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Impact of Information and Communication Technology on Distance Education: The case of National Open University of Nigeria   *(Pp. 325-341)*

Osaat, Sunday D. - Institute of Education, Faculty of Education, University of Port Harcourt, Rivers State, Nigeria

Nsereka, Leton Rebecca - Institute of Education, Faculty of Education, University of Port Harcourt, Rivers State, Nigeria

Abstract

This study investigates the impacts of information and communication technology media on effective distance learning education in Nigeria. It implores the use of questionnaire as instrument with reliability index of 0.89 (using Cronbach) to generate data. The data were analyzed using mean scores, cluster mean scores and criterion mean scores to answer the 4 research questions. The paper finds out that information and communication technology media have greater positive impacts on distance education enhancing academic success; that the National Open University of Nigeria (NOUN) has not fully employed ICT media such as radio/television broadcast of lectures, computer aided instruction and tele/video conferencing exception of e-library, sms and email/internet. The study also shows that methods of teaching employed include email for assignment collection and

submission, e-library and to lesser extent internet bracing and radio/television broadcast. The authors recommend more government assistance and urge the lecturers and students to be receptive of all the teaching/learning methods akin to ICT media as to improve on their achievements.

Introduction

Over the years, education has been recognized as the bedrock of every society. The world has grown to the point that the uneducated man looses relevance in every society. Thus the demand for education is so highly esteemed that it is almost becoming insatiable. It is quite easy to agree with Coombs in Keegan (1996) that many countries in the world today need educational systems capable of handling very large student populations of 100,000 and more. But government in both developed and developing countries no longer have the money to erect and maintain buildings for such large number of students a year. Or if they did, they would not put the money into educational buildings because of the changing political and developmental priorities.

The answer to this must come from somewhere other than the conventional system! What is needed now is a source of education that is capable of satisfying the educational needs of all sections of the society and handles the educational needs of those who are unable to pursue full time regular courses. With it, in-service personnel, housewives, disabled persons, aged people, people residing in remote areas, school dropouts, etc should be able to avail themselves of the courses offered. This has to be **Distance education** or **Open Learning system**. It is only distance education that can play this complimentary role to schools, colleges, and universities in many national settings.

In Nigeria, National Open University of Nigeria (NOUN) is perhaps the most current and comprehensive of distance learning programme in use today. Through it, universities' programmes have been introduced across the nation and beyond. The Nigeria, National Policy on Education (1972) revised (1987, 1998 and 2004) made provision for a National Open University. A Beman planning committee set up in 1981 worked on the establishment of the university. Through the senate graciously passed the bill establishing the university could not take off until 2002 and ex-President Olusegun Obasanjo administration, presently, the University has opened up branches in several states including Rivers State.

The National Open University of Nigeria (NOUN)
The Open University is perhaps the most comprehensive of existing distance learning programmes in use today. Through it, universities bring their programmes across the country and beyond. Here in Nigeria, the National Policy on Education (1977) revised (1998), 2004 made provision for a National Open University. A three man planning committee was set up in 1981 to start work on the establishment of the university. Bill was passed by the senate. In spite of the tremendous amount of work that had gone on for the establishment of the NOUN, it never really took place until the Olu-Obasanjo administration reactivated it again in the year 2002.

The university has branches in several states of the federation and new branches are being established as the people embrace the usefulness of this form of learning.

With the advent of the internet, the job of distance education and distance educators has become easier. As the world becomes a global village, communication and information can now be both assessed and shared through the information super highway. The contemporary society has come to the point where as sandbank quoted in Nsereka (2003, p. 3) would say, one person by the manipulations of nature could be in touch with millions of people in different places at the same instant.

In the past few years, the experience of schools using **Information and Communication Technology (ICT)** has gradually been disseminated. While one could talk about the use of communication devices such as the telephone, fax, SMs, HyperCard, Hypermedia, video conferencing and teleconferencing , electronic news gathering, electronic publishing one has got to also talk about wireless paging, the computer and of course the internet and information super highway.

Based on the foregoing indicators, the researchers have decided to carry out this study to find out whether information and communication technology has great impact on distance education or open learning or not especially as regards academic performance of the learners.

Purpose of the Study
The purpose of the study has been broken down into the following specific objectives such as to:

1. Find out whether Information and Communication Technology (ICT) has any impact on distance education

2. Identify the types of Information and Communication Technology media used by NOUN.
3. Determine the teaching methods in distance education that support use of Information and Communication Technology media.
4. Determine the relationship between the use of Information and Communication Technology media and the academic performance of the learners.

