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APPROPRIATE MEDIA FOR EFFECTIVE INSTRUCTIONAL DELIVERY IN TERTIARY INSTITUTIONS IN NIGERIA

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ABSTRACT: *Media is a means through which information, knowledge, ideas, opinions, values and skills are transferred from one person or place to another. This paper examined various media that could be used for effective instructional delivery in tertiary institutions. The evolution of newer media and their application as means of instructional delivery in tertiary institutions such as computer, internet, e-mail, telephone, video-conferencing, software innovative technological media and teaching machines were discussed. Also the major constraints to the use of these media like poor power supply, time factor, finance, shortage of ICT teachers and technophobia were highlighted. Finally, recommendations on ways of overcoming the inherent problems associated with the use of these media as instructional materials were advanced.*

KEYWORDS: Appropriate (Newer) Media, Instructional Delivery and Tertiary Institutions.

INTRODUCTION

Change is the only concept in existence that is constant. Instructional delivery constantly changes to meet the need of our ever changing society. To achieve quality education and meaningful learning, there is need to embrace new media in instructional pedagogy which is the target of educational technology. Educational technology focuses on the use of varied innovative media to facilitate teaching-learning and promote productivity and solve educational problems.

According to Okwo and Eze (2013:11) "educational media are essential tools and devices which arouse and sustain learners' interest