''LEARNERS' PERCEPTION OF INTERACTIVE INSTRUCTIONAL MEDIA IN DISTANCE EDUCATION IN SOUTH-EAST NIGERIA''

A DISSERTATION SUBMITTED

BY

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''Learners' Perception of Interactive Instructional Media in Distance Education in South-East Nigeria''

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I, <u>Omachi Daniel </u>hereby certify that this 'Thesis' is a product of my original Research. All works, papers and books cited and referenced are duly acknowledged and credit and honor given to whom they are due.

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February, 15, 2021.

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ABSTRACT

Learners' Perception of Interactive Instructional Media in Distance Education in
South-East Nigeria''

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The study was carried out to determine the perceptions of learners on the use of interactive instructional media required or used in the implementation of distance education programmes in South-East Nigeria. A survey research design was adopted for the study. Four research questions and eight hypothesis guided the study. The instrument for data collection was a structured questionnaire developed by the researcher. With a stratified random sampling technique, a total of 393 distance learners of NOUN and NTI distance education programmes from Abia and Enugu States were selected out of the total population of 47,084. Only 364 copies of the questionnaire administered were however returned and analyzed. Three experts, two in curriculum and instruction and one in measurement and evaluation carried out a face validation of the questionnaire, while a reliability coefficient of 0.70 was obtained through Cronbach Alpha Method of determining the internal consistency of instrument. The research questions were answered using mean and standard deviation while the hypothesis were tested at 0.05 level of significance using t-test statistics. The results of the data analysis revealed non-availability, non-accessibility and underutilization of most of the studied interactive instructional media. The used media were however found to be effective in the delivery of instructions. There was no significant difference in the mean ratings of Abia and Enugu State learners' perceptions but there was significant difference between the perceptions of NOUN and NTI learners. Designing awareness/knowledge and skill acquisition training programmes on the use of interactive media, provision of enabling access and utilization facilities were some of the recommendations made. Suggestions were equally made for further studies.

DEDICATION

This work is dedicated to my family:

My wife; Princess Grace Omachi Daniel and my children: Elyon Eneojima Daniel and Stainless

Chimamanda Daniel in appreciation of their support and understanding all the time.

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CHAPTER ONE

INTRODUCTION

Background to the Study

Education holds the key to the sustainable development of humanity and every nation. Education makes it possible for man to continuously adapt to the changing circumstances of his culture and environment. It is a process through which individuals are made participating members of the society, the system through which man becomes a moral agent capable of living in a society and contributing towards the growth and development of the society; a process through which the young acquires the ability to be useful to himself and others, and a process through which man realizes his potentialities and uses it for self-fulfillment in the service of himself and others (Ocho, 2005). Education is important for self realization, self actualization and self confidence of individuals. Education implies the development of independent, self reliant, free, responsible, morally upright citizens and effectively contributing members of the society rather than parasites (Ukeje, 1986 in Asogwa 2010).

This essence of education in human development had since been noted. Hence Article 26 of the Universal Declaration of Human rights adopted by the United Nations General Assembly in December, 1948, had made the following provisions:

i. Everyone has the right to education. This shall be free at least in the elementary and primary stages.

ii. Elementary education shall be compulsory while technical and professional education shall be made generally available.

iii. Higher education shall be equally accessible to all on the basis of merit.

iv. Parents have a prior right to choose the kind of education that shall be given to their children (Nwagwu, 1976 in Ocho, 2005:66-69).

Similarly, the 1999 Constitution of the Federal Republic of Nigeria, as amended 2011, under the fundamental objectives and directive principles of state policy, section 18 sub-sections (1 - 3) also provides as follows:

i. Government shall direct its policy towards ensuring that there are equal and adequate educational opportunities at all levels.

ii. Government shall promote science and technology (education)

iii. Government shall strive to eradicate illiteracy, and to this end, government shall as and when practicable provide:

    a. Free compulsory and universal primary education

    b. Free university education; and

    c. Free adult literacy programme.

Thus, members of the society require education not only to be able to fit properly into the society but to be effectively contributing members of the society.

Education fosters the worth and development of the individual, for each individuals sake, and for the general development of the society (FRN, 2004). Where the individual members of a nation are developed, the nation is naturally developed. Hence, Education is considered the greatest instrument for national development. Nigeria in her National Policy on Education (2004:6-7) recognized that:

a) Education is an instrument for national development; to this end, the formulation of ideas, their integration for national development, and the interaction of persons and ideas are all aspects of education;

b) Education fosters the worth and development of the individual, for each individual's sake, and for the general development of the society

c) Every Nigerian child shall have a right to equal educational opportunities irrespective of any real or imagined disabilities, each according to his or her ability.

Accordingly, Nigeria has adopted education as an instrument par excellence in her over-all national development. Education becomes the basic tool with which Nigeria hopes to attain the national objectives.

The Nigeria philosophy of education as contained in the National Policy on Education (FRN, 2004) is, therefore, based on "...(c) the provision of equal access to educational opportunities for all citizens of the country at the primary,

secondary and tertiary levels both inside and outside the formal school system",
(P.7).

In line with the above recognitions, Nigeria had launched and pursued such educational policies and programmes as the Universal Primary Education (UPE), and the Universal Basic Education (UBE).These programmes were executed or and are being executed to certain degrees of success. Such organizations as the United Nations Educational, Scientific and Cultural Organization (UNESCO) had equally planned and executed activities intended to fight illiteracy and to provide educational opportunities in different parts of the world including Nigeria.

All these efforts and programmes underscore the essence and place of education in human and national development as well as the efforts of the Nigerian nation and its agencies towards the provision of educational opportunities to its citizens. However, these efforts are yet to be sufficient. There are a great number of the people yet to be educated; there are a good number who were forced out of the system by circumstances but who would want to get back; and there are others who are not satisfied with what they have and as such desire for some more. Indeed, where there are opportunities, education should be a lifelong project.

Again, the world as a whole and Nigeria in particular is currently experiencing {learners population explosion. The increase in learners' population affects all levels of the educational system. It is however particularly noticeable at the higher

education level. According to Jegede (2001), there is high demand for university education in Nigeria today as a result of the continuous growth in her population. The increase is geometrical such that in spite of the alarming number of public and private higher institutions in Nigeria, the country still cannot provide for up to 50% of its admission applications. There are many private and public universities recognized and approved by the National Universities Commission, and even more number of Polytechnic and mono-technic recognized by the National Board for Technical Education (NBTE) as well as Colleges of Education accredited by the National Commission for Colleges of Education, yet there are still admission problems in Nigeria. This means that desiring learners cannot all be accommodated in the formal education system.

According to the National Open University of Nigeria (NOUN, 2010), every year since independence, the demand for places in the universities had remained unmet. Between 1990 and the year 2000, there was no time the universities were able to admit more than 15% of the total qualified applicants. Hence, in order to catch up with advanced countries like Japan, and to meet existing demand for university education, there is need to expand the capacity of the university system by a factor of ten (10). There are two possible ways of doing this; either by multiplying the current admission by a factor of 10 or by expanding the number of universities by a factor of 10. Unfortunately, the country cannot conveniently do any of the two.

The only solution lies on Open University and distance learning. Thus, if Nigeria must meet the world's educational requirements and its educational needs generally, there is a need for some form of non-formal education system. Distance Education is one of such opportunities.

The term distance education is variedly and interchangeably referred to as correspondence study, home study, off campus study, independent study, distance study (Jegede, 2004); correspondence education, correspondence study, further study, distance teaching, external studies, teaching at a distance, distance learning etc (Ransom-Jores, 1974 in Aggarwa, 2007) or postal tuition, open learning, open school, Open University, on-line learning, virtual classroom or distance learning (Mangal and Mangai 2010). These terms may not be exactly the same but they are obviously similar or synonymous. For one, they all refer to means and methods of providing distance educational opportunities.

According to National Policy on Education (2004), distance education is the mode of teaching in which learners are removed in time and space from the teacher. It uses a variety of media and technologies to provide and/or improve access to good quality education for large number of learners wherever they may be" (P.44). A reference to Hornby (2010) also shows that one of the meanings of the word distance is "being far away in space or in time" while that of education is "a process of teaching, training and learning especially in schools or colleges, to

improve knowledge and develop skills". By these definitions, one may rightly infer that Distance Education is the form of education (teaching, training and learning) given or received from schools and colleges far away in space and or in time.

Keegan (1996) as well as Manga and Mangal (2010) made analysis of definitions of Distance Education and came up with a number of characteristic features of which may be summarized to include;

i. That there is a quasi-permanent separation of the teacher and the learner in space and or time through the length and breadth of the teaching learning process. This feature distinguishes it from the conventional face-to-face education.

ii. That there is the influence of an educational organization or institution both in the planning and preparation of learning materials and in the provision of the students support services. Thus, It is distinguished from private study and teach-yourself programmes.

iii. That there is the use of technological instructional media viz; print, video/television, computer, electronic, audio/radio, and other devices. This feature replaces the interpersonal communication feature of the conventional oral group-based four wall education, and industrializes the educational process.

iv. That currently, there is a maximized use of ICT opportunities and which facilitates instructional communication. It now uses two-way interactive communication systems.

v. That Distance Education allows the learner independence and freedom of choice in terms of time, space, pace, medium, access and curriculum.

As Yusuf (1999) observed, distance education has the potential of accommodating students much more than all the existing universities could accommodate. Through distance education, students who cannot find a place or who do not wish to join a regular college or university department, although they have the necessary qualification to pursue higher education, would be able to do so. Besides, for those who could not get admission into existing universities, the flexible nature of distance education makes it appropriate for them and for some other categories of students. Distance education would provide tertiary education to workers, housewives, the indigent members of the society and students who had to discontinue their education because of lack of aptitude and motivation but who may later on become motivated. It is useful for young students in geographically remote areas and individuals who look upon education as a life-long activity.

Penalver (1990) also noted that distance education originated from the need to extend learning opportunities at various levels to people who did not have access

to traditional modes for various reasons, such as, economic and time restrictions as well as factors related to job and family responsibilities or distance from educational centres. Distance education supports the concept of learning as a continuing or lifelong process that provides ongoing cultural and professional development, thus increasing technical skills, and encouraging the general public to keep abreast of current topics in scientific and technological advancements.

Distance education has been effectively used in many advanced countries of the world. Examples of such countries are Great Britain, Canada and the United States of America. Countries within the African continent have also exploited the potentials of distance education in providing education to several disadvantaged citizens of their countries (Jegede, 2004). Jegede also reasoned that distance education can indeed be used to tackle the priority areas of needs such as training primary school teachers where many are still under-qualified, unqualified or professionally untrained. It can also be used to provide access to equitable distribution of educational opportunities for those who otherwise would have been denied of it.

The National Policy on Education (FR1V2004) acknowledged this essence of distance education. Hence/it "encourages all forms of functional education given to youths and adults outside the formal school system" (P.21). Under its Mass-Literacy, Adult and Non-formal Education Programme, it provides for;

i. Functional literacy and continuing education in the adults and youths who have never had the advantage of formal education or who did not complete their primary education. These include the nomads, migrant families, the disabled and other categories or groups, especially the disadvantaged gender;

ii. Functional and remedial education for those young people who did not complete secondary education;

iii. Education for different categories of completers of the formal education system in order to improve their basic knowledge and skills;

iv. In-service, on-the-job, vocational and .professional training for different categories of workers and professionals in order to improve their skills; and

v. The giving of the adult citizens of the country necessary aesthetic, cultural and civil education for public enlightenment among others (FRN 204:25).

Distance education is a major means of achieving the above provisions of the National Policy on Education.

Like in other parts of the world, distance education is not new in Nigeria. According to Okoye (2010) it began in the 1940s as correspondence studies. Many Nigerians got enrolled in the correspondence colleges in Great Britain and studied for various examinations including the General Certificate Examinations, Ordinary Level and Advanced Levels, (GCE, O level and GCE, A' Level). In

addition, there were those who studied for various technical, commercial and business examinations. Some of the Correspondence Colleges were the Rapid Results College, Exam Success College and Wesley Hall College. The main mode of instructional delivery was the print media. The successive study materials were sent by post and adequately planned to get to the students at a time the student was completing the volumes at hand. This continued for a long time until some Nigerian universities, through their Institutes of Education, started distance learning programmes.

Thus, it is obvious that Distant Education has for long existed in Nigeria, but in various forms. What is of interest however is that the form of education is evolutional, that its structure and *modus operand/*changes along with the developmental stages; and that advancement in communication and information dissemination technologies influence the development, structure and method of operation.

There are quite a number of such programmes. Indeed almost every higher institution in Nigeria currently runs one form of Distance Learning programmes or the other. However, the major Distance Education programmes in Nigeria are currently provided by the National Open University of Nigeria (NOUN) and the National Teachers Institute (NTI).

The National Open University of Nigeria (NOUN) was first established inJuJyJ-983. It was however closed down in 1984 because of various defects and reasons which the Federal Government felt should be corrected. In 2001, the National Open University of Nigeria Act of 1983 suspended in 1984, was reactivated. This paved the way for the resuscitation of the National Open University of Nigeria as it is today.

The National Teachers' Institute (NTI), Kaduna, was established with the assistance of UNESCO in 1976 and with its headquarters in Kaduna as a result of pressing need to train teachers for all levels of education. Acts No.7 of April, 1978 establishing the institute charged it with the responsibility of providing courses of instruction leading to the development, upgrading and certification of teachers as specified in the relevant syllabus using distance learning system (DLS). The NTI was thus mandated by the federal government to develop or design full distance learning programmes (packages) which are to facilitate private study, so that the under qualified teachers would be able to obtain required teaching certificates (Ogunranti, 1988).

In the South East geo-political zone, both the National Open University of Nigeria (NOUN) and the National Teachers Institute (NTI) have study centres where their respective distance education activities are coordinated. The research has 5 study centers: Abia, Anambra, Enugu, Imo States and a special study centre at Nigerian

Prisons, Enugu. A centre was however, recently created in Enugu bringing up the number to 6. There is none in Ebonyi State. The NTI also has a regional headquarter at Enugu and a state coordinating centre and study centres in all the five states of the zone. Such academic activities as student guidance counseling, distribution or provision of accesses to instructional media, and occasional contact meetings for tutorial and socialization purposes are carried out at the study centres of the programmes.

The National Open University of Nigeria (NOUN) as well as the National Teachers I Institute (NTI) takes the distance education mode which predicates on flexibility and use of instructional media for instructional delivery. Instructional materials are normally sent to students in different modes (1) as printed materials, (2) in audio tapes, video tapes, CD ROMs or on the web so that they can use e-learning or e-studying (Jegede, 2003).

Instructional media are all forms of information career that can be employed to record, preserve, store, transmit and retrieve information for the purpose of instruction. Instructional media is used interchangeably with Instructional materials' and 'educational resources' to refer to materials, equipment, facilities and even people used in the instructional process. They are however not synonymous.

Instructional materials' precludes or excludes people, equipment, facilities, natural and cultural phenomenal, simulations and games. 'Educational resources' is equally too broad, it is conceived as constituting the entire facilities or resources of the educational system. Instructional media' is thus considered most appropriate in the contemporary educational literature. It encompasses the diverse means through which content and learning experiences are generated, preserved, transmitted, amplified, replicated and carried between the teacher and the learner. They include a broad range of devices, equipment, materials, people and facilities which can be used to facilitate communication in the teaching/learning process. The media alone can teach when thoughtfully programmed and when prescribed to the learners in an appropriate conducive environment. (Agun 1988, Ike, Chimezie a/id Iwu 2002, Edozie 2003, Falade 2004, and Mangal and Mangal 2010).

Instructions, even in the conventional four wall education, is no longer a matter of 'chalking' and talking'. It is now rather a highly sophisticated, technologically based system. Stakeholders in the instructional business are therefore working hard to bring up instruction in particular and education in general to be in tune with the current information and communication technology age. Thus the relationship between instructional media and distance education can hardly be overemphasized. With particular reference to Distance Education, in the absence

of direct face-to-face interaction between distance institutions and distance learners, the media become the major means of instructional delivery and contact. In other words, the teachers and the learners are linked majorly by the instructional media. Indeed, Distance Education is sustained principally by the instructional media.

According to Garrison and Shale (1987) distance education implies that the majority of educational communication between the teacher and student(s) occur through the f media. The teacher and the students are separated in time and space but must interact for purposes of instruction. Such interaction must therefore involve a two way communication between the teacher and the student(s) for the purpose of facilitating and supporting the education process. It uses technology to facilitate the necessary two-way communication. To Barker, Bruce, Anthony, Fishie and Patrick (1989), Telecommunications-based distance education approaches are an extension beyond the limits of correspondence study. The teaching-learning experiences for both instructor and student(s) occur simultaneously - it is contiguous in time. When an audio and/or video communication link is employed, the opportunity, for live teacher-student exchange in real time is possible thereby permitting immediate response to student enquiries and comments. Much like a traditional classroom setting, students can seek on the spot clarification of issues. Also to Moore and Kearsley (1996),

distance education is a planned learning that normally occur in a different place from teaching and as a result it requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technologies as well as special organizational and administrative arrangements. Galusha (2000) equally noted that the use of multi-media would compensate for direct contact between students and teachers as it would provide avenue for a two-way communication process by ensuring feedback mechanism for learning.

Teaching-learning in its desirable form is always designated as a two-way process needing well-maintained communication link between the source of teaching and the learner, A distance education programme also needs a good and appropriate media or advanced technologies for the desired communication between the source and the distant learners to be ensured. Presently, there is a variety media available for this purpose in the form of print, radio, television/computer, telephone, telex, e-mail, fax, and internet. There are equally unlimited opportunities of interaction and communication provided through the large scale computerization, e-conferencing and satellite-based communications. Thus, the success of a distance education, in this technology age, very much depends upon the availability, accessibility, and utilization of adequate and appropriate

interactive instructional media and technologies for effective instructional delivery.

Interactive instructional media consist of those communication technologies that provide for a two-way interaction between the teacher and the learner and among or between the learners. Such media provide opportunity for interaction between the teacher and the learner, and among or between the learners irrespective of their varied locations. According to Kumar (2008), these technologies are not single technologies, but a combination of hardware and software media and delivery systems. They include various forms of electronic conferencing; teleconferencing, audio-conferencing, video-conferencing, computer conferencing, audio-graphic conferencing, web-conferencing, E-Learning, internet learning, and others.

The interactive instructional media employs the use of multimedia, interactive electronic systems and software tools to provide Teacher-student interaction', 'Student-student interaction/ and student-instructional media interaction to make learning active and participatory. It creates a kind of virtual classroom which bridges the gap in inter-personal relationship caused by the physical separation between the teacher and the learners. It thus brings the distance education at par or close to what is obtainable in the regular four-wall, face-to-face educational system.

The application of these interactive media in the delivery of distance education is however recent. Its availability, accessibility, utilization and effectiveness in the attainment of the Distance Education goals have not been adequately appraised. There is still a dearth of interactive media compared to the print and other non-interactive media (Kumar 2008). The student's access to interactive technology is still limited (Manga and Mangal, 2010:795). The utilization of the interactive media, even where available and accessible is still problematic (Yaya 2006). The extent to which the used media achieve the intended objectives (effectiveness) is indeed a source of worries. Commenting on the usefulness and desirability of the communication media and technology available at present, Ramanujam (2007) noted that;

> *Computer technology and satellite communication have opened up a wide range of interactive media which enables the students to overcome the communication barrier imposed by the physical distance between the learner and the teacher/institution in the context of distance education. However, the questions related to availability, access and use of relevant technology for distance education need to be considered carefully before institutions commit themselves to policies of technology and multimedia.*

Instructional media, particularly the interactive media are not commonly available. According to Alele-Williams (1990), where they are available, they may be inaccessible to learners due to various reasons. For instance, in the case of the institutions serving learners who are well versed in the use of sophisticated technologies e.g. computer, internet and World Wide Web the course material may be placed on the website. This cannot provide the desired results if the learners cannot afford the use of such communication systems. Thus utilization is also an issue of concern.

In sum, the indispensable position of instructional media in educational instruction generally and with particular reference to distance education has been severally underscored. Indeed, distance education is presently sustained by the use of available sophisticated two-way interactive information communication technologies. The extent of availability, accessibility and "utilization of the instructional media is however subject to variation in relation to place, time and circumstances. In other words, the availability, and usability of the media, at different locations, times and prevailing circumstances are not universally the same. Even of a particular concern is the extent to which teachers and learners, appreciate and use the available media effectively. Accordingly, reason demands that occasional, if not regular appraisal of the availability, accessibility, utilization and the efficacy or effectiveness of these instructional media should be made. The

interactive media in particular are recent communication systems. Their respective applications in instructions and with particular reference to ensuring quality distance education are yet to be adequately evaluated. This study thus intends to ascertain learners' perceptions of the availability, accessibility, utilization and effectiveness of the interactive instructional media used for effective distance education.

Statement of the Problem

Education remains an essential tool for socializing, modernizing, transforming, developing and uplifting both ah individual and his society or nation. Unfortunately, myriad problems faced by nations of the world, especially the developing ones, make it difficult to provide education for all citizens through the traditional classroom based, face-to-face instruction. There is therefore a need to exploit the benefits or opportunities offered by the informal and non-formal sector specifically in the nature of Open and Distance Education.

In Distance Education, the teacher and the learners are separated in time and place. The interpersonal relationship and interaction necessary for effective instruction are provided mainly by the instructional media. Thus the indispensable position of instructional media needs no more emphasis. Indeed, Distance Education is currently sustained by the use of sophisticated two-way interactive technologies. The application of interactive communication systems; e-conferencing, web-

conferencing, multimedia, internet chat and other instructional media are recent. The extent of availability, accessibility, utilization and effectiveness of these media in the delivery of instructions are subject to variation and changes in relation to time, place, forms and circumstances. Therefore, they need 'to be evaluated in relative circumstances. Unfortunately, in spite of the long history of distance education in the Nigerian educational system, few empirical studies have been conducted on the utilization and not even on the effectiveness of the media used in distance education.

In fact, the researcher could not find any study that appraised the media used in the delivery of distance education and with particular reference to the interactive media in the South-East Nigeria. Again, since the establishment of the NTI in 1976, and the National Open University of Nigeria in 2001, not much of empirical studies have been carried out on the effectiveness of the media used in the programmes let alone the interactive media.

In other words, it needs no more emphasis to state that the distance educational system of necessity needs to co-exist in complementary disposition with the formal four-wall education system in the provision of the much needed education for the Nigerian citizens. What should be of primary concern is quality assurance of the distance system compared to the regular system. The quality of the education provided by both systems should, by all standards fall 'on all fours'.

Technological two-way instructional media not only provide the link in the distance education system where the teacher and the learner are separated in time and space, but also serve to provide the necessary environment, the learning experiences and interactions required for quality distance learning to take place. Instructional media particularly the interactive form is a basic consideration in ensuring quality in the current form of the distance education. The effectiveness of the interactive media in the delivery of distance learning instruction is still doubtful and any doubt in relation the effectiveness of the media is therefore a source of worry. Thus, whether the interactive instructional media, required for attaining quality distance education are available, accessible, utilized and effective' for distance education instructional delivery or not is the problem of this study.

Purpose of the Study

Generally, the purpose of this work was to determine the learners perceptions of the interactive instructional media used for the implementation of distance education programmes in Nigeria with particular reference to NOUN and NTI; programmes in the South East Zone of Nigeria. Specifically, the study was designed to determine:

i. The learners' perceptions on the availability of interactive instructional media for distance education in the South-East Nigeria.

ii. The learners' perceptions on the accessibility of interactive instructional media for distance education in the South-East Nigeria.

iii. The learners' perceptions on the utilization of interactive instructional media for distance education in the South-East Nigeria.

iv. The learners' perceptions on the effectiveness of the interactive instructional media used in distance education in the South-East Nigeria.

Significance of the Study

The quality of distance education instruction and standard, generally, depends on the media. The findings on the effectiveness of the media used in the implementation of distance education programmes should therefore, naturally be of immense benefits to the learners, the teachers and the managers of Distance Education programmes, NTI, NOUN, Curriculum Developers, researchers, supervisory agencies, National Universities Commission (NUC), National Commission for Colleges of Education (NCCE) and National Board for Technical Education (NBTE), Educational development sponsors as well as the government/policy makers, and indeed all other stakeholders in the education industry.

First, the findings of the study, would enable the learners determine those media that are suitable for their respective studies and interests. There are different kinds of learners, and what appeals to a learner's interest, aptitude or circumstance might not appeal to the other. An analysis of the learners' perceptions i.e. the results or findings of the study would enhance the learners' awareness on the availability, suitability, accessibility, usability and the effectiveness of the instructional delivery system of distance education. Since, learners in distance education are allowed freedom of choice with regards to instructional media; the findings would guide them in making appropriate choice of instructional media to be used for their respective studies. It may also enable them to study with ease and understanding, and thus making their studies more effective.

The identification of those interactive instructional media that are available, accessible, and effective in the delivery of distance education would enhance the awareness of the teachers and in effect adequately equip, and guide them in their choice of appropriate instructional media to be used. The findings of the study would help the teachers to become more effective in discharging their professional roles and in attaining the instructional objectives by using the right media for instruction. Instructional activities equally become more interesting.

The distant learning programme managers should naturally be concerned, about the success of the programme. One way of attaining the goal and sustaining the

programmes is by ensuring effective instruction. The knowledge of the availability, accessibility, usability and the overall effectiveness of the instructional media would influence and enhance the managers' decisions and interests. This is with particular reference to the selection and provision of interactive instructional media. The findings would equally guide the managers on the provision of the logistics and facilities necessary for effective use of the media. The findings may equally help them in designing appropriate and affordable course content, programmes and activities.

Currently, open and distance education is being embraced in Nigeria as in other countries of the world. It is hoped that the findings of this study will enable the government and policy makers determine appropriate media for effective distance learning programmes based on learners' types, interests and needs. The government may be able to initiate effective instructional delivery policies towards the realization of the distance education goals and objectives.

Instructional media is a basic element in the instructional delivery system of distance education. Currently, interactivity is a "major concern in- designing the distance learning system. This study may identify those interactive instructional media that are suitable, accessible, usable and effective in distance learning. Thus, the findings of the study may be of immense guide to curriculum planners and developers with particular reference to the selection of instructional media in the

course of instructional design. Instructional media for distance education should differ significantly from those of the regular system. The study may create this awareness to the benefit of curriculum developers.

The recent impetus given to distance education through the establishment of the National Open University, has further underscored the need for studies on the state of availability, utilization and effectiveness of the media for distance education in Nigeria. The application of ICT based interactive media as instructional medium is relatively recent. The findings of this study may naturally identify some gaps which will be of interest and benefits to researchers in the field of education and with particular reference to educational technology, methodology and-distance education.

Education supervisory and accrediting agencies such as the NUC, NCCE and NBTE would equally benefit from the findings of the study. They may note those instructional media and facilities required for effective, functional and quality distance education and insist on their provisions, before approvals and accreditations. Education promotion and donor agencies as the Petroleum Trust Fund and others who are interested in providing educational facilities may from the findings of this study identify areas of need and assist in the provision of interactive instructional media and facilities generally and particularly for distance education.

Other stake holders, including media workers, technicians and others may find the work useful depending on their various respective interests. Technicians and media

workers may discover areas where their services are required and get set to render such. Electronic and electrical experts, information and communication technologists may discover areas of modifications and needs. Indeed the general public may find the findings of this study quite significant.

Scope of the Study

The work was delimited to the learners' perceptions of the interactive instructional media used in distance education in South East Nigeria. The students of the National Open University of Nigeria (NOUN) and the National Teachers Institute (NTI) in the study centres of the South-East Geo-political zone of Nigeria were studied. The study specifically determined the availability, accessibility, utilization, and other factors as indices of the effectiveness of-the interactive instructional media use for distance education in the area.

Research Questions

The following research questions guided the study:

i. What are the learners' perceptions on the availability of interactive instructional media for distance education in the South East Nigeria?

ii.   What are the learners' perceptions on the accessibility of interactive instructional media for distance education in the South East Nigeria?

iii.   What are the learners' perceptions on the utilization of interactive instructional media for distance education in the South East Nigeria?

iv.   What are the learners' perceptions on the effectiveness of the interactive instructional media used in distance education in the South East Nigeria?

Hypotheses

The following null hypotheses tested at 0.05 level of significance also guided the study:

HO_1:   There is no significant difference between the mean responses of NOUN and NTI learners on the availability of interactive instructional media for distance education in the South-East Nigeria.

$H0_2$:   There is no significant difference between the mean responses of NOUN and NTI learners on the accessibility of interactive instructional media for distance education in the East Nigeria.

$H0_3$.   There is no significant difference between the mean responses of NOUN and NTI learners on the utilization of interactive instructional media for distance education in the South-East Nigeria.

Ho$_4$: There is no significant difference between the mean responses of NOUN and NTI learners on the effectiveness of interactive instructional media used in distance education in the South-East Nigeria.

Ho$_5$: There is no significant difference between the mean responses of Abia State and Enugu State learners on the availability of interactive instructional media for distance education in the South-East Nigeria.

Ho$_6$: There is no significant difference between the mean responses of Abia State and Enugu State learners on the accessibility of interactive instructional media for distance education in the South-East Nigeria.

Ho$_7$: There is no significant difference between the mean responses of Abia State and Enugu State learners on the utilization of interactive instructional media for distance education in the South-East Nigeria.

Ho$_8$: There is no significant difference between the mean responses of Abia State and Enugu State learners on the effectiveness of interactive instructional media for distance education in the South-East Nigeria.

CHAPTER TWO

LITERATURE REVIEW

In this chapter, literature-related to the topic of the study were reviewed and presented under the following sub-headings:

Conceptual Frame-Work

The Concept of Distance Education

- Features of Distance Education

- Historical Development and functions of Distance Education

- Distance Education in Nigeria

- Distance Education in the South-Eastern Nigeria

The Concept of Instructional Media

- Instructional Communication

- Instructional Media

- Classification of Instructional Media

- Interactive Instructional Media

- The Roles of Instructional Media in Instruction

- Interactive Instructional, Media and Distance Education

- Availability of Interactive Instructional Media

- Accessibility of Interactive Instructional Media

- Utilization of Interactive Instructional Media

Effectiveness of Interactive Instructional Media

- Effectiveness of Instructional Media

- Effectiveness, Instructional Media and Distance Education

The Concept of Perception

Theoretical Framework

- Schramm's Communication Theory

- Theory of Constructivism

- Transactional Distance Theory

- Interaction Theory

- Social Context Theory

Empirical Studies

Summary of Literature Review

Conceptual Frame-Work

The Concept of Distance Education

Different nomenclatures have been-used from time to time to refer to the concept of distance education. Correspondence Education, Independent Study, Postal tuition, Open School, Open Learning, Open University, On-line Learning, Distance learning, E-Learning, Virtual Classroom, and others had been variously used. According to Hanson, Maushak, Schlosser, Anderson and Simon (1997:1), "the term distance; education has been applied to a tremendous variety of programmes serving numerous audiences via a wide variety of media." The term distance education at times is used synonymously with such terms like correspondence study, home study; off campus study, independent study and distance study (Jegede, 2001). Correspondence Education (CE), Continuing Education System Organization (CESO), Distance Education (DE), Distance. Learning System (DLS), Mature Age Programme (MAP), University of the Air Programme (UNIAIR) and Sandwich Education Programme (SEP) have all been interchangeably used as if they are all conterminous with distance education.

Indeed, the term can be used to describe a number of instructional situations...,
(Obi-Okoye 2005).

This however does not deny the little shades of difference in meaning and form of
these terms (Obi-Okoye, 2005). For instance, Falade (2004) attempted a
distinction between Open Education and Distance Education. According to him,
although both seem related and people erroneously or interchangeably use open
education to mean distance education, they are not exactly synonymous to each
other. Open Education is just an integral part of distance education. Open
Education is an innovative approach where students have control over their
learning... It is a flexible learning system that affords learners with choices of
control over their learning. It is open in terms of entry requirements, time
constraints, financial demands, geographical distance, as well as social and
cultural barriers.

Kumar (2008) also distinguished Correspondence Education from Distance
Education. For him, correspondence education is operated predominantly by
"mailing printed lessons, tutorial sheets etc and asking the students to submit their
responses" (p.304) by mailing as well. These may be supplemented by occasional
short-term contact programme, otherwise, they are limited to- print matters; but
distance education is an updated version and perhaps, a new generation of the
correspondence education" (p. 304). It is a comprehensive method of non-formal

education where teaching and learning at a distance are supported by a number of alternatives from educational technology; (a) Well-designed self-instructional materials, (b) A set of books, references and journals, (c) Charts, posters and other visual materials, (d) Video and audio programmes with texts, and (e) Television and radio broadcasts and podcasting, where possible.

Perraton, Robinson and Creed (2001), equally distinguished between Distance Education and Open Learning. To them,, Distance Education is "an educational process in which a significant proportion of the teaching is conducted by someone far removed in space and or in time from the learner" while "Open learning in turn is an organized educational activity based on the use of teaching materials in which the constraints on study are minimized in terms of access, entry, or time and place, pace, method of study, or any combination of these" (p.231). They prefer the use of open and distance learning jointly and see it as an educational approach designed to reach learners in their respective homes/offices/shops etc; provide learning resources for them to qualify without attending formal classes in person, or create opportunities for life-long learning, no matter where or when they want to study.

Of course, in language, no two words or terms are exactly the same. Often, there are but near synonyms. Actually, there may be reasons for the choice of anyone of the terminologies in preference to the others, but that can hardly be of a major

concern and of this study. Besides, these nomenclatures seem to have emerged flowing from the evolutional development of distance education with particular reference to the predominant instructional media used at each period. It started from the period of correspondence courses or study when the print media was the predominant instructional media to the period of instructional radio and television, and to the current periods of sophisticated interactive instructional media and now referred to as E-Learning and Virtual Classroom. Different terminologies were used at each of the respective developmental periods,

Thus, distance education has been used to refer to a wide range of systems for teaching and learning and this makes a comprehensive definition of the term not exactly an easy task. However, this has not deterred scholars and practitioners from putting forward a multiplicity of definitions projecting their various view points (Onuebunwa, 1995). "No definition has been found to be exhaustive in attempting to define open and distance learning; rather there are several approaches to defining the term" (Olugbenga, 2008). There are quite an innumerable number of definitions from various authorities. Attempts have been made towards a classification of these definitions into earlier or traditional definitions and recent or new media and other approaches to the conceptual definitions.

The traditional definitions laid emphasis on the idea of geographic separation of students and teachers. They include the definitions of Dohmen (1967), Peters (1973), Homberg (1995), Keegan (1996), Moore and Kearsley (1996).

According to Dohmen (1967) distance education is a systematically organized form of self-study in which student counseling, the presentation of learning material and the securing and supervising of students' success are carried out by a team of teachers, each of whom has responsibilities. It is made possible at a distance by means of media which can cover long distances. The opposite of distance education is 'direct." education' or "face-to-face education', a type of education that takes place on the direct contact between lecturers and students.

This early conception highlighted;

 i.   The organization of the programme by an institution

 ii. Self-study by the learners, and

 iii. The use of media as contact point

 iv. Distinction between Distance Education and Direct or face-to-face' education.

