on the level to which Internet Facilities are utilized in Federal Colleges of Education in North Eastern Nigeria were collected and analyzed as shown in Table 3.

Table 3 Mean and Standard Deviation of level of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria

S/N	Items	n=365	Mean	S. D	Remark
1	Lecturers use on-line assessment data for instructional decision making		4.39	0.88	HL
2	Lecturers provide a variety of opportunities that support student's integrated e-learning development		4.50	0.94	VHL
3	Lecturers employs integrated planned instruction to meet the learning needs of all students using multimedia tools		4.61	0.97	VHL
4	Lecturers employs online Internet based instruction to meet the learning needs of all students		4.64	0.98	VHL
5	Lecturers use Value-Added Models to provide a summary score of the contribution of various factor towards growth in students achievement		4.59	0.96	VHL
	Average Mean		**4.55**	**0.95**	**VHL**

The mean and standard deviation of the level of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria are shown in Table 3. A high level of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria is indicated by an average mean score of 4.55 and standard deviation value of 0.95. This implies that to a very high level; Lecturers employs online Internet based instruction to meet the learning needs of all students, Lecturers employs integrated planned instruction to meet the learning needs of all students using multimedia tools and Lecturers use Value-Added Models to provide a summary score of the contribution of various factor towards growth in students achievement.

3 Hypotheses Testing

3.1 H_{01}: There is no significant relationship between Multimedia Applications and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

Table 4 Summary of PPMC of relationship between Multimedia Applications and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria

Variable	Mean	S. D	R – value	P - value	Remark
Multimedia Applications	4.38	.92	0.821	0.000	**H_{01} reject**
Lecturers Job Productivity	4.55	.95			

The summary of the results from the PPMC analysis performed to investigate the relationship between Multimedia Applications and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria are presented in Table 4. According to the result, Multimedia Applications and Lecturers Job Productivity are strongly, positively and significantly correlated ($r = 0.821$, $p < 0.05$).

3.2 H_{02}: There is no significant relationship between Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

Table 5 Summary of PPMC of relationship between Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria

Variable	Mean	S. D	R – value	P – value	Remark
Internet Facilities	4.58	.98	0.802	0.000	**H01 reject**
Lecturers Job Productivity	4.55	.95			

The results of the PPMC analysis used to investigate the relationship between Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria are summarized in Table 5. The outcome shows a significant strong and positive relationship (r - value = 0.802, p 0.05) between Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

3.3 H_{03}: There is no significant relationship between Multimedia Applications, Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

Table 6a Summary of Multiple Regression of relationship between Multimedia Applications, Internet Facilities and Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.394	1	17.867	33045.230	.000[b]
	Residual	.456	363	.001		
	Total	85.850	364			

a. Dependent Variable: **Lecturers Job Productivity**
b. Predictors: (Constant), **Multimedia Applications**, **Internet Facilities**
Results of Analysis in Table 6a revealed that Multimedia Applications and Internet Facilitiesare significant predictors of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria, $F_{(1, 364)} = 33045.230$, $p < 0.05$. Since the p – value (0.000) is less than 0.05 alpha level, we can conclude that the null hypothesis should be rejected. This means that Multimedia Applications and Internet Facilitiessignificantly predict Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

Table 6b Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.994[a]	.992	.893	.02325

a. Predictors: (Constant), **Multimedia Applications**, **Internet Facilities**
The result in Table 6b shows a model summary which shows how the independent variable explains the variance in the dependent variable. The result shows that Multimedia Applications and Internet Facilitiesexplained 89.3% of the variance in Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

Table 6c Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.016	.012		1.416	.156
	Multimedia Applications	.485	.004	69.2	220.051	.000
	Internet Facilities	.486	.004	68.3	198.742	.000

a. Dependent Variable: Lecturers Job Productivity
The analysis in Table 6c shows the coefficients of multiple regression analysis. The regression analysis presented reveals how each variable included in the model contributed in Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria. Multimedia Applications has a beta value of .692 which implies that is Multimedia Applications explains 69.2% of the variance in Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria, at a p-value of 0.000. Furthermore, Internet Facilities has a beta coefficient of .683 which implies that is Internet Facilities explains 68.3% of the variance in Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria, at p – value of 0.000. It can be concluded that Multimedia Applications make the strongest unique contribution to explaining Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria, when the variance explained by all other variables in the model are controlled for since it has the largest beta coefficient of .692.

4 Summary of Major Findings

The following are the findings of the study:

1. Multimedia Applications and Lecturers Job Productivity are strongly, positively and significantly correlated ($r = 0.821$, $p < 0.05$).
2. The outcome shows a significant strong and positive relationship (r - value = 0.802, p 0.05) between Internet Facilities and Lecturers Job Productivityin Federal Colleges of Education in North Eastern Nigeria.
3. The results revealed that Multimedia Applications and Internet Facilitiesare significant predictors of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria, $F_{(1, 364)} = 33045.230$, $p < 0.05$. Since the p – value (0.000) is less than 0.05 alpha level, we can conclude that the null hypothesis should be rejected. This means that Multimedia Applications and Internet Facilitiessignificantly predict Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria.