Research Questions

The following research questions have been made to guide the study;

1. What impact does the use of Information and Communication Technology media have on the practice of distance education?
2. What are the types of Information and Communication Technology media used by the National Open University of Nigeria?
3. What teaching methods in distance education support the use of Information and Communication Technology media?
4. What is the relationship between the use of Information and Communication Technology media and the academic performance of the learners in the distance education programmes

Conceptual Framework

As long as people have been able to write or even d raw pictures, they have tried to use those skills to get messages sent to other people. The invention of printing and in the last century, broadcasting has enabled the development of new methods of communicating with people who are not face to face with us. These techniques have also made it possible to communicate with very large numbers of people through a single act of writing or broadcasting, very many more people than a teacher or lecturer could teach in a lesson.

Writing on open learning in the book Trends and Issues, the institute of education, University of Ife (now Obafemi Awolowo University) stated clearly factors that have brought distance education such profound popularity it has. They include:-

1. The increasing demands by an increasing number of persons for higher education especially those who have missed the opportunity at their youthful ages to gain admission to conventional universities.
2. The need to exploit the vast potential of modern technology for educational purposes of transference of knowledge and experience.

3. The need to update knowledge through lifelong learning because of the exponential developments in information gathering and storage as well as rapidly dynamic analysis and application, which tend to render previously acquired knowledge obsolete in little or no time.
4. The need to relate education to work.

Chandlers (19991, p.16) looking at the objectives of distance education stated that it should aim at computer mediated communication at some or all of the following:-

i. Providing an additional or parallel system to the formal system.
ii. Providing for a more flexible diversified and open system.
iii. Provide for an egalitarian society reaching people of all age, sex, economic classes and remote areas.
iv. Provide for a means of in-service and lifelong education and lastly,
v. To make use of communication technology with a view to achieving a wider reach of education, this is more important.

Use of technology in distance education
The use of effective technology is critical to distance education. Yet an overview of academic activity field suggests many institutions have a long road to travel before they can offer successful Distance programs. Hartley (2004) concluded that "the technology revolution has not reached academic or advising systems" (as he called them). He reached the conclusion by noting that only 2 of 10 technologies used to support the work of Teachers (Advisors) were found on more than 50% of campuses. These were :- online registration(60%) and degree audit system(57%)(p.25) the only synchronous delivery technology found on more than half of the campuses was the old, but reliable telephone (72%) with the next closest being the FAX machine (35%).

Correspondingly, the only asynchronous delivery technology found on over 50% of all campuses was Email (85%). When respondents were asked to evaluate their satisfaction with the effectiveness of advisors a 3.03 rating on a 5 point scale was realized (Hartley, 2004 p.84).

The critical importance of Hartley's analyses is that distance education is defined as the use of asynchronous technologies to assist both the traditional and distant learners, identify and achieve their maximum educational potential which enables them reach their educational goals. Without these technologies and techniques the students will not engage in effective distance

education. Ojo (1981) recognized that distance learning utilizes a wide range of teaching technique. He added that apart from using prints, radio, television, there are other supportive services like posts, telegraph and computer facilities. These all come together to be branded as Information and Communication Technology Media.

Educational media

An educational medium is a channel of communication which is used or can be used in an educational program (Todds, 1983). This definition includes all forms of communication not just the mass media of broadcasting and press. They are itemized and briefly discussed below:-

Print media come in varied forms including correspondence courses, instructional materials; work cards programmed texts, news papers and magazines, flip charts etc. Permanence is an important feature of Print which is limited to use.

Broadcast Media refers to the radio and television. The **radio** has enormous potential and can cover large audiences and reach isolated spots. It is good at creating dialogue either within a listening group or between listeners and the program organizers. Tutorial broadcasts can be made for correspondence students (with students given prior knowledge of the time it is going on air) responding to commonly felt difficulties. The features of the **television** are similar to that of radio, but the visual elements give an additional dimension to it. Hence, given a choice, people often prefer TV to radio. The television makes it possible to use broadcasting for visual presentation (for example in geography or science having a target audience in mind) which would otherwise have to be done in print.

Face to face contact. Some learners actually prefer impersonally presented information while other put off learning altogether if they react adversely to the person concerned. It is believed however that even the smallest face to face contact makes distance education more effective.

Cassette: Cassette players and tapes as well as interactive sessions on a CD of a computer usually need to be provided and distributed. They are very useful.

Slides: - These are simple forms of graphic presentations the main item with high cost is the taking of the photographs but the slides themselves are cheap and easy to produce.

The computer: The computer is one of the finest legacies of these times. The advent computers revolutionalized printing and academic activities. It is a machine that can accept data in raw form, process it and supply the results as output.