According to Holmberg (1995); "The term distance education covers the various forms of study at all levels which are not under continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises but

' which, nevertheless, benefit from the planning guidance and tuition of a tutorial organization" (P.59),

Holmberg's definition gives room for the following essential deductions:

i. That there is a separation between the teacher and the learner as a fundamental feature of all forms of distance education whether prints, audio/radio, video/television, or computer based.

ii. That this separation differentiates distance education from all forms of conventional, face-to-face or direct teaching and learning.

iii. That distance education is planned and organized by an educational institution, which structures or designs the instructional media and materials as effective links for effective learning,

iv. That the institutional based nature differentiates distance education from private study, and incidental learning from interesting books or cultural television.

To Moore and Kearsley (1996), "Distance Education is planned learning that normally occur in a different place from teaching and as a result it requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organization and administrative arrangements" (P. 2).

This definition like in Holmberg's, lays emphasis on the planning, organization and administration of learning activities by institutional/educational agencies as a point of distinction between distance education and casual learning. But more importantly and for this study, it identifies with the need for "special techniques of course design, special instructional techniques and special methods of communication by electronic and other technology.

'Peters (1973) believes that Distance teaching/education is:

> *"a method of imparting knowledge, skills and attitudes which is rationalized by the application of division of labour and organizational principles as well as by the extensive use of technological media, especially for the purpose of reproducing high quality teaching materials which makes it possible to instruct great number of students at the same time wherever they live. It is an industrialized form of teaching and learning" (P.206).*

Thus, Otto Peters, another pioneer in the field, took the concept of planning and organization to a higher level of importance in distance education and attributed an "industrial" characteristic to the field. The characteristics of Peter's position are:

- The use of technical media;

- The mass education of students at a distance; and

- The industrialization of the teaching process.

- Division of labour where several kinds of expertise are called for,

- Mass production and distribution of educational materials and information, and;

- Sensitivity of the distance education enterprise to economies of scale

Gough (1984), sees Distance education as "means of providing learning experiences for students through the use of self-instructional materials and access to educational resources, the use of which is largely determined by the students and which allows the student, for the most part, to choose the time, place and circumstances of learning" (P.10).

Gough, thus prefers privatization and freedom of distance learners to earlier positions of authorities. Tutor marked assignments, or computer marked assignments, rigidity of content of learning materials and flexibility learning structures, are common features of distance education. Hence independence is not a proper element. The term privatization is closer to the reality. A distance system takes the student from the learning group and places him/her in a more private situation. Learning is often private when it is not institutionalized. Distance education is characterized by the privatization of institutional learning (Smith 1990:30). What is of particular interest to us here is that the privatization which allows the individual learners to study on their own respectively even when the

learning activities are planned and organized by educational institutions should have implications on the structure or design of effective instructional media-and materials in order to enhance learning.

Keegan (1996) made an analysis and synthesis of varied definitions of distance education and came up with the following characteristics, or defining elements of Distance Education:

- The quasi-permanent separation of teacher and learner throughout the length of the learning process (this distinguishes it from conventional face-to-face education);

- The influence of an educational organization both in the planning and preparation of learning materials and in the provision of student support services (this distinguishes it from private study and teach-yourself programmes);

- The use of technical media - print, audio, video or computer-to unite teacher and learner and carry the content of the course.

- The provision of two-way communication that the student may benefit from or even initiate dialogue (this distinguishes it from other uses of technology in education); and

- The quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and

norm groups, with the possibility of occasional meeting; for both didactic and socialization purposes.

In his definition, the teacher and the learner are separated in time and space, but must communicate with each other via a two-way medium, such as telephone. In addition, the practice of distance education according to Keegan must involve an educational institution. In other words, watching educational television, or using the web does not constitute distance education, unless such an educational institution would prescribe these activities in fulfillment of learning requirements. Furthermore, Keegan asserted that distance education is complex enough to have an industrial base and division of labour but with the teacher standing at the center of practice. In distance education, although the teacher is still central to the practice, there are others involved as well. Depending on the complexity of the practice, a course team could consist of a faculty, as well as, instructional designers, subject matter specialists, writers, videographers,, graphic artists, computer programmers, animators, musicians, song writers, actors and a host of others including media technicians.

The recent or new media concepts of Distance Education were informed by the development of highly sophisticated, computer based multimedia and internet communication technologies. The introduction of these media led to an incredible growth and lofty conceptualization of distance education. The emphasis was on

two-way interactive communication between the teacher and the learner and among the learners and the teacher. Some of the proponents include; Barker et al (1989), Moore (1990), Harasim (1990), Garrison and Shale (1987) Portway and Lane (1994).

According to Garrison and Shale (1987:11): Distance education implies that the majority of educational communication between teacher and student(s) occur non-contiguously. It must involve a-two-way communication between teacher and student(s) for the purpose of facilitating and supporting the education process. It uses technology to mediate the necessary two-way communication.

Barker, Bruce, Anthony, Fishie and Patrick (1989) are positive that Telecommunications-based distance education approaches are an extension beyond the limits of correspondence study. The teaching-learning experiences for both instructor and student(s) occur simultaneously - it is contiguous in time. When an audio and/or video communication link is employed, the opportunity for live teacher-student exchange in real time is possible, thereby permitting immediate response to student enquiries and comments. Much like a traditional classroom setting, students can seek on the spot clarification from the teacher. To Portway and Lane (1994) the term distance education refers to teaching and learning situations in which the instructor and the learners are geographically

separated and therefore, rely on electronic devices and print materials for instructional delivery. Distance education: includes distance teaching - the instructor's role in the process - and distant learning -the student's role in the process. Moore (1990) also sees distance education as all arrangements for providing instruction through print or electronic communication media to persons engaged in planned learning in a place or time different from that of the instructor or instructors.

Thus, the 'new media' concept of distance education places emphasis on interactivity among parties in the teaching-learning process, close to what is obtainable in the traditional face-to-face education, irrespective of the physical separation in place and or in time. The two-way interactive concept is empowered and made affordable by the availability of sophisticated telecommunication computer nexus; internet, satellite and other electronic communication technologies and facilities. The new conception is concerned with "the social nature of the learning environment." It holds on to the opinion that distance education should be a group activity, and should involve the process of social interaction just as in the 'face-to-face' education. This is contrary to the belief of the earlier or traditional distance education concepts which emphasized independence of learner (Moore 1996) and privatization of learning (Keegan 1986); According to Harasin (1990). "Historically, the social, affective, and

cognitive benefits of peer interaction and collaboration have been available only in face-to-face learning. The introduction of online education opens unprecedented opportunities for educational interactivity" (P.42). The Harasin further identified five characteristic features of online (distance) education as:

i. Many-to-many communication,

ii. Place independence,

iii. Time independence,

iv. Text based communication, and

v. Computer mediated interaction.

This implies the inclusion of active participatory learning, sharing of knowledge and ideas through peer communication, and social process of knowledge building into the overall concept and definition of Distance Education. Thus, knowledge is socially constructed by the participants in a shared virtual environment provided by networked computers.

Salomon (1993), while comparing personal and social learning, said, "once human behaviour is examined in real-life problem solving situations and in other encounters with the social and technological surrounds, a different phenomenon emerges people appear to think in conjunction or partnership with others and with the help of culturally provided tool and implement. (P.64)"

Kirshner and Whitson (1997) used the term "situated cognition" to demonstrate the social and cultural construction of learning. "What situated cognition theory promises as a next step is a model for dealing with knowledge and learning as fundamentally social and -cultural, rather than as artifacts of an individual's journey through an impersonal and objective world." For example, collaborative learning in classrooms, or online is a new learning model based on the theory of distributed and situated cognition.

The new media concept, prefers the use of such terms as 'On-line Education', 'E-learning, 'Virtual Classroom' and others, and imported the idea of "Distributed teaming", "Distributed expertise" and Distributed or Situated Cognition" to describe the instructional system available through the internet technologies - private computer networks, and worldwide web.

Note that:

1. **On-Line Learning:** In other words referred to as on-line education is a form of learning carried out through the internet or web-enabied technology. It is a process of learning electronically through the internet; closely related but narrower than E-Learning.

2. **E-Learning:** Primarily used in business, is the newest term entering the vocabulary of distance education. It denotes learning by electronic means, including the computer and telecommunications. The concept and

mechanism of e-learning is associated with the use of the internet and web technology delivered to the end users - students, via computers or lap-tops. "It is a learning carried out, supported and facilitated by the advanced multimedia facilities as well as internet and web-technology delivered to the end users via computers and mobile ICT appliances" (Mangal and Mangal 2010:767). E-Learning is learning devoid of time and space, carried out through advanced technologies involving multimedia, internet, e-mail, website, mobile phone, ipod etc. It has developed to the level of "m-learning" (mobile-learning).

3. **'Virtual Classroom'** is an improvement on E-learning. It creates a true reflection of the lively environment of the real activities of the classroom in the form of interaction among students as well as between the students and the teacher; and reflects the true depth that can be provided by an instant face-to-face dialogue. According to Turaft (2007), Virtual Classroom is a web-based environment that allows you to participate in live training events without the need to travel. You listen to lectures, participate in lab exercises, ask questions, and receive feedback just as you would do in a conventional classroom - except you do it from the convenience of your desktop, or anywhere you have an internet and phone connection. It saves the hassle, expense, and travel time to a training site.

4. **Distributed Learning:** Distributed learning is a term coined to describe the use of internet capabilities by educational institutions. It stems from the idea that internets are private computer networks, set up to take advantage of interne technologies such as World Wide Web (www) but which keeps the use of the information stored on the computers connected via such networks to a limited group of people who may be in different, locations. Thus, 'Distributed Education (Learning)' refers to the application of this process for educational purpose or the use of internets for proprietary teaching, learning and training.

5. **Distributed Expertise:** Distributed Expertise, based on similar idea as in the distributed learning refers to the use of the internet or mediated communication for education and training by experts within an organization"; and who may be at different locations from their students or trainees, in a multi-campus university system for instance.

6. **Distributed Cognition:** This describes the learning that occurs as a result of the social interaction facilitated by the internet networked communications.

Thus, it is a fact that Distance Education is evolutional. It has developed from the use of visual, audio-visual, electronic, computer and internet to what is referred to as virtual classroom or virtual learning system. Virtual system is based on

electronic face-to-face teaching at a distance. Unlike the earlier form of distance education in which interpersonal communication and face-to-face interaction in a group learning, a cultural imperative for education, were eliminated. In virtual or electronic classroom, it is now possible to teach face-to-face at a distance. This is possible with linkage to satellite or by compressed video code technology. In the virtual system, the lecturer can see and hear the students present in the class and also the other students at the other sites hundreds or thousands of kilometers away. The interaction of face-to-face education has been repeated electronically (Peters 1991),

It is yet another fact that research, knowledge discoveries and inventions generally, and with particular reference to the communication technologies and their application in the field, of education or instructional delivery system, greatly influence the conceptions and definitions of Distance Education. Its definition therefore, has to be approached functionally.

Thus, for the purposes of this study, Distance Education is a form of education offered to a specified target audience by an organized educational institution but in which the learners and the teachers are fully or partially physically separated in place and or in time such that the instructional contents are delivered through technological communication media, This is distinguished from the incidental learning that may occur through listening to the radio, television or other mass

communication media that are not planned, not sequentially delivered, and not directed to a specific and recognized learners. It is also distinguished from the traditional four-wall based, face-to-face education. It is an institution based formal education, where the teachers and the learners are separated and where interactive technological communication media are used to organize instructional resources and to deliver instructions to the learners. According to the National Policy on Education (2004), it is the mode of teaching in which learners are removed in time and space from the teacher. It If includes, contact, non-contact and part time education. It is often taken for lifelong learning by those who:

a. Graduated from school and desire to update their knowledge and skills in discipline or courses of their choice (as "first chance" opportunity) for their continuing professional entrepreneurial development.

b. Left school for one reason or the other, but who having matured would want to make a re-entry into the knowledge arena.

c. Did not avail themselves the opportunity to go to school but who are still interested in acquiring basic education in view of the goal of 'Education For All'.

d. Were not successful when they finished school but now wish to remedy their deficiencies and proceed further studies".

According to Ukeje (1994) in Okoye (2006), it is a kind of education where the teaching and learning process take place in different settings but connected by the use of a multimedia approach. It differs from the traditional face to face teaching method in that:

1. There is a separation between the teacher and the learner - a fundamental characteristic of all distance education.

2. There is influence of Educational Organization which distinguishes it from private study.

3. The use of educational media - print, audio, video, computer etc. to'unite the teacher and the learner and to carry the educational content.

4. The provision of two-way communication so that the student may benefit from or even initiate dialogue.

5. The possibility of occasional meeting for both didactic and socialization purposes and;

6. The provision of industrial form of education which makes mass education of students at a distance and which commends it in a state of supply and demand. The Ukeje, thus identifies with (Keegan, 1990).

According to Manga and Mangal (2010), "a system of education runs along a two-way interaction and communication between the source of teaching and the learner maintained through the conventional as well as advanced information and

communication technologies with an eye on providing opportunities to the learner to engage in his self-study with a freedom of choice related to time, space, pace, medium, access and curriculum" (P.209). Specifically;

1. Distance education provides a systematic means and platform for the self-study carried on by the willing learners separated by the factors of time and space from the source of teaching.

2. It is an industrialized form of teaching and learning with an emphasis on division of labour and cost-effectiveness.

3. It makes use of the conventional and non-conventional media and technologies for the desired two-way interaction and communication between the source of teaching and the learner.

4. It includes distance teaching and the distance learning.

5. It provides independence and freedom to the learner in so many aspects like freedom of choice related to time, space, pace, medium, access and curriculum.

6. It utilizes the concept of system approach for its planning and organization with a reasonable control on the input and process components with an eye on the realization of the desired outcomes in the form of the output of the system.

Features of Distance Education

Flowing from the analysis of definitions and conceptions of authorities, Keegan (1996) identified the following features of distance education:

- The quasi-permanent separation of teacher and learner throughout the length of the [earning process (this distinguishes it from conventional face-to-face education);

- The influence of an educational organization both in the planning and preparation of learning materials and in the provision of student support services (this distinguishes it from private study and teach-yourself programmes);

- The use of technical media-print, audio, video or computer-to unite teacher and learner and carry the content of the course;

- The provision of two-way communication that the student may benefit from or even initiate dialogue (this distinguishes it from other uses of technology in education;

- The quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and norm groups, with the possibility of occasional meeting; for both didactic and socialization purposes; and

- The participation in an individualized form of education which, if accepted, contains the genus of radical separation of distance education from other forms within the education spectrum.

Like Keegan (1996), Hulsmann (1997) approached the definition-and concept of 'Open and Distance Learning' from the characteristic point of view; and identified four crucial features of distance education as follows;

- The separation of the teacher and the learner in time or place, or in both time and place.

- Influence of an educational institution: necessity for institutional accreditation of programmes and courses.

- The use of technical media: involving mixed media courseware such as print, radio and television broadcasts, video and audiocassettes, computer based learning and telecommunications.

- The provision of two-way communication: allowing for interaction between learners and tutors either synchronously or asynchronously, as opposed to the passive receipt of broadcast signals.

The ODL trainers' toolkit published jointly by the Commonwealth of Learning and the Asian development Bank (2000) identified two additional features of distance education as:

- Possibility of face-to-face meetings for tutorials, learner-learner interaction (self-help study groups), library study, laboratory and practice sessions.

- Use of industrialized processes; that is, in large scale open and distance learning operations, labour is divided and tasks are assigned to various staff working together in course deveiopment teams. (Olugbenga, 2008)

Mangal and Mangal (2010) identified flexibility and freedom as basic features of distance education. According to them, distance education offers the learners;

- Freedom of time: A high level of freedom allows students to communicate whenever it is convenient for them.

- Freedom of space: The students can choose where they want to study (in a classroom, at home, at work, or wherever a busy life situates them).

- Freedom of pace: Pacing implies meeting deadlines for starting a course, for examinations, and for assignments. Deadlines, however, can be flexible or rigid. They are flexible when the students can set the deadlines, or select one of several deadlines. A high level of freedom allows the students to choose the pacing they prefer.

- Freedom of medium: Programmes with a high level of freedom provide students access to several media or sources of information: print, video, face-to-face meetings, computer conferencing, etc.

- Freedom of access: Programmes that aspire to a high level of freedom must eliminate discrimination on the basis of social class, entry qualifications, gender, age, ethnicity, or occupation.

- Freedom of curriculum: A high level of freedom allows students to choose among a range of courses and to transfer credits between programmes and universities.

Other authorities; Ezema (2010) for instance, identifies "independence/ 'autonomy", 'teaching" 'environment/ 'interaction/ and 'communication process' as features of distance education. By independence, distance education places emphasis on independent learning to the extent that it becomes individualized learning (Barrows and Tommlyn 1980). It promotes learning activities in an environment where the teacher and learner as well as the learners are separated from each other. This requires an individual's own learning space and at the learners own convenience irrespective of the extent of distance. It also requires the provision of materials containing fairly private or self-learning activities often linked with the use of a highly structured plan of the learning content.

By autonomy, the learner, unlike in the traditional education system, is not dependent on the teacher, for guidance, instruction, timing and others. The learner is expected to enjoy substantial degree of freedom, autonomy and responsibility in the selection of objectives of learning, resources for the promotion of learning

and evaluation of the success of learning (Hiltz .1994). Hence, autonomy implies that the teacher concentrates on the preparation of materials and making same available for a large number of learners and, by interaction, modern distance education insists on the provision of a-two way communication system which allows interaction between learners and teachers either synchronously or asynchronously as opposed to the passive receipt of broadcast signals and print media. This is made possible by electronic or computer devices which facilitate e-learning and virtual classrooms.

Ezema's ideas resulted from his analysis of Distance Education Theories of:

i. Autonomy and independence as propounded by Homberg (1977), Wedemeyer Delling, (1989) and Moore (1996) which places the learners in distance at the fore front of the teaching-learning process, "the centrality of the learner is one of the distinguishing features of distance education, and understanding this fact is essential for discovering why it is essentially different from other forms of education" (Saba, 2003:4).

ii. Industrialization, as propounded by Peters (1973), Garrison (1993), Keegan (1996): and Anderson (1997) which compares distance education with industrial production of goods, as a method of teaching and learning that can reach a mass audience. "Structural concerns and issues on the pattern and model provided   by the industrialization are the main total points of

these theories along with how these issues influence the teaching and learning process" (Keegan, 1996 and Saba, 2003);

iii. Interaction and communication as propounded by Baath (1992), Hoimberg (1995), Daniel (1996), Stewart, Hong and Strudler (2004) and Smith (2006). This theory "highlights the constructs of interaction and communication as important factors in distance education" (Keegan 1999).

A further analysis of the conceptions of authorities and for the purpose of this study, Meads to the conclusion that Distance Education is currently and essentially characterized by:

i. Separation (Complete or Quasi) of the teacher and the learner in place and or in time or both in time and place. Authorities accept this as a central characteristic feature of distance education (Keegan, 1996, and Moore, 1988).

Some however accept that there may be occasional contacts between the teacher and the learner and which may hold voluntarily or compulsorily. Hence quasi-permanent separation is more generally acceptable. Note however, that in the contemporary idea of distance education, where the use of sophisticated interactive communication media to create virtual classroom is advocated; the parties to the educational process can communicate synchronously. Thus, separation in time is extinguished. What subsists therefore becomes geographical

place separation. Ail the same separation whether in place and time or place only, is of primary distinction between distance education and the conventional, oral, group based classroom or face-to-face education.

ii. Influence of educational institutions or agencies for purposes of accreditation, management, planning, preparation and administration of the educational resources and services. Here authorities are advocating that formal distance education should be based, on institutions (private or public) established for educational purposes. Such institutions, and its courses and programmes are normally accredited by government established accreditation agencies and based on philosophical, sociologically and functionally founded government policies. This thus, distinguishes distance education from the incidental learnings that naturally occur from many different sources; mass media, (TV) talks/religious preachings, private reading, discussion with friends, films, plays and others.

iii. The use of Technological Media (Channel; media bearing tools or communication enhancing Technologies). In the ordinary language and communication usage, media is made up of the verbal (oral or written) and the non-verbal (signs and gestures) of the language codes while channel constitutes of the systems and technologies that enhance or facilitate the transfer of the media borne information from the source to the destination

(Obasikene; 2001). In educational literature however, media refers to the technological communication systems and facilities as well as the language verbal and non-verbal codes jointly (Edozie, 2003, and Kumar, 2008),

Thus, the use of technological media here refers to the use of print, electronic, computer, internet and telecommunication facilities, by this, the interpersonal communication between and among parties in the educational process is replaced by mechanical or electronic communication. There are different forms 'of these media classified variedly by different authorities, with interactive media being the most currently advocated for.

iv. The Provision of two-way communication system which allows interaction among the parties in the educational process. Here distance education requires the provision of a two-way communication system which allows some form of classroom interaction between the teacher and the learner(s), between learner and learner(s) or among all the parties in the educational process. This may be done synchronously where the interaction occurs at the same time or asynchronously where it occurs at different times based on the learners' convenience, The learners are not mere passive recipients of information but can initiate and benefit from dialogues with the instructions and learning experience that are provided by the learning materials as well as fellow learners. The intention of the interactive or two-

way media is to bring distance education up to the standard, qualities and features of the face-to-face classroom education.

In Asynchronous communication style; course information or learning experiences are passed to the learners through e-mail, discussion forum, web pages, web logs, blogs, wikis or through the records CD-ROM and DVD, as a result, the teachers and the learners do not interact simultaneously. Instead, messages/information/reading materials are posted on a forum or web page or are sent as e-mail. At an unspecified time later, a reply is provided. Any follow-up questions are dealt with through additional postings or messages with requisite delays. Where the reading material is available in the form of recorded CD and DVD, it neither provides any opportunity for the face-to-face dialogue nor any on-line direct timely interaction between the teacher and the students.

While in the synchronous communication style; the communication between the teacher and students directly occurs in an on-line chat room or through live audio-video conferencing. It allows them to gather at a specified time for communicating with each other regarding the course material. As a result, a teacher can provide; valuable information, lecture or share one or the other learning experiences with his students. He can immediately respond to the queries and questions put to him by the students. The follow-up questions can also be addressed immediately at an appropriate level of detail. Moreover, the teacher can inquire as to whether the

students are clear on what has been communicated to them through course materials or learning experiences. In this way, synchronous communication offers proper opportunities of lively interaction between the teacher and students although in a virtual reality created by a system of e-learning. The web technologies thus, enable synchronous learning at a distance to take place.

v. Quasi-permanent separation of learners or learning groups: The learners or learning groups are separated from each other throughout the length and breadth of the learning process. There may be possible, but occasional meetings just for didactic and socialization purposes. Else every learner is on his own in his place and learns from the learning experiences and resources provided by the provider institutions at his own convenient time and pace. Apart from the occasional meetings, where possible, interaction is only by the interactive media. The earlier concepts see it as the teaching of students as individuals' but the later concepts emphasized the idea of electronic grouping of learners through audio, tele and computer conferences -(Garrison and Shale 1987).

vi. Privatization of Institutional Learning: In Distance Education, Educational Institutions provide learning experiences through self-instructional media or materials and access to educational resources but allows the learners, for the most part, to determine the uses(s) to make of the provided learning

opportunities as well as reasonable freedom of choice with regards to time, place, pace and circumstances of learning (Gough, 1984). The ideas of independence, autonomy, individualism and freedom of distance learners are subsumed under privatization. The provider institutions exercise some measure of control.

vii. Industrialization of the educational [J] process: Distance Education creates opportunities where instructional resources are mass produced in large scale through division of labour among members of a course development team and for the purposes of open and distance learning operations. This idea accords with Peters (1998) concept of distance Education.

viii. Interactivity Among Parties in the Educational Process: Distance Education, with particular reference to the contemporary concept advocates the provision of opportunities for interaction among parties in the learning process through synchronous and asynchronous communication styles and technologies as well as the creation of virtual classrooms by the use of sophisticated interactive and hyperactive communication media. This is affordable by the use of E-learning facilities, electronic, computer, video, audio, and computer conferences. This is to bridge the gap between the traditional face-to-face education and the distance education.

A further analysis of the authoritative definitions and conceptions of distance education above guides us to identify some forms or delivery formats that Distance may take. The classification may be based on; historical time perspective, organizational structure of programmes, and principally on the nature of the predominant instructional communication technology. The forms or classifications are as follows:

Earlier or Traditional and Recent or New Media Concepts: This classification is based on the evolutional nature of distance education. The initial ideas about distance education as conceived by such authorities as Dohlmen, Holmberg, Oho Peter and others is that distance educations is based on quasi physical separation between the teacher and the learners. The predominant instructional communication media then was the print media, while the programmes were majorly referred to as correspondent studies. Instructional contents, assessments and communication generally are delivered through mails, supported by occasional contacts for tutorials and socializations.

But recently, the discovery and development of information communication technologies led to different ideas and conceptions about distance education.

There are currently available high-tech, two-way interactive communication technologies that can be used for instructional purposes and which can drastically bridge the physical and or time separation between the teacher and the learner as

well as among the learners. The new media can create virtual classrooms which are equal to or very dose to the four-wall, face to face learning environment of the direct or regular education. Hence, distance education is characterized by two-way interactive media and marked by such terms as E-learning in distance education, virtual classroom or open education.

2.   **Correspondent Style and Technological Style:** Distance Education may also be categorized based on whether it is run by the use of mails, and correspondence delivery system-correspondence style; or by the use of modern technologies as computer, internet and others.

3.   **Complete Physical Separation and Quasi-Physical Separation;** This is based on the organizational structure of the distance learning programme. A programme may be organized such that the learners are completely physically separated from the teacher and from each other. Learning activities are completely individualized. The learners are physically separated from the teacher and from each other. Learning activities are completely individualized and privatized in which case it is referred to as complete physical geographic separation; or the programme may be organized to include occasional contacts between the teacher and the learners and among the learners - weekends, weekends, or monthly, for tutorial and socialization in which case it is referred to as Quasi-physical geographic separation.

4. **Synchronous and Asynchronous:** This is also categorized based on the organizational structure, but with particular reference to the instructional communication style or media used and the instructional delivery timing system. The programme may be organized such that instructions are delivered by the teacher to all the learners at the same time, in which case it is referred to as synchronous; or such that instructions are received by learners at each learner's convenient time. In this case, it is referred to as Asynchronous.

Synchronous instruction requires the simultaneous participation of all students and instructors. The advantage of synchronous instruction is that interaction is done in" real time" and has an immediacy. Examples include interactive tele-courses, teleconferencing and web conferencing, and internet chats.

Asynchronous instruction does not require the simultaneous participation of all students and instructors, Students do not need to be gathered together in the same location at the same time. Rather, students may choose their own instructional time frame and interact with the learning materials and instructor according to their schedules. Asynchronous instruction is more flexible than synchronous instruction, but experience shows that time limits are necessary to maintain focus and participation. The self-paced format accommodates multiple learning levels and schedules. Examples of asynchronous delivery include e-mail, audiocassette courses, videotaped courses, correspondence courses, and www-based courses.

5.   Low-Tech Instructional System and Interactive Instructional System:

This is also a categorization based on the nature of the instructional communication media. There are such communication technologies as print media, audio and video based instructional media, or radio and television that are currently regarded as low technology compared to computer, internet and other interactive media. A programme is low-tech' when it is based on the use of the low-tech instructional communication systems but interactive when it uses the interactive instructional communication media.

Historical Development and Functions of Distance Education

Historically, distance education evolved from correspondent studies, during which print media was the predominant instructional media. "Correspondent Education denotes the type of education where mails are the sole medium of communication between teacher and students. Through study guides, answers to the written works of students, and teachers' comments and reports, teaching and learning take place. According to Good (1973) Correspondence Education is a formal study and instruction conducted by mail using texts, course outlines and other materials. Notable example includes the famous Rapid Result College (RPlC) and Worsley Hall College (WHC) of London. It may also be in form of Distance Learning System (DLS), an organized system of teaching students who are separated from their tutors by physical distance -through a combination of

correspondence course materials and specially arrange contact sessions at different centres for the purpose of giving students occasional feedbacks and tutorials. By this form, distance education teachers travelled to remote sites and taught classes or corresponded with the students through mail, telephone, or fax machine. Detailed course Instructions were normally sent to the learner who performed assigned tasks and returned the completed work to the teacher for evaluation and re-assignment where necessary. This stayed as primary means of distance learning until the middle of this century when instructional radio and television became more popular (Imel; 1996), With time the period of Correspondence Education and use of print media became replaced or complemented by instructional radio and television, This state suffered the problem of absence of two-way communication system between the teacher and the learner. The invention and availability of more sophisticated interactive communication technologies however moved distance education to new dimension. Technology thus, raised the quality of individualized distance instruction. The use of various forms of electronic media increases time effectiveness and improves the delivery of information. Video, audio, and computer-based applications may enhance the product received by the independent learner. Electronic delivery can occur using synchronous communication, in which class members participate at the same time, or

asynchronous communication where participants are separated by time (Romiszowski, 1993). The interactive capability of many of these networks has produced a distance classroom that is nearly identical to a regular classroom. Teachers and students can interact through both two-way video and one-way video with two-way audio systems. The recent development of Desktop Video Conferencing (DVC) which brings interactive I video capability to the desktop computer, further enhances learning opportunities. We ' can now "talk of m-learning" a form "e-learning".

According to Mclean (1996), the-linking of computer technology through the use of the internet or CD-ROM with television transmission also provides a potentially new dimension to distance education. This technique can link university professors to high school teachers, or to physically disabled students, in a distance setting. Currently, the popular distance education media are computer-based and internet communication systems; including, E-mail, audio conferencing, video conferencing, video conferencing with 1 or 2-way video and audio broadcast, cable telephone, fiber-optics, satellite, microwave, closed circuit or low powered television, audio-graphic teleconferencing, compressed video and fax systems. Distance Education systems now involve a high degree of interactivity between teacher and students, even in rural and isolated communities separated by perhaps thousands of miles away. Distance learning allows student

to hear and even see the teachers as well as allowing the teachers to react to their students' comments and questions. In distance education, virtual learning communities can be formed, in which the students and the teachers throughout the world who are part of the same class or study group can | contact one another anytime of the day or night to share observations, information and experience with one another.

Thus, the history of distance education aptly coincides with the development of information communication technologies moving from print media, to various levels of ages of electronic and internet technologies.

The purposes, functions or essence of distance education has been extensively ' discussed by authorities. According to Mangal and Mangal, (2010) distance education is the only choice in the provision of educational opportunities for those who:

- are gainfully employed and thus are unable to attend the regular classes of a particular course or school and university education.

- have a lot of social obligations, responsibilities and commitments such as housewives, adults, priests, social workers, farmers and cowmen, hence not able to attend the regular classes.

- are poor and deprived and thus cannot afford the cost of the regular higher or professional education.

- have been unsuccessful or denied admissions to the regular system of school, college or professional education on account of their previous educational background, low scores in the entrance tests or non-availability of seats for a particular course.

Indeed, distance education originated from the need to extend learning opportunities at various levels to people who did not have access to traditional modes for various reasons, such as economic and time restrictions related to job and family responsibilities or distance from educational" centres Penalver, (1990). Oiugbenga (2006) noted that providing quality education to millions of candidates has been one of the challenges facing developing countries like Nigeria. The formal system of education, via the conventional classroom setting which had been in existence for centuries has gained some sort of loss in momentum and is slow in responding to the challenge of the exponential rise in the population of those 'who have expressed , interest in education. This rise in the population of those seeking educational opportunities in the conventional system calls for a radical departure from the traditional method of educating people. Fortunately, the increase in the development of information and communication technologies as they are applied to the education process has created a new set of learners who are not merely restricted to the brick, and mortal classrooms, as they once existed. It is time to explore the possibility and effectiveness of alternative and innovative

approaches to the educative process, since expanding educational opportunities through conventional means to groups that had hitherto been unreached such as women in purdah, migrant cattle farmers, fishermen, offshore oil workers, prisoners, working women, full time house wives, etc, means putting great strains on the already shrinking education budgets. It is against the backdrop of this that open and distance learning has been identified as the panacea to the perennia problems of equitable access to education, equality of opportunities as well as providing a second chance for those who had once been in the system but had to leave *'dropouts',*

Thus, distance education is of immense assistance to developing countries like Nigeria in achieving their target of compulsory education to ail citizens. It can:

1. prove a boon to overcome the problems of overcrowding in the school, and higher and professional education classes.

2. due to its cost-effectiveness, attract a huge number of the school and higher education learners;

3. become an effective and forceful media for mass education, adult and continuing education, population education, health and sanitation education, sex education and in social awareness, and eradication of many evils prevalent in the society.

4. be quite helpful in developing and inculcating among the students a number of good habits like self-study, independent problem solving ability, and time and resource management.

5. suit the likings, needs and temperaments of a wide variety of learners on account of the flexibility and freedom offered by it.

6. distance education and open learning of the present age governed by e-learning and virtual classroom system give valuable opportunities for the students to get acquainted with and be well versed in the use and application of the advanced technologies for collecting, storing and disseminating needed information and knowledge for self-study an 70020d progress, (Manga! and Mangal, 2010).

According to Kumar (2008), advantages of distance education over formal education include the following:

- relatively cheaper, more economical.

- any number of students may enroll themselves.

- one good teacher or one team of teachers can prepare the instructional resources

- for a subject and the same can be mailed to all the students. Teacher student

- ratio is 1: n where n is any number.

- teachers from schools and universities can be part-time course developers.

- less teachers on the regular pay-rolls of distance education.

- no need for buildings, classrooms, students' hostels, staff quarters, etc.

- no teachers association, no staff unions and no strikes.

- no students on campus, no strikes, no enmass cuts and no unrest.

- no delays in examinations and results.

- no rigid levels of entry and admission.

- open to housewives, disabled persons and the underprivileged.

- available to working personnel without leaving their jobs.

- instruction at all levels of education.

- flexibility to add newer subjects.

- economies of large scale, greater number of enrolment make it cheaper to operate distance education.

- facilities for large scale, greater number of enrolment make it possible to employ

- television and radio channels of communication.

- no restriction of time and place of learning.

- no restriction on the pace of learning.

- development of continuing study habits for lifelong learning.

- no need for reservations. No bar on caste and creed.

WHO (1964), World Bank (1968), Keegan (1999), Kaufman and Watkins (2000), Jegede (2001) etc, all established essence for distance education. According to Tyler (1980 in Kumar 2008), Distance Education fosters the use of print 'and electronic media in bringing together teaching behaviours and the learning behaviours. Teachers and learners meet face to face only occasionally for specific tasks. The most potent justification for distance education, it was argued, lay in its ability to enable people to study at their own pace, place and time; and in fact, that a vast number of people could be reached at the same time wherever they live.

Distance Education in Nigeria

Like in other parts of the world, Distance Education is not new in Nigeria. According to Obi Okoye (2005), Open and Distance Learning is not totally new in Nigeria. It began in the 1940s as correspondence studies. Many Nigerians got enrolled in the correspondence colleges in Great Britain and studied for various examinations including the General Certificate Examinations, Ordinary Level and Advanced Levels, (GCE, O'Level and GCE, A'Level). In addition, there were those who studied for various technical, commercial and business examinations. Some of the Correspondence Colleges were Rapid Results College, Exam Success College, and Woolsey Hall College. The main mode of instructional delivery was the Print. The successive study materials were sent by post and adequately planned to get to the students at a time the student was completing the volumes at hand.

This continued for a long time until some Nigerian Universities, through their institutes of Education, started distance learning programmes. According to Onyedeji, Omolewa and Asiedu "-(1992), the Nigerian Broadcasting Service had started Media Education (Schools Broadcast) a form of distance education, as far back as 1962. Thus, it is obvious that Distance Education has for long existed in Nigeria but in various forms. What is of interest therefore is that the form of education is evolutional, that it's structure and modus operandi changes along with the developmental stages; and that advancement in communication and information dissemination technologies influence the development, structure and method of operation.