5 Discussion of Findings

The finding of this study revealed that Multimedia Applications and Lecturers Job Productivity are strongly, positively and significantly correlated. The major findings were that; that lecturers use of video (screen-capture, Lecture Capture, talking head videos, animation, glass screen videos), slideshow/presentation and infographic to improve cognition using graphics to enhance the human visual system's ability to see patterns/trends to a high level. Similarly, a test of related hypothesis revealed that Multimedia Applications and Lecturers Job Productivity are strongly, positively and significantly correlated ($r = 0.821$, $p < 0.05$). This finding corroborate with that of [10] whose findings revealed that multimedia technology has some characteristics like integration, diversity, and interaction that enable college lecturers to communicate information or ideas with digital and print elements to her target audience (the students). [10] further reveaked that digital and print elements in this context refer to multimedia-based applications or tools used for the purpose of delivering information to students for better understanding of abstract concepts, thereby making teaching and learning experiences more interesting. The finding corroborate with that of [2] revealed that apart from text and images, existing tools were found to have multimedia components such as audio, video, animation and 3-D. [2] concluded that the majority of the multimedia solutions deployed for teaching and learning target the solution to the pedagogical content of the subject of interest and the user audience of the solution while the success of the different multimedia tools that have been used on the various target groups and subjects can be attributed to the availability of internet technologies and components embedded in their development for ease of utilization.

The second findings of the study revealed that there is a significant strong and positive relationship between Internet Facilities and Lecturers Job Productivityin Federal Colleges of Education in North Eastern Nigeria (r - value = 0.802, p 0.05). The major findings were that College lecturers use; Retrieval Services to gaining access to information/data stored on the Internet through Net surfing or browsing, VoIP (Voice over Internet Protocol) to make/ receive phone calls over the internet and User Network (USENET) to hosts newsgroups on certain topics to a very high level. Similarly, a test of related hypothesis revealed showed a significant strong and positive relationship between Internet Facilities and Lecturers Job Productivityin Federal Colleges of Education in North Eastern Nigeria (r-value = 0.802, p 0.05). This finding is in agreement with that of [15] whose findings revealed that the internet is seen as an electronic library that provides and displays large amount of information through various sources for effective teaching and learning in schools. [15] further revealed that internet has no doubt, provided the means by which researchers and teachers access useful information they need for teaching and research in higher educational institutions. The finding further corroborate with that of [3] whose findings revealed that stable internet connectivity and computer is necessary for electronic learning in schools. [15] further revealed that Internet reliability could be seen as critical hindrance to integration of e-learning into education system of developing countries, especially in Nigeria who is the 'Giant of Africa'. [15] revealed that lecturers recognized that the use of e-learning facilities could enhance their job effectiveness. [15] further revealed that majority of lecturers do not often use electronic board. Further, result by the [15] showed that lecturers' use of e-learning facilities significantly influence their job effectiveness. [15] suggested that lecturers should use e-learning facilities for increased productivity in carrying out their academic work.

The third finding of the study revealed that Multimedia Applications and Internet Facilitiesare significant predictors of Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria, $F_{(1, 364)} = 33045.230$, $p < 0.05$. Since the p – value (0.000) is less than 0.05 alpha level. This means that Multimedia Applications and Internet Facilitiessignificantly predict Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria. The major findings of the study revealed that to a very high level; Lecturers employs online Internet based instruction to meet the learning needs of all students, Lecturers employs integrated planned instruction to meet the learning needs of all students using multimedia tools and Lecturers use Value-Added Models to provide a summary score of the contribution of various factor towards growth in students achievement. Similarly, a test of related hypothesis revealed Multimedia Applications and Internet Facilitiessignificantly predict Lecturers Job Productivity in Federal Colleges of Education in North Eastern Nigeria. This finding is in line with that of [15] whose findings revealed that lecturers' use of e-learning facilities (Internet and multimedia tools) significantly influence their job effectiveness. Sunday's finding further corroborate wit the finding of this study because it revealed that lecturers should use e-learning facilities for increased productivity in carrying out their academic work. This finding is consistent with that of [16] whose findings revealed that multimedia technology has some characteristics like integration, diversity, and interaction that enable college lecturers to communicate information or ideas with digital and print elements to her target audience (the students) through stable internet connectivity.

6 Conclusion

Based on the findings of the study, it was concluded by the researchers that the role multimedia applications and internet facilities plays in lecturers job productivity in Federal Colleges of Education cannot be over-emphasized. The researchers envisaged that if lecturers in Federal Colleges of Education utilize the immense benefits of multimedia applications and internet facilities in their daily instructional delivery; their job productivity would be greatly enhanced.

7 Recommendations

Based on the findings of the study, the following recommendations were made:

1. Federal Government should ensure adequate provision of quality and up-to-date multimedia applications such as; video (screen-capture, Lecture Capture, talking head videos, animation, glass screen videos), slideshow/presentation and infographic as this could enhance lecturers job productivity in classrooms.
2. Federal government and other non-governmental organisations should ensure college lecturers are provided with daily free access to stable internet connectivity in order for them to explicitly use retrieval services to gain access to information/data stored on the Internet through Net surfing or browsing, VoIP (Voice over Internet Protocol) to make/ receive phone calls over the internet and also use User Network (USENET) to hosts newsgroups on certain topics as this could enhance lecturers instructional delivery on a daily basis.
3. Lecturers should employ online Internet Based Instruction, Integrated Planned Instruction and Value-Added Models to meet the learning needs of all students in order to improve students' achievement through improved e-instructional delivery.

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