The Internet; Much has been written about the internet as the hub of modern Information and Communication Technology and accruing benefits of the on-line activities which it offers on the internet. For example, exchange of electronic mail, downloading of information, news update, on-line registration and e-library among others are both possible and available (Nwajinka 2004).

The success of distance education

The seeming fragility of distance education and its continued lack of status in the eyes of many administrators and educationists in conventional institutions do not make it less successful a form of education (Keegan, 1996:26). An answer to this is provided by Perry the foundation Vice Chancellor of the Open University of the United Kingdom quoted by Keegan (1996) as follows:

> Academics all over Britain accept that Open University has succeeded; that distance learning works, and that the Open University graduates are as good as any others. They (these graduates) have been accepted by every British University in Post Graduate courses without question. The quality of the course seen and is commended by academics in other universities (p. 26).

Giving credence to the above is the fact that university of Port Harcourt and several others in Nigeria accept students from NOUN by offering them admission into the Post Graduate programmes without question.

It has been found that distance education can expand one's opportunities for education. It is also capable of improving the quality of teaching by upgrading the teachers. It overcomes and transcends geographical boundaries of many students making education more relevant to people's lives by way of providing a rich curriculum and a wide range of courses to choose from. Distance education has been found to be comparably cheap due to increase on opportunities for education without cost in proportion.

Looking at the disadvantages, one can say that it could cause isolation of students from the lecturers, fellow students as well as the institution. It could possibly lead to rote learning where deficit organization and administration is employed. There is hesitant approach to learning among potential students, who may have little formal education.

Methodology

The **Research Design** adopted for this study is the survey design. This is because the study involves the use of a representative sample from a population and drawing conclusion based on the analysis of available data. A survey research according to Nworgu (1991, p. 55) is one which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group.

The **Area of study** for this work was the National Open University of Nigeria (NOUN) Port Harcourt, Rivers State Chapter, located at the premises of the Rivers State College   of Education, Saint John's Campus now University of Education. The university has faculties and departments with students and lecturers of diverse disciplines and areas of specification concerned with the routine services of teaching, learning and research. The fact that there are enough students in the university within and outside makes the researchers certain that adequate sample size representative of the entire population of students could be obtained from the university. Also, the researchers are certain that the students could accurately read, understand and fill the copies of the questionnaire

The **Population of the Study** consists of all the 2000 students of the National Open University of Nigeria, Rivers state chapter. Students are chosen for this study among other populations for certain reason(s). It is students that participate in the teaching provided by the school. They are at the receiving end of which every information and communication technology medium the school uses or utilizes should be either in their advantages or disadvantages. Therefore they should be capable to make suggestions to schools on the method of study they prefer to others.

For the Sample and sampling techniques, a sample of 200 students was drawn from the population; this was a fair representation of the current enrolment level at the branch of the university. However, as a general rule, the larger the sample, the more likely it is to fairly represent the population (Ali, 1996). A simple random sampling procedure was used. This was done by determining the population of students in each department. The enrolment

was not so high, the population is not so large compared with conventional universities in the state. Hence a 10% of the general population was drawn out for the study: this gives 200 students accessible population (sample).

The **instrument for data collection** was a structured questionnaire developed by the researcher titled: - Success Enhancement With use of Information and Communication Technology Media in Distance Education (SEITMED) to elicit information from the students. SEITMED was presented in such a way as to make interpretation simple and restrict the respondents from using unacceptable words.

 The establishment of the reliability coefficient of SEITMED was done with test and re-test method. The researchers administered copies of the instrument to 20 students in the school, which were not used in the study. Within a period of two weeks, these students were re-administered with the instrument and the result s were taken and analyzed with the Cronbach **alpha** (**α**) which yielded reliability coefficient of 0.89.

The data collected through SEITMED was analyzed using descriptive statistics. Research questions 1- 4 were answered and analyzed using frequency tables and weighted mean scores.

In analyzing data from the four-point scale Likert-type questions in the instrument, responses to items weighted as shown in the 4 tables addressing the four questions.

The score of 2.50 was used as the criterion mean for decision on responses to each item. Any mean response which is equal to or more than 2.50 is positive (i.e the respondents agree with the item) while any mean response less than 2.50 is negative.

Analysis of data
The research questions were analysed using the four-point Likert scale. Each research question has a table/data analysed by the use of mean score-cluster and criterion mean scores. The criterion mean for a four-point Likert scale is 2.50. It implies that questionnaire items with 2.50 and above mean scores have to be accepted while the mean scores below 2.50 have to be rejected. The data presentation was done according to the research question and analyzed as said earlier to provide answer to the research questions.