According to Ojo (1982 in Falade 2008), Distance Education in Nigeria may be classified into two types; (i) The unorganized stage and (ii) The organized stage. The unorganized stage was "when individuals made their own arrangements directly with overseas institutions which provided the course materials leading to certain certificates, diplomas and degrees". Such overseas institutions include; University of London, Wesley College, Rapid Results College, and others. While the organized consists of those distance learning programmes organized by educational institutions where learners are recognized as part time students of higher educational Institutions. It involves an organized system of teaching and learning by students who are in most part, separated from their teachers and

institutions by physical and or time distance. It is usually organized through correspondence, continuing education or vacation programmes and other modes of specially arranged contact sessions .which differ substantially from the regular, full-time programme. The programmes go by such nomenclatures as Correspondence Education (CE), Continuing Education (CE), Distance Education (DE), Distance Learning System (DLS), Mature Students Programme (MSP), University of the Air Programme (UNIAIR), and Sandwich Education Programme (SEP) etc, The terms are interchangeably used as if they are all coterminous with part-time or 'non regular' programmes especially since they all involve in varied degrees and modes, elements of life-long or Continuous Education Programmes (CEP), and are mostly based in the Continuing Education Centres/Departments/Units of the institutions of higher learning (Obi-Okoye, 2005). There are however some little differences in structure and methods used by some of the programmes as may be noted in the following specific definitions.

1.   **Correspondence Education:** This denotes a type of education where mails are the sole medium of communication between teacher and students. Teaching and learning take place through study guides. According to Good (1973:20), "correspondence education is a formal study and instruction conducted by mail, using texts, course outlines and other "materials, with lesson reports, corrections and examinations." Notable examples of correspondence education providers

include the famous Rapid Results College (RRC) and Wolsey Hal! College (WHC) of London, the May Flower College, the National School of Salesmanship, Burleigh College of Concise Studies, all in Great Britain. There are also the Fernlehrins Institute in Hamburg (Germany); Nigeria Certificate in Education (NCE programme) of the Institute of Education, Ahmadu Bello University, Zaria; Exam Success Correspondence College of Lagos and Pacific Correspondence College of Obosi, Anambra State.

2.   **Distance Learning System (DLS):** This is an organized system of teaching students who are separated from their tutors by physical distance through a combination of correspondence (course materials) and specially arranged contact sessions at different centers for the purpose of giving students occasional feedback. Notable examples include the erstwhile London and Cambridge Universities external degree programmes, the NCE and Teacher's Grade II Programmes of the Institute of Education, ABU Zaria and the programmes of the National Teacher's Institute, Kaduna. Both the NCE programmes of the Institute of Education, ABU Zaria and the NCE by DLS of NTI Kaduna are educational programmes for the training, and upgrading of teachers through correspondence courses intermingled with contact sessions. For NTI students there are also bi-weekly weekend contacts at local government area centres scattered across

Nigeria. These two programmes are each a type of advanced Teachers College/College of Education without the four walls.

3. **Mature Study Programme (MSP)/Continuing Education Programme (CEP or Part-Time Programme (PT):** This is an organized educational programme for mature age students, usually workers, who could not undertake a regular tertiary education course because of their work engagements; instead they attend week-end lectures on Friday evenings through Saturday evenings. MSP or CEP programme, takes a little longer duration than the regular full-time courses. Nnamdi Azikiwe University (UNIZIK) Awka, Enugu State University of Science and Technology, Madona University, Okija Anambra State and OSISATECH Polytechnics, Enugu have such programmes.

4. **University of the Air (UNIAIR) Programmes:** This is an organized educational programme which uses some sort of multi-media approach e.g. it combines educational broadcasts with correspondence (study materials) and week-end contact (tutorial) programmes, to teach students. Good examples of successful UNIAIR programmes include the Ordinary and Higher National Diploma programmes of the Institute of Management and Technology (IMT), Enugu and Federal Polytechnic Oko, Anambra State.

5. **Sandwich Education Programme (SEP):** This is an organized educational programme meant for the acquisition of higher educational and

professional qualifications and competencies. Sandwich (vacation) education are organized to take place during the long vacation" (July to September) and the Easter and Christmas breaks. The aim is to give students a minimum of twelve weeks of lectures and two weeks of examinations. Almost all of the Nigerian Universities/Colleges of Education and Polytechnics offer sandwich programmes in order to assist Nigerian teachers to upgrade their qualifications and to increase the revenue base of the institutions. Most of the sandwich programmes are in-service training (INSET) programmes while a few students join for initial or pre-service training.

These different forms of distance education programmes are provided by both private and public educational institutions. Jegede (1980 in Falade 2008) had identified:

    a. Exam Success Correspondence College, Lagos

    b. Walton Solomon and Associates Limited, Lagos

    c. Nigerian Technical Correspondence College, Lagos

    d. Bosede Business Training College, Ibadan,

As government approved private institutions, and:

    a. University of Lagos, Correspondence and Open Studies Institute (COSIT),

    b. National Teachers' Institute, Kaduna

    c. Ahmadu Bello University, Zaria

    d. Institute of Management and Technology, Enugu

    e. Imo State University, Okigwe

    f. University of Ibadan, Ibadan g, School Broadcasts

    g. University of Abuja, Abuja and

    h. National Open University

As public institutions that provide Distance Education Programmes respectively. According to him, colleges cover a wide range of subjects, particularly of the pre-university level. Though in some cases, they issue their own diploma, they rely primarily in preparing candidates for examination conducted by other bodies (both local and foreign) such as G.C.E., Ordinary Advanced levels, City and Guilds of London Examination, R.S.A. and other professional courses. They have two modes of operation; full-tuition and self-tuition. In full tuition, the lessons are sent to the learners in bits in an agreed schedule and he/she is allocated to a tutor to whom completed exercises are sent. By this means, some sort of two-way communication is achieved. In self-tuition, however, the centre course materials are sent to the learners in one swoop and they are not expected to send any assignment back to the college, Correspondence colleges employ neither multimedia nor face to face: techniques but they employ the print media. As for enrolment, the biggest of these colleges, Exam Success Correspondence College, Lagos, had about 12,000 students before 1980, located mainly in Nigeria with a

few scattered around Gambia, Sierra Leone, Ghana, Uganda, Kenya, Tanzania, Malawi and Zambia (Jegede, 1980) in Falade (2008).

The above information may be true as at then but obviously not at present. Currently there are over 117 approved private and public higher institutions in Nigeria, most of which provide one form of distance educational programme or the other. Again, most of the identified colleges that provide for pre-university education and preparation of candidates for examinations have equally become defunct. The provision of part-time and Sandwich forms of distance education programme at off campus contact centres around 1990s to early 2000s was so proliferated that the government had to place a ban on such off campus centres. In spite such odds, higher institutions still make .provisions for distance education programmes, even in better forms. The National Teachers Institute (NTI) with its headquarters at Kaduna and the National Open University of Nigeria (NOUN) with the headquarters in Lagos are established solely, to provide educational opportunities through distance learning for improvement on qualifications and professional growth to workers as well as higher educational qualifications for those who could not afford or missed the opportunity of regular education.

The need for this form of education, distance education was underscored by the National Policy on Education. The National Policy on Education explicitly refers to it as Open and Distance Education (ODE). It describes it as a system which

encompasses education for ail, education for life, life-long learning, life-wide education, adult education, mass education, media-based education, self learning, personalized learning, part-time studies, and much more.

Further, the National Policy on Education (FRN, 2004) states that: "Education is the most important instrument of change in any society" (p.9): and that "any fundamental change in the intellectual and social outlook of any society has to be preceded by an educational revolution" (p.9). It emphasized that;

> *"Federal Government shall undertake to make life-long education the basis for the nations education policy and that at any stage of the educational process after primary education, an individual will be able to choose between continuing his full-time studies, combining work with studies, or embarking on full-time employment without excluding the prospect of resuming studies later on...the education system will be restructured to develop the practice of self-learning" (P.9).*

An analysis of access to university education in Nigeria made in a publication of the National Open University of Nigeria (2010) is worthy of note in establishing the need for distance education in the Nigeria Educational system. According to the publication, "in 1959, as Nigeria prepared for independence the Government

set up the Ashby commission. The recommendations of that Commission guided a number of decisions and issues in education in the years immediately after independence. Though the report was detailed and incisive, it failed to realistically appreciate the actual zeal for education in Nigeria neither did it recognize the potency of independence in; catalyzing social demands. In 1960 for example, Ashby recommended four Universities for Nigeria and projected a total student population of 7,500 by 1970 (ten years after independence). By the middle of the 1970s however, the total number of Federal universities had risen to 13, with the establishment of the second generation universities of Jos, Kano, Calabar, Ilorin, Maiduguri, Sokoto and Port Harcourt added to the first generation universities of Ibadan, Zaria, Lagos, Nsukka, Ife, and Benin. By 1999, five of the six first generation universities had each been admitting between 16,000 to 30,000 students. Also by 1999, the Federal universities had a total of almost 400,000 students. Every year since independence, however, the demand for places in the universities had remained unmet. Between 1990 and year 2000, there was no time the universities had been able to admit more than about 15% of the total qualified applicants. Projections equally showed that by the year 2010, almost 7.5 million applicants jostled for places in the universities.

In order to handle the issue of access it had been suggested that to catch up with a country like Japan and meet existing demand there is need to expand the capacity

of the university system by a factor of 10. There are two possible ways of doing this; either by multiplying the current admission by a factor of 10, or by expanding the number of existing universities by a factor of 10. This country cannot conveniently do any of the two as of now. Even if it can, how would the issue of facilities, infrastructure and production of academic staff be handled?

Hence it has also been suggested that one of the easiest ways of solving the problem of access is to rely on the Open University and Distance Learning, with the hope that what the conventional system cannot absorb, the Open University system would mop up. One thing which is clear globally is that the Open University anywhere in the world is not established to compete with conventional universities. The National Open University of Nigeria therefore is not established to compete, but rather to complement the conventional, public as well as private universities. It carries out the business .of providing university education in a non-conventional manner, non-conventional in the sense that there is no continuous face-to-face lecture as is the case in conventional universities. The students are free to carry on their full-time employment. They can carry their academic load in small bits as their capacity allows.

National Teachers' Institute

The National Teachers' Institute (NTI), Kaduna, was established with the assistance of UNESCO in 1976 and with its headquarters in Kaduna as a result of

pressing need to train teachers for all levels of education. Acts No. 7 of April, 1978 establishing the institute, charged it with the responsibility of providing courses of instruction leading to the development, upgrading and certification of teachers as specified in the relevant syllabus using distance education technique (DLS). The NTI was thus mandated by the federal government to develop or design full distance learning programmes (packages) which are to facilitate private study, so that the under qualified teachers would be able to attain the required teaching certificates (Ogunranti, 1988).

Apart from the overall goal which is to uplift the quality of teachers, upgrading knowledge and skills, the following objectives were outlined for the institute:

1. Assist in the upgrading of sub-Grade II teachers to Grade II level.

2. Assist in upgrading of Grade II teachers and West African School Certificate (WASC) holders to Nigeria Certificate in Education (NCE) level.

3. Offer diploma, certificate and testimonials in language arts and communication skills, mathematics, science and skills, environment studies and sciences, social and cultural studies, religion and moral studies for those others who wish to avail themselves for the opportunity.

4. Provide degree and post graduate qualifications in education for graduate teachers who lack this qualification. NCE for primary education to over 32,000 students who are already enrolled for the course (NTI, Ibadan).

The NTI has offices at both zonal and state capitals across the nation under the administrative head of both zonal and state coordinators. The administrative structure is further expanded at the state levels to ensure effective implementation of the institute's educational programmes.

National Open University of Nigeria

The National Open University of Nigeria (NOSJN) is a positive response of the Federal Government of Nigeria to make education accessible, affordable and equitable to all Nigerians. The university offers diploma, first degree, master degree and other postgraduate programmes in Business and Administration, Science and Technology, Education, Arts and Social Sciences, Law and other areas of study. It has a network of study centres established at state levels. Such study centres serve as resource centres for distance learners to collect instructional materials, access lecturers, submit and collect marked assignments, receive regular guidance and counselling with respect to their studies, and use information communication technology facilities for a variety of learning purposes (Jegede 2004).

Thus, the National Open University of Nigeria, and other Nigerian Universities offering distance learning programmes use such programmes to make education more accessible to people who may not have had access to the traditional modes for reasons such as economic and time restrictions to job and family responsibilities. Nigerians at various levels and professions have been utilizing the opportunities provided by these universities for professional development.

The National Open University of Nigeria (NOUN) was first established in July 1983. It was dosed a few months later in 1984 because of various defects and reasons which the Federal Government felt-should be corrected. The Act of 1983 which established the Open University was thus, suspended. In 2001, the National Open University of Nigeria Act of 1983 suspended in 1984, was reactivated. This paved the way for the resuscitation of the National Open University of Nigeria as we have it today.

The major purpose of NOUN is to make education available to as many people as have the ability and are willing and ready to benefit from quality education provided through flexible and affordable distance .learning. The vision of the National Open University of Nigeria is providing highly accessible and enhanced quality education anchored by social justice, equity, equality, and national cohesion through a comprehensive reach that transcends all barriers while its mission is to provide functional cost-effective, flexible learning, which add

lifelong value to quality education for ail who seek knowledge. In addition to the broad vision and mission statements, some of the major objectives of the National Open University of Nigeria are to:

1. ensure equity and equality of opportunities in education generally but specifically in university education.

2. provide a wider access to education generally but specifically to university education in Nigeria.

3. enhance education for all and lifelong learning.

4. provide the entrenchment of global culture.

5. provide educational resources via an intensive use of information and communication technology.

6. provide flexible but qualitative education.

7. reduce the cost, inconveniences and hassles of education delivery.

It is expected that the Open University will among other things do the following:

1. Raise the literacy level in Nigeria

2. Substantially increase access to university education

3. Widen the catchments scope of beneficiaries of university education thus reaching the hitherto unreachable and ensuring that nobody interested in and capable of having university education, is left out.

4. Help Nigerians to be on the right side of the digital divide.

5. Enhance and facilitate workplace training and professional development.

6. Meet the yearnings of Nigerians for university education.

7. Reduce the pressure on university Education place in the conventional universities.

The NOUN Headquarters is at 14-16 Ahmadu Bello Way, Victoria Island, Lagos. This is the twelve storey building, the glass house, which served as the former Federal Ministry of Education in Lagos. It houses the administrative machinery of the university comprising the offices of the Vice-Chancellor, the principal offices of the university, and the Schools and Centres through which the academic programmes are delivered. Presently, the University has the following schools, Centres and Directorates with their offices at the Headquarters in Lagos:

i. The school of Arts and Social Sciences

ii. The School of Business .and Human Resource Management

iii. The School of Education

iv. The School of Science and Technology

v. The Centre for Continuing Education and Work Place Training.

vi. The Regional Centre for Training and Development in Open and Distance

vii. Learning (RETRIDAL)

viii. The Directorate of Learner's upport Services;

ix.   The Directorate of Media and Information;

x.   The Directorate of Computer and Networking Services;

xi.   The Directorate of Legal and Protocol services.

The National Open and Distance Learning Planning Office (NODLP) at 245, Samuel Ademulegun Street, Central Business District, Abuja caters for the centralized planning, coordination and regulation of Open and Distance Learning programmes nationwide and also serves as a training and- capacity building centre.

The study centres are the main centres of student learning activities of the NOUN and where the Federal presence is being articulated. From the initial 18 temporary Study Centres approved by the Federal Government for takeoff of the university, the NOUN now has 48 study centres spread across the breadth of the country and headed by Directors who are ably assisted by professional counsellors. Its approach to distance learning is composite and comprehensive. It includes personal contacts and a combination of resources such as:

- Regular contacts with the tutor
- Availability of course materials in print, (study materials, textbooks, workbooks etc),
- Course materials on CD-ROMs;
- Computer conferencing facilities;

- Audio and video cassettes;

- Networking opportunities with the classmates and peers;

- Websites for courses;

- Television instruction using the NTA Educational Unit, State and Private broadcasting stations;

- Radio broadcasts using the FRCN, State and private broadcasting units; Feedback regularly on Tutor Marked Assignments and;

- Periodic face-to-face contact sessions; using tutorial facilities.

NOUN is special set up to give everyone a chance to study at the university level without giving up one's job, pleasures, family or any other commitments. In fact, at NOUN, students develop the self discipline to successfully juggle all other commitments and combine them effectively with high quality education and study.

Flexibility is the cornerstone of NOUN endeavours; flexibility in terms of time and timing, programmes and programming; and all without compromising quality. The National Open University of Nigeria, has the following programmes:

i. **Access Programmes:** These are courses which one can take if one does not directly quality for admission into a degree programme. They last between two semesters to four semesters depending on ones stage.

ii. **Certificate Programmes:** These are courses that last between six months to one academic year. They are mainly sub-degree programmes and in some cases could qualify candidates for enrolment into a diploma programme. There are some other certificate courses which when completed will not qualify one for a higher enrolment. These are called proficiency certificate courses.

iii. **Diploma Programmes:** Diploma programmes run for minimum of one academic year. They are also sub-degree programmes. They can stand on their own or they could be pre-requisites to admission into some degree programmes at the Open University. Diplomas too could be taken on a full time mode or in flexible mode.

iv. **First Degree Programmes:** These are programmes that lead to the award of first degree in any given discipline. Students carry the load according to their ability, availability of time and their financial situation.

v. **Higher Degree Programmes:** These are programmes one registers for after a first degree. It could be at the Diploma level or at the Master or Doctorate level. Some first degree holders may be required to possess a post-graduate diploma to qualify them for admission into some Master programmes in the university. Postgraduate diploma programmes normally last for one academic year if taken as full-time.

The programmes offered and degrees awarded are all subject to the same quality assurance as all Nigerian Universities. It's programmes are all subject to the assessment and accreditation regulations of the National Universities Commission. Alongside this, NOUN is subject to quality assurance of authorities on different professions like the Council of Legal Education (National Open University of Nigeria NOUN, 2010),

Distance Education in South-Eastern Nigeria

In the South-East geopolitical zone of Nigeria just as the other parts, there are quite a good number of higher institutions that provide distance education programmes of different forms. Such institutions include Ebonyi State University, Federal Polytechnic, Uwana Afikpo, Abia State University Isukwuato, Federal University of Agriculture Umudike, Umuahia, and others in Abia State; Nnamdi Azikiwe University (UIMIZIK) Awka, Federal Polytechnic Ok.o, Federal College of Education (Technical) Umunze, Anambra State University Uii, Anambra State College of Education Nsugbe, and Madonna University Okija. University of Nigeria Nsukka, Enugu State University of Science and Technology, Agbani, Federal College of Education, Ehamufu, Institute of Management and Technology (IMT) Enugu, Enugu State College of Education (Technical), OSISATECH Polytechnic Enugu, Caritas University Amorji-Nike, and Bishop Okoye Memorial University, Enugu, Imo State University (IMSU), Avan Ikokwu College of

Education Owerri, and Federal University of Technology Owerri. The "National Teachers' Institute (NTI) and National Open University of Nigeria (NOUN) equally have study centres in all the states, for the co-ordination and management of irrespective distance educational programmes and activities.

National Teachers' Institute, South-East Zone

The National Teachers', Institute (NTI) in the South East, has its regional headquarters at Enugu, with state co-ordinating centres in all the states as well as study centres in some local government areas of the respective states.

The population of NTI students as at 2011/2012 and 2012/2013 is about 26,279 students distributed as follows; Abia - 9572, Anambra 3541, Ebonyi - 4236, Enugu -3680, and Imo 5250, a total of 26279. (National Teachers Institute (NTT) Enugu Zonal Office, 2014),

The National Open University of Nigeria South East Zone

The National Open University of Nigeria (NOUN), currently has about 48 study centres spread across the length and breadth of the country. The South East geopolitical zone of Nigeria has 5 of the study centres, located as follows:

1. Federal Polytechnic, Nekede, Owerri (Owerri/Aba Road, Nekede), Imo State.

2. National Root-Crops Institute, Umudike, Umuahia, Abia State

3. Nike-Lake Road, Enugu, Enugu State

4. NOUN special study centre, Nigerian Prisons, Enugu

5. Defunct party Building, Abagana, Anambra State,

In the 2012/2013 academic session, the NOUN has a total students population of 20,805 students distributed as follows; 5,860, 6,619, 4,822, and 3,504 for Awka, Enugu, Owerri and Umuahia respectively (NOUN, Enugu study Centre, 2014).

The Concept of Instructional Media

The primary essence of instructional media is to enhance instructional communication. It is thus necessary to discuss instructional communication briefly in order to understand instructional media and its roles in instruction.

Instructional Communication

According to Mangal and Mangal (2010), instruction is concerned with the development of knowledge and understanding in an individual about a thing, system or process. It has to do with imparting knowledge and understanding; the development of the intellect and thus affects the cognitive domain of one's behaviour. Although instruction can be and is always a part of teaching, it is distinguished from teaching, For one, while teaching is concerned with the development of the whole the cognitive, affective and the psychomotor domains, instruction cares only for the development of the intellect, i.e. the cognitive domain. The face-to-face interaction of the teacher and students found in teaching

is not very essential in the process of instruction. In instruction, the teacher may be replaced by programmed material, computer, teaching machine, radio, television, video and tape recorder but ' -not in teaching.

However, Gragne and Briggs (1979 in Edozie 2003) defined instruction as the process whereby the environment of an individual is manipulated to enable him emit or engage in specified behaviours under specified conditions or as responses to specified situations, while Abimbade (1997) defined it as specified techniques or means of controlling or manipulating sequence of events to produce a change of behavior through learning. Edozie (2003) made an analysis of definitions and concluded that instruction is wider than teaching, that teaching and learning are sub-sets of instruction and thus defined instruction "as the process of teaching and learning". He concluded that instruction should be used synonymously with 'teaching and learning'.

Irrespective of the minor differences, authorities found a strong link between teaching and instruction, acknowledged them as near synonyms and use them interchangeably in the discussion of the teaching-learning process. On this premise, instruction like teaching, is a process of establishing inter-personal relationship between the teacher and the students as a result of which the behaviour of the later is modified or a process of interaction between the teacher and the student, a cooperative enterprise, a two-way traffic and a commonly

shared phenomenon, which results in the improvement of both the participants - the teacher and the student; or the triadic relation and tripolar   process involving the source of teaching (human or material), student and a set of activities designed and manipulated primarily to bring changes in the behaviour of the student. Instruction thus, may be analyzed as comprising of various specific activities of life - introducing, demonstrating, contrasting, exploring, proving, justifying, explicating, defining, rating, appraising, amplifying, vindicating, interpreting, questioning, elaborating, identifying, designating, conjecturing, confirming, etc of the teacher and the learner aimed at achieving learning objectives (Komisar 1969 in Mangal and Mangal 2010). These "interpersonal relationship, 'interaction and various activities' herein referred to are communication activities related to instruction.

Instructional Communication thus, consists in the art, interactions and activities of the parties involved in instruction. It has to do with all the activities, aimed at transferring the content of instruction from teacher to the learner, the exchange of ideas about the content of instruction between the teacher and the learner or, the art, activities, learning experiences and interactions involved in transferring the content of instruction from the teacher to the learner. It is "a process of deliberate arrangement of information, interactions and activities to change (or modify) and assess the experiences and behaviours of the target audience" (lyang-Abia,

1988:24) or "an interaction process in which information or message is designed and disseminated in order to enable the target audience achieve the instructional objectives" (Okwor, 1995:110). The definition of communication by Newcomb (1976 in Agbo and Ezinwa 2006) as "a process by which a person refers to something either by pointing to it or using a symbol for it in such a way as to lead another person to have a more or less similar experience of it" (P. 120) Rightly fits into the definition of an instructional communication.

The essential component parts of the instructional communication process compared to or flowing from the established general communication process naturally include; content (information), the teacher/learner (Encoder)-, instructional media (channel/medium), learner/teacher (Decoder), and effect or evaluation (Feedback), (Singh, Sharma and Upadhya 2008).

The content consists of "the knowledge, skill, concept, principles, laws, theories, generalizations, techniques and values to be learned" (Ofoefuna and Eya 1999:54), In other words, the behavior previously unknown to the learner but which the learner is expected to acquire or desires to acquire through the instructional system. This content and a breakdown of its different aspects, is normally stated serially in order of presentation under specific objectives.

The teacher/learner consists of the human elements in the communication process. The use of both the teacher and the learner jointly as the encoder, as well as the

decoder, fails in line with the circular nature of communication. In the communication process, there is normally an exchange of roles between the encoder and the decoder, such that who becomes the encoder or the decoder is determined by the sender of required information. In an instructional process, the teacher and the learner exchange roles while interacting to execute the learning experiences. The instructional media (channel) here stands for the instructional techniques, strategies, media, materials or media enhancing technologies used in the presentation of the learning experiences, Note that the learning experiences "means the interaction between the learner and the external condition in the environment to which the leaner can react" (Akubuilo; 2007:173), thus it constitutes an aspect of the instructional media.

Effect (Evaluation or feedback) is the change in the behavior of the receiver occurring in response to the message received (Singh et al 2008). In other words, 'Effect' is the change in the behavior of the learner which occur as a result of the interaction, or the presentation and reception of content and learning experiences between the teacher and the learner. The effect is normally determined through evaluation which tests the extent to which the specified objectives were achieved and thus provides the feedback necessarily required to complete the communication cycle.

The channel or the instructional communication media is one of the component parts of the instructional communication and thus forms the major trust of this study.

Instructional Media

Instructional communication in sum consists in the art and process of activities and interactions between or among the parties involved in the instructional system, aimed at transferring the content of instruction from the teacher to the learner and through "if which an expected change (learning) occurs in the behavior of the learner. The basic component parts of the instructional communication are; content (skills, knowledge, behaviours, etc), the teacher/learner, the 'media (channel), the (earner/teacher, and Evaluation (feedback, response or effect).

Thus one of the basic elements or components of the communication process is channel or media. The media consists of the Verbal elements (words, oral or written) and the non-verbal elements (gestures and symbols) which serve as the vehicle for the transfer of information from the source to the receiver. The media may be in the written or oral modes. The effectiveness of the media in the transfer of information may be facilitated by media enhancing technologies that appeal to the various sense organs- sight, hearing, touch, taste and smell. These technologies are referred to as information communication technologies (ICT) and include;

telephone, tele-printer, telegram, fax, e-mail/ radio and tele-broadcasting, computer, internet etc.

According to Obasikene (2001), between the Tx (transmitter) and the Rx (receiver) are two important facilitators of the communication process: the channel and the medium. The channel is an access or a means by which the message moves from Tx to Rx, while the medium is a system of "previously agreed symbols (often referred to as the code), which may be verbal or non-verbal. If it is a verbal medium, it may be spoken or written. He thus attempted a distinction between channel and medium. Medium or its plural form media refer to the (mutually understandable) language codes used for communication, channel on the other hand refer to the access means or systems through which the media or codes appropriately selected by the source .are transmitted to the receiver. He referred to the two as facilitators of the communication process; the channel as communications and listed examples of communications to include, roads, railways, air routes, postal and telegraphic services, messenger services, electronic communication (telephones, radios, televisions, computers and internet-world's communications network). In other words, what happens in a communication process is that the source or the encoder bearing the information he intends to send and the receiver in mind, chooses a mutually understandable language and from the set of the language codes, selects appropriately, the codes capable of bearing

the information; tie then imputes the selected codes into a chosen channel the Access means, or system viz, electronic communications or other systems, which then carries the codes across to the receiver for possible interpretation, understanding and reaction or feedback. In this context therefore, the communication technologies used in instruction, teaching and learning may be more appropriately referred to as instructional channels rather than instructional media which may be better referred to as language of instruction.

According to Mangal and Mangal (2010), media in general takes two distinctive forms -verbal (spoken or written words) and non-verbal (gestures, sign language, body language, morse code etc). In a communication process both the sender and receiver are forced to make use of the media or channel of communication that is mutually acceptable as well as effective. In Mangal and Mangal (2010), there is no clear distinction between channel and media - "Media or Channel," but he made reference to what he referred to as 'sensory channel' - "Further, for the actual physical transmission of this symbolic expression, he may use a variety of channels. These channels of transmission are in fact nothing but media or means which call for the use of our senses of sight, hearing, touch, taste and smell" (p 309), In the context, "media or symbolic expressions' refer to verbal and non-verbal codes while 'sensory channels or means which call for the use of our

senses'...refer to access means or systems, i.e. electronic communications and other physical systems and technologies.

Eze(2011) refers to channel as "vehicles for conveying messages to the expected destination" (P 7). According to him, "sound waves carry spoken words, light waves carry visual messages...radio signals travel by electromagnetic radiation until they travel through the air to our ears" (P 7). Here, channel still has to do with electronic systems and technologies. "The communication media can be the spoken word-, gesture, picture, visual display, print, broadcast, film - all the signs and symbols by "which humans try to convey meanings and value to one another", Schramm, (1968) in Aggarwal (2007:109). No reference to channel, nor distinction between channel •and media. Channel represents the medium through which a source sends encoded messages to a receiver. Examples include air waves, telephone, and all instructional media like television, radio, computer, films, books, relia, charts, specimens and 'posters (Edozie 2003). Here again, there is no distinction between channel and media.

All the same, while one may identify with the distinction clearly made by Obasikene (2001) and implied by Mangal and Mangal (2010) and Eze (2011), it is observed that the roles and relationships between the media enhancing technologies (channel) and [the media (language, verbal and non-verbal codes), particularly when there is a gap [in space and or time, are so intertwined, such a

twiddle, that most authorities do not bother to distinguish between the two. Indeed much of the writings in communication, and particularly with reference to education or instructional communication, refer to the technologies, instruments or appliances and devices used in the delivery of instruction as 'instructional media'. Hence instructional devices, equipment or technological products used in instruction, as well as realia, people, natural and cultural phenomenal used in enhancing instruction are referred to as instructional media or instructional communication media, and it is here understood as such, at least technically.

According to Edozie (2003), "Educational media encompasses (the) diverse means through which content and learning experiences are generated, preserved, transmitted, amplified, replicated and carried between a teacher (or resource person) and the learner" (P 73). They include a broad range of devices equipment, materials, people, and facilities, which can be used to facilitate communication in the teaching/learning process (P 73). He noted that Educational media has been referred to by various terms such as apparatus, audio-visual aids, instructional materials or instructional media.

Essentially, media are collection of materials and equipment that can be used to aid; communication between two systems. Educational media are information carriers designed specially to fulfill the objectives of educational communication as aid to instruction; a broad range of resources which can be used to facilitate

effective and "efficient communication in the teaching process. They are essentially working devices to affect a control of communication (Falade 2004). Instructional media are all forms of information carriers that can be employed to record, preserve, store, transmit or retrieve information for the purpose of instruction, (Abinbola, 2001) Today's advances in technology have made it possible to produce materials and devices that could be used to minimize the talking and at the same time make the message clearer, more Interesting and easier for learners to assimilate. These materials and devices are "collectively referred to as instructional media (Akanbi 1993 in Edozie 2003). The term "instructional media in the strictest sense refer to all forms of information carriers that can help to bring about maximum and noticeable effectiveness in teaching-learning situation (Agun and Imogie 1988, Adewoyin 1991, Nwosu 1995,). Media is the means (usually audio-visual or electronic) for transmitting or delivering messages. Media includes such things as prints, graphics, photography, audio-communication, teevision simulating games and computer (Locatis and Atkinson 1984 in Ike et al 2002). Educational media are information carriers designed specifically to fulfill the objectives of educational communication in teaching and learning and thus serve as aids to instruction (Russel; 1974, Abinbade; 1999). These are but a few of the pretora of authoritative reference to instructional devices and technologies as instructional media.

Some authorities in education equally see educational technology as a synonym of audio-visual resources, or methods of selecting and utilizing both human and physical resources,' Association for Educational Communication and Technology (AECT) for one, defined Educational Technology as a field dedicated to the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning (Tenkins and Ressett'2000:52). Omoniyi (2009) also observed that "in Nigeria the field (Educational Technology) has been dedicated to preparing classroom teachers and educators to use educational technologies and principles of technology in enhancing instructional process." Thus while educational technology as a course may differ, and widely too, instructional media is often referred to as educational or instructional technology. Schramm (1954), and Edozie, (2003), probably because they are primarily concerned with instructional communication did not make reference to the verbal media. Their conception of media lies on the non-verbal symbols, materials and technologies which bear and carry information across from the sender to the receiver or from the teacher to the learner and vice versa.

Ike et al (2002) and Edozie (2003) successfully argued for the use of instructional in preference to the other nomenclatures. According to them:

- The use of "Apparatus," 'suggests portable items that can be carried into the classroom and precludes community resources like people, natural and cultural phenomenal as well as equipment'.

- Teaching aids/instructional aids" connotes 'anything used by an instructor to make a point clear/ something that aids the teaching of a topic'. This implies that;

  i. The aid only helps the teacher to make his point clear and understandable. In other words, except it is used by the teacher, it cannot make a point clear nor contribute in any other way;

  ii. The 'aid' does not do the whole' as part of the job is performed by other elements, (usually the human teacher);

  iii. The 'aid' is administered and controlled by the teacher; and

  iv. The 'aid' works because the other part of the teaching job is performed satisfactorily (Atkinson 1975, UNESCO 1887, and Romiszowski, 1977, all in Ike et al 2002:10).

Thus, teaching/instructional aids are tools, the teacher uses in his efforts to communicate with the learners, Unlike instructional materials or media, the 'aids' are not self-supporting. They are supplementary to or are used to support instruction. Audio/Visual/Audio-Visual Aids" is but a classification of the 'aids' based on the sense organs to which they appeal - the senses of sight, touch,

hearing, smelling and taste. Besides being easily misunderstood as electronic media only, it excludes the manipulatives and phenomenal. "Instructional materials", excludes people, equipment and facilities, natural and cultural phenomenal, simulations and games. "Educational materials" are too broad as it may be conceived as constituting the facilities and resources of the entire educational system. But "Instructional Media" covers all the means -.materials equipment, facilities, and even people (Edozie; 2003) used in the instructional process; or all the devices which present a complete body of information, and largely self-supporting rather than supplementary in 'teaching-learning process (Allen; 1963 in Edozie 2003). It encompasses all the diverse means through which content and learning experiences are generated, preserved, transmitted, amplified, replicated and carried between a teacher and a learner (Edozie; 2003).

Thus the media consists of all the means-devices, equipment materials, facilities, people, natural and cultural phenomenal, simulations, and games, other information communication technologies as well as the language codes or symbols, verbal or non-verbal used for instructional communication. It is a subsystem of the instructional system. The media is self-supporting and can teach alone when thoughtfully; programmed and presented to the learners in an environment conducive for learning. '"Instructional Media" is therefore preferred in the contemporary education literature.

The above discussions clearly indicate .that different nomenclatures are used in reference to the instructional media. This is most probably due to the developmental nature of Educational Technology, a field of the educational studies concerned with the design, production and utilization of instructional media, with particular reference to an aspect of it often referred to as technology in education and concerned with the application of the products of technology in enhancing educational instruction. Evolutionally, educational technology witnessed periods of hardware, software, hard-software systems and of course, "interactive ware' approaches in the description of the use of technology in education and which probably informed, the use of such "terms as "apparatus', 'audio aids', 'visual aids', 'audio-visual aids', 'teaching aids', 'educational materials', "educational resources', 'teaching or instructional materials', and instructional media'.

Thus, an analysis of the varied conceptions of authorities in relation to communication media generally, with particular reference to instructional communication and for the purposes of this study, instructional devices are referred to as instructional media and consists of all the communication media enhancing or facilitating technologies used for instructional purposes as well as the language codes verbal or non-verbal which they carry across from the teacher to the learner or receiver, This is irrespective of an awareness of the conception

that in communication generally, there is a distinction between media and channel. Communication media means the verbal (written or spoken) and non-verbal forms of language while channel consists of the systems and technologies that may be used to convey the media, In other words, Instructional media here and for the purposes the study refers to both the systems and technologies (i.e. the channel) as well as the language codes, whether verbal or non-verbal (i.e. the media), which the channel 'bears or conveys across from teacher to the learner or vice versa. In other words, the researcher has rationally and logically adopted the use of instructional media and thus takes it to apply in all cases irrespective of the term used in reference thereto.

Classifications of Instructional Media

Edozie (2003), classified educational media in five different ways viz, (1) Hardware, software and hard-software, (2) Electronic and non-electronic, (3) projected and non-projected, (4) Phenominals and manipulatives, (5) Print and non-print.

1.   Hardware, Software and Hard-software Media:

Hardware, include ail machines or devices (equipment) used in an instructional process e.g. television, video, radio-tape recorders, projectors and so on. They car be touched with the hands and seen with the eyes.

Software include materials used for instruction like charts, films, tapes and so or referred to as software carriers, and not as defined by computer experts computer programme, procedures, rules and any associated documentation concerned with the operations of a data processing system" (computer programmes being used as a series of computer instructions that cannot be seen or touched through which instructions or commands are given to a computer system).

While hard-software is formulated to describe instructional materials (software carriers) since they can be seen and touched - a hybrid or inter-mixture of hard and software viewed from computer expert ideas of software 'stricto senso'.

2.   Electronic and Non-Electronic Media:

Electronic media include:

  i.   Audios - audio records, radios (or transistors), telephones, public address systems, phonodiscs, and language laboratory.

 ii.   Visuals - overhead, opaque, slide, and filmstrip projectors as well as video camera.

iii. Audio-visuals - television, computer system and film projectors. Non-electronic media should accordingly include all materials that do not depend on electrical power manipulations.

3.   Projected and Non-Projected Media:

a) Projected media includes; - transparencies, slides, filmstrips, video tapes, VCD/Diskettes and Opaque materials; while

b) Non-projected media includes; educational-boards, globs, charts, models, realia, photographs and cards.

4.   Phenomenal and Manipulatives Media:

A.   Phenomenal refer to community resources which are useful in communicating curricular contents. They include; phenomenal; (a) Human-experts, resource persons, celebrities, public figures, people of a place;   (b) Naturals - oceans, seas, rivers, lakes, springs etc./ mountains, valleys, ecological disaster sites (erosion, floods etc), vegetable resources, forest/game reserves; (c) Culturals- bridges, roads, buildings, festivals, construction sites/projects, factories, zoo, museum, palace, farms.

While (B) manipulatives consists of practical skills and activities .i.e. communication materials and resources that learners actually handle skillfully or

manipulate - expertly as a precondition for the desired behavioural changes to occur (lyang-Abia and Umoren 1994 in Edozie (2003). The manipulatives include; (a) Tools/Instrument - cutting tools, holding tools, drilling tools, drawing instrument, agricultural implements, sewing tools, weather/mapping instruments, driving tools;

(b) Equipment - lathe machines, sewing machines, gas cooker, computer system, generator, engine, welding machine, battery charger, spraying machine, tractor;

(c) Contrivances and Practical Materials - puppets, simulations and games, animated cartoons, clay, practical specimens (like frog, insects, rabbit), food items, clothing materials, electric wire, chemicals, metal, wood etc.

5.   Print and Non-print Media:

The print media consists of curriculum resources in book form. E.g. (a)Texts - textbooks, workbooks, journals, manuals, guides; (b) Reference Books, encyclopedia, dictionary, thesaurus,, abstracts of research, dissertation, atlases;

(c) Periodicals/Advertor- magazines, newsletters, newspapers, bulletins, posters, printed charts;

While non-print media consists of all forms of instructional media other than the prints media.

According to Mangal and Mangal (2010), besides the two distinctive forms of the media-verbal and non-verbal, instructional media may still be classified

depending sensory experiences using a different approach as audio media, visual media, audio-visual media, multi-sensory media, .mass media and multi-media:

1.   Audio Media: This consists of media forms that appeal to the sense of hearing only. Includes radio, tape recorder, etc.

2.   Visual Media: This include communication through charts, diagrams, graphics, magazines, newspapers, demonstrations and illustration things usual media and others that applied to sense of sight.

3.   Audio-Visual: This consists of those media that appeal to the both senses of hearing and sight at the same time. It includes such electronic systems as video.

4.   Multi-Sensory Media: "Our senses are said to be the gateway of knowledge. Hence, each of the five senses (sight, hearing, smell, taste and touch) separately or in combination may work well as an effective media for the communication process". This involves making use of the different types of media and aid material involving as many senses as possible.

5.   Mass Media: This includes all communication media used in carrying out communication with the masses. Radio, television, video, cinema, films, printed media like books, newspapers and magazines, the internet communication in the form   of e-mail,   teleconferencing, and   satellite communication and transmission all come within this   provision.   The on-line education and

correspondence courses run by many institutions make use of the mass media in a quite formal and organized ways.

6. Multimedia: A communication process may be termed as based on the multimedia approach when it employs a number of media in a planned and organized combination for deriving the maximum output in a particular communication situation.

Kumar (2008) also classified the instructional media according to level of technology into "low tech", "Medium tech" and "high tech" as follows;

Low Tech; Paper (via surface mail), Video tape, Audio tape, E-mail, Listserve posting, Local resources (e.g. libraries, mentors, local faculty, etc), Phone.

Medium Tech; Web-based resources, FTP, Newsgroups, Existing software, Conferencing call, Fax, Voice mail, Telnet.

High Tech; 2-way video conferencing, Satellite (1-way video conferencing), Desktop videoconferencing, Web-based plug-in resources, Audio graphics, Real Audio, Real\Video, Podcasting, Computer conferencing, Chats, Web-based telephony, Shared f workspace, Digital drawing pads, Hand-held scanners.

Aggarwal (2007) classified instructional media into six (6) different forms;

i. Projected and non-projected aids';

ii. Audio, visual, and Audio-visual materials';

iii. Hardware and software';

iv. 'Big Media and Little Media'; the big media includes; Computer, VCR and TV. While little media include radio, films strips, graphic, audio cassettes and various

v. Three Dimensional Aids'; (a) Models, (b) Mock-ups and (c) Specimens. Three dimensional aids are replicas or substitutes of real objects.

vi. 'New technologies in education'; these includes; Computer, Artificial Intelligence (AI), Computer Assisted Instruction, CD-ROM (Compact Disc Read Only Memory), Dial Access, Educational Television, EDUSAT (Educational Satellite), E-mail (Electronic mail), Teleconferencing, Tele-lecture, Tele-tutorial, Tele-seminar, Video, Interactive , Video-tex, Video conferencing, Digital Resources, Virtual University, Internet.

Abolade (1999) also observed that media can be classified by their forms or functions in the educational systems, as: big media and little media; hardware and software, projected and non-projected, locally produced and commercially procured, consumable and non-consumable materials, or classified by way of encoding or response demand. Russel (1976), also classified instructional media into five basic categories, namely print media, projected media, audio inputs, real objects and human interaction. This he derived from .an appraisal of Edgar Dale's Cone of f Experience.

Interactive Instructional Media

These varied classifications based on varied criteria made by varied authorities may guide us to here attempt a classification of instructional media based on **interactive** and **non-interactive** media. Interactive instructional media consists of those communication technologies that provide for a two-way interaction between the teacher and the learner, and among or between the learners. According to Kumar (2008), interactivity means a two-way communication. Rao (2008) also noted that interactive multimedia technology is any computer-delivered electronic system that the user to control, combine and manipulate different types of media such as sound video, graphics, and animation.

Thus, such media provide opportunity for interactive group communication or a real time interaction between two or more people in two or more locations through electronic medium. As noted by Kumar (2008), these technologies in most cases are not single technologies, but a combination of hardware and software, media and delivery systems. Interactive media are various forms of e-learning and are in the main, software application systems that use various forms of electronic and internet tools, hardwares and service providers to provide person to person and group interactions not minding the location and time variation. They make

communication seem like everyone is in one room even if they are on separate continents. They include such systems as;

(1) Various forms of electronic conferencing - Audio conferencing, video conferencing, Audio-graphic conferencing, Audio-visual conferencing teleconferencing (Telephony), Computer conferencing and web conferencing. (2) Multi-media (3) Online chat or (web chat) (4) Application sharing (5) Blog (weblog) (6) Screencast (7) Webcam (8) Podcasting (9) Interface computing (10) File sharing (11) Collaborative software (12) Wiki application system (13) E-mail (14) faxing (15) Skype (16) Instant messaging (internet chat) (17) Computer mediate communication (CMC) (18) Close Circuit Television (CCTv) and others. The Non-interactive media are those technologies that provide one-way communication system from the teacher to the learner. They include all other instructional media that cannot be included in the interactive list. The classifications of Edozie (2003) earlier presented provides a guide.

The concept of interactive technology can actually be traced back to the teaching apparatus in the early 1920s (Chen, 1991). Unfortunately, such ideas as individualized learning and immediate feedback did not reform the educational establishment as Sidney Pressey, the creator of the teaching apparatus machine, expected. The next significant development in interactive technology came as a result of B.F, Skinner's teaching machine and N. Crowder's branded programmed

instruction in the 1950s. Although the novelty of these machines wore off fast, the branched programmed instruction approach was the fore-runner of computer-assisted instruction (Chen, 1991). Since the early 1960s, CAI has become an important tool in teaching and has had many powerful instructional features such as individualized pacing, branching, immediate feedback on answers and reinforcement (Chen, 1991).

Media in distance learning not only incorporate interactive formats (Brodman, 1993), but are also multi-media in design. As postulated by Perraton (1988), the most effective approach to utilization of media in distance education is the multi-media approach. Multi-media systems sprang to light in recent decade and are based on widespread distribution of instruction through various media such as printed matters, television, audio and videotape, education software etc. (Trentin, 2000), Multi-media -have been reported as not only exploding but causing a revolution in instructional methods by making learning interactive and self-pacing. Some of the technological 4 options, identified by Brodman (1993) as incorporating interactively includes; Interactive Video Disc (IVD), Compact Disc-Interactive (CD-I), Digital Video Interactive. Others are Compact disc - Read Only Memory (CD-ROM), World Wide (www), Electronic Mail (E-mail).

Some of the interactive media are specifically described as follows:

1. **Electronic Conferencing:**

Conferencing according to Oxford Advanced Dictionary of current English, means "the activity of organizing or taking part in meetings, especially when people are in different places and use telephones, computers or video to communicate", Thus, conferencing and with particular reference to it as an instructional media, connotes a class meeting or interactive session between the teacher and the learner and or among the learners for instructional purposes. An interactive group communication or a real time interaction between two or more people in two or more locations through an electronic medium" (Mangal and Mangal 2010) or "a two-way electronic communication between two or more groups or three or more individuals who are at .separate locations" (Aggarwal 2007:109). Thus conferencing describes the use of sophisticated electronic technologies in providing a two-way interaction between and among individuals or groups of people who are separated in space or who are at different locations, thus, a substitute for face-to-face meeting. According to Aggarwal (2007), in distance education, conferencing provides:

i.   Expert instructors to remote schools, colleges and universities

ii. Offers quality instruction to learners scattered over several sites or over a large area.

iii.   Allows learners to interact with the expert and with each other at multiple locations, and

iv.   Provides in-service training without leaving the workplace.

The reference to conferencing as teleconferencing by Aggarawal (2007) connotes the use of telephone in all the conferencing systems. This may be misleading since such conferencing as computer and web conferencing do not use phone. Rather, there shall be a distinction between teleconferencing and the other forms.

The equipment often required for conferencing include; satellite transponder, stubs, studio uplink with earth station that can uplink the programme to the satellite, and ' reception centres with direct reception facilities which can download the programmes uplinked from the studio; telephone, and computer network. There are different types of conferencing classified base on the information communication technologies employed in the conferencing. They include:

(i)   Audio-conferencing: This is conducted by linking several telephones of different location together into a network that allows all the stations to transmit and receive spoken messages at a time, It is often amplified for group listening. It is a natural extension of the person-to-person telephone calls'. For enabling communication and conversation among more than two persons at a time.

(ii)   Video-conferencing: This is conducted by providing full audio-visual message transmission among all linked stations, or limited one-way video transmission from one station supported by multi-way audio transmission among all the satellite stations. In other words, it provides oral and sight view of the faces and actions of the participants in the conference, irrespective of locations, through the use of television and audio systems.

(iii). Audio-graphic conferencing: This is conducted by the use of audio conferencing system, supported by some transmission and visual display systems such as fax, electronic whiteboard, networked personal computers, or special purpose slow-scan 'television camera systems that can capture and transmit still images and printed materials from one station to another. Thus it involves integration of different teleconferencing systems or possible synthesis of different modes of teleconferencing and possibilities of signal transmissions.

An audio-plus transmission system, also called audio-graphic system, employs the interactive audio as the basic system supplemented by some form of one-way visual display. Examples of the audio-plus system are as follows:

- Electronic whiteboard: It is a pressure-sensitive surface that converts anything written or sketched into digital information. Remote viewers look at the monitors; they may be able to see chalkboard work as it progresses.

- Slow-scan television system: It transmits black-and-white still photographs of real objects, people and visuals at intervals of 15 to 30 seconds.

- Electronic overhead projection: It transmits the instructor-drawn graphics to project on overhead projectors for remote learners.

- Videotex system-teletext: Colour pages of digital information with text and graphics is sent to viewers to view it on colour television receivers. A central computer is the key component in such database systems.

- Document/facsimile transmission (FAX): Electronic copies of pieces of type-written information are transmitted to all sites to be duplicated as paper handouts.

- Compressed video: Selected bits of video information are transmitted to remote television in colour but with limited motion. Full-motion video transmission may also be employed merely to transmit a video programme (Kumar 2008).

(iv). Computer conferencing - This is conducted by the use of computer network system. With the use of computer technology and its networking system, individuals or groups or participants in a conference can send focus text and graphic messages as well as view the faces, actions and conversations of conference participants through the web cameras. Computer conferencing has an added advantage of permitting people to participate synchronously at the same

time and asynchronously at different times according to their conveniences. For this, purpose, transmitted information may be stored and used later by a participant at his convenience time. Participants in this context need not all be at their computer terminals at the same time.

(v).   Videotext system conferencing - This is conducted by the use of video conferencing system supported by text transmission systems, as videotext or tele-text systems where digital information with texts and graphics can be sent to the participants for viewing on the monitors and television screens.

(vi).   Web-conferencing - This is conducted through the use of World Wide Web (www) - websites. Participants receive and send information through established websites. The audio and video signals get beamed to the satellite when the teacher station in front of the camera. The satellite sends signals back to the earth.

The reception terminals receive the signals where the reception dish antennas have been installed and are oriented towards the satellite transponders. Thus, the teaching s now can be viewed and heard in the classroom. Aggarwal (2007) referred to it as Edusat and noted that it provides the following channels:

  i.   Virtual classroom through two-way videoconferencing

 ii.   Educational broadcast with or without interactive facilities

iii.   Virtual classrooms through computer conferencing both real-time as well as asynchronous.

iv.   Digital storage and retrieval of educational software at convenience

v.   Internet-supported interactive learning.

(vii). Teleconferencing (Telephone Teaching): The telephone has offered a direct substitute for student/tutor interaction. The student can receive an immediate response to his question through the telephone as in the lecture. Advances in telephone technology now allow individuals or groups of people at two or more locations to hear and be heard clearly and easily. According to Heinrich, Molenda and Russel (1985 in Edozie 2003), the use of telephone is an example of audio conference which involves a live, two-way conversation using the telephone to connect people at different locations. Although Telephone teaching is prohibitively expensive, since cost depends very much on geographical factors and phone company pricing policies, if distance education systems wish to provide a wide range of courses to students in remote campus, telephone tuition is the on y practical way of providing two-way interactive tutorials (Sharma, 1997). Telephone, Tele-tutorial and tele-seminar are equally forms of telephone teaching. The preparation of tele-lecture has much in common with the preparation of a face-to-face lecture except that the structure of the message and its packaging in different forms of media and materials must take into account the constraints of the particular system that is going to be used. A telelecture is usually followed by pre-telecast preparation and follow-up.

2. **E-Learning:** Electronic learning is "a learning carried out, supported and * facilitated by the use of advanced multimedia facilities as well as internet and web-technology, delivered to the end users via computers, laptops and mobile ICT appliances" (Mangal and Mangal 2010:357). E-Learning provides learning experiences to the learners using advanced communication technologies involving multimedia, internets, web services and M-learning services. It is electronically carried out and is facilitated by such advanced electronic information and communication media as CD-ROMs and DVDs, E-mail, live chat, internet and web facilities, on-line reference libraries, video game-style, simulations, etc. It uses E-mail, as well as synchronous and asynchronous communication styles;

(i). **E-mail Style:** E-mail is used in distance education to send individual messages. E-mail is personal messaging in which learners and teachers can work one-on-one. It allows for communication between the teacher and student, A learner can also exchange information with other learners. Thus, E-mail is a tool to facilitate learning activities by gaining feedback from the teacher or other learners (Huang, 2000).

(ii). **Asynchronous Communication Style:** In this style, the course information or learning experiences are passed to the learners through e-mail, discussion forum, web pages, web logs, blogs, wikis or through recorded CD-

ROM and DVD. As a result, the teachers and learners do not interact simultaneously. Instead, messages/information/reading materials are posted on a forum or web page or are sent as e-mail. At an unspecified time later, a reply is provided. Any follow-up questions are dealt with through additional postings or messages with requisite delays.

(iii).   Synchronous Communication Style: Here the communication between the teacher and student directly occurs in an on-line chat room through live audio-video conferencing. It allows them properly to gather at a specified time for communicating with each other regarding the course material. As a result ~a teacher can provide valuable information, lecture or share one or the other learning experience with his students. He can immediately respond to the queries and questions put to him by the students. The follow-up questions can also be addressed immediately at an appropriate level of details. Moreover, the teacher can inquire as to whether the students are clear on what has been communicated to them as a course material or learning experiences. In .this way, synchronous communication offers proper opportunities of lively interaction between the teacher and students although in *virtual reality in a system of e-learning.*

Thus, e-learning can have a variety of modes and styles for its operation serving as a support provider, collaborator or partner and substitute or alternative of the real time actual teaching-learning encounters of our classrooms. In all of its three

forms, e-learning tries to maintain its basic features, i.e. providing learning experiences to the students through the adoption of advanced learning and communication technologies involving multimedia, internet, web services and m-learning. Further, for adopting its styles of communication between the teacher and students, it may choose the 'synchronous style of communication held in real time setting or the asynchronous style to allow the students to undergo the desired experiences at their own pace and convenience.

According to Mangal and Mangai (2010), e-learning, characterized as the learning devoid of time ad space and carried out through the advanced technologies involving multimedia, internet, e-mail, website, mobile phone, ipod, etc, may prove quite an effective tool and technique for rendering valuable support, assistance and alternative to the traditional system of education.

3. **Online Chat** may refer to any kind of communication over the internet that ill offers a real time transmission of text messages from sender to receiver. Chat messages are generally short in order to enable other participants to respond quickly. Thereby, a feeling similar to a spoken conversation is created, which distinguishes chatting from other text-based online communication forms such as internet forums and email. Online chat may address point-to-point communications as well as multicast communications from one sender to many

receivers and voice and video chat, or may be a feature of a web conferencing services.

Online chat in a less stringent definition may be primarily any direct text-based or video-based (webcams), one-on-one chat or one-to-many group chat (formally also known as synchronous conferencing), , using tools such as instant messengers, internet Relay Chat (IRC), talkers and possibly MUDs. The expression online chat comes from the word chat which means "informal conversation". Online chat includes web-based applications that allow communication-often directly addressed but anonymous between users in a multi-user environment.

The following are common chat programmes and protocols: Apple messages, AOL /Instant Messenger (AIM), Camfrog, Campfire, Gadu-Gadu, Google Talk, 12p-Messenger, ICQ (OSCAR), Internet Relay Chat (IRC), MUD, Paltalk, QQ, Skype, Talker, TeamSpeak (TS) Whatsapp, Windows Live Messenger; Chat programmes supporting multiple protocols include; Adium, Google+ Hanouts, IMVU, Kopete, [Miranda IN, Pidgin, Quiet Internet Pager, Trillian, IBM sametime, Windows Live Messenger while Web sites with browser-based chat service include, Cryptocat, /eBuddy, Facebook, FilmOn, Gmail, Google+, Hall.com, MeBeam, Mibbit, Talkomatic, JTinychat, Trillian, Userplane, Wireclub, Zumbl.

4. **Multimedia:** Originally the term multimedia is the delivery of learning experiences through a combination of text, TV, telephone, audio cassette and the radio. In other words, delivering learning experiences through the use of multiple media (Kumar). Currently however, multimedia is not just the 'use of many media but it is the synthesis' of the many media (Kumar 2008) with reference to Encyclopedia Britannica multimedia is defined as follows:

> *Computer delivered electronic system that allows the user to control, combine and manipulate media, such as text, sound, video, computer graphics and animation. The most common multimedia- machine consists of a personal computer with a sound card, modem, digital speaker unit, and CD-ROM. Interactive multimedia systems under commercial development include: cable, television services with computer interfaces that enable viewers to interact with TV programs; high-speed interactive audio-visual communications systems, including video game consoles, that rely on digital data from fibre-optic lines or digitized wireless transmission; and virtual reality systems that create small-scale artificial sensory environments (p.205).*

Interactive multimedia technology is any computer delivered electronic system that allows the user to control, combine and manipulate different types of media such as text, sound, video, graphics, and animation (Rao 2008). Interactive multimedia has been called a "hybrid technology". It combines the storage and retrieval capabilities of computer database technology with advanced tools for viewing and manipulating materials. It has the following features;

Interactive multimedia is any package of materials that includes some combination of texts, graphics, still images, animation, video and audio.

These materials are packaged, integrated, and linked together in some way that offers users the ability to browse, navigate and analyze these materials through various searching and indexing features, as well as the capacity to annotate or personalize these materials;

Interactive multimedia is always "reader-centered." In interactive multimedia; it is the reader who controls the experience of accessing the material by being able to select among multiple choices, choosing unique paths and sequences through the materials. One of the key features of interactive multimedia is the ability to navigate through material in whatever ways that are most meaningful for individual users.

Kumar (2008), compared multimedia to human beings as follows;

Human Capabilities	*Multimedia Capabilities*
A human being can	*Multimedia can*

- *Write*   *Print*

- *Draw lines*   *Draw lines*

- *Make graphics*   *Make graphics*

- *Draft pictures*   *Show pictures*

- *Talk*   *Play voices*

- *Sing*   *Play music*

- *Respond to touch*   *Respond to touch-screen, keyboard, mouse, etc*

- *See and react*   *Respond to hand movement*

- *Respond to voice*   *Respond to voice*

- *And think!*   *And interpret input!*

And concluded that man is developing multimedia in his own reflection.

5.   The Computer System: "An electronic machine that can store, organize and find information, do calculations and control other machines". Oxford Advanced Learner's Dictionary, 7th Edition). The computer thus, is a complex electronic communication device or machine. It accepts information (data or input) through an input device, (the keyboard). It then processes the information

with instruction or programmes stored in its memory. And then produces a resultant information (the output) through an device (the printer) or it stores the processed information for future retrieval.

The computer is capable of "thinking", learning', 'reasoning' and 'decision making' (Kumar 2008). In other words, the computer generally performs numerous functions and with particular reference to education, its function ranges from individualizing instruction, providing meaningful interaction, real life situations, access to information, solutions to problems and others. Its application to instruction is commonly referred to by such terms as Computer Aided Instruction (CAI), Computer Assisted Learning (CAL), Computer Managed Instruction (CMI) and others (Aggarwal, 2007). According to Mangal and Mangal (2010), the use of computers is the latest and the most useful link in the use of hardware technology in the field of instruction and education. The services rendered through them in the form of the utilization of multimedia, word processing, Power Point presentations, database management, retrieval and storage of information, access to internet and worldwide web services, e-learning, tele and videoconferencing, etc. have been proving their worth in the planning, organization, execution and controlling of all the tasks and activities related to education and instruction, both at the individualized and group or mass level.

6. **The Internet:** The internet, otherwise known as the NET or International Computer Network or "the information superhighway" is a worldwide collection of computer networks i.e. a bunch of computers hooked together in order to communicate. The network shares digital information through a common set of networking and software protocols. Anyone from any part of the world can connect a computer to the internet and communicate with the other computers and users on the net. The internet is a global network of computers with worldwide collection of digital telecommunication links that share a common set of computer-network technologies, protocols and applications. With the internet, different forms of computers speak the same networking language, and use functionally identical programme and exchange information, even multimedia pictures and sound, with the next door neighbor or across the planet. The internet services are not restricted as those of intranet and extranet which serve only members. The World Wide Web i.e. a bunch of pages of information - texts, pictures etc. connected to each r around the globe, depends on the internet system, E-mail services also depend on the internet.

According to Aggarwal (2007), internet is the abbreviation of inter-network systems and is described as a network of the computer system. In a general sense, the internet is defined as "a global pool of information and services, accessible by means of locally executed interface software. When two or more computers or

other devices are connected together in such a way that they communicate by sending message to i, each other, they form a network.

Educationally, the internet;

1. provides access to information and contains huge quantity of data on numerous topics;

2. Provides wider access to good quality education at a low cost;

3. Provides information and education to the wider population located in every nook and cranny of the globe;

4. Serves as a tool to disseminate large quantities of information, to propel the masses forward on a path of prosperity in the shortest possible time with minimum resources;

5. Provides interesting and interactive learning process,

The internet would also remove the limitations of:

  i.   Classroom sizes, fixed timing of imparting education,

 ii.   Restrictions on the learner's pace of learning, and

iii.   The learner's ability to afford quality education at the best school, college or university anywhere in the world.

7. **Interactive Video and** Text: This technology combines the attributes of sound, motion, colour, audio and tailored information via branching presentations. Interactive video permits a viewer to participate in a simulated conversation on the TV screen. On account of its heavy costs and complexity the service of this medium das not expanded in the field of education as anticipated earlier. Interactive video typically consists of a micro-computer and a video source (either video-tape or videodisc) with the ability to present both computer text and true video scenes within the same instructional lesson (Milheim, 1990 in Aggarwal 2007). A computer interface connects each of these parts into a single presentation medium to be used by the student. Studies have shown that interactive video is widely used in delivery of distance education (Harrington, 1990; Melhein, 1990; Brodman, 1993, Galusha, 1999). Interactive Videodisc regarded to be more versatile than video cassettes. Discs are reported to have advantages over cassettes: freeze-frame, a rapid and accurate search, large single frame storage capacity, slow and speeded-up motion and lower machine cost (Bates, 1988). Videotex involves the transmission of display text and graphics and their reception on a television set. Videotex is of two types: (i) Broadcast Videotex (telecast), and (ii) Interactive Videotex (View Data). Both are used for educational purposes.

8. **Closed circuit Television (CCTV)** - It is the selective telecast which can be used only by specially equipped receivers. Its range is limited to the length of

the cable. CCTV can be used to great advantage in educational institutions. Its capabilities are asunder:

i.   It increases the range of instruction to one or more locations beyond the classroom.

ii. It enables institutions to present televised instruction in accordance with their specific needs and schedules.

iii. It provides opportunities for the exchange of professors and courses between one institution and another linked to a circuit.

iv. In teacher training institutions CCTV with video-tape-recorders can be used to record performance of the teacher trainee during micro-teaching lessons. Videotape provides the necessary feedback.

v.   CCTV is used in many medical colleges in developed countries. The entire operation can be covered by using a single television camera or a battery of cameras located at vantage points.

Roles of Instructional Media in Instruction

In this age of information communication technology, the place of instructional media in instruction can hardly be over-emphasized nor neglected. Instruction cannot take place without the media. Successful instruction is sustained by effective communication which in turn reasonably depends on the appropriateness of the instructional media (Mangal and Mangal, 2010). According to Aggarwal

(2007), classroom communication is very important in teaching-learning, as it is the chief means by which the teacher and the student work together. "Effective teaching and communication are synonyms; for good teachers are clear communicators and good 'communicators are effective teachers...our society today has a vast array of modern .media of communication.. These communication media are among the tools, the education profession uses to mould and shape human minds" (P. 217).

According to Aggarwal (2007) Instructional media are devices that help the teacher to clarify, establish, co-relate and co-ordinate accurate concepts, interpretations and appreciations and enable him to make learning more concrete, effective, interesting, inspirational, meaningful and vivid. They help in completing the triangular process of learning viz: motivation-clarification-stimulation. The basic assumption underlying the use of media is that learning-clear understanding-stems from sense experience. The teacher must 'show' as well as 'tell' The media provide significant gains in informational learning, retention and recall, thinking and reasoning, activity, interest, imagination, better assimilation and personal growth and development. The aids are the stimuli for learning 'why', 'how', 'when' and 'where'. The 'hard to understand

principles' are usually made clear by the intelligent use of skillfully designed instructional media.

To Gandhiji (1992 in Aggarwal 2007), "True education of the intellect can only come through a proper exercise and training of bodily organs - hands, feet, eyes, ears and nose" (P.206). In the words of Edgar Dale (1968), "Because audio-visual materials supply concrete basis for conceptual thinking, they give rise to meaningful concepts enriched by meaningful association, hence they offer the best antidote for the disease of verbalism" (P. 112).

Aggarwal (2007) specifically identified some of the important values of the proper use of instructional media as follows: encouraging students to develop more interest, zeal and attention; helping to reduce verbalism and thus gives clarity to concepts and, accuracy to learning and providing clear images through the use of sense organs-,see, hear, touch, taste and smell, as our experiences are direct, concrete and more or less permanent. Learning through the, sense becomes the most natural and consequently the easiest. They provide first-hand educative experiences and or substituted experiences, as well as variety where necessary; 'mere chalk and talk' do help. Hence, they offer opportunities to students to handle and manipulate things. Helping to increased retention of learning; Enabling the teacher to follow the ; maxims of teaching like 'concrete to abstract', 'known to unknown' and learning by doing' and helping the teacher in providing proper

environment for capturing as well as sustaining the attention and interest of the students in the classroom work. • Instructional media help in achieving this objective by providing several activities, experiences and stimuli to the learners. A good deal of energy and time of both the teachers and students can equally be saved on account of the use of media as most of the concepts and phenomena may be easily clarified, understood and assimilated through their use. The use of media provides a touch of reality to the learning J situation, Instructional media, through their wide variety of stimuli, provision of active participation of the students and vicarious experiences encourage healthy classroom interaction for the effective realization of teaching-learning objectives. Instructional media help in providing opportunities for education to people living in remote areas. They also help in promoting adult and distance education. In place of listening to facts, students observe demonstrations and phenomena and thus cultivate scientific temper. Unlike verbalism which promotes memorization; uses of appropriate media stirs up the imagination, thinking process and reasoning power of the students, calls for creativity, inventiveness and other higher mental activities on the parts of .students and thus help the development of higher faculties among the students. The media prove effective reinforcements in increasing the probability of re-occurrence of the responses, associated with them and thus render valuable help in the teaching-learning process. Use of instructional media helps in the learning

of other concepts, principles and solving other real problems of life by making possible the appropriate transfer of learning and training received in the classroom, to real life situation.

With reference to the interactive or new information technologies Aggarwal (2007), observed the following key factors in the application of the media in distance education;

Factors in the application of media in Distance Education

Factors	Development
Time	The time factor will no longer be a constraint. Asynchronous education frees the student from the demands of time.
Space	The distance factor will no longer be a constraint. The student can take part in education without being physically present at the teaching institution.
Cost	The pedagogical investment for modern distance education is certainly greater than that of the traditional model, whether in terms of initial outlay or the investment connected with delivering the education. There are two factors, however, which will reduce the overall cost in factors of scale: The reduction of

	needs in terms of area and premises; and The appreciable increase in the size of the virtual class.
Relationships	The traditionally vertical teacher-student relationship will evolve towards a more horizontal model, in which the teacher becomes active. *In* this evolution of roles the group will gain importance as a source for consultation, dialogue and collaboration. Through this mechanism the education is 'received' by the individual in interaction with a group, of which the teachers constitute only one element. Roles are thus completely redefined, and the dynamism of the new roles requires a new student.
Information /Knowledge	The transfer of knowledge is no longer the primary object of education. The student must learn to gather information as the need arises, to evaluate it, and to transform it into knowledge through the relational process.
Market	By easing the constraints of space and time, education will open up to the global market, where language will become one of the main constraints on expansion.

Competition /Collaboration	The internationalization of the education market and the emergence of new entities placed deliberately in the commercial area will intensify competition between educational establishments. In parallel, collaboration and strategic alliances on the part of universities will become imperative as the appropriate response to change.
Assessment	The traditional concepts of student assessment based on examination results will have to be adapted to new methods in which the assessment of the process will gain more importance so that the measuring of assimilated knowledge can be circumvented and factors more sensitive to the equation of the new professional can be integrated: ability to carry out research, to adapt, to communicate, to collaborate, etc.
Type	The distinctions drawn between the various types of education (primary, secondary, technical, university, vocational) will become less important, and the emphasis will be placed on continuing education.

(UNESCO 1998 in Aggarwal 2007)

Interactive Instructional Media and Distance Education

Authorities are nursing fears that Distance Education may sooner or later displace the traditional face-to-face educational system. The fears are informed by the "tremendous advantages and opportunities that the system provides in the educational system. For instance, Schiffer (2000) observed that distance education is the hot topic in higher education these days. It provides answer to the problems of availability, accessibility and cost, and the demand for the flexibility in time, place and pace of learning. It is not new but its use of interactive Computer Mediated Communication (CMC) systems is new and intriguing.

It is however equally noted that Distance Education is essentially self-learning, and requires great will power, self-discipline as well as suitable learning skills on the part of the students; that it suffers inferior public image and or low popularity compared to conventional studies; and that different skills and media are required to successfully teach at a distance. The Schiffer (2000) referred to such authorities as, Sewartt, Keegan and Homberg (1983), Strain (1987), Hackman and Walker (1990), Forsyth (1996), Keegan (1996), Khan (1997), and Beller (1998), to suggest that there is a need to mount training programmes on how to use the technologies or software in distance education.

Thus, the essence of distance education is well established but the concern is on measures to make it effective, how to bring up Distance Education to be at par with the traditional four wall education. The panacea seems to lie on the

instructional media,-systems and technologies that not only serve as the link between the teacher and the learner but provides the overall teaching-learning environment. In other words, the success and operation of distance education is sustained by the use of technological media, which provides the link and serves as the means of instructional delivery. This is with particular reference to interactive media or technologies. Instruction media is of particular essence in distance education. For one, there is a wide gap in place and or in time and space between the teacher and the learner as well as between and among the learners. It is only appropriate instructional media can fill the gap. Many authorities are of this view; Mangal and Mangal (2010), toe (1990), Garrison and Shale (1994), Portway and Lane (1994), Moore and Kearsley (1996).