This research question was answered with questions 8 – 12 of the questionnaire, the items responded to on a 4 point likert scale quantified as 4,

3, 2 and 1 for strongly agree, agree, disagree, and strongly disagree respectively.

From table 1, items for question 8 to 12 have mean scores above 2.5. This means that almost all the respondents accepted that information and communication technology has great impact on distance education.

From table 2, one can find that not many existing ICT media are utilized currently by the National Open University of Nigeria for lecture delivery. Items a, c, d, f, g, h to I above show that NOUN is yet to introduce the use of teleconferencing, slides, satellites, information sharing, computer assisted instruction, TV, radio broadcast, video conferencing and telephone chatting as a measure for lecture delivery.

However, item 13b and 13e indicate that NOUN has a vibrant digital virtual library also called e-library and as well carry out information sharing using ICT media such as SMS, etc. With the e-library, students get access to books on the net whenever they need them which is a welcome development.

Table 3 reveals from the responses of the respondents that while some teaching methods in distance education support use of ICT media, there are others that do not. Items 14a to 14c indicate from the responses that correspondence method, study centre and independent study are teaching methods in distance education but do not encourage or support use of ICT media. Nevertheless teaching methods such as radio/television broadcast, use of email for assignment collection and submission and the e-library are accepted by the respondents as teaching methods that support use of ICT.

From table 4, items 15a, b, c, and e fall above 2.5 indicating a greater acceptance of the fact that ICT supporting lecture setting will effectively lead to academic success in the programme. Lecture settings like telecast lectures, video and audio cassettes of lectures, sending and receiving assignments through email and a general reduction in the current rate of face-to face contact with active use of different ICT media to deliver lectures will go a long way in enhancing academic success in a distance education programme.

However the respondents seem not to believe in the use of satellite lectures with weighted mean score of 1.75, below 2.5.

Discussion of findings
One of the findings in the present study is the clear identification of the fact that information and communication and technology media have serious

impact on distance education. According to the study, nearly all the factors used as determining criteria for testing the impact of information and communication technology media on distance learning were above the 2.50 level of acceptance. The study accepted the suggested factors that relate success in distance education to use of information and communication technology media as correct. For an example, according to Hulsman (1997) one of the crucial features of distance education is the uses of technical media involving mixed media soft ware such as print, radio and television broadcast video and audio cassettes, computer band learning and telecommunications.

As for the teaching methods in distance education that support use of information and communication technology media, the respondents affirmed that though the use of such teaching methods are yet to be practiced by the National Open University of Nigeria (NOUN), yet they are methods that should enhance academic success in the learners if efficiently harnessed. This affirmation happens to agree with the works of Todds (1983) and Aggarval (2006) that insist on the systematic utilization of education technology to achieve academic success in distance education.

The mass utilization of information and communication technology depended on the availability of materials especially relating to constant power supply and issues like computer literacy. Yet from the attitude of respondents to the use of these items it could be seen that where they are easily accessible that the learners will cultivate a possible attitude towards them.

Discussion with members of the staff of National Open University of University of Nigeria (NOUN), shows that the contention was that whatever ICT media introduced by authorities will be accepted and practiced provided the means of practicing them are available. Therefore the question of under utilization of an available media did not arise.

Furthermore this study suggests that the NOUN as well as such providers of distance learning should pay serious attention to effective utilization of existing information and communication technology media noting that academic success of their learners are seriously associated with this.

Finally, the finding that ICT media that are pertinent to enhancing success in distance education should encourage the NOUN to utilize such media as Television/radio broadcast of lectures, teleconferencing, internet and several other information and communication technology media mentioned in this work which are presently underutilized by them . Hence it is eminent that the

NOUN has got to belt up and go for the best for their learners to realize ease of work. Also the learners themselves should not shy away from requesting and insisting on the best.

Conclusion

From the findings, it can be concluded that one of the major distance education providers of the country, the National Open University of Nigeria (NOUN), is highly esteemed and respected by all and sundry, with a very high enrolment level all over the country. Appreciated is the fact that NOUN textbooks are written with such format that they are a kind of teach-yourself at home books, justifying the weekend meetings of coming together to discuss what one has read, yet there is need for the program to be all encompassing, such that other measures of lecture delivery such as use of teaching methods that support information and communication technology media would be utilized to enhance academic success of learners.

The thrust of this study has been on determining the ways in which effective use of ICT media could enhance academic success of learners and of course lecturers in distance education as handled by National Open University of Nigeria (NOUN). The findings showed that the NOUN has not fully employed the ICT media that are currently made available but still patronizing the use of study centres, and face-to-face weekend/evening conventional methods/classes which were found a bit ineffective especially considering the large students' population involved. However, the little utilization of the available ICT media has proved successful as introduced and applied by NOUN and should be encouraged by students and all distance learning providers.