When students and teachers are geographically separated, technology is used to their communication (Mangal and Mangal 2010). The Mangals further expatiated that; "Teaching-learning in its desirable form is always designated as a two-way process needing a well-maintained communication link between the source teaching and the learner" (P. 127). A distance education programme also needs a proper media/multimedia or help from the developed technologies for its desired communication and delivery to the distant learners. At the present, there are a lot of media available for this purpose in the form of multimedia like print, radio-audio, television/video, telephone, telex, e-mail, fax, and internet along with the

unlimited opportunities of interaction and communication provided through the large scale computerized, teleconferencing and satellite-based communications. The success of a course or programme, in fact, very much depends upon the availability, selection, accessibility and employment of the available communication media and technologies not only on the part of the distance education institutions but also on the part of the learners for whom it has been generally or specifically designed.

Commenting on the usefulness and desirability of the communication media and Ethnology available for distance education, Ramanujam (2007) writes:

> *Computer technology and satellite communication have opened up a wide range of interactive media which enables the students to overcome the communication terrier imposed by the physical distance between the learner and the teacher/institution in the context of distance education. However, the questions related to availability, access and use of relevant technology for distance education need to be considered carefully, before institutions commit themselves to policies of technology and multimedia (P.205).*

Teachers' Guide to Distance Learning (1999), it is pointed out that - Distance technologies (instructional media) can provide convenient locations for both students and instructors. Many of the technologies, such as the internet, videotape, and telephone, are easily accessed at home. Others, such as desktop videoconferencing, can be distributed from a single point (such as schools). Satellite transmissions can be viewed at specific sites, or the transmissions can be videotaped for later viewing at home or school.

Delling (1996) called instructional media the 'signal-carriers', and noted that "because of the physical distance between the instructor and learners in distance education, the delivery medium plays a crucial role in minimizing the gap between teaching and learning". He noted further that in previous decades, correspondence study encouraged learning at home and communication with instructors, who offered guided readings and frequent tests. Print materials such as textbooks, study guides, workbooks, course syllabi and so on, served as a fundamental element of distance education. This correspondence study was the first generation of distance education. The second generation involves the use of audio and radio, while third generation consisted of course materials delivered via broadcast television, videotape, interactive TV, interactive telephone, satellite and cable. The fourth generation of distance education consisting of computer networks and computer-

based multimedia workstations has existed for the past decade or so (Huang, 2000).

While explaining the term transactional distance, Moore (1990) emphasized that it not merely mean the physical distance between the two. The distance in education is not determined by the geographic separation of educators and students. When students do not take interest in their learning and are not engaged in a meaningful dialogue with educators, there is tremendous distance between them, even if they are under the same roof. However, if teaching is structured to afford students opportunity for having a creative and meaningful dialogue with educators, decreases. Therefore, what is needed on the part of the teachers in distance education is to provide the requisite structure for students to meet certain standards earning excellence, along with the necessary opportunity and means to let them age in learning that meets their individual needs.

Distance education permits almost unlimited freedom in the choice of the curriculum, space, time, pace and even media to the learner in the course of instruction and in the educational system. This equally can only be attained through appropriate functional communication media. As noted in Olajumoke (2010), many forms of distance learning technologies provide students the option to participate whenever they wish, on an individualized basis. For example, some students may want to review a videotape in the middle of the night or read their

e-mail during early morning hours. In addition, one student may wish to spend 30 minutes reviewing a website, while another spends an hour; many forms of distance learning involve little or no cost. For example, over 99% of the homes in the United States have televisions and 65% are connected to a cable-TV service (Casey, Dager, & Magel, 1998 in Eya 2004). For these homes, it is relatively easy for the students to watch a videotape or public broadcast television show. In addition, almost all homes have access to a telephone, enabling the use of voicemail and audio-conferencing; and one of the benefits of distance learning is that there is a wide variety of material that can meet everyone's learning preference - at least part of the time. For example, some students learn from visual stimuli, such as video, and others learn best by listening or interacting with a computer program. If distance learning courses are well designed, they will likely offer learners a wide range of choices, thereby proving the optimal combinations of interaction and media.

Furthermore, the rational desire to bring up Distance Education to fall 'on all fours' or prepare favourably with the real time, regular, four walls, face-to-face education, at first to the extent of effectiveness, naturally requires appropriate instructional media Ware capable of creating virtual classrooms where place, time and pace shall not constitute any barrier. According to Peters (1998) distance education replaces the interpersonal communication or group communication

inherent in face-to-face education with some form of mechanical or electronic communications: print, telephone, teleconference, audio,' video, broadcasting, computer, all of the communications have to take place by the use of one or a combination of those technological media.

The Olajumoke (2010) also opines that not only is distance learning convenient, it is also effective. Several research studies have found that distance learning is equally or more effective than traditional instruction when the method and technologies used are appropriate to the instructional tasks, when there is student-to-student interaction, and when there is timely teacher-to-student feedback. In a study conducted at California State University, students who participated in a web-based course achieved significantly higher test scores (Schutte, 1996 in Omotayo 2009) and that contrary to popular opinion, distance learning courses can offer increased interactions with students. In particular, introverted students who are too shy to ask questions in class will often "open up" when provided the opportunity to interact via e-mail or other individualized means (Franklin, Yoakam, & Warren, 1996 in Omotayo 2009). Through- the increased interactions, teachers can better meet individual student's needs.

Thus, the identified features and desires of Distance Education can only be protected by the use of effective instructional media. A basic feature of distance education is that it is offered by the use of technological media. Hence there is no

Distance Education without the use of communication enhancing technologies or facilities that sear the verbal and non-verbal codes, containing the learning experiences. That causes the change in behavior-learning; and herein referred to as the instructional media, and with particular reference to the interactive form.

Availability of Interactive Instructional Media:

Information and Communication Technologies (ICT), often referred to as scientifically designed means or ways of transmitting and receiving information, artificial satellite f dishes and such other inventions as the computer technologies, hard and softwares, internet and digital facilities have jointly made quite a reasonable number of interactive communication systems available for use in different circumstances and purposes. Such interactive communication technologies, systems or applications as phone, various forms of e-conferencing, multimedia, online chat, virtual reality facilities and other forms of electronic communication systems are readily available for various purposes. The instructional system is not left out in the use of these technologies.

According to Harrison (2009), with the introduction of relatively low cost high capacity "broadband telecommunication services in the late 1990s, coupled with powerful competing processors and video compression techniques, such communication systems as videoconferencing has made significant, inroad in business, education and media industries just like all other long distance

communication technologies such as and internet. He noted that video conferencing was very expensive, though, and could not be used for applications such as telemedicine, distance education, and business meetings. Attempts at using normal telephony networks to transmit slow-,scan video, such as the first systems developed by AT&T Corporation, first researched in the 1950s, failed mostly due to the poor picture quality and the lack of efficient video compression techniques. The greater 1 MHz bandwidth and 5 Mbit/s bit rate of the Picture phone in the 1970s also did not achieve commercial success, mostly due to its high cost, but also due to a lack of network effect with only a few hundred phones in the world, users had extremely few contacts they could actually call to, and interoperability with other videophone systems would not exist for decades. It was only in the 1980s that digital telephony transmission network became possible, such as with ISDN networks, assuring a minimum bit rate (usually 128 kilobit/s) for compressed video and audio communication. Many of these technologies, such as the media space, are not as widely used today as videoconferencing but were still an important area of research. The first dedicated systems started to appear in the market as ISDN networks and were   expanding throughout the world. Videoconferencing systems throughout the 1990s rapidly evolved from very expensive proprietary equipment, software and network requirements to a

standards-based technology readily available to the general public at a reasonable cost.

Finally, in the 1990s, internet Protocol-based videoconferencing became possible, and efficient video compressed technologies were developed, permitting desktop, or personal computer (PC)-based videoconferencing. In 1992 CU-SeeMe was developed. In 1995 the first public videoconference between North America and Africa took , linking a technofair in San Francisco with a techno-rave and cyberdeli in Cape , At the winter Olympics opening ceremony in Nagano, Japan, Seiji Ozawa conducted the Ode to Joy from Beethoven's Ninth Symphony simultaneously across five continents in near-real time.

Zuras (2010) also noted that there is a large number of multimedia systems and which find application in various areas including, but not limited to advertisements, art, education, entertainment, engineering, medicine, mathematics, business, and scientific research. Brodman (1993) had also identified interactive videodisc (IVD), compact disc - interactive (CD-I), Digital video interactive, compact-disc-read only memory (CD-ROM), world wide web (web), electronic mail (E-mail) as available interactive media which can be conveniently used for instructional purposes.

On the contrary however, Yaya (2006) carried out a research on the tutorial support materials required for the distance learning system of the NTI in South-

South geopolitical zone of Nigeria and found out that, although most of the support materials researched on were available, the interactive form viz, Compact Disc (CD) internet services as well as electronic/projected materials were the least available, H least accessible and rarely used.

Osunde and Omoruyi (2004) in an evaluation of the students views on the constraints of the National Teachers Institute (NTI) man-power training programmes for teaching personnel in Mid-Western Nigeria, found out that "inadequate finance, inadequate teaching/learning materials, library facilities and laboratory equipment" were the major constraints to effective implementation of the NTI programmes. Falade (2008) too, in a study on Assessment of Available and Utilized Media in NTI distance education in Oyo State had discovered that modern or sophisticated instructional media such as E-mail, internet, radio, television, satellite broadcast and conferencing were not available in the NTI distance education, according to the Falade (2008), findings on the type of instructional media available in the distance education revealed that modern or sophisticated instructional media such as e-mail, internet, radio, television, satellite broadcast, and- conferencing are not available in NTI distance education, those available are the conventional media such as prints media, chalkboard, graphic and poster materials. This cuts across study centres in all the zones and can as well be used to generalize to all other NTI study centres in the State" (p.

79).   ; The availability

of these interactive media are however relative to the availability of *the* application

facilities, service providers, costs and other locational circumstances. Thus

availability in this context will be based on the existent or non-existent of

software, hardware and application tools that could facilitate the use of the

interactive systems.

Accessibility of Interactive Instructional Media:

Accessibility is the noun form of the adjective word accessible. According to

Chambers, 21st Century Dictionary, accessible means "means of approaching or

entering a place, the "right, opportunity or ability to use, approach or meet with

'something" and with particular reference to computer it means "the right and

opportunity to log on to a computer system and read and edit files that are held

thin it often requiring the entry of a password or the possibility of transferring data

to and from a memory device or to locate or retrieve information in the memory

of a computer".

By this, accessibility has to do with the ability, right and opportunity to gain access

to computer systems, softwares and files in order to read, edit, add or download

information therein contained. This is distinguished from the term utilization,

which according to the Chambers Dictionary is a noun form of the word "utilize

and which means, to make practical use of something". In other words, while accessibility is concerned with possessing the ability, rights and opportunities to gain access to the computer systems and files, utilization has to do with the practical use of the software systems or files for specified purposes, and in this context, instruction. Interactive instructional media are in the main electronic computer systems softwares and tools, designed and protected under legal patent rights and trademarks. Although of them can be freely accessed, many can only be accessed exclusively or with permission of service providers. In effect, the accessibility of these media at any or for any purpose naturally depends on the extent to which the enabling and logistics are put in place.

Yaya (2006) in a research on the tutorial support materials for NTI distance learning , noted that out of the" instructional materials researched on, the least accessible were the electronic interactive media, viz Compact Disc (CD), internet services as well as electronic/projected materials. Falade (2008) in a study on assessment of available and utilized media in NTI distance education programmes in Oyo State also discovered that modern or sophisticated instructional media such as E-mail, internet, radio, television, satellite broadcast and conferencing were not and where available were not utilized due to poor access facilities. The (2009)

would have observed that the media were inaccessible but because he not distinguish between utilization and accessibility.

(2010), Ekpeyong (2011) and Maduabuchi (2012) in similar studies equally observed that the electronic interactive media, where available were usually inaccessible due to poor access facilities and inadequate knowledge and skills on the part of the desiring users. The reason often adduced for the inaccessibility include; such facts as paucity of access facilities, locational geographic circumstances, poor or inadequate knowledge of the use of the media by both teachers and learners and others. The internet server operations, for instance, are practically affected by circumstances and thus do not function equally at all locations. The finding contradicts the opinions of such authorities as Argawal (2007), Mangal and (2010) and Broadman (1993) who are of the opinion that the advancement in the development of Information Communication Technologies (ICT) and facilities has made quite a large number of interactive media systems available and accessible. This opinion may be true to some extent but obviously not generally practically e in all locations and circumstances. One fact which may have informed this and other opinions on accessibility is that availability and accessibility are intertwined. People find it difficult to differentiate accessibility from availability and to extent utilization probably this is why most research works in this regard are on and utilization and nothing on

accessibility. Accessibility is only often -mentioned in passing while discussing availability and utilization. Distinctively however, accessibility denotes access road or ability to use when there is intent to use an available facility. For instance, a leaner may wish to obtain information from available internet system, but the internet server may not be functional in his location or he may lack the necessary knowledge and skills to operate the system. This is a factor of accessibility. On the hand, availability denotes physical existence while utilization has to do with application.

Utilization of Interactive Instructional Media

The concepts of interactive technology can actually be traced back to the teaching apparatus in the early 1920s (Chen, 1991). The next significant development in interactive technology came as a result of B.F. Skinner's teaching machine and N. Crowder's branched programmed instruction in the 1950s. Although the novelty of these machines wore off fast, the branched programmed instruction approach was the fore-runner of computer-assisted instruction (Chen, 1991). Since the early 1960s, CAI has become an important tool in teaching and has had many powerful instructional features such as individualized pacing, branching, immediate feedback on answers and reinforcement (Chen, 1991).

Despite many benefits associated with the use of CAI, however, one of the most important limitations of most CAI programmes is their heavy reliance upon abstract or teaching (Buttery & Parks, 1988). They are not capable of depicting static or visual materials with the same accuracy as a video presentation. Instructional Videotape has been used widely in the classroom for instructional purposes for quite some time. It has several notable characteristics: it provides spoken description, instructions, and other sound effects as' well as good quality visual stimuli. The aforementioned advantages of CAI are greatly lost in the instructional videotape (Buttery and Parks, 1988). For example, it is not capable of feedback, remediation, and individualized pacing. The inherent limitations of both CAI and instructional video, in effect, may be overcome by combining the interactive capability of computer with unique properties of video presentations, and where the cost of computer is prohibitive other devices of achieving interactivity (e.g. telephone) may be considered. It is important that the student receives prompt feedback in any institutional setting, particularly in distance learning where the learners is impaired by the lack of casual contact with the teacher and other students (Wood, 1996).

Media in distance learning not only incorporate interactive formats (Brodman, 1993), but are also multi-media in design. As postulated by Perraton (1988), the most effective approach to utilization of media in distance education is the multi-

media approach, Multimedia systems sprang to light in recent decades and are based on widespread distribution of instruction through various media such as printed matters, television, audio and videotape, education software etc. (Trentin, 2000). Multimedia been reported as not only exploding but causing a revolution in instructional by making learning interactive and self-pacing. Some of the technological options identified by Brodman (1993) as incorporating interactive features include; interactive video disc (IVD), compact disc-read only memory (CD-ROM), World Wide Web (web), electronic mail (e-mail).

E-mail: This is used in distance education to send individual messages. E-mail is messaging in which learners and teachers can work one-on-one. It allows communication between the teachers and student. A learner can also exchange with other learners. Thus, E-mail is a tool to facilitate learning activities feedback from the teachers or other learners (Huang, 2000).

World Wide Web (www): The web provides hypertext link and hyper media ability to facilitate instruction. In hypertext, since the text contains links to other texts, users can decide their own routes of enquiry. Hypermedia, a kind of linking mechanism that may include images, video, and sound, allows the users non-linear access to information. The web offers access to text, image and sound (multimedia) presentations that provide the opportunity for discussion in a

structured environment, and links to other online resources (Sorensen, 1999 in Aggarwal 2007).

Compact Disc-Read Only Memory (CD-ROM); As reported by Huang (2000), the CD-ROM is characterized by a large storage capacity for video, audio, animated and interactive multimedia. CD-ROMs offer media formats, such as text, image, graphics, sound and animation. Distance learners can study the content only through their own computers, not through online environment. Therefore, a CD-ROM provides distance learners effective tool for the purpose of individual drill and practice. They can also access courses at any time, at their own pace, without the necessity of an online connection.

The use of some of these technologies in distance education poses some barriers. For instance, apart from incurring technology costs, if the internet is used, then the must have access to a computer modem, and associated software, telephone charges to the internet services provider will be incurred. In to cost considerations, the technology itself presents many problems. One is inadequate telecommunications facilities. Harry (1992) mentions that "the tele-communications systems (in United States of America) are inefficient expensive to use, so that educational institutions are unlikely to place too reliance on them for teaching, support or information searching" (P. 189). If situation was that bad in technologically developed and economically vibrant as United States of

America, what then should be the fate of a poor and ica.ly dependent nation such as Nigeria, if it decides to use internet or other networks to prosecute distance learning? Perhaps that explains why some countries still use print, cassettes (radio and video), telephone and radio methods (Galusha, 1999).

Telephone Teaching: Teaching at a distance now, has for long .relied upon the technology of printing. Other more recent technologies have supplemented this, but none has replaced it (Sewart, 1988, Galusha, 1999). The telephone has offered a direct substitute for student/tutor interaction. The student can receive an immediate response to his question through the telephone as in the lecture.

Advanced in telephone technology now allow individuals or groups of people at two or more locations to hear and be heard clearly and easily. According to Heinich, Molenda and Russel, (2002), the use of telephone is an example of audio conference which involves a live, two-way conversation using the telephone to connect people at different locations. There are, nevertheless, still many problems in the use of telephone for distance learning. In some countries (e.g. Nigeria) telephone teaching is prohibitively expensive, for one, cost depends very much on geographical factors and phone company pricing policies. However, if distance education systems wish to e a wide range of courses to students in remote campus,

telephone teaching is practical way of providing two-way interactive tutorials (Sharma, 1997).

Interactive video: Interactive video typically consists of a micro-computer and a video source (either vide-tape or video-disc) with the ability to present both computer text and true video scenes within the same instructional lesson (Milheim, 1990). A computer interface connects each of these parts into a single presentation medium to caused by the student. Studies have shown that interactive video is widely used in delivery of distance education (Harrington, 1990; Brodman, 1993; Galusha, 1999). Interactive Videodisc regarded to-be more versatile than video cassettes. Discs are reported to have advantages over cassettes: freeze-frame, a rapid and accurate search, large single frame storage capacity, slow and speeded-up motion and lower machine cost (Bates, 1988).

Interactive Videodisc IVD), known for providing better quality video enjoys tremendous patronage in distance education programmes of technologically developed nations, in the area of, special education, Goldberg and Rubin (1978) reported a study on the effect of Digital Video Interactive on teaching of post high school deaf students speech and reading skills. Findings show that Digital Video Interactive Devices Systems (DAVIDS) had a positive effect on their achievement. In a recent internal survey of distance education activities of George Washington University (USA), Cox (2001) reported that computer-interactive

video and video-based technology were mostly used in supplementing prints. For instance 66.7 percent of respondents claimed to used video conferencing constantly while 79.2 percent indicated that they used pre-recorded video tapes for delivery of distance education programme. It was noted that most staff tended to use a combination of internet-based and video-tape instruction, with substantial number also using some of video interaction.

In United States of America and other developed countries, IVD is most widely used medical training, industrial training, professional training and training in safe ices (Bodman, 1993). It is so patronized because of its effectiveness when on" experience is important and not difficult, dangerous or expensive to (Brodman, 1993). For example, IVD prpgrammes can put medical students in situations where they learn to make rapid, accurate decisions, without endangering the lives of real patients. IVD can substitute for equipment for which damage would be expensive e.g. teaching welding skills or printing of pictures,

Its effectiveness in simulating real situation makes it relevant in the education of teachers. Harvard (1990) in a study "some exploratory uses of interactive teacher education: designing and presenting interactive video sequences to student teachers" (p.155) examined the potential use of interactive video in promoting primary student teachers thinking about, and their interpretation of, various

classroom episodes as a means of making them more aware of the processes of learning how to teach. The study combined a computer and videodisc player in selecting from available database on videodisc, as examples of typical primary classroom practice. On the strength of the findings, the study predicted that interactive video would eventually become a means of independent learning within the context of students' professional learning.

In a similar study here in Nigeria, videotaped instruction was found to have positive effect on students in learning concepts. The study, designed to determine the effects of videotape recording on micro-teaching techniques, showed that the group taught with pre-recorded videotapes demonstrated a significant improvement on the micro-teaching skills when compared to the control group (Ajayi-Dopemu and Talabi, 1986), The efficacy of instructional video in a conventional classroom had earlier been investigated by Ajayi-Dopemu and Talabi (1988). The study was to ascertain whether videotape mediated instruction had any effect on the learning of audiovisual instruction and on the development of practical skills. A total of 100 students were used as the sample; 50 students (control group) received lectures and 50 students (experimental group) received both videotaped and lecture based instruction; Results show that the experimental group gained more generally than did the control group.

Distribution of television material on video-cassette removes many of the constraints of broadcast programmes such as inconvenient transmission time. Crooks and Kirkwood (1990) opine that video cassettes-can perform all the educational functions broadcast television and can achieve some of them more effectively due to additional control the learner can exert by stopping, restarting and replaying the material.

Video on cassette certainty offers some degree of interactivity especially when compared, with the passivity of broadcast television. The high degree of interactive possible between the .student and the material is due to the search, replay and pause facilities on a video cassette recorder/player VCR). The ability to stop in order to read associated theoretical material, answer question or discuss issues raised with other learners makes it possible for students to operate on and utilize the content in a very active way.

The appropriate institutional structures for distance education obviously depend on the size of a country and its communication infrastructure. Neither the central China Television University with a student body of over a million, nor the Wisconsin interactive communication systems, with teleconference telescript and interactive videodisc for faculties in dozens of locations is a promising model for a poor developing country like Nigeria. Students may not have access to reliable telecommunications and computers due to the level of communication

development and prohibitive costs of computer systems. It is therefore imperative for such nations 10explore other means of providing interaction in the use of videotape to supplement printed materials for distance education.

Videotape has been reported to be very effective in the delivery of instruction to conventional classroom learners. A study reported by Abolade (1999) examined the comparative effectiveness of video mediated instruction and traditional classroom on secondary school students' achievement in ecological concepts of Biology. Findings show the superiority of video instruction over conventional method. Students who received video mediated instruction performed better than subjects that were taught using the conventional method of instruction.

Effectiveness of Interactive Instructional Media

Effectiveness is the noun form of the adjective; "effective'. It is thus derived from the adjective, effective which in turn relates to the root morpheme, "effect'. According to Advanced Learners Dictionary (7th Edition), one of the meanings of the word 'effect' and the one that relates to this study is "a change that somebody or something causes in somebody or something else; a result". The Dictionary gave the synonyms to include, result, consequence, outcome and repercussion. Consequence and repercussion are used to indicate negative effects while result and outcome are preferred for positive effects. The Dictionary further compared

result and outcome and shows that while result is used to talk about things that are caused or produced directly by something else, and after an event to talk about what happened; outcome on the other hand refers to the result of an action or process and is normally used to talk about what happened at the end of a process, when the exact relation of cause and effect is less clear or more often used before an action or process to talk about what is likely to happen. 'Effective', a derivation from effect, on its own, means 'producing the result that is wanted or intended, producing a successful result". 'Effectiveness is also the noun form of the adjective, and of the same root morpheme, "effect".

Accordingly, a clear understanding of the concept of effectiveness reasonably demands reference to the morpheme, 'effect and 'effective', and with particular reference to the synonym, 'outcome' which presupposes, a change(s) caused by somebody or something on somebody or something else after an action or series of actions and or a process of activities. In other words, 'effective or effectiveness' smote, a successful, positive, wanted or intended outcomes or changes produced y caused by somebody or something on somebody or something else after leading re later through a process of actions or activities. And with reference to instructional effective and effectiveness should naturally have to do with the ability of tee media to cause or produced the expected changes - attainment of

educational objectives (learning or change in behaviour), after being used in the instructional process. In other words, the media is effective where the instructional objectives are achieved by the use or after the use of the media in an instructional process. Instruction is a system and a process. Instructional communication is a component part of the process. It involves exchange of interactions, learning experiences, methods and other activities between the teacher and the learner. It is expected that there will be positive changes (learning) and attainment of instructional objectives, after the communication interaction, hence an effective instructional communication.

In the words of Edozie (2003), "communication forms the core of instruction-without it the whole process of teaching, learning and evaluation will be non-existent" (p.28). instructional communication depicts "the communication that takes place in the leaching learning process or in an instructional system" (Edozie, 2003:38). In other words, "the process of deliberate arrangement of information, interactions and activities to change (or modify) and assess the experiences and behaviour of the larger audience" (Inyang-Abia., 1988:103).

The effectiveness of the form of communication defined above naturally depends on tie extent to which the communication encounter achieves the

desired change in the behaviour of the target audience - the learner. Inyang-Abia (1988) opined that for such communication to be effective, it must be:

a. Directional: It must be directed towards a target audience (e.g. JSS1 students, NCE students, Women, Men, Teachers etc).

b. Purposeful: It must have an aim, goal or objective.

c. Meaningful and Perceptual: It must have the ability to be-understood through adequate encoding and decoding. In other words, effective communication must not be ambiguous and easily misunderstood.

d. Systemic: One idea, message, or component must cooperatively reinforce the other. This means that there must be a link between the ideas, or components.

e. Transactional: It must be business-like, interactive, and reciprocally influence one another. It must have an effective and efficient feedback component (P.92).

Ofoefuna and Eya (1999) shares a similar view, that it should be directional, purposeful, meaningful, systemic, transactional and perceptual. Singh et al (2008) founded the conditions to make the communication system effective on the following principles; principle of clarity, principle of integrity, principle of informality, principle of attention, principle of timelines, principle of feedback

and the principle of communication-network. Although they are primarily concerned with organizational or management communication; the principles equally apply to instructional communication. For instance, under the 'principle of clarity', they opined that "the idea or the message to be transmitted should be clearly worded so that it ray be interpreted by the receiver in the same sense in which it is communicated. There should be no ambiguity in the message. For this purpose, the idea to be communicated should be very clear in the mind of the sender, It should be kept in that the words do not speak themselves, but the speaker gives them meaning, message is clear, it would evoke an appropriate response from the other party. It is also necessary that the receiver must be conversant with the language, the inherent assumptions, and the mechanics of communication. For effective classroom communication Argarwal (2007) equally recommends;

1.   **Two-way Communication System:** Two-way communication instead of one-way communication is needed. One-way communication, i.e. lecturing or telling or demonstrating by the teacher denies the facility of seeking clarification to students. The learners remain passive listeners. Two-way communication has a built-in-system of feedback. It ensures that further information, clarification etc, are provided whenever possible. The receivers or the learners get opportunities to understand the message or the content.

2. **An Effective Feedback for Efficient Teaching:** Feedback ensures that the message has reached the receiver. This can take the form of a nod, an acknowledgement or an execution of the behaviour suggested in the communication. Thus, the feedback provides a learning opportunity to the sender and the receiver because it mirrors the consequences of behaviour. In addition if the behaviour has ten found to be incongruous with the message it opens avenues to make corrections wherever necessary. Without feedback it would be difficult to ascertain whether communication has been received as intended or not.

3. **Principle of Clarity in Communication:** Communication possesses clarity it is expressed in language and transmitted in a way that can be comprehended receiver. Clarity requires familiarity with language patterns of the learners.

4. **Development of Motivation:** The learners cannot listen or read with understanding unless they concentrate. Listening by fits and starts, listening inattentively or ignoring or skimming out written words shows poor understanding. Adherence to the need for attention will gradually overcome certain barriers to communicate, inattention, loss in transmission and poor attention. Motivation on the part of the learners will increase the quality of learning and they will certainly feel encouraged for their efforts.

5.   **Use of Instructional Technology:** Teaching technology should be made use of in providing effective communication in classroom teaching. Information revolution implies the use of technology especially electronic devices in communicating formation, knowledge and skills.

Teaching Strategies-and Skills: Teaching strategies and skill should be fully to make communication inspirational and pragmatic. The recommendation on the use of instructional technology is of particular concern and on it; he suggested characteristics of good instructional media and principles that should guide the use of the media generally and specifically as follows; that the media should be meaningful and purposeful, accurate in every respect, simple, cheap, as far as possible, be improvised, large enough to be properly seen by the students for whom they are meant. They should also be up to date, easily portable, according to the mental level of the students and motivate the learners.

He also suggested the following principles for the use of instructional media;

1.   **Principle of selection;** Teaching aids prove effective only when they suit the teaching objectives and unique characteristics of the special group of learners.

The following points may be kept in view in this regard.

   i.   They should suit the age-level, grade-level and other characteristics of the learners,

ii. They should have specific educational value besides being interesting and motivating.

iii. They should be the true representatives of the real things.

iv. They should help in the realization of desired learning objectives.

2. **Principle of preparation:** This principle requires that the following points should be attended to:

i. As far as possible, locally available material should be used in the preparation of an aid.

ii. The teachers should receive some training in the preparation of aids.

iii. The teachers themselves should prepare some of the aids.

iv. Students may be associated in the preparation of aids.

3. **Principles of physical control;** This principle implies that;

i. Teachers should carefully visualize the use of teaching aids before their actual presentation,

ii. Teachers should fully acquaint themselves with the use and manipulation of the aids to be shown in the classroom.

iii. Adequate care should be taken to handle an aid in such a way that no damage may be done to it.

    iv.   The aid should be displayed properly so that all the students are able to see it, observe it and derive maximum benefit out of it.

    v.   As for as possible, distraction of all kinds should be eliminated so that full attention may be paid to the aid.

4.   **Principle of evaluation;** This principle stipulates that there should be continuous evaluation of the materials and accompanying techniques in the light of the realization of the desired objectives.

Mangal and Mangal (2010) found answer to issues of achieving effective communication on the improvement of the components of the communication process, i.e. the source, the .material, the media or channel and the receiver. On each of the components, he reasoned as follows:

Source of Communication: Communication effectiveness very much depends upon the strengths and qualities of, its source. Some of the strengths and analysis of successful communicator may be (i) their proper knowledge of the subject matter, content or field of information (ii) confidence in knowledge and stock of information (iii) name and fame (credibility) as good teachers (iv) their way of communicating J|and interacting, and (v) the impact of their overall behaviour and personality.

Communication Material: The effectiveness of a communication process in any classroom situation very much depends on the quality and nature of the

communication material. If the content and message has some attraction, force and value to the receiver, it will surely catch his attention and make him quite attentive and an active participant in the communication process. The contrary is the case, if there is nothing new, novel or valuable in the message.

Communication Media or Channel: The communication media or channel lies in between the source and the receiver like a bridge or connecting link. The nature and Duality of the traffic flowing on the bridge is very much dependent on the 'appropriateness, strength and quality of the bridge. Similarly, the effectiveness and the strength of the communication flow between the communicator and receiver sorely depends upon the nature and quality of the verbal and non-verbal means, or the media and channels employed in the process of communication. For this purpose, the following things should always be kept in mind:

- Use the language that is quite known and understandable on the part of the receivers.

- The verbal means should be supported by the non-verbal clues, gestures, body language, physical movements, etc. for giving the required strength   and effectiveness to the process of communication.

- To reduce the ill effects of verbalism, attempts should be made to make use of audio-visual aid material and appliances suiting to the very nature and timings of the communication.

- The essential skills should be learnt well both by the communicators and the receivers for drawing the maximum advantage through the communication.

- As a communicator one should not use a media or means that is not capable of conveying what is intended. It should always be within the reach and comprehension of the receivers so that the chain of proper encoding and decoding can be continuously maintained.

- Have variety, novelty and creativity in making use of different means and media for the communication. Always prefer the multimedia approach over the single or the limited usual means,

Receiver of the Communication: The actual key of effective classroom communication lies with the receiver. If he has the characteristics of a good receiver, he may rise to the occasion for making the communication efforts of the communicator most fruitful and commendable in spite of the slackness, deficiencies and hurdles in terms of the use of proper media and channel of communication. These characteristics may be summarized as given below:

- The receivers must have sufficient previous knowledge and general background for receiving and understanding the communicated message.

- They must have the required proficiency and abilities in terms of communication skills such as listening, observing, reading, writing, speaking, mapping, drawing, measuring, surveying, thinking, analyzing, synthesizing, evaluating and drawing inferences.

- They-must have the skill and potential required for the use of various modes, media and means of communication. Their sense organs should be well adapted to the use of various audio-visual aid material and appliances.

- They must remain quite alert and attentive for receiving the intended message and provide essential response for giving the required feedback to the communicator for carrying tut the chain of communication.

- They must show proper zeal enthusiasm, curiosity as well as need for maintaining the chain of communication.

- They must not put themselves into a passive recipient of the information or message given by the communicator but should make themselves enquirers and active partners in the process of communication.

It is a well-known fact that a teacher who can communicate well is bound to get access in the on-going teaching-learning process. But his success is quite dependent upon the success of the learner's power of communication. In turn the

success of the task very much depends on the appropriateness of the media of communication.

According to Ike et al (2002), many noise factors are present in the communication encounter. Some of these factors are caused by psychological barriers; some are caused by outside-of school conditions (home, life; telecast, magazines, etc) but others arise from conditions generated within the classroom itself. The teacher's serious duty is not only to recognize these noise factors or references, but also to the means by which a clear channel of communication may be established and maintained with efficiency. He should be able to improve the nature and strength of e messages passed to the students, or remove the barriers to receiving these messages. For the teacher's message to be clear and understandable, he must be able to identify and avoid the following and often overlook psychological barriers to effective classroom communication viz; verbalism, referent confusion, day dreaming, perception and actual physical discomfort. Apart from the psychological factors, sociological, philosophical, economic and biological factors may influence communication. The teacher should take them into consideration in any teaching-situation: for example, we may not be able to communicate effectively because of; Age difference, sex difference, economic, location or residential, mental, educational level, organization, vocation, social, racial and disability factors.

According to Aggarwal (2007) barriers to verbal classroom communication includes: Inaudibility of speech, abnormal speed of speech, unfamiliar pronunciation of the teacher, use of unfamiliar words and technical terms without explanation. Lack of understanding of the basic knowledge of the students -known as referent confusion, Day dreams on the part of the students on account of their inattentiveness, unsystematic presentation of the subject-matter, lack of scope of immediate feedback, lack of physical facilities in the classroom and socio-economic and cultural differences among the students. The Aggarwal also observed problems in the use of instructional media to include; Apathy of the teachers, indifference of students, ineffectiveness of the media, financial hurdles, absence of electricity, Absence of facilities for training. Improper selection of the media was also observed as a major area of concern.

Edozie (2003) also observed that the factors responsible for ineffective communication are referred to as obstacles or barriers, or impediments of effective communication. These obstacles may be grouped into; defective communication, encoding and decoding skills, content factors, media factors, socio-cultural and environmental factors, physical and psychological factors, perceptual factors, instructional strategy, personality-related factors (or participant characteristics).

On media factors he observed that; Misuse of media can act as a barrier to effective communication. This happens where:

i. The teacher lacks the technical and cognitive ability to utilize a given instructional media.

ii. The media replaces the teacher

iii. The media fails to generate interest and participatory learning

iv. The media is irrelevant to the message it is intended to transmit or it is wrongly applied.

v. The media is defective or malfunctioning

vi. The media is inaccessible and beyond the purchasing power of the receivers (learners).

According to Falade (2004), the use of some of these technologies in distance education poses some barriers. For instance, apart from incurring technology costs, if the internet is used, then the student must have access to a computer modem, and associated software. In addition to cost considerations, the technology itself presents many problems. One issue is inadequate telecommunications facilities. Harry (1992) mentions that, "the existing telecommunications systems (in United States of America) are inefficient and/or expensive to use, so that educational institutions are likely to place too much

reliance on them for teaching, support or information searching", (p. 189) If the situation was that bad in technologically developed and economically vibrant nation as United States of America, what then should be the fate of a poor and technologically dependent nation such as Nigeria, if it decides to use internet or other computer networks to procure distance learning? Perhaps that explains why some developing countries still depend majorly on the print media, telephone and radio delivery methods.

Galusha (1999) observed that there are many problems in the use of telephone for distance learning. In some countries, (e.g. Nigeria) telephone teaching is prohibitively expensive, and cost depends very much on geographical factors and phone company pricing policies. Distance education systems are equally expected to pay the telephone charges for telephone tuition (Bates, 1988). Thus, telephone teaching tends to reduce student costs, but increases institutional costs. However, if distance education systems wish to provide a wide range of courses to students in remote campus, telephone tuition is the only practical way of providing two-way interactive tutorials (Sharma, 1997).

Effectiveness, Interactive Instructional Media and Distance Education

The availability and use of interactive instructional media in distance education is obviously of immense essence but the effectiveness of the used instructional media in attaining the instructional objectives, is of much more essence. This is

informed by need and strong desire to bring, the distance education to the standard obtainable in the normal classroom face-to-face educational process. It necessarily has to be so, since the products of both processes are awarded the same certificates. They equally face the same or similar other measures or evidence of being educated. For one they are members of the same society, expected to compete on a level playing ground in toe job market, political and social positions. Interactivity seem to have been established as panacea, in the desire to bring- up distance education to the level of the traditional four wall education.

Thus, the effectiveness of an instructional media, depends on the extent to which media provides interactions, activities and learning experience that cause effective change in the behavior of the learner. And with particular reference to distance education, effectiveness of instructional media will depend on the extent to which the technological media offers the distance learners the necessary interactions, activities or learning experiences that cause learning or the expected change in behaviour. Delling (1996) believes that such instructional media 'the signal carrier', due to its diversified procedures requires careful formulation in order to achieve its role in distance education.

The features of distance education as identified by authorities such as Keegan (1996), and Ritchie (1997), Olugbenga (2006), Mangal and Mangal (2010), and Ezema (2010) (2) Separation of the teacher and learner in place and in time,

influence of educational institutions or agencies, the use of technological media, provision of two way communication media, privatization of institutional learning, industrialization of the educational process and interactivity among parties in the educational process among others. The effectiveness of the media, used for distance education, depends on the extent to which the media bears all these features in mind.

Until the advent of telecommunications technologies, distance educators were hard pressed to provide for two-way real time interaction, or time-delayed interaction between students and the instructor or among peers. In the correspondence model of distance education, which emphasized learner independence, the main instructional medium was print and it was usually delivered using the postal service. Interaction between the student and the instructor usually took the form of correspondence of self-assessment exercises that the student completed and sent to the instructor for feedback. Formal group work or collaborative learning was very rare in distance education even though attempts were made to facilitate group activities at local study centers. Also, traditionally, distance education courses were designed with a heavy emphasis on learner independence and were usually self-contained. With the development of synchronous (two-way, real time interactive technologies) such as audio teleconferencing, audio graphics conferencing and videoconferencing it is now

possible to link learners and instructors who are geographically separated for real me interaction. The asynchronous (time-delayed) feature of Computer-Mediated Communications (CMC), for instance, offers an advantage in that its class is open 24 ours a day and seven days a week to accommodate the time schedules of distance earners. The CMC systems may be either synchronous (real-time), or asynchronous time-delayed). The asynchronous CMC, because of its time independent feature is an important medium for facilitating cooperative group work among distance learners. Current developments in digital communications .and the convergence of telecommunications technologies exemplified by international standards such as ISDN 'Integrated Services Digital Network), make available audio, video, graphic and data communication through an ordinary telephone line on a desk top workstation. Therefore, as we look at distance learning technologies today and look to the future, it is important to think in terms of integrated telecommunication systems rather than video, audio, data systems. More and more institutions that teach at a distance are moving towards multi-media systems integrating a combination of technologies both synchronous and asynchronous that meet learner needs. While in fie 1970's and 1980's many distance education institutions used print as a major delivery medium, currently, many institutions have adopted telecommunications-based systems for the delivery of distance education.

Interactivity has been identified as a basic element in ensuring effective instructional communication in distance learning. According to Oliver and Mclonghhim (1997) the quest for interactivity has become a necessary goal in the design and provision of distance education programmes. Berge (1999) provides a description of interaction in a distance learning setting, "interaction is two-way communication among two or more people within a learning context, with the purposes of either task/instructional completion or social relationship-building, that includes a means for teacher or learner to receive feedback and for adaptation to occur based upon information and activities with which the participants are engaged" (P. 13).

Literature reveals that creating interaction in the classroom is essential to student earning and to the overall success and effectiveness of distance education (Hodgson 1999 in Omotayo 2009). Distance educators confirm that classroom interaction have positive educational outcomes. When students are actively learning, they learn more information, retain the information longer and are able to apply the information in a better manner and continue the learning process (Flotemesch, 2000). Recent studies have also found that interaction in distance learning may lead to increased academic achievement and greater retention rates (Omotayo 2009).

The following interactions have been identified as necessaries in Distance Education;

i. **Teacher-Student Interaction:** Interaction is central to the expectations of teachers and learners in education, and to that extent it is a primary aim of the educational process. The ability to provide necessary feedback between learner and teacher will continue to make interaction a critical component of education. Addressing the role of interaction in distance education, Barker, Frisbie, and Patrick (1989) observed that; "...like (in) traditional classroom settings, students in distance education settings can seek on-the-spot clarification from the instructor. Opportunities for teacher-student interaction can promote greater spontaneity for all participants in teaching and learning process" (p. 23). To achieve quality in distance education requires incorporating effective teacher-student interaction into the format of instructional delivery. Such will promote active participation of the learners.

ii. **Student-Student Interaction;** Structurally, interactivity is a circuit of messages *flowing from an originating entity which is referred to as interactive loop. Entities* in an interactive loop can be students, instructors, computers, or others capable of receiving and sending messages (Yacci, 2000). Common interactive loop patterns might be:

student to teacher to student, or student to computer programme to student. This implies that instructional interactivity does not occur from the student point of view until a message loop from and back to the student has been completed. While there are a variety of relationships within schools in general to achieve varied goals, the primary educational relationships are between teachers and students and among students themselves (Flottemesch, 2000). Research indicates that student-student interaction is a determinant of educational success when a network of interpersonal relationship is established in the classroom, promotion of positive interaction and increased student exchange of information fosters educational success. Student-to-student interaction through active participation and feedback has been found to be positively linked to critical thinking and problem solving skills (Huang 2000).

iii. **Interaction between students and learning material;** To examine closely the role of interaction in teaching and learning, Hilman, et al (1994) opined that the concept should be broadened to include learner-interface interaction, between learner and the technology that is being used to access course materials and to communicate with the instructor and other students.

In sum the effectiveness of interactive instructional media with particular reference to distance education depends principally on the extent to which the media provides two-way interaction activities between the teacher and the learner as well as among the learners. In other words, the ability of the media to provide opportunities for exchange or sharing of ideas, immediate feedback, participatory learning experiences and interactions. In addition, such a media should possess the other qualities of an instructional media as recommended by such authorities as, Ike et al (2002), Edozie (2003, Argawal (20007), Singh et ah (2004), and Mangla and Mangai (2010). An analysis of the recommendations leads to the conclusion that the effectiveness of interactive instructional media depends on the following:

i. The ability of the media to provide a two-way interaction between and among the parties in the instructional system,

ii. The teachers and learners or awareness or knowledge of the instructional opportunities offered by a given instructional media.

iii. The teachers and learners abilities and skills for the utilization of a given instructional media.

iv. The extent to which the media generates participatory learning experience and activities.

v. The extent to which the media arouses learning interest in the learners.

vi.   The relevance and appropriateness of the media to content intended to be transmitted.

vii.   The extent to which the media is accessible or affordable to the learner.

viii.   The availability of the media

ix.   The accessibility of the media, and

x.   The usability of the media by both teacher and learner

The Concept of Perception

Discussion on perception is an age long one. There are quite a number of Theoretical, conceptual discourses about perception viz; Sense-Datuum Theory, the Adverbial Theory, the Intentional Theory-, the Disjunctive Theory, the Casual Theory, the Phenomenon Theory, the Judgment Theory, and others (Anibueze 2000). The theorists spent time trying to distinguish between perception and such terms as illusion, hallucination and sensation as well as arguing against each other on the meaning and structure of perception. Unfortunately there is yet to be a universally acceptable definition of perception.

Bryne (1977) defines perception as "the action of the mind in giving meaning to a sensation." In an elaborate form, he states that any message coming in from the body through any of the senses is called sensation. When that sensation is experienced and the message is in the mind, the mind tries to make sense out of it, just as when a wireless operator receives a message; he studies it to see what

he has to do about, or when there is a noise of thunder if the ears registers that noise, and a message is passed to the hearing part of the brain, a sensation has been experienced. Then the mind starts to ask questions such as, "What have I heard? Where does it come from? Have I heard that sound before? How do I recognize it another time it occurs? When all these questions have been answered and the mind recognizes that sound as being thunder, perception of the sensation has taken place. It then means it has been understood.

Hugard and Atkinson (1978) in Okoye (2010), assert that the mind gets its Information about the world through the senses - the eyes, the ears, smell, taste and touch. Whenever they are affected by the right king of stimulus. For instance, light in case of the eyes- the senses respond by sending electro-chemical messages to the brain. The brain then decodes these messages. A person's awareness of the sight, hearing, taste, smell or touch depends upon special centres in the brain. For example, most messages coming from the eyes are received in the visual context, which is located at the rear of the brain. Any electrical stimulation in that part of the brain is interpreted as vision. They further added that throughout the day, even during sleep, the brain receives an endless stream of information from the senses. From this chaotic jumble, it has to sort out what is meaningful from what is trivial, and it has to organize the information into coherent picture of the word. To the authors, this is perception.

Sperling and Martin (1979 in Anibueze 2000) on their part, refer to perception in its simplest form as "the act of interpreting a stimulus registered in the brain by one or more sense mechanism. They posit that while the eye receives, the mind-perceives. If one sees, hears and responds to situation in meaningful contexts and is able to organize these things in his mind into forms, shapes, melodies, structures or scenes hat possibly make up a respective meaningful whole, perception has occurred. This perception, according to them, is indeed a unified meaningful experience.

Morgan, King and Robinson (1979) in Okoye 2010 explained the way the world looks, nears, feels, tastes and smells things while trying to define perception. In their succinct view, they refer to perception as the ability one has according to his immediate experience to be aware of the objects, qualities, or events stimulating the sense organs. They highlight that the sensory inputs one has, comes into one's awareness as interpreted in his mind as objects, shapes, patterns and forms of everyday experience which must stand out from a background. Moreover, if one is able to distinguish an object from its general background as an organized pattern or grouping, perception has been effected.

Another attempt to define perception was made by Nweke (1996), he gave a descriptive and summative definition of perception as "the process by which an

individual becomes aware of objects and objective facts in his own environment on the basis of stimuli from the objects which affect the senses". He further expressed that the process by which one receives, interprets and responds to the stimulus or a group of-stimulus which register in one's brain through one or a combination of the sense mechanisms is considered as perception. Thus, although a number of attempts have been made by various writers to define perception clearly and precisely, there are difficulties in making any of the definitions universally accepted. There are however, facts that are usually common.

They all agree that there are stimuli. The stimuli register in the brain through the sense mechanisms which first receive them. The action of the brain comes to mind. The mind then exerts the power, the ability or stamina and process involving analysis and synthesis of the object of awareness. The operational interpretation is then made. Meaning, is then read into the registered stimuli. After a sort of discrimination or sorting out the meaningful and the trivial the mind finally brings out a coherent picture of the registered stimuli, i.e. perception.

Wright and Taylor (1972) in Anibueze (2000) have argued that when we generally refer to perception as awareness, we get an impression of the term as illusion. To them, illusion perse is misleading perception. They maintain that there is no clear demarcation between illusion and perception. Howes and Solomon (1950) in Wright Taylor (1972) posit that perception has been equated with awareness and

judgment or rather discrimination. It has also been argued that awareness has only been associated with recognition. Perception has a longer process than awareness. Awareness moves a little further than sensation and a leading step to perception. Some writers categorize it as sensation while some refer to it as perception but actually it is quite in between both concepts. Wright and Taylor (1972) in Anibueze [2000) point that a subject may become aware of a stimulus registered through any of the senses without consciously reading meaning to the situation, awareness is there but perception has not taken place because there has been no actual analytical interpretation.

By and large, in the process of perception, there must be conscious and automatic inference. Again, impression mark must be made and meaningful interpretation too. Judgement has to be reached with some sort of discrimination between relevant and irrelevant materials or ideas. It exists when all sensation has been interpreted consciously and meaningfully. Perception is not an illusion because decision has been taken, discrimination has been effected and judgment passed. The idea or knowledge or belief has been proved automatic. It cannot give an idea that does not really exist. The state of the mind must be quite clear and real. Perception is applied fairly generally to the whole range of experience from detection of a flash of light to estimates of the nature of complex stimuli. Some psychologists would so far extend the term as to apply it, in the field of "person

perception", to the process whereby we form impression of personality characteristics of other people. Our perception of events depends on how our sense organs detected the stimuli, and how our brain interprets information coming from the senses. Much of our behavior is motivated by such needs as hunger, thirst and the avoidance of fatique or pain. Since man is not a passive recipient of imprints from things around him, he is actively seeking his ways sounds, hearing, touch, smell and sights. The situation brings to light both t internal and individual or internal element in person. This kind of perception helps us to see things exactly as we are naturally prone to seeing them. Hence, perception in view is the process of recognition of objects and aspects of the environment in which ways as to prepare one for their appropriate utilization.

Thus, perception, at least in this context has to do with the conceptual conclusions out of conscious and meaningful interpretation of the stimulus obtained through the sense organs. In others words, perception is the conclusions or ideas formed from logical interpretation of the experiences, objects, qualities or events, received through any or a combination of the senses - sight, hearing, smell, touch and taste; or a person's view or opinion rationally derived from logical analysis and synthesis of sensory experiences. Perception can often be an effective way of devaluating an existing situation or events. According to Nweke (1996) perceived

4|effectiveness may be a better means of evaluating or appraising a process as many at I times decision are based on perception.

Theoretical Framework

Interaction and interactive media is a basic contemporary issue in Distance Education. Interactive communication media provide a near similar teaching-learning situation as the regular classroom teaching. Hence, theories that are related to interaction activities form the basis of this work. These includes: Schramm's (1977) transactional communication model, constructivism, interaction and social context theories form the main framework for this study. They offer important insight into the use of technology, particularly interactive technology in Stance education. In distance education system, technology is used not just in resenting materials to the learners, but as the linking process across time and space Reiser-and Ely, 1997 in Eyi 2004).

Schramm's Communication Theory (1977)

According to Schramm (1977), effective communication takes place at the intersection or overlap of the fields of experience of the sender and the receiver. Because the receiver and the sender interpret the message and feedback according to their fields of experience, the model is referred to as transactional. The

transactional posture of this model shows that there is a middle ground of agreement and that the meaning of a message must not only be seen from the perspective of the sender or the receiver, but from both of them. In a sense, therefore, the model is democratic and ideal for inquiry approach to instruction. According to the model, in an instructional communication process, the source encodes curricular content into meaningful symbols to achieve the learning objectives. The success or the effectiveness of the communication will depend on the skill of the source (teacher) in encoding symbols that are meaningful to the receiver (students) and the students' skill in decoding them. It is clear that if the signal (the message) is within the field of experience of both the source and the receiver, the opportunity for successful communication is assured. An understanding of this model, in relation, to effective instructional communication implies that the effectiveness of instructional communication is sustained by:

The ability, knowledge and skills of the encoder in successful encoding of the curricular content into the instructional media and media enhancing technologies.

i. This in turn depends on the encoder's knowledge and proficiency in the use of the instructional communication media-verbal and non verbal It requires a good knowledge of diction or choice of word; principles of grammar and mechanics of the use of the chosen language and a functional knowledge of

the use of the communication technologies. In other words, knowledge of the use of the media (i.e. verbal and non-verbal codes) and the channel (i.e. systems and technologies that bear the media across from encoder to decoder), where the encoder is the teacher/learner, and decoder, the learner/teacher.

ii. The ability, knowledge and skills of the decoder in the successful decoding of the curricular content (information) perfectly as contained in the instructional media. This again entails an equally proficient knowledge, and use of the language of instruction and the media technologies. Note that in language there are varieties, occasioned by fields of specialization and life, academic levels, social status and environmental exposures, referred to as register. The knowledge or otherwise of the variety, forms and styles of the language employed by the encoder will naturally affect the decoding ability of the decoder.

iii. That the environment "field of experiences" of both the encoder (teacher/student) and the decoder (student/teacher) affects the encoding and the decoding abilities of the parties respectively. Hence the field of experience of both parties should be similar for effective encoding and decoding. The meaning of an instructional content should not be seen from the context of either the encoder or the decoder but from both of them.

iv. That the knowledge of the subsisting environment of both the teacher and the learner is of essence in 'instructional communications. The environment consists of, the physical, psychological and socio-cultural status of both the teacher, and the learner. In other words, the psycho and socio-cultural elements of the environment should be similarly understood and commonly used.

Thus, interactive instructional media provide the point of intersection, interactions and fields of experiences of the teacher and the learner required for effective distance station instructional commendation.

Theory of Constructivism

Another theory that is of basic relevance to this study is the Theory of Constructivism; the theory perceives learning as a change in meaning constructed from experience (Newby, 1996), that humans build their knowledge through experience (Chin 1999), that crucial interaction enables learners to construct, test and refine their knowledge. In his concept of the zone of proximal development, Vygotsky (1978), the founder of the theory of social constructivism highlighted that good instruction could provided by determining where a learner is in the learner's development and building on that learner's experiences (Tarn, 2000 in Okwudili 2008). Hence, the teacher is a facilitator who encourages the achievement of student's knowledge by identifying the tasks that can be

accomplished within the zone of student's proximal development. The zone of proximal development virtually serves as a "guide for curricular and lesson planning (Chin 1999 as cited in Okwudili 2008). Another implication of the constructivist theory is that "....the amount of guidance provided by the teacher will depend on the knowledge level and experience of the students" (Newby, 1996).

As perceived by supporters of the constructivist theory, collaboration is an essential part of the learning process. Hence a central strategy in the learning process is to create a Collaborative learning environment. This kind of constructivist instructional setting is doubtlessly enhanced by instructional technology: i.e. "the reflective and recurrent process of design, organization and management of instruction utilizing the educational media (interactive multimedia devices) (Reiser, 1997).

The rapid development of instructional media presently presents fascinating learning opportunities which can push distance learning further towards self-guided individualized instruction. Constructivism is supported by technologically advanced educational establishments. Computer, multimedia and internet are great tools for the exploration of intellectually rich settings. By this the learners are given a chance to build meaningful experiences and to construct their understandings by exploring the variety of interactive CD ROMS and DVD

ROMS, websites, electronic libraries and museums, search engines, etc while on the other hand, instructors face a number of challenges facing the use of the instructional technology i.e. the expensiveness of Hardware and software, lack of properly trained technicians and others. The constructivist theory is open to all the existing instruction and research methodology allows an individual student to construct his own understandings, discuss it with others, explore and reflect on which corresponds to the fundamental interpretivist assumption about the subjective and social character of knowledge or truth.

Contrary to the traditional information approach in which the teacher represents a fixed body of information or abstract ideas as a concrete image to the learner through a medium; and in which the learner in turn perceives, decodes, and stores it; in the constructivist principles a learner actively constructs an internal representation of knowledge by interacting with the material to be learned. This is the basis for both situated cognition (Streibel 1991) and problem-based learning (Savery & *Duffy* 1995),

According to Prawat and Floden (1994), to implement constructivism in a lesson, one must shift one's focus away from the traditional transmission model to one which is more complex, interactive and evolving. "Human beings are at their best when they interact with the real world and draw lessons from the bumps and bruises they get (Simon 1994). According to Perraton (1988), the distance teacher

plays his role best when, through the most effective choice of media, she meets the distance students face-to-face, and becomes a facilitator of learning rather than a communicator of a fixed body of information.

Distance education now involves a high degree of interactivity between the teacher student, even in rural and isolated communities separated by perhaps thousands of miles. Distance learning allows students to hear and perhaps see teachers as well Jas allowing teachers to react to their student's comments and questions. Moreover, mutual-learning communities can be formed, in which students and researchers throughout the world who are part of the same class or study group can contact one another at any time of the day or night to share observations, information, and expertise with one another, (Vandervan 1994, Wolfe 1994 and Sherry 1996). Other theories considered of essence include;

Moore's Transactional Distance Theory (1990)

Moore's (1990) concept of "transactional distance" encompasses the distance which, he says, exists in all educational relationships. This distance is determined by the amount of dialogue which occurs between the learner and the instructor, and the amount of structure which exists in the design of the course. Greater transactional distance occurs when an educational program has more structure and less student-teacher dialogue, as might be found in some traditional distance education courses. Education offers a continuum of transactions from less distant,

where there is greater interaction and less structure, to more distant where there may be less interaction and more structure. This continuum blurs the distinctions between conventional and distance programs because of the variety of transactions which occur between teachers and learners in both settings. Thus distance is not determined by geography the relationship between dialogue and structure.

Saba and Shearer (1994) carry the concept of transactional distance a step further by proposing a system dynamics model to examine the relationship between dialogue and structure in transactional distance. In their study, Saba and Shearer conclude learner control and dialogue increases, transactional distance decreases. It is not location which determines the effect of instruction, but the amount of transaction between learner and instructor. This concept has implications for traditional classrooms as well as distant ones. The use of integrated telecommunication systems permits a greater variety of transactions to occur, thus improving dialogue to minimize transactional distance. This implies that the existence of interaction in the instructional system reduces the gap between the teacher and the learner in distance education.

Interaction Theory:

Another theoretical construct of recent interest to distance educators, and one that has received much attention in the theoretical literature, is that of interaction.

Moore (1990) discussed three types of interaction essential in distance education. Learner-instructor interaction is that component of his model that provides motivation, feedback, and dialogue between the teacher and the students. Learner-content interaction is the method by which students obtain intellectual information from the material. Learner-learner interaction is the exchange of information, ideas and dialogue that occur between students about the course whether this happens in a structured or non-structured manner. The concept of interaction is fundamental to the effectiveness of distance education programs as well as traditional ones. Hillman, Hills and Gunawardena (1994) have taken the idea of interaction a step farther and padded a fourth component to the model, learner-interface interaction. They note that the interaction between the learner and the technology which delivers instruction is a critical component of the model which has been missing thus far in the literature. They propose a new paradigm which includes understanding the use of the interface all transactions. Learners who do not have the basic skills required to use a communication medium spend inordinate amounts of time learning to interact with the technology and have less time to learn the lesson. For this reason, instructional designers must include learner-interface interactions which enable the learner to have successful interactions with the mediating technology. Thus, the effectiveness of instructional media in attaining the instructional objectives lies only where the

learner-interface interaction is appropriately considered in the design, selection and utilization of the instructional media.

Social Context Theory:

Finally, the social context in which distance learning takes place is emerging as a significant area for research. Theorists are examining how the social environment affects motivation, attitudes, teaching and learning. There is a widespread notion that technology is culturally neutral and can be easily used in a variety of settings. However media, materials and services are often inappropriately transferred without attention being paid to the social setting or to the local recipient culture (Mclsaac, 1990). Technology-base learning activities are frequently used without attention to impact on the local social environment. Computer-mediated communication attempts to reduce patterns of discrimination by providing equality of social interaction among participants who may be anonymous in terms of gender, race and physical features. However, there is evidence that the social equality factor may not extend, for example, to participants who are not good writers but who must communicate primarily in a text-based format (Gunawardena, 1993). It is particularly important to examine social factors in distance learning environments where the communication process is mediated and where social climates are created that are very different from traditional settings. Feenberg and Bellman (1990) propose a social factor model to examine computer

networking environments that create specialized electronic social environments for students and collaborators working in groups.

The social factor that is particularly significant to distance educators is social essence. Social presence is the degree to which a person feels "socially present" in a mediated situation. The notion is that social presence is inherent in the medium itself, id technologies offer participants varying degrees of "social presence" (Short, lams, & Christie, 1976). Hackman and "walker (1990), studying learners in an interactive television class, found that cues given to students such as encouraging stores, smiles and praise were social factors that enhanced both students' satisfaction and their perceptions of learning. Constructs such as social presence, immediacy and intimacy are social factors which deserve to be incorporated in distance learning. Interactivity as provided by interactive media can afford this opportunity in distance learning.

Empirical Studies

Although not many studies have been carried out on interactive instructional media, there are quite some empirical studies on the availability, accessibility and utilization of instructional media. Osunde and Omoruyi (2004) carried out an evaluation of the National Teachers' Institute's manpower training programmes for teaching personnel in mid-western Nigeria. The study among other things, sought the views of the respondents on the needs and constraints of the

programmes. Four research questions and two hypotheses guided the study. A survey research design was used in carrying out the study. 240 students drawn from the NCE, DLS and Pivotal Teachers Training Programme (PTTP) constituted the population of the study. Questionnaire was the instrument used for data collection, while percentages were used in analyzing the data. Inadequate finance, non availability of appropriate teaching/learning materials, lack of library facilities and laboratory equipment among others were identified by the respondents as the constraints to the effective implementation of the programmes. The result of the study is relevant to this study since it provided an opinion of the availability of instructional media. However, the study was carried out on only NTI programmes while simple percentages were used in analyzing the data. More learners, a number of distance education providers and better statistical method other than the simple percentages should have been employed. Besides, the study was carried out in the mid-west (south-south) not South-East.

Omotayo (2009) carried out a study on the availability and utilization of instructional materials in the NTI programmes in Oyo, Ogun and Ondo States. The purpose of the study was to find out the extent of availability and utilization of some listed instructional media in the implementation of NTI programmes. Five research questions and five hypotheses guided the study. A survey research design was adopted while the population of the study was 7,540 NTI students from which

a sample size of 754 students were actually Studied. A total of 20 instructional devices classified into visual, audio, audio-visual, equipment and facilities were constructed into a checklist and used for the collection of data. Mean scores and standard deviation were used in the analysis of the research questions. The findings of the study showed that the respondents were generally of the opinion that the studied instructional media were relatively available but rarely used. Most of the available materials were however the print visual materials and facilities. The study indicated that the available media were majorly the visual print media in the forms of textbooks, study manuals, charts, board and other such non-electronic media. It is thus relevant to this study. The study although had audio-visual materials in the checklist did not actually study the interactive media. The study was equally restricted to the states in the South-West and not the South-East.

Obasi (2007) carried out a study on the availability, utilization and effects of audiovisual materials for teaching English Language in secondary schools in Enugu State. The study specifically examined the extent of availability, utilization and perceived effects of the use of audio-visual materials in the teaching of English language. Three research questions and two hypotheses guided the study. A survey research design was used. A sample size of 55 teachers and 1,525 students randomly drawn from urban and rural locations were actually studied.

Questionnaire formed the research instrument. Mean scores and standard deviations were used in the data analysis. The findings of the study indicated that the audio-visual materials were not adequately available and rarely used. The study is relevant to the present study because it provided information on the availability and utilization of instructional media. Audio-visual materials are closely related to interactive media but the study obviously is not on interactive media.

Onoh (2012) studied the availability and utilization of instructional materials for effective implementation of National Certificate in Education by distant learning system of National Teachers Institute, Enugu State. The study specifically examined the extent to which course books or modules and tutorial support materials were *available and utilized by facilitators and students for the implementation of the NCE*-DLS programme of the NTI. Four (4) research questions and three (3) hypotheses were designed to guide the study. A survey research design was adopted. The population of the study was made up of 269 course tutors and 2,251 students of the NCE-DLS study centres in Enugu State from which the 269 facilitators and a sample of 450 students were actually studied. The instrument for data collection was questionnaire developed by the researcher and validated by 3 experts. The reliability of the instrument was equally conducted, using Cronbach alpha formula. The centre managers were trained and

used for data collection. Mean and standard deviations were used to answer the research questions while t-test statistics were used in testing the hypotheses. The result of the study indicated that the materials relatively available and utilized. The study provided information on the liability and utilization of instructional media and therefore relevant to the present study. It is however restricted to Enugu State, NTI and on course module and tutorial support materials. It is obviously not on interactive media.

Adebayo (2010) carried out a study on the availability, accessibility and utilization of electronic media for instructional purposes in the South-West Nigeria. The purpose of the study was to find out the extent of availability, accessibility and utilization of a listed number of electronic media required for instructional delivery in the NTI distant learning system. Four research questions and four hypotheses guided the study. A survey research design was used. The *NTI distant learning system* students formed population of the study. Questionnaire was the instrument used for data collection while simple percentage was used in the data analysis. The results of the analysis indicated very low extent of availability, accessibility and utilization of electronic media. The reasons for the low extent were majorly due to non availability access facilities such as electricity problem, facility attendants and others. The study is relevant to the present study. For one

it provided information on accessibility instructional media but it was carried out again in the South-West Nigeria not in the South-East.

Yaya (2006) carried out a survey study on the utilization of tutorial support materials in the Distant Learning System (DLS) of the National Teachers Institute in the South-South geo-political zone of Nigeria. The study specifically examined the availability, accessibility and the utilization of the tutorial support materials required for the NCE (DLS) programme of the NTI. Three research questions and two hypotheses guided the study. Three states (Edo, Bayelsa and Akwa Ibom) were studied and out of all the states, 50% of the study centres were randomly selected and studied. 17 support materials, 16 equipment and 12 facilities identified by experts through validation as tutorial support materials required for the NCE (DLS) programme were constructed to a checklist and used as instrument for the collection of data. The reliability coefficient of the instrument was obtained through trial testing. Simple percentage used in the data analysis. The results of data analysis revealed among others, that most of the tutorial support materials were available and accessible. It was specifically found out that 60% of the study centres had more than 50% of the items in the checklist. It was also found out that the support materials though available and accessible were never used or were sparingly used. The most frequently used items were science kits, chemicals, specimen, chalkboard and classrooms/halls.

Computer based resources such as compact discs, internet services as well as electronic/projected materials such as cameras and projectors were the least available, least accessible and rarely used. The study provided information on the availability, accessibility and utilization of tutorial support materials, in other words, instructional media. It is thus relevant to the present study. It is however, not specifically on the interactive instructional media.

Enyi (2004), assessed the availability and utilization of Resources for Distance Education in Nigerian universities. Specifically, the study assessed the availability of Human and non-human resources, the degree of usage of the resources and the problems militating against effective usage of the resources. Four (4) research questions guided the study. A survey research design was adopted. Six Nigerian ' universities that run distance education, viz, University of Lagos, Ahmadu Bello University, Zaria, University of Abuja, University of Calabar, Ekiti State University and lmo State University were studied. Out of the total population, a total of 180 lecturers, involved in distance education programme in the ratio of 30 each were purposively selected and studied. The   research instrument was questionnaire validated by experts in distance education and curriculum. .Simple percentage scores e used to answer the research questions. The results of the analysis revealed among others, that only chalkboards and print media were generally available while such electronic media as, TV, radio, internet and

computer progs, telephone networks, GSM, satellite, fax, E-mail and Audio-video facilities were unavailable. Only chalkboards, print media and audio-videotapes were the only non-human resources utilized. The analysis also revealed that the reasons for non-use of the media include; lack of technical support, lack of grants for the provision of materials and expenses, negative comments about distance education, as well as lack of professional prestige and skills. The study provided an insight on the utilization of resources including instructional media in distance education and therefore relevant to the present study, percentages were however used for the analysis. The study was equally not on interactive media.

Falade (2008) equally assessed the availability and utilized media in the National Teachers Institute distance education programme in Oyo State. The study was specifically designed to identify the type of media available for NTI distance education, determine the extent to which the NTI learners use the media and to ascertain the problems militating against effective use of the available media by distance learners. Three research questions guided the study. Survey research method was adopted. The NTI distance learners in Ibadan, Ibarapa, Ogbomoso, Oke-Ogun and Oyo zones constituted the sample population studied. The research instrument was questionnaire validated by experts while frequency count and percentages were used for data analysis. The results of the analysis revealed among others, that only common media, such as chalkboards, print media,

photographs and graphic materials used in conventional institutions were available and utilized in the NTI study centres in Oyo State, whereas Radio, TV, internet, computer and satellite broadcast were not available let alone being utilized. It also showed that several factors militate against the use of media including lack of fund, absence of electric power supply, poor maintenance culture, government policies, lack of experts and lack of interest on the part of learners. Again the study is relevant to the present study. It considered the availability, utilization and the problems militating against the usage. However, the use of frequency count and simple percentage is inappropriate. It is equally not particularly on interactive media and the study was conducted outside the area covered by the present study.

Videotape has been reported to be very effective in the delivery of instruction for distance and conventional classroom learners. A study reported by Abolade (1999) examined the comparative effectiveness of video mediated instruction and traditional if classroom method on secondary school students' achievement in ecological concepts Biology. The findings show a superiority of video instruction over conventional method. Students who received video mediated instruction performed better than those that were taught using the conventional method of instruction. The study was an experimental study and t-test statistics was used in the data analysis. It is relevant to the present study, since it provided information

on the effectiveness of an electronic media. The study was however not on interactive media and was carried out outside the area of the present study.

Benedict (1988) examined the effects of .three types of media presentation on performance of secondary school students in fine arts. The experimental group; Motion Assisted Instruction (MAI), had treatment consisted of imported and locally recorded video tape instructions. The second group was treated with Static Instructional Materials (SIM); drawings, pictures, graphics and lettering. ANCOVA analysis of the data showed that the MAI (treated with recorded video lessons) performed significantly better than the other groups. Yusuf (1999) investigated the effects of video and slide tape instructions on student's achievement in junior secondary school social studies. The quasi-experimental study sought for significant difference in the post-test and retention test achievement scores of students taught using videotape; slide tape and the conventional classroom instruction. Social studies achievement test (SSAT) was administered on the one hundred and ninety-one (191) students that constituted the sample. The results indicated that students taught using videotape and those taught with slide tape performed significantly better than the control group. A similar study by Fakomogbon (1997) developed videotape instruction instructional technology for special learners using coordinated team approach.

The group treated with video tape instructions achieved slight improvement in performance, though there was no statistically significant difference in the performance when compared with the control group. It is apparent that the studies of Benedict (1988); Fakomogbon (1997) and Yusuf (1999) sampled students of regular, conventional school system with a view of finding media for supplementing normal classroom instruction and not for distance education; hence the absence of interactive devices. Thus, the three studies were on regular education systems not distance education and on linear media not interactive media. They are however relevant to the study as they studied effectiveness of media in instructional delivery.

Similar studies have been carried out on distance learners taught using interactive media. In a study that investigated -the effects of distance learning on student outcomes in general education courses, Stanton (1995) compared student outcomes in a general education courses of 135 on-campus students and 122 remotely located students. The two groups received simultaneous instruction via interactive television. The quasi-experimental study was analyzed using t-test statistics and the results found the process acceptable to both teachers and students, and no apparent difference in achievement or attitude related to location. The study confirmed the elative effectiveness of distance learning, particularly when interactive media are used and therefore relevant to the present study. The

study was however carried out n a different geographical setting other than the area covered by this study.