Recommendations

Based on the findings, discussions and conclusion of this study, the following recommendations are made:

1. That ICT media should be uses in distance education to reach greater population of workers and school dropouts.
2. That distance education providers and students/lecturers should accept the innovation in teaching approaches (methods) through the use of ICT media to enhance academic performance of learners (in-service).
3. That government should equip NOUN and other institutions with ICT media for increase student enrolment, and effective distance learning programme.

4. That NOUN should endeavour to adopt the innovation fully utilize ICT media and new teaching approaches as to gradually phase-out the obsolete weekend/evening face-to-face methods.
5. That government of Nigeria and individuals should support the NOUN and other distant learning programmes provide enabling environment through the provision of power, ICT media and personnel for improve academic performance of students and the general literacy level in Nigeria.

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Table 1: **Mean score of the impact of use of ICT media on the practice of distance education (Cluster A)**

Cluster A	Item no.	SA 4pts	A 3pts	D 2pts	SD 1pt	No. of Respondents	Total	Mean score	Cluster Mean score
Distance education is facilitated by the use of information and communication technology.	8	212	321	24	28	200	585	2.93	3.07
Distance education programmes are geared towards utilizing the most appropriate information and communication technology (ICT) media	9	356	213	52	14	200	635	3.18	
Reasonable resource are devoted by distance educators to make students benefit from existing information and communication technology media.	10	292	342	4	11	200	649	3.25	
Distance education may not be easy for those who chose to remain computer illiterate.	11	554	180	40	64	200	508	2.54	
The era of information and communication technology has boosted the image of distance education.	12	416	246	28	-	200	690	3.45	

Table 2: Types of information and communication technology media used by NOUN with weighted mean scores for cluster B

Cluster B	Item no.	SA 4pts	A 3pts	D 2pts	SD 1pt	No. of Respondents	Total	Mean score	Cluster Mean score
Tele Conferencing	13a	212	60	172	41	200	285	2.43	
Digital/virtual library	13b	488	114	64	8	200	674	3.37	
Slides	13c	128	72	160	64	200	424	2.12	
Satellites	13d	68	27	220	64	200	379	1.90	
Information sharing over the Net	13e	200	129	172	21	200	522	2.61	2.13
computer assisted instruction	13f	40	75	170	85	200	370	1.85	
Delivery of lectures through TV or radio broad casting with prior knowledge of student	13g	32	42	164	96	200	334	1.67	
Video – conferencing	13h	20	36	142	112	200	310	1.55	
Use of telephone chatting for tutorials	13i	-	-	256	72	200	338	1.6 4	

Table 3: Teaching methods in distance education that support use of information and communication technology media and their Weighted Mean scores

Cluster C	Item no.	SA 4pts	A 3pts	D 2pts	SD 1pt	No. of Respondents	Total	Mean score	Cluster Mean score
Correspondence method	14a	32	96	240	40	200	408	2.04	
The study centre approach whereby lectures are delivered on weekends at stipulated venues.	14b	24	54	112	120	200	310	1.55	3.14
The independent study method whereby lecturers hand over the course out-line with prescribed reading materials to students to study on their own.	14c	32	-	224	80	200	336	1.68	
Radio/Television broadcast.	14d	484	165	8	20	200	657	3.29	
Assignments and test are submitted through email.	14e	504	174	32	-	200	710	3.55	
Lecturers sand handouts and textbooks to students through e-library.	14f	512	183	16	3	200	714	3.57	

Table 4: Use of ICT media and success in academic performance of students and their Weighted Mean scores

Cluster D	Item no.	SA 4pts	A 3pts	D 2pts	SD 1pt	No. of Respondents	Total	Mean score	Cluster Mean score
Telecast lectures create excitement about distance education which leads to ease of learning.	15a	320	240	48	16	200	624	3.12	2.90
Getting video cassettes and audio cassettes of recorded lectures enhance academic success in this programme.	15b	354	252	24	8	200	668	3.24	
Having assignments sent through internet or email motivates one to work internet, one to work faster and summit such assignment as against traveling to school just to pick up an on assignment.	15c	260	354	14	8	200	638	3.47	
Receiving lectures through satellite is accepted by me.	15d	48	84	118	101	200	351	1.75	
Receiving lectures with less face-to-face contact yet with full participation through ICT media certainly reduces overall cost.	15e	320	135	70	40	200	565	2.85	