While trying to verify the perception of students toward the use of interactive television in distance learning, Tiene (1997), conducted a survey of 52 high school students taking placement courses in Psychology, French, Spanish, German and Latin interactive television. The report revealed that 90% of the students agreed that learning experience was different from a regular classroom; 77% agreed that a fax machine speed up the exchange of materials and 61% agreed that technical difficulties interfered with the course. This study is relevant to the present study. The simple percentage used is however not a wonderful statistical tool.

Summer (1991) reported an experimental investigation aimed at determining the effect of interactivity upon student achievement, completion intervals and affective perceptions. In the quasi-experimental study, a group experienced the pre-purposed interactive videodisc-based instructional unit while the second group experienced the linear video tape-based presentation mode. Computed t-test revealed no statistically significant difference in student's achievement. In a study that examined attitudes of students receiving instruction via two-way interactive television. Burkman (1994) reported that students enrolled in the interactive television psychology classes held more positive than negative

attitudes towards interactive television as a medium of instruction. The study was a quasi-experimental study which compared two groups of learners. These studies though on interactive media and even on distance education, were carried out in very different areas with very different background and circumstances. They are however relevant to the present study.

Although several studies have been carried out with regard to the teacher-student and even student-student interaction in the teaching-learning process, and on the effectiveness of instructional media, Tinko (1987), Tell (2002), Lui (2009) etc, distance education issues, with particular reference to interactive technology is relatively a newly developing area which requires many more studies in order to keep abreast with the rapidly developing phenomenon. Currently, advances in information technologies have given a new lease of life to our education and instructional delivery system. The result is that many institutions of higher learning have adopted distance and on-line education as the next logical step in educational delivery systems. These are being promoted as the educational pedagogy of the future. Some experts have gone as far as predicting that the "residential based model", that is, students attending classes at pre-arranged times and locations will disappear in the near future 'Blustain, Goldstein, and Lozier 1999 and Drucker 1997). However, one overriding question that must be addressed is how will these new approaches that move away from the basic face

to face relationship between a professor and student impact on the students' learning and the students perceptions of learning. In other words, how effective are the distance and on-line learning technologies and methodologies. This has not been well researched on, particularly in this part of the world. To better understand how learning technologies impact on students learning, there is a need for a study of this nature.

Summary of the Literature Review

Literature related to the topic of study was reviewed under conceptual and theoretical frameworks as well as empirical studies. Under the conceptual framework, concepts of distance education, instructional media, availability, accessibility, utilization, effectiveness of instructional media and perception were discussed. Schramms Communication Theory, Theory of Constructivism, Transactional distance, Interaction and social context theories were handled under the theoretical concept; while the empirical studies considered related studies on availability, accessibility, utilization and effectiveness of interactive instructional media used in distance education. The review shows that Distance Education, is the form of education in which the teachers and the learners are separated in space and in time, and in which the learners enjoy a very high percentage degree of autonomy and freedom of choice in terms of location, time, curriculum and pace, but in which the gaps are appropriately filled by instructional communication

media" and or media enhancing technologies. The form of education is not new in Nigeria. It has been there at least from about the 1940s, in various, unorganized and organized forms. It started from the unorganized self study and correspondence study programme, where the main mode of instructional delivery was the print media. Then the organized efforts of some Nigerian universities and other higher institutions in providing various forms of -formal, regular and non-regular and non-resident educational opportunities in forms of part-time, sandwich, uniair and other such programmes. And then the current open and distance education system where sophisticated interactive media or media enhancing technologies which are capable of creating interactive and virtual realities, constitute the means of instructional delivery.

Due to established short falls of the regular face-to-face education, and the invaluable essence of the distance education system in complementing the regular system, distance education is becoming the vogue. Hence whether the form of education has come to complement, work along parallel lines or to replace the regular system, is irrelevant, what is of immense essence is to bring up the system to fail on all fours with the regular system through quality assurance.

Instructional communication media are all forms of information career that can be employed to record, preserve, store, transmit and retrieve information for the purposes of instruction. The media consist of all the means-devices, equipment,

materials, facilities, people, natural and cultural phenomenal, simulations, games and other information communication technologies as well as the language codes (verbal or non-verbal) used for instructional communication.

There are various forms of instructional media normally used for distance education. Some of them provide for a one-way communication system, from the teacher to the learner or vice versa, and are referred to as non-interactive communication media system, while others provide for a two-way interactive communication system, between the teacher and the learner and among the learners and teachers. These are said to be interactive. Some of these interactive media include; the satellite, on-line learning, E-learning, the use of computer - computer conferencing, teleconferencing, video-conferencing, virtual classrooms and others.

Interactive instructional media was discovered to be a basic element in the distance education instructional delivery. It *bridges the gaps created by the physical s*eparation between the teachers and learners in time and space, and by so doing bring the quality of distance education to fall "on all fours" with the formal education system". The form of instructional media is however relatively new. Their availability, accessibility, usability and effectiveness are yet to be properly appraised. While some authorities considered them unavailable,

unaccessible and rarely used, others were of contrary opinion. They were however considered very effective when used.

The study is naturally an appraisal or evaluative study, and meant to find out the effectiveness of interactive instructional media required for distance education. The evaluation was based on the perceptions of the learners. Hence the concepts of effectiveness and perceptions were discussed to reasonable extents. There are a number of communication and distance education theories on which the study was based. These were discussed Empirical studies were equally analyzed to establish the gap and need for this study.

Eventually, the researcher discovered a complete absence of any previous work or study carried out on interactive instructional media in the South-East geopolitical zone, and with particular reference to its effectiveness in the delivery of distance (educational instructions. This is what this study has tried to address.

CHAPTER THREE

RESEARCH METHOD

In this chapter, the procedure employed in carrying out the research is presented under the following sub-headings: Research Design, Area of the Study, Population of the Study, Sample and Sampling Technique, Instrument for Data Collection, Validation of the Instrument, Reliability of the Instrument, Method of Data Collection and Method of Data Analysis.

Research Design

A survey research design was adopted for the study. A survey research is one in which a group of people or items is studied by collecting and analyzing data from only a group of people or items considered to be a representative of the entire group (Nwanna, 1981; Anigbo, 2010 and Nworgu, 2006). It uses sample deemed to be a representative of the population, and aims at collecting information from which references may be drawn about the people or items as a whole (Nwoye, 2010). Surveys are often used to gather data with the intent and purposes of describing and interpreting the nature of existing conditions, prevailing practices, beliefs, attitudes or on-going process (Ndagi, 1984). Thus, the survey design is considered appropriate for the study because the study intends to obtain and analyze the perceptions or opinions of a relatively large population of distance learners on their current study conditions through representative samples.

Area of the Study

The study was carried out in the South East geopolitical zone of Nigeria. The zone is one of the six (6) geographical zones of Nigeria; it is made up of 5 states viz: Abia, Anambra, Ebonyi, Enugu and Imo State. The zone has quite a good number of higher institutions of learning and almost all of them provide one form of distance learning programme or the other. The National Open University of Nigeria (NOUN) and the National Teachers Institute (NTI) are however National institutions established primarily for distance education purposes and as such play rather dominant roles in the distance education programmes currently. The students can provide effective learners perceptions on issues of distance education.

The zone has five (5) study centers of the National Open University of Nigeria (NOUN) located in Awka, Enugu, Owerri, Umudike and the Nigerian Prisons, Enugu. A new center was recently established at Awgu, Enugu State bringing up the number to six but was not used in this study. There are also forty-four (44) study centers of the National Teachers' Institute (NTI) distributed as follows: Abia 12, Anambra 9, Ebonyi 6, Enugu 6 and Imo 9 (National Teachers' Institute, Enugu Zonal Office, 2014).

Population of the Study

All the students in all the study centers of the National Open University of Nigeria (NOUN) and the National Teachers' Institute (NTI) in the South-East Zone of

Nigeria constituted the population of the study. The current students' population of the National Open University of Nigeria is 20,805 students. The population is distributed as follows: Umudike (Umuahia) 3,504, Awka 5,860, Enugu 6,619 and Nekede (Owerri) 4,822, (NOUN, Enugu Study Center, 2014). The students' population of the National Teachers' Institute programmes in the South-East Zone is 26,279 students. The population distribution is as follows: Abia – 9,572; Anambra – 3,541; Ebonyi- 4,236; Enugu – 3680 and Imo – 5250; total – 26,279 (Source: NTI, Enugu Zonal Office, 2014). Thus, the total population for the study is 47,084 students made up of 20,805 and 26,279 students of the National Open University of Nigeria and National Teachers' Institute in the South East Zone of Nigeria respectively.

Sample and Sampling Technique

Out of the 5 states in the South East Zone of Nigeria, 2 states – Enugu and Abia States were randomly sampled and used for the study and out of the total population of 23,375 students of the two states, 393 was selected for the study. This was made up of 170 NOUN students and 223 NTI programme students. Stratified (proportionate) random sampling was also used in selecting samples of students used for the study from the two states and from both institutions.

The stratification was based on states – NOUN centers and NTI centers. Yaro Yamene's sample size selection formula was used for the determination of the sample size. That is:

$$n = \frac{N}{1 + N(e)^2}$$

Where;

n   =   Sample Size

N   =   Population

e   =   Error margin or level of confidence (0.05)2

The proportionate random sampling technique helped the researcher to draw respondents randomly from each stratum and in such a way that the sample size in such proportion is relative to the stratum's proportion of the entire population. It also ensured equal and unbiased opportunity for each member of the population to be sampled (Nworgu, 2006). The sampling procedure is further described in a table and thereafter attached as appendix F.

Instrument for Data Collection

The instrument for data collection is a researcher designed questionnaire meant to obtain data on the availability, accessibility, utilization and effectiveness of the interactive instructional media used in Distance Education programmes. The questionnaire was divided into two sections: A and B. Section A was meant to

obtain personal data while section B sought for information that provided answers for the research questions and for testing the hypotheses. The section B comprised of 70 items arranged in 4 clusters of 1, 2, 3 and 4 in line with the research questions they were used to answer. A four point response format of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) was used to elicit information from respondents and was assigned numerical values for analysis as follows:

Strongly Agreed (SA)   -   4 points

Agreed (A)   -   3 points

Disagree (D)   -   2 points

Strongly Disagree (SD)   -   1 point

Validation of the Instrument

The instrument was face validated by three experts; two from the field of curriculum and instruction and one from Measurement and Evaluation; all of the ranks of Associate Professors and Senior Lecturers, and of the Faculty of Education, Enugu State University of Science and Technology (ESUT), Agbani-Enugu. Each of the validates were given a copy of the instrument for validation. The research topic or title, purpose of the study, research questions and hypotheses were equally given to guide them in the validation.

The validation were requested to validate the instrument with particular reference to the following:

i. Appropriateness of the items in relation to the attainment of the purpose of the study, research questions and hypotheses

ii. Clarity of instructions, statements and directives given to the respondents

iii. Relevance, adequacy and proper wording of the items

iv. Comprehensiveness of the content; and

v. Possibilities of ambiguities, errors and omissions

The critical comments of the validates guided the researcher in making necessary modifications before the production of the final copy of the instrument for data collection. The instrument as well as the validates comments are hereafter attached as appendix C.

Reliability of the Instrument

To establish the reliability of the instrument, copies of the instrument were administered on a sample population different but similar to the study population (respondents) in another state specifically Delta State. The data obtained from the trial test were then used to compute the reliability of the instrument using Cronbach Alpha Statistics. In the end, reliability co-efficient were obtained   for the entire instrument. The choice of Cronbach Alpha method was because it was considered most appropriate for determining the internal consistency of items not

dichotonomously scored and when an instrument is administered once to the respondents. The details of the computation of the reliability are hereafter attached as Appendix D.

Method of Data Collection

The researcher administered the instrument with the help of trained research assistants. The assistants were trained in a one-day consultative meeting with particular reference to the selection of respondents, purpose of the study, distribution and the collection of the filled questionnaire. Out of the 393 copies of the questionnaire distributed, 364 were properly filled, returned and used for the analysis. This represented 93% return.

Method of Data Analysis

Mean scores and standard deviation were used to answer the research questions. The choice was informed by the use of a four point scale in the design of the instrument. The decision rule was that any mean score of up to or above 2.50 was regarded as positive while that below 2.50 was considered negative. The decision rule was arrived at by calculating the average of the 4 point scale thus:

$$\text{Average} = \frac{4+3+2+1}{4} = \frac{10}{4} = 2.50$$

t-test at 0.05 level of confidence was used to test the hypotheses. The t-test was calculated using the following formula:

$$t = \frac{X1 - X2}{\frac{S1^2 \ x \ S2^2}{n1 \ x \ n2}}$$

where;   x1   =   Mean Score of Abia Respondents

x2   =   Mean Score of Enugu Respondents

S1   =   Standard Deviation of Abia Respondents

S2   =   Standard Deviation of Enugu Respondents

n1   =   Sample Size of Abia Respondents

n2   =   Sample Size of Enugu Respondents

The decision rule was that where the calculated t-value is equal to or greater than the critical value, the null hypotheses was rejected but where the calculated t-value is less than the critical value, the null hypotheses was not rejected. The t-test was considered appropriate because it is applicable to both large and small samples (Uzoagulu, 1998).

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

In this chapter, the results of data analysis are presented. The results are presented

in tables according to the research questions and hypothesis that guided the study.

Research Question One:

What are the learners; perceptions on the availability of interactive instructional

media for distance education programmes in the South East, Nigeria?

Table 1: Mean Ratings of Students Perceptions on the Availability of Interactive

Instructional Media for Distance Education in the South East, Nigeria.

N = 364

S/N	Indicate your opinion on the availability of the following interactive instructional media systems in your study center	X	SD	Decision
1.	Audio conferencing	1.69	1.04	Disagree (D)
2.	Video conferencing	2.05	0.97	D
3.	Teleconferencing (Telephony)	1.34	0.88	D

4.	Audio-graphic conferencing	1.29	0.86	D
5.	Computer conferencing	2.54	1.01	Agree (A)
6.	Web conferencing	2.56	1.03	A
7.	Multi-media	2.68	0.94	A
8.	Online chat (web chat or instant messaging (IM)	1.24	0.83	D
9.	Application sharing	1.30	0.91	D
10.	Blog (web blog)	1.22	0.85	D
11.	Webcam	1.28	0.90	D
12.	Podcasting	1.41	1.02	D
13.	Wiki application system	1.72	0.92	D
14.	E-mail	2.05	1.00	D
15.	Faxing	1.84	1.05	D
16.	Skype	2.12	1.11	D
17.	Close Circuit Television (CCTV)	1.13	0.81	D
18.	Screen cast	1.18	0.90	D
	Grand Means & SD	**1.70**	**0.60**	**Disagree**

Table 1 shows that out of a total of 18 interactive instructional media systems,

high mean ratings were recorded for only three of them. Specifically, high mean

ratings of 2.54, 2.56 and 2.68 were obtained for items 5, 6 and 7 respectively while low mean ratings (below 2.50) were obtained for the remaining 15 items.

A grand mean of 1.70 with standard deviation of 0.60 was obtained for all the items, indicating that generally, the listed interactive instructional media systems were not available in the distance education study centers under study. The learners (students) generally perceived the interactive instructional media systems as being relatively available.

Research Question Two:

What are the learners' perceptions on the accessibility of interactive instructional media for distance education programmes in the South East Nigeria?

Table 2: Mean Ratings of Students' Perceptions on the Accessibility of Interactive Instructional Media for Distance Education in the South East, Nigeria.

S/N	Indicate whether you easily access, receive or participate in lectures delivered through each of the following	X	SD	Decision
1.	Audio conferencing	1.51	1.02	Not Accessible
2.	Video conferencing	2.00	1.00	NA
3.	Teleconferencing (Telephony)	1.22	0.97	NA

4.	Audio-graphic conferencing	1.21	0.84	NA
5.	Computer conferencing	2.52	0.99	Accessible (A)
6.	Web conferencing	2.53	1.01	A
7.	Multi-media	2.59	0.96	A
8.	Online chat (web chat or instant messaging (IM)	1.19	0.92	Not Accessible
9.	Application sharing	1.24	0.88	NA
10.	Blog (web blog)	1.15	0.91	NA
11.	Webcam	1.16	0.89	NA
12.	Podcasting	1.33	1.05	NA
13.	Wiki application system	1.64	0.95	NA
14.	E-mail	2.01	0.98	NA
15.	Faxing	1.71	1.10	NA
16.	Skype	2.03	1.12	NA
17.	Close Circuit Television (CCTV)	1.11	0.76	NA
18.	Screen cast	1.12	0.83	NA
	Grand Means & SD	**1.63**	**0.53**	**Not Accessible (NA)**

Table 2 shows that high mean ratings of 2.52, 2.53 ad 2.59 were obtained for items 23, 24 and 25 respectively, indicating that the respondents perceived those items computer conferencing, web conferencing and multi-media as being accessible. On the other hand, low mean ratings (1.11 – 2.00) were obtained for the remaining 15 items indicating low accessibility.

A grand mean of 1.63 with standard deviation of 0.53 was obtained for all the 18 items thereby indicating that the respondents generally perceived the interactive instructional media systems as not being accessible. The relatively low standard deviation (0.53) is indicative of the fact that the respondents did not differ remarkably in their opinions regarding the accessibility of the various interactive instructional media systems.

Research Question Three:

What are the learners' perceptions on utilization of interactive instructional media in distance education programmes in the South East, Nigeria?

Table 3: Mean Ratings of Students' Perceptions on Utilization of Interactive Instructional Media in Distance Education in the South East, Nigeria.

N = 364

S/N	The following interactive instructional media are properly utilized in lecture delivery to students	X	SD	Decision
37.	Audio conferencing	1.49	1.01	Disagree (D)
38.	Video conferencing	1.98	0.99	D
39.	Teleconferencing (Telephony)	1.16	0.96	D
40.	Audio-graphic conferencing	1.80	0.92	D
41.	Computer conferencing	2.50	0.97	Agree (A)
42.	Web conferencing	2.51	0.98	A
43.	Multi-media	2.56	0.87	A
44.	Online chat (web chat or instant messaging (IM)	1.18	0.94	Disagree (D)
45.	Application sharing	1.19	0.90	D
46.	Blog (web blog)	1.12	0.95	D
47.	Webcam	1.12	0.88	D
48.	Podcasting	1.23	1.02	D
49.	Wiki application system	1.58	0.89	D
50.	E-mail	2.00	0.91	D

51.	Faxing	1.64	1.07	D
52.	Skype	2.01	1.10	D
53.	Close Circuit Television (CCTV)	1.07	0.80	D
54.	Screen cast	1.09	0.86	D
	Grand Means & SD	**1.62**	**0.51**	**Disagree (D)**

Table 3 shows that high mean ratings of 2.50, 2.51 and 2.56 were obtained for items 41, 42 and 43 respectively, indicating that the respondents (students) agreed that the available interactive instructional media (computer conferencing, web conferencing and multi-media) were utilized in lecture delivery to them. On the other hand, low mean ratings (1.07 – 2.01) were recorded for the remaining 15 items (items 37 – 40 and 44 – 54), indicating that the respondents disagreed that the interactive instructional media represented by those items as being utilized by their lecturers in instructional delivery.

A grand mean of 1.62, with standard deviation of 0.51 was obtained for all the 18 items (37 – 54) indicating that the students generally disagreed with the view that the available interactive instructional media were utilized in lecture delivery at the study centers. The relatively low standard deviation (0.51) suggests that the

respondents did not reasonably differ in their opinions regarding the individual items relating to utilization of the listed interactive instructional media systems.

Research Question Four:

What are the learners' perceptions on the effectiveness of interactive instructional media used in distance education programmes in the South East, Nigeria?

Table 4:

Mean Ratings of Students' Perceptions on the Effectiveness of Interactive Instructional Media Used in Distance Education in the South East, Nigeria.

S/N	Interactive instructional media are considered effective because of the following	X	SD	Decision
55.	The lectures are aware of existence of the media	2.88	1.01	Agree (A)
56.	The lectures normally use the media in teaching	1.94	0.93	Disagree (D)
57.	The students are aware of the existence of the media	2.71	1.08	A
58.	The students normally participate in the use of the media	2.08	1.10	D
59.	The lecturers possess the relevant skills for use of the media	2.43	0.97	D

60.	The students possess the relevant skills for participating in the use of the media	1.96	0.95	D
61.	The students easily access information presented through the media	2.17	1.03	D
62.	Relevant facilities and systems for the use of the media are always available	1.66	1.11	D
63.	The facilities and systems for use of the media are always functional	1.89	1.04	D
64.	The facilities and systems for the use of the media are affordable to the students	2.56	1.03	A
65.	There are enough available technicians to assist in the use of the media	1.83	1.04	Disagree (D)
66.	The use of the media arouses learning interest in the students and engages their attention	3.28	0.94	A
67.	The use of the media generates students' participatory learning activities in the classroom environment	2.61	1.02	A
68.	The media is normally appropriate for the topics being treated	2.59	1.07	A

69.	The use of the media provides opportunity for a two-way interaction between the lecturers and students	3.72	0.92	A
70.	The media serve the students irrespective of time and locations	3.54	0.92	A
71.	The media enables the students to successfully respond to the lecturers evaluation questions	3.63	0.95	A
72.	The use of the media enables the students share ideas with each other	3.22	1.00	A
	Grand Mean & SD	**2.59**	**0.64**	**Agree (A)**

Table four (4) shows that out of a total of 18 items relating to the effectiveness of interacting to the media used in distance education in the South East, Nigeria; the respondents (learners) agreed with ten (10) of them and disagreed with the remaining eight. Specifically, the learners agreed with items 55, 57, 64, 66, 67, 68, 69, 70, 71 and 72 with mean ratings of 2.88, 2.71, 2.56, 3.28, 2.61, 2.59, 3.72, 3.54, 3.63 and 3.22 respectively; indicating that they perceived such items as effective. Conversely, low mean ratings of 1.94, 2.08, 2.43, 1.96, 2.17, 1.66, 1.89 and 1.83 were recorded for items 56, 58, 59, 60, 61, 62, 63 and 65 respectively

thereby showing that the respondents did not perceive such aspects of interactive instructional media as being effective.

A grand mean of 2.59 with standard deviation of 0.64 was obtained for all the 18 items indicating that the learners (respondents) generally perceived the interactive instructional media used in distance education in the South East Nigeria as being effective. The relatively low standard deviation of 0.64 is suggestive of the fact that the respondents generally had similar opinions regarding the effectiveness of the individual items.

Testing of Hypothesis

Ho1: There is no significant difference between the mean ratings of the NOUN and the NTI learners on the availability of interactive instructional media available for the distance education programmes in the South East, Nigeria.

Table 5:   t-test analysis of mean perception ratings of NOUN and NTI learners on the availability of interactive instructional media for distance education in the South East, Nigeria.

Distance Edu. Prog.	N	X	SD	df	t-cal	t-crit.	Decision
NOUN	154	1.96	1.03				Reject

				362	4.73	1.96	Ho
NTI	210	1.44	1.07				

Table 5 shows that the calculated t-value, at 0.05 level of significance and 362 degree of freedom, is 4.73 while the critical t-value is 1.96. Since the calculated t-value is greater than the critical t-value, the null hypothesis is therefore rejected. This invariably means that there is significant difference between the mean perception scores of learners in NOUN and their counterparts in NTI regarding the availability of interactive instructional media for distance education programmes in the South East, Nigeria.

Ho2: There is no significant difference between the mean ratings of the NOUN and the NTI learners on the accessibility of interactive instructional media for distance education programmes in the South East, Nigeria.

Table 6: **t-test analysis of mean perception ratings of NOUN and NTI learners on the accessibility of interactive instructional media for available distance education in the South East, Nigeria**

Distance Edu. Prog.	N	X	SD	df	t-cal	t-crit.	Decision

NOUN	154	1.84	0.98				Reject
				362	4.16	1.96	Ho
NTI	210	1.42	0.93				

Table 6 shows that the calculated t-value, at 0.05 level of significance and 362 degree of freedom is 4.16 whereas the critical t-value is 1.96 under the same conditions. The null hypothesis is then rejected, since the calculated t-value is greater than the critical t-value. This means that a significant difference actually exists between the mean ratings of learners in NOUN and their counterparts in NTI regarding the accessibility of interactive instructional media for distance education programmes in the South East, Nigeria.

Ho3: There is no significant difference between the mean ratings of NOUN and NTI learners on the utilization of interactive instructional media in the distance education programmes in the South East, Nigeria.

Table 7:   t-test of analysis of mean ratings of learners in NOUN and their counterparts in NTI on the utilization of interactive instructional media in distance education in the South East, Nigeria

Distance Edu. Prog.	N	X	SD	df	t-cal	t-crit.	Decision

NOUN	154	1.73	1.97				Reject
				362	2.10	1.96	Ho
NTI	210	1.51	0.91				

Table 7 shows that the calculated t-value at 0.05 level of significance and 362 degree of freedom is 2.10 while the critical t-value under the same conditions, is 1.96. Since the calculated t-value is greater than the critical t-value, the null hypothesis is therefore rejected. This invariably means that there is significant difference between the mean ratings of learners in NOUN and those in NTI regarding the utilization of available interactive instructional media for distance education programmes in the South East, Nigeria.

Ho4: There is no significant difference between the mean ratings of NOUN and NTI learners on the effectiveness of interactive instructional media used in the distance education programmes in the South East, Nigeria.

Table 8:   t-test analysis of mean ratings of learners in NOUN and their counterparts in NTI on the effectiveness of interactive instructional media used in distance education in the South East, Nigeria

Distance Edu. Prog.	N	X	SD	df	t-cal	t-crit.	Decision

NOUN	154	2.72	1.02				Reject
				362	2.43	1.96	Ho
NTI	210	2.46	0.98				

Table 8 shows that the calculated t-value at 0.05 level of significance and 362 degree of freedom is 2.43 while the critical t-value is 1.96. The null hypothesis is therefore rejected since the calculated t-value is greater than the critical or table t-value. Thus, there is significant difference between the mean ratings of learners in NOUN and their counterparts in NTI regarding the effectiveness of the interactive instructional media that are used in distant education programmes in the South East, Nigeria.

Ho5: There is no significant difference between the mean ratings of Abia and Enugu State learners on the availability of interactive instructional media for distance education programmes in the South East, Nigeria.

Table 9:   t-test analysis of the mean ratings of learners in Abia and their counterparts in Enugu State on the availability of interactive instructional media for distance education in the South East, Nigeria.

State	N	X	SD	df	t-cal	t-crit.	Decision

Abia	208	1.76	0.92				Do not reject
				362	1.18	1.96	Ho
Enugu	156	1.64	1.00				

Table 9 shows that the calculated t-value at 0.05 level of significance and 362 degree of freedom is 1.18 as against the critical t-value of 1.96. The null hypothesis is therefore not rejected since the calculated t-value is less than the critical t-value. This means that there is actually no significant difference between the mean ratings of learners in Abia State and their counterparts in Enugu State regarding the availability of interactive instructional media for distance education.

Ho6: There is no significant difference between the mean ratings of Abia State and their Enugu State counterparts on the accessibility of interactive instructional media for distance education in the South East, Nigeria

Table 10:   t-test analysis of the mean ratings of learners in Abia State and their Enugu State counterparts on the accessibility of interactive instructional media for distance education in the South East, Nigeria.

State	N	X	SD	df	t-cal	t-crit.	Decision
Abia	208	1.69	0.88				Do not reject
				362	1.32	1.96	Ho

Enugu	156	1.57	0.84				

Table 10 shows that the calculated value t at 0.05 level of significance and 362 degree of freedom is 1.32 as against the critical t-value of 1.96. The null hypothesis is therefore not rejected since the calculated t-value is less than the critical t-value.

This means that there is actually no significant difference between the mean ratings of learners in Abia State and their counterparts in Enugu State regarding the accessibility of interactive instructional media required for distance education programs in the South East, Nigeria.

Ho7: There is no significant difference between the mean ratings of Abia state and Enugu state learners on the effectiveness of interactive instructional media used in the distanced education programs in the South East, Nigeria.

Table 12: t-test summary table for the difference between the mean ratings of learners in Abia State and their counterparts in Enugu State on the effectiveness of interactive instructional media used in distance education in South East, Nigeria.

State	N	X	SD	df	t-cal	t-crit.	Decision

Abia	208	252	1.01				Do not reject
				362	1.27	1.96	Ho
Enugu	156	2.66	1.06				

Table 12 shows that the calculated t-value, at 0.05 level of significance and 362 degree of freedom, is 1.27 while the critical t-value is 1.96. Since the calculated t-value is less than the critical, the null hypothesis is therefore not rejected. This implies that there is actually no significant difference between the mean ratings of learners in Abia State and those in Enugu State on the effectiveness of the interactive instructional media systems used in distance education programmes in the South East, Nigeria.

Summary of Findings of the Study

Results of data analysis relating to the study have shown that:

i. Learners in the distance education programmes in the South East, Nigeria are generally of the opinion that interactive instructional media are not available for utilization in the programmes.

ii. Interactive instructional media for implementation of distance education programmes in the South-East, Nigeria are perceived to be generally inaccessible by students of the programmes.

iii. Availabnle interactive instructional media for implementation of distance education programmes in the South-East, Nigeria are generally perceived by students of the programmes to be underutilized.

iv. Interactive instructional media used in the distance education programmes in the South-East, Nigeria are perceived to be effective by the learners.

v. There is significant difference between the mean ratings of NOUN and NTI learners regarding the availability of interactive instructional media for the distance education programmes in the South-East, Nigeria

vi. A significant difference exists between the mean ratings of NOUN and NTI learners on the accessibility of the available interactive instructional media for distance education programmes in the South-East, Nigeria

vii. There is significant difference between the mean ratings of NOUN and NTI learners regarding the utilization of available interactive instructional media in the distance education programmes in the South-East, Nigeria.

viii. A significant difference exists between the mean ratings of NOUN and NTI on the effectiveness of the interactive instructional media that are used in the distance education programmes in the South-East, Nigeria

ix. There is no significant difference between the mean ratings of Abia State learners and their Enugu State counterparts on the availability of interactive instructional media for implementation of the distance education programmes in the South-East Nigeria

x. There is no significant difference between the mean ratings of learners in Abia State and those in Enugu State on the accessibility of interactive instructional media for implementation of distance education programme in the South-East, Nigeria

xi. No significant difference exists between the mean ratings of learners in Abia State and their counterparts in Enugu State regarding the utilization of available instructional media in the distance education programme in the South-East, Nigeria

xii. There is no statistically significant difference between the mean ratings of learners in Abia State and those in Enugu State regarding the effectiveness of the interactive instructional media used in distance education programmes in the South-East, Nigeria.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSIONS AND

RECOMMENDATIONS

The Discussion of Findings, Conclusions, Educational Implications of the Findings, Recommendations, Limitations of the Study and Suggestions for Further Studies are presented in this chapter as follows:

Discussion of Findings

One of the findings of the study is that learners in the distance education programmes in the South East Nigeria are generally of the opinion that interactive instructional media are not significantly available for the implementation of the f distance education programmes in the zone. This finding is the answer to research f; question one. It is derived from the result of the analysis of the data and mean ratings of the perceptions of the distant education learners presented in table 3. The result of the data analysis of the 18 items meant to answer the research

question one indicated a grand mean of 1.70 and thus, the conclusion. This finding actually contradicts the position of Harrison (2009); Zuras (2010) and Broadman (2012).

Harrison (2009) had opined that with the introduction of relatively low cost but high capacity broad band telecommunication services in the late 1990s, coupled with powerful computing processors and video compression techniques, such communication systems as video conferencing has made significant in road into business, education and media industries just like all other long distance communication technologies such as phone and internet. Zuras (2010) also noted that there is a large number of multimedia systems which are applied in various areas including but not limited to advertisement, art, education, entertainment, engineering, medicine, mathematics, business and scientific research, while Broadman (2012) also identified Interactive Video Disc (IVD), Compact Disk Interactive (CDI), Digital Video Interactive (DVI), Compact Disc-Read Only Memory $_r4$ (CD-ROM), World Wide Web (WWW) and Electronic Mail (E-mail) as available interactive media which can be conveniently used for instructional purposes.

These authorities however noted that the availability of the interactive media are relative to the availability of their application facilities, service providers, cost implications and other locational circumstances. In other words, the availability

or non-availability depends on the existence or non-existence of the software, hardware, application tools and even personnel and technical skills required for the use of the interactive systems.

The finding is however in line with the findings of Yaya (2006). The Yaya had carried out a research on the tutorial support materials required for the distance learning systems of the NTI in South-South geopolitical zone of Nigeria and found out that although most of the support materials researched on were available, the interactive form, viz, compact Disc (CD), internet services as well as electronic/projected materials were the least available, least accessible and rarely used. Osunde and Omoruyi (2004) in an evaluation of the students views on the constraints to the National Teachers Institute (NTI) manpower training programmes for teaching personnel, in Mid-Western Nigeria, found out that "inadequate finance, inadequate teaching/learning materials, library facilities and laboratory equipment" were the major constraints to effective implementation of the NTI programmes. Falade (2008) too, in a study on Assessment of the Available and Utilized Media in NTI distance education programmes in Oyo State had discovered that modern or sophisticated instructional media such as E-mail, internet, radio, television, satellite broadcast and conferencing were not available in the NTI distance education, According to the Falade (2008), "Findings on the type of instructional media available in the distance education revealed that

modern or sophisticated instructional media such as e-mail, internet, radio, television, satellite broadcast, and conferencing are not available in NTI distance education. Those available are the conventional media such as prints media, chalkboard, graphic and poster materials. This cuts across study centres in all the zones and can as well be used to generalize for all other NTI study centres in the State" (p. 79).

Due to rapid developments in technology, courses are delivered to learners at various locations using a variety of media in an effort to serve the educational needs of growing populations. In many cases, development in technology allow distance education programmes to provide specialized courses to students in remote geographical areas with increasing interactivity between student and teacher. Such programmes are particularly beneficial to many people who are not financially, physically or geographically able to obtain traditional education. In other words, most distance learning programmes rely on technologies.

Thus, in relation to the finding, the opinions expressed by Riel (1993) and Perkins and Barret (1995 in Enyi 2004) are worthy of note. Distance education has experienced dramatic growth both nationally and internationally since the early 1980s. It has evolved from early" correspondence education that used primarily print based materials into a worldwide movement using various technologies.

Variety of technologies should currently be used as delivery systems to facilitate learning at a distance (Riel, 1993). Distance education relies heavily on media. Broadcast media, video, and computer conferencing, electronic mail, multimedia computer technology should all be used to promote student-teacher interaction and provide necessary feedback to the learner at a distance. Recent developments in interactive multimedia technologies which promise to facilitate "individualized" and "collaborative" learning are blurring the distinctions between distance and traditional education (Perkins & Barrett, 1995 in Enyi 2004). Thus, the non-availability of interactive instructional media for distance education in this technology age is an uncomfortable truism. It is however encouraging to note that the non-availability is to a large extent a matter of vocational and awareness circumstances.

There is a significant difference between the mean ratings of the NOUN and NTI learners on the availability of interactive instructional media for the distance education programmes in Nigeria. The t-test analysis of the difference between the mean ratings of NOUN and NTI learners regarding distance education programmes as presented in table 7, showed a calculated t-value of 4.73 as against the critical t-value of 1.96. The null hypothesis of no significant difference was thus rejected. NOUN was established to operate purely, from a distance without much contact sessions, unlike the NTI which operate predominantly on contact

centres scattered at different parts of states or zones. The contact nature of the NTI means the use of non-interactive media, in the nature of memographs, handouts, course modules etc. Thus, NTI students are majorly ignorant of interactive media. Their opinions on the interactive media are thus bound to differ from those of NOUN, which was founded on a different motive. The nature of the learners equally counts.

There is, however, no significant difference between the perceptions of Abia state learners and their counterparts in Enugu State on the availability of interactive instructional media. The t-test analysis as shown in table II indicated that the calculated t-value of 1.18 is less than the critical t-value. The null hypothesis of no significant difference was therefore not rejected. This finding agrees with the earlier finding of Falade (2008), that the non-availability situation of interactive media cuts .across all NTI centres and states, and can as well be generalize to all other NTI Centres. The NOUN and NTI distance education environments, facilities and practice systems are more or less homogeneous. Hence the finding is not a surprise. Facilities and lecture guidelines are provided from a source and equally distributed to the different zones, states and centres.

Another finding of the study is that the interactive instructional media required for the implementation of the distance education programmes are perceived to be generally inaccessible. The analysis of the 18 items meant to answer research

question two, with regards to the accessibility of interactive instructional media showed high mean ratings of 2.52, 2.53 and 2.59 on item numbers 23, 24 and 25 i.e. computer conferencing, web conferencing and multimedia respectively but very low ratings of 1.11-2.00 on the other 16 items. There is also a grand mean of 1.63 with standard deviation of 0.53 for all the 18 items. Thus, the respondents generally were of the opinion that the interactive instructional media systems were not accessible. The relatively low standard deviation is equally indicative of the fact that the respondents did not differ remarkably in their opinions. This finding agrees with the findings of the earlier works of Yaya (2006), Adebayo (2010), Ekpeyong (2011) "and Maduabuchi (.2012). Out of the instructional media researched' on by Yaya (2006), the ones available and accessible were such media as science kits, chemical specimen, chalkboard, classroom halls, and other such non interactive media. The electronic interactive media were generally inaccessible. The other authorities above all equally discovered that the electronic interactive media, where available were usually inaccessible. The reasons adduced for the inaccessibility include such facts as paucity of access facilities, locational geographic circumstances, poor or inadequate knowledge of the use of the media by both teachers and learners and others. The internet server operations, for instance, are practically affected by locational circumstances and thus do not function equally at all locations. The findings however contradicts the opinions of

such authorities as Argawal (2007), Majigal and Mangal (2010) and Broadmand (2012) who are of the opinion that the advancement in the development of information communication technologies (ICT) and facilities has made quite a large number of interactive media systems available and accessible. This opinion maybe true to some extent but obviously not generally practically applicable in all locations and circumstances. One fact which may have informed this opinion and other opinions on accessibility is that availability and accessibility are intertwined. People find it difficult to differentiate accessibility from availability and to some extent utilization. Probably this is why most research works in this regard are on availability and utilization and nothing on accessibility. Accessibility is only often mentioned in passing while discussing availability and utilization. Distinctively, however, accessibility denotes access road or ability to use when there is an intent to use an available facility. For instance, a learner may wish to obtain information from available internet system, but the internet server may not be functional in his location or he may lack the necessary knowledge and skills to operate the system. This is a factor of accessibility. On the other hand, availability denotes physical existence while utilization has to do with application.

A significant difference exists between the perceptions of the learners in NOUN and their counterparts in the NTI regarding the accessibility of interactive instructional media for distance education. The t-test analysis of the difference

between the perception ratings of the NOUN and NTI on accessibility presented in table 8 showed that the calculated t-value is greater than the critical t-value thus indicating a significant difference. The reason for this discovery may not be far-fetched. For one, historically, the reason for setting up the programmes, the orientation structure and modus operandi of the two programmes may be similar but not exactly the same. The NTI programme, was actually initiated to provide opportunities specifically for practicing teachers to remedy their professional deficiencies and for professional growth. Structurally, co-ordinating and study centres are scattered at states and at various local levels bearing the intended learners in mind. Most of the study centres had little or no facilities that can support interactive media system. The access abilities and facilities for interactive media is almost zero. The media in use are non-interactive, mainly course modules, textbooks and contact sessions. The NOUN is a beat different. It was meant to serve people of all professions and age levels, who have to work and learn as it suits their circumstances. The centres are located in the urban areas where facilities that can support interactive media systems exist. The use of interactive media systems was equally a primary consideration in the establishment of the NOUN. There is however, no significant difference between the mean ratings of learners in Abia State and their counterparts in Enugu State regarding the accessibility of interactive media. The finding is in line with the

earlier discoveries of Falade (2008), and Adebayo (2010). Structure, method of operation and circumstances of the programme are similar in all the states and centres.

Available interactive instructional media required for the implementation of distance education programme in South-East Nigeria are generally perceived by the learners to be under-utilized. This conclusion is derived from the results of the analysis of data on the utilization of available interactive media presented in table 5. The analysis of the data showed that only 3 out of the 18 items studied i.e. item numbers 41, 42 and 43, (computer conferencing, web-conferencing and multimedia) have high mean ratings of 2.50, 2.51 and 2.56 respectively, whereas all the rest of the 15 items recorded low mean ratings of 1.07 - 2.01. There is equally a grand mean of 1.62, with a relatively low standard deviation of 0.51 obtained for all the 18 items. Thus, interactive instructional media are generally either not used or under-utilized in distance education instructional delivery. The finding agrees with Yaya (2006), and Falade (2008). They both found out that the interactive materials significantly available and reasonably accessible were never used or were sparingly used. The frequently used items were science kits, chemical specimen, chalkboard and other non-interactive media. Computer based resources such as computer discs, internet services as well as electronic/projected materials were rarely used.

Galusha (2000), D'Acton (2001), Dede (2001), had all investigated the attitude of learners and teachers towards the use of telecommunication in the delivery of distance education and reported a negative attitude. The findings, opinions or comments of authorities as Me Isaac (1990), Chickering and Ehmanni (1996), Jegede (2002) and Falade (2008) are equally worthy of note. According to Jegede (2002), the findings on the available media suitable for the delivery of NTI distance education revealed that prints media and chalkboard were obviously found used, so also were models, photographs and graphic materials. In the early days of distance education, the aforementioned instructional media were relevant until recently when they are no longer the major means of distance education delivery. They seem to have been overtaken by white boards, computer packages and internet facilities. Findings on the utilization of the instructional media in the NTI distance education revealed that 'modern or sophisticated instructional media were not in any way utilized by distance education learners. Since modern instructional media and technologies were not employed due to their non-availability, they were restricted to the utilization of chalkboards, models, posters, photographs and print media, thus reducing the programme to either correspondence or conventional education with face-to-face mode and not necessarily distance education as it is popularly but erroneously known and called.

Therefore, appropriate and relevant modern instructional media were not utilized because of their non-availability (Faiade, 2008).

According to Chickering and Ehrmanni (1996), in considering the utilization and suitability of media in distance education, both learners and instructors must realize that new paradigms for delivery should be incorporated. Course content for distance education must be re-evaluated and restructured in order to maximize the benefits the media and to minimize the disadvantages posed by separations of time or place.

The findings on the factors militating against the effective use of media in distance education include the following: lack of fund to procure modern instructional media to run the programme, absence of electric power supply in the rural areas, unreliable supply of electricity, poor government policies, and lack of emphasis on the importance of media. Others include poor maintenance culture, inadequate, competent experts, and lack of interest on the part of the learners, Ekpeyong (2011).

Lack of financial resources available for conducting adequate needs assessment in many countries particularly prior to embarking on a massive distance education plan is a common problem (Mclsaac, 1990). Arggawal (2007) observed problems in the use of instructional media to include; apathy of the teacher, indifference of students, ineffectiveness of the media, financial hurdles, absence of electricity,

absence of required facility, absence of training programmes, and improper selection of the media. Falade (2008) observed that the use of these technologies in distance education posses some barriers; apart from encuring costs, if the internet is used, then the students must have access to the computer modem, and associated softwares. Additionally, telephone charges to the internet services provider will be incurred and the technology itself presents many problems. Harry (1992) noted that, the "existing telecommunications systems (in United States of America) were inefficient and/or expensive to use, so that educational institutions are unlikely to place too much reliance on them for teaching, support or information searching" (p. 189). If the situation was that bad in a technologically developed and economically vibrant nation as United States of America, what then should be the fate of a poor and technologically dependent nation such as Nigeria, if it decides to use internet or other computer networks to "procure distance learning? Perhaps that explains why some developing countries still depend majorly on the print media, telephone and radio delivery methods. Galusha (1999) equally observed that there are many problems in the use of telephone for distance learning. In some countries, (e.g. Nigeria), telephone teaching is prohibitively expensive, and cost depends very much on geographical factors and phone company pricing policies. Distance education systems are equally expected to pay the telephone charges for telephone tuition (Bates, 1988). Ozoemene

(2013), in a study on the availability and utilization of instructional media found out that instructional materials for social studies instruction were not effectively utilized. It was discovered that even the few available ones such: as newspapers, maps, and fictions were not fully utilized. Uyoath (2005) and Olayimola (2006) in Ozoemene (2013) had similar findings and found the reasons for the situation on the poor attitude of teachers towards the use of instructional materials and which may not be unconnected with the poor moral of teachers.

Thus, quite a number of research works had noted that instructional media were under-utilized even in the regular educational system and advanced a lot of reasons for the situation. However, the countries communication system has greatly improved. In this ICT age, interactive instructional media are available. It is unfortunate that teachers and learners are predominantly unaware of their existence, and most unfortunately do not possess the skills necessarily required for their utilization.

There is a significant difference between the perceptions of learners in NOUN and those of the NTI with regards to the utilization of available interactive instructional media. The t-test analysis as presented in table 9 shows that the calculated t-value of 2.10 is greater than the critical t-value of 1.96. The null hypothesis of no significant   Difference is therefore rejected. The type of programmes, whether of NTI or NOUN not be the reason for this difference.

However, the nature of learners, locational circumstances, as well as the access and utilization of support facilities are probable sources. The location of NTI study centres in very local or rural areas, and the initial emphasis on contact session as well as distribution of course modules and other non-interactive media may naturally make a difference when compared with the NOUN centres mostly located in the major urban cities.

There- is no significant difference between the mean perception of the Abia State learners and those of their counterparts in Enugu State on the utilization of interactive instructional media. The analysis of the mean ratings of the calculated t-value is 0.83 while the critical value is 1.96. The calculated value is thus, less than the critical t-value. Hence the null hypothesis of no significant difference is not rejected. The environment, structure, access and other utilization circumstances of the states and with reference to the programmes are similar. The situation as earlier observed by Falade (2008) may be generalized as being applicable in all other States.

Interactive instructional media used in the distance education programmes in South-East Nigeria were generally perceived to be effective. This conclusion was drawn from the results of the analysis of the 18 items meant to answer research question 4. The mean ratings of the learners' perceptions as presented in table 6 showed high grand mean of 2.59 and thus leads to the above conclusion. In other

words, those interactive instructional media used, i.e. computer conferencing, web conferencing and multimedia were perceived to be effective in the implementation of the distance "education programmes. This finding, agrees with Ajai Dopemu and Talabi (1986) husuf (1999), Summar (1991), Burkman (1994), and Lui (2004). They all found 'interactive media to be very effective in instruction. Stanton (1995)'s study, also confirmed a relative effectiveness of interactive instructional media in distance education.

Summar (1991) had reported an investigation aimed at determining the effects of interactivity upon the achievement, completion intervals and affective perceptions. He studied two groups; the pre-purposed interactive videodisc and the linear video tape. In the end, a t-test analysis showed a relatively statistically significant difference. In a study that examined attitudes of students receiving instruction, via two-way interactive television, Burkman (1994) had reported that students enrolled in the 11 interactive television psychology classes held more positive than negative attitude towards interactive television as a medium of instruction.

Authorities; Keegan (1996), Hulman (1997) Olugbenga (2006), Mangal and Mangal (2010) and Ezema (2010) had established the features of distance education and agreed that the effectiveness of the media used in the distance education system depends on the extent to which the media has to bear with those

features. The finding equally accords with the recommendation of Ike et al (2002), Edozie (2003), Aggawal (2007), Singh et al (2008) and Mangal and Mangal (2010) that effectiveness of interactive media, depends on the following:

i. The ability of the media to provide a two-way interaction between and among the parties in the instructional system.

ii. The teachers and learners awareness or knowledge of the instructional opportunities offered by a given instructional media.

iii. The teachers and learners abilities and skills for the utilization of a given instructional media.

iv. The extent to which the media generates participatory learning experience and activities.

v. The extent to which the media arouses learning interest in the learners.

vi. The relevance and appropriateness of the media to content intended to be transmitted.

vii. The extent to which the media is accessible or affordable to the learner.

viii. The availability of the media

ix. The accessibility of the media

x. The usability of the media by both the teacher and the learner.

All these features constituted the items used in collecting data in answer to research question 4 in relation to effectiveness of interactive instructional media.

It further "accords with Schramm's theory (1977), that effective communication takes place at the intersection or overlap of the fields of experience of the sender and the receiver. The interaction and social context theories equally apply.

A significant difference exists between the mean perception ratings of the NOUN and the NTI learners on the effectiveness of the interactive instructional media use in the distance education programmes in South-East Nigeria. The analysis of the mean perception ratings is shown in table 10 and it indicates a calculated t-value of 2.43 as against the critical t-value of 1.96. The NTI was initially established to function along the traditional or old distance education format, with contact centres where non-electronic instructional materials are distributed to the learners, and tutorials organized for them. Most of the centres are located in the villages with little or no electricity and communication systems. The class of learners equally comes into play. The learners under the NTI programme are predominantly local teachers, with families seeking to improve on their salary levels, afraid of adventures and are rather not interested in the opportunities offered by the interactive media.

The NOUN, as it seems, abinitio, had the modern electronic, interactive media systems in mind. The students of the NOUN programme are equally young learners, who are there only because they had to work and study, or even because they could not gain admission in the traditional education system. These probably

account for the significant difference between the perception of the NOUN and NTI learners on the effectiveness of the interactive instructional media. The NTI learner who did not experience the use of interactive media could not have determined their effectiveness. The truth is that the interactive instructional media are neither available nor utilized for NTI distance education programmes. The NOUN centres can boast of using the interactive web systems, at least in the registration of courses, accessing results, course materials and other such uses. Thus, they are at least, aware of the availability of such communication systems.

There is no significant difference between the perceptions of the Abia State learners and those of their Enugu State counterparts on the effectiveness of interactive instructional media used in the distance education programmes. Learners in both states and in both NTI and NOUN all identified computer conferencing, web conferencing and multimedia as the available, accessible and utilized interactive instructional media and that such use are quite effective in the delivery of distance *education instruction.*

This positions accords perfectly with the opinion and findings of earlier mentioned authorities viz, Mangal and Manga! (2010), Argawal (2008), Edozielj2003), Ike et al (2003), Enyi Bassy (2004), Ekpeyong (2011), and others. Thus that interactive instructional media is effective in the delivery of instructional media is not questionable. It is the availability, accessibility and usability that are in

issue. The same reasons as in the cases of availability, accessibility and utilization could be adduced as being responsible for the non-significant difference. The findings in each state can naturally be generalized to be applicable in all the states (Falade 2008). The centres share facilities, systems and resources from the same source. Hence they are bound to enjoy similar benefits and suffer similar disabilities.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

i. Interactive instructional media required for the current modern form of the distance education programmes to the extent of learners' knowledge are not available. This is so qualified because it is of common knowledge that advancement in Information Communication Technologies (ICT) have provided much of these electronic interactive opportunities that could be exploited for instructional purposes. These interactive media are not all hard-wares which could be installed in the study centres per-say but are in the main application soft-wares which require application j awareness, facilities, knowledge and skills. Hence the interactive instructional media are not available only in the sense that the learners and even the teachers or facilitators were either not aware of their existence or did not possess the application abilities or both.

ii. The interactive instructional media necessary for distance education programmes are not accessible due to (i) ignorance of the existence of such facilities (ii) absence or inadequate knowledge and skills required for access and utilization of the media. (iii) paucity of application enabling or enhancing facilities and environment.

iii. The available interactive instructional media are either underutilized or not used due also to the reasons canversed in the second conclusion above.

iv. The utilization of interactive instructional media in the delivery of instruction in distance education is effective. In other words, where interactive instructional media are available, accessible and utilized for the delivery of distant educational instructions, instruction will be effective. Interactivity is thus a basic element in ensuring effective instructional communication in distance education.

v. There is a beat of significant difference in the instructional delivery systems of the NOUN and NTI distance education programmes. While the NOUN can boast of little extent of some form of availability, accessibility and utilization of interactive instructional media, the NTI is still predominantly practicing the contact centre tutorial and module form of the Distance Learning System.

vi.   The findings of this study may be generally applicable to all the centres of the NTI and NOUN respectively in the South-East geo-political zone or the nation at large.

Educational Implications of the Study

The findings of this study have far reaching implications for the Nigerian education system in general and with particular reference to the distance education. Some of the implications include:

i.   Distance education is currently in vogue. It is playing both complementary and alternative roles in providing educational opportunities for various categories of learners. It is particularly helpful in providing solutions to the problems of insufficient carrying capacities and admission policies of the formal four wall educational system. Of course, the essence of the distance education in the Nigerian education had been severally underscored. In fact, it is even feared that it may be displacing the formal system in no distant time. Such a system that mounts so much displacement or alternate pressure on the current formal educational system or that plays so much complementary roles implies some serious educational concern. It implies great demands on the effective planning and development of the modus operandi and the over-all quality of the distance education system. If it had to be compared in juxtaposition with the traditional system, then serious

educational efforts should be geared towards a quality assurance of the distance system.

ii. Instruction is the primary business of every educational system. The means and methods of attaining effective instruction and instructional communication is therefore of serious educational concern. For effective distance educational instruction, interactivity as normally provided by two-way interactive instructional media has been established as a basic element. Thus, where the interactive instructional media are neither available, accessible nor utilized; instruction will naturally not be effective. The quality of such an educational system will in effect be anything else but of standard. Hence, there is an immense need to improve on the provision of facilities for two-way interactive instructional systems required for appropriate distance education.

iii. That interactivity as a basic element in attaining effective distance education implies that interactive instructional media needs to and should be made available, accessible and usable by creating necessary information and awareness opportunities for exploiting the interactive facilities made available by developments and advancements in the Information Communication Technology (ICT) world for instructional purposes.

iv.   The findings of the study also imply a need for the provision of knowledge and skill acquisition training opportunities as may be organized through seminars, workshops and conferences for the benefit of both the distance education learners and their resource persons. Such training programmes may be offered to the learners before exposure to the main course content. It may also be incorporated into the curriculum content of the distance system.

Recommendations

Based on the findings of this study, the researcher recommends as follows:

i.   Distance education of right quality, in this technological age, can only be delivered by the use of interactive instructional media and other contemporary information communication technologies capable of creating near similar natural classroom environments. NOUN and NTI administration as well as other providers of distance education should do everything possible to enshrine the use of interactive instructional media in distance education instructional delivery.

ii.   Awareness, knowledge and skill acquisition training programmes for interactive media should be enshrined into the curriculum and implemented at all levels of the Nigerian educational system. This will equip teachers and learners with the knowledge and skill that enables one to identify and

use interactive and other contemporary two-way information communication technologies. This is informed by the fact that much of these interactive instructional media are available but unknown to the learners and resource persons of both the NTI and NOUN distance education programmes.

iii. The government should provide necessary and accessible infrastructural facilities, in both rural and urban areas of the country. This will enable distance education learners to have access to interactive and other modern instructional media for quality distance education.

iv. Distance education providers and indeed all educational institutions, interested in the provision of distance education, should develop training programmes on the modern modes of delivering distance education instructions and the utilization of those modes. This will enable institutions to adopt and actually apply appropriate, distance educational instructional modes.

v. The NOUN and NTI as leading distance educational institutions in Nigeria should improve on access and use of their websites, to enable learners and other interested persons to access necessary information about their programmes and activities, and in particular for the purposes of distance instructional delivery.

vi.   Seminars, workshops or conferences with themes that border on distance educational delivery systems should be organized by stakeholders in distance education regularly to identify available interactive instructional media and learn their access and usage systems. Distance education providers as NOUN and NTI should take the lead in organizing such occasions.

vii.   Distance education co-ordinating centres should be adequately equipped with man and materials that are capable of supporting the use of interactive instructional media. This will facilitate the knowledge and use of the media.

Limitations of the Study

A number of limiting factors were encountered in the course of this study. The major ones are as follows;

i.   Out of a population of 47,084 students, only 393 students, from only two out of the five states of the zone were studied, probably, a more valid generalizable finding would have been made if more number of states, learners and study centres were used for the study.

ii.   The attitude of the learners or even the public is very negative, rather disheartening. The learners required much persuasion and incentives before they could accept to fill the questionnaire, and when they accepted, they might fill the questionnaire recklessly. Thus, some of the respondents

copied each other while some gave faked responses which can distort the result of the study.

Suggestions for Further Studies

Further studies could be carried out in the following areas:

  i.   The extent of knowledge and skills of teachers on the utilization of interactive instructional media for the distance education programmes.

 ii.   The availability of facilities required for the utilization of interactive instructional media in instruction generally.

iii.   The availability and utilization of interactive instructional media in specific distance education programmes.

 iv.   The availability, utilization and or effectiveness of specific interactive instructional medium in a distance education programme.

  v.   The effects of the use of some of these interactive instructional media on the academic performance of-the learners.

 vi.   Similar studies in other geopolitical zones of the country.

vii.   The attitude of learners and teachers towards the interactive instructional media in distance education programmes.

Summary of the Study

The purpose of the study generally was to find out the learners perceptions on the interactive instructional media for distance education. Specifically, the study examined the learners perceptions on the availability, accessibility, utilization and effectiveness of interactive instructional media required for the implementation of distance educational programmes in the South-East Nigeria. Four research questions and eight hypotheses tested at 0.05 level of significance guided the study. Related literatures were reviewed based on conceptual framework, theoretical framework and empirical studies. The study was conducted using 170 NOUN students and 223 NTI students from Abia and Enugu State study centres. A researcher structured questionnaire was used as instrument for data collection. The questionnaire designed to elicit appropriate information from the respondents was face-validated by 3 experts, two in curriculum and instruction, and one in measurement and evaluation. The reliability coefficient of the instrument was conducted using Cronbach Alpha. An overall reliability coefficient of 0.70 was obtained indicating a high reliability of the instrument. Mean scores and standard deviation were used to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance, 362 degree of freedom, and 1.96 critical t-value. Some of the major findings include: non availability of interactive instructional media, inaccessibility of interactive instructional media, under-utilization of interactive instructional media and effectiveness of the used

interactive instructional media. There were no significant difference between the perceptions of Abia State distance education learners and those of their counterparts in Enugu State but there was a significant difference between the perceptions of the NOUN distance education learners and those of the NTI learners on the availability, accessibility, utilization and effectiveness of the interactive instructional media. The findings imply, in the main, that interactive instructional media, a basic requirement for effective implementation of quality modern distance education programmes is yet to be exploited in the South-East Nigeria. Based on the findings, and implications, some recommendations including the need for awareness and skill acquisition training programmes, provision of access and utilization facilities, were made by the researcher. Due to limitations-observed in the course of the study, suggestions for further studies were equally made.

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Appendix A

Department of Educational Foundations,
Faculty of Education,
The University of America,
California.
20th May, 2020.

Dear Respondent,

Request for Assistance

I am a student of the above named institution currently carrying out a study on the topic "Learners' Perception of Interactive Instructional Media in Distance Education in South East, Nigeria".

Kindly assist me in the collection of the necessary data by filling the attached questionnaire. The information required is solely for academic purposes and would be kept strictly confidential.

Thank you for your cooperation.

Yours faithfully,

Omachi Daniel
Ph.D/1920/000679

Questionnaire

S/N	Items	SA	A	D	SD	REMARK
	Cluster A: Availability The following Interactive Instructional Media Systems are available in our study centers;					
1.	Audio conferencing					
2.	Video conferencing					

3.	Teleconferencing (Telephony)					
4.	Audio-graphic conferencing					
5.	Computer conferencing					
6.	Web conferencing					
7.	Multi-media					
8.	Online chat (web chat or instant messaging (IM)					
9.	Application sharing					
10.	Blog (web blog)					
11.	Webcam					
12.	Podcasting					
13.	Wiki application system					
14.	E-mail					
15.	Faxing					
16.	Skype					
17.	Close Circuit Television (CCTV)					
18.	Screen cast					
	Cluster B: Accessibility					

	I easily access, receive or participate in lectures delivered through each of the following;					
19.	Audio conferencing					
20	Video conferencing					
21.	Teleconferencing (Telephony)					
22.	Audio-graphic conferencing					
23.	Computer conferencing					
24.	Web conferencing					
25.	Multi-media					
26.	Online chat (web chat or instant messaging (IM)					
27.	Application sharing					
28.	Blog (web blog)					
29.	Webcam					
30.	Podcasting					
31.	Wiki application system					
32.	E-mail					
33.	Faxing					

34.	Skype					
35.	Close Circuit Television (CCTV)					
36.	Screen cast					
	Cluster C: Utilization The following interactive instructional media systems are properly used in delivering lectures to us;					
37.	Audio conferencing					
38.	Video conferencing					
39.	Teleconferencing (Telephony)					
40.	Audio-graphic conferencing					
41.	Computer conferencing					
42.	Web conferencing					
43.	Multi-media					
44.	Online chat (web chat or instant messaging (IM)					
45.	Application sharing					
46.	Blog (web blog)					

47.	Webcam				
48.	Podcasting				
49.	Wiki application system				
50.	E-mail				
51.	Faxing				
52.	Skype				
53.	Close Circuit Television (CCTV)				
54.	Screen cast				
	Cluster D: Effectiveness The used interactive instructional media are effective because;				
55.	The lectures are aware of existence of the media				
56.	The lectures normally use the media in teaching				
57.	The students are aware of the existence of the media				
58.	The students normally participate in the use of the media				

59.	The lecturers possess the relevant skills for use of the media					
60.	The students possess the relevant skills for participating in the use of the media					
61.	The students easily access information presented through the media					
62.	Relevant facilities and systems for the use of the media are always available					
63.	The facilities and systems for use of the media are always functional					
64.	The facilities and systems for the use of the media are affordable to the students					
65.	There are enough available technicians to assist in the use of the media					
66.	The use of the media arouses learning interest in the students and engages their attention					
67.	The use of the media generates students' participatory learning activities in the classroom environment					

68.	The media is normally appropriate for the topics being treated					
69.	The use of the media provides opportunity for a two-way interaction between the lecturers and students					
70.	The media serve the students irrespective of time and locations					
71.	The media enables the students to successfully respond to the lecturers evaluation questions					
72.	The use of the media enables the students share ideas with each other					

Appendix B

Department of Educational Foundations,

Faculty of Education,
The University of America,
California.
20th May, 2020.

Dear Sir/Ma,

REQUEST FOR VALIDATION OF INSTRUMENT

I am a student of the above named institution currently carrying out a study on the topic "Learners' Perception of Interactive Instructional Media in Distance Education in South East, Nigeria".

Kindly assist me in validating the attached instrument to make it function well.

Thank you for your cooperation.

Yours faithfully,

Omachi Daniel
Ph.D/1920/000679

Appendix D

RELIABILITY ESTIMATE OF THE QUESTIONNAIRE (IRWLSEPQ)

USING CRONNACH ALPHA (CLUSTER BY CLUSTER)

CLUSTER A   **n = 30**

ITEM	SA (4)	A (3)	D (2)	SD (1)	VARIANCE (vi)
1.	3	5	13	9	0.89
2.	2	6	8	14	0.95
3.	11	7	7	5	1.27
4.	1	4	15	10	0.60
5.	9	10	7	4	1.06
6.	10	8	7	5	1.22
7.	9	10	9	2	0.88
8.	10	9	7	4	1.11
9.	6	7	10	7	1.14
10.	2	8	16	4	0.62

11.	4	6	15	5	0.84
12.	2	9	13	6	0.74
13.	5	7	12	6	1.00
14.	8	12	7	3	0.90
15.	2	9	16	3	0.57
16.	6	14	8	2	0.72
17.	2	8	16	4	0.62
18.	2	2	18	8	0.62

$$\sum vi \quad = \quad 15.75$$

Cronbach Alpha (α) $\quad = \quad \left(\dfrac{k}{k-1}\right) \qquad \left(1 - \dfrac{\sum vi}{vt}\right)$

where; $\quad$ k $\quad = \quad$ 18

$\quad \sum vi \quad = \quad$ 15.75

$\quad$ vt $\quad = \quad$ 66.78

Substituting,

$\quad$ α $\quad = \quad$ 18 $\quad$ 1 − 15.75

$\qquad\qquad$ 17 $\qquad$ 66.78

$$= \quad 1.06\,(1 - 0.24)$$

$$= \quad 1.06 \text{ x } 0.76$$

$$= \quad 0.8056 \quad \approx \quad 0.81$$

CLUSTER B   **n = 30**

ITEM	SA (4)	A (3)	D (2)	SD (1)	VARIANCE (vi)
19.	13	9	5	13	1.03
20.	2	6	14	8	0.75
21.	10	8	7	5	1.22
22.	0	4	16	10	0.44
23.	8	10	6	6	1.11
24.	8	10	7	5	1.11
25.	9	11	8	2	0.85
26.	8	12	7	3	0.90
27.	2	4	14	10	0.75
28.	0	2	12	16	0.40

29.	1	5	14	10	0.64
30.	0	4	10	16	0.52
31.	4	8	12	6	0.92
32.	8	12	6	4	0.9
33.	6	10	8	6	1.09
34.	1	4	15	10	0.60
35.	0	3	10	17	0.46
36.	0	2	12	16	0.40

$$\sum vi \quad = \quad 14.18$$

$$\text{Cronbach Alpha } (\alpha) \quad = \quad \left(\frac{k}{k-1}\right) \quad \left(1 - \frac{\sum vi}{vt}\right)$$

where; $k \quad = \quad 18$

$\sum vi \quad = \quad 14.18$

$vt \quad = \quad 50.10$

Substituting,

$$\alpha \quad = \quad \frac{18}{17} \quad \frac{1 - 14.18}{50.10}$$

$$= \quad 1.06 \, (1 - 0.28)$$

$$= \quad 1.06 \times 0.72$$

$$= \quad 0.7632 \quad \approx \quad 0.76$$

CLUSTER C   **n = 30**

ITEM	SA (4)	A (3)	D (2)	SD (1)	VARIANCE (vi)
37.	2	6	8	14	0.95
38.	0	4	10	16	0.52
39.	4	8	8	10	1.13
40.	0	2	12	16	0.40
41.	8	12	8	2	0.81

42.	10	10	8	2	0.89
43.	10	12	6	2	0.83
44.	12	10	7	1	0.78
45.	2	6	12	10	0.83
46.	0	4	10	16	0.52
47.	6	8	7	9	1.27
48.	0	2	12	16	0.40
49.	6	8	9	7	1.15
50.	7	7	10	6	1.16
51.	6	8	9	7	1.15
52.	0	2	12	16	0.40
53.	0	3	13	14	0.45
54.	0	4	12	14	0.51

$$\sum \text{vi} \quad = \quad 14.15$$

Cronbach Alpha (α) $\quad = \quad \left(\dfrac{k}{k-1}\right) \qquad \left(1 - \dfrac{\sum \text{vi}}{\text{vt}}\right)$

where; $\quad$ k $\quad = \quad$ 18

$$\sum vi \quad = \quad 14.15$$

$$vt \quad = \quad 48.38$$

Substituting,

$$\alpha \quad = \quad 18 \quad 1 - \underline{14.15}$$

$$17 \qquad 48.38$$

$$= \quad 1.06\,(1 - 0.29)$$

$$= \quad 1.06 \times 0.71$$

$$= \quad 0.7526 \qquad \approx \quad 0.76$$

CLUSTER D   **n = 30**

ITEM	SA	A	D	SD	VARIANCE
	(4)	**(3)**	**(2)**	**(1)**	**(vi)**

55.	6	7	9	8	1.21
56.	5	6	10	9	1.15
57.	4	5	11	10	1.06
58.	3	6	12	10	0.83
59.	5	7	10	8	1.11
60.	6	7	8	9	1.26
61.	4	6	10	10	1.09
62.	8	9	8	5	1.13
63.	6	7	10	7	1.14
64.	10	7	6	7	1.40
65.	11	8	7	4	1.15
66.	8	7	9	6	1.22
67.	10	9	8	2	1.02
68.	9	8	7	6	1.02
69.	8	7	8	7	1.26
70.	10	9	7	4	1.11

$$\sum vi \quad = \quad 18.43$$

Cronbach Alpha (α) $\quad = \quad \left(\dfrac{k}{k-1}\right) \qquad \left(1 - \dfrac{\sum vi}{vt}\right)$

where; $\quad$ k $\quad = \quad$ 16

$\quad \sum vi \quad = \quad$ 18.43

$\quad$ vt $\quad = \quad$ 82.39

Substituting,

$\quad$ α $\quad = \quad$ 16 $\quad$ 1 – 18.43

$\qquad\qquad$ 15 $\qquad$ 82.39

$\qquad = \quad$ 1.07 (1 – 0.22)

$\qquad = \quad$ 1.07 x 0.78

$\qquad = \quad$ 0.8346 $\qquad \approx \quad$ 0.83

345

OVERALL RELIABILITY ESTIMATE OF IRWLSEPQ

USING CRONBACH ALPHA

Cronbach Alpha (α) $= \left(\frac{k}{k-1}\right) \left(1 - \frac{\Sigma vi}{vt}\right)$

Where k = 70

vi = Sum of item variances

= 62.51

vt = Total variance of instrument

= 198.87

Substituting, we have that;

$\alpha = \left(\frac{70}{69}\right) \left(1 - \frac{62.51}{198.87}\right)$

= 1.014 (1 − 031)

= 1.014 x 0.69

= 0.69966

= 0.70

Appendix E

SAMPLE SIZE DETERMINATION USING YARO YAMANE

FORMULAR

i.e.

$$n = \frac{N}{1 + N(e)^2}$$

Where;

n　=　Sample size

N　=　Population

e　=　Error Margin or level of significance $(0.05)^2$

Thus, the total sample size and the proportionate sample sizes for the study were calculated as follows;

1.　Total sample size;

$$\frac{23{,}375}{1 + 23375(0.05)^2} = \frac{23{,}375}{1 + 58.4375} = 594375 = 393.27 = 393$$

2.   Sample Size for NOUN Abia State

$\dfrac{9572}{23375}$ x $\dfrac{393}{1}$ =   58.91   =   59

3.   Sample Size for NTI Abia State

$\dfrac{9572}{23375}$ x $\dfrac{393}{1}$ =   160.93   =   161

4.   Sample Size for NOUN Enugu State

$\dfrac{6619}{23375}$ x $\dfrac{393}{1}$ =   111.28   =   111

5.   Sample Size for NTI Enugu

$\dfrac{3680}{23375}$ x $\dfrac{393}{1}$ =   61.87   =   62

Appendix F

Sample Size Distribution Table

S/N	States	Programmes	Population	Sample Size
1.	Abia	(1) NOUN (2) NTI	3,504 9572	59 161
2.	Enugu	(1) NOUN (2) NTI	6619 3680	111 62
	Total	**-**	**23,375**	**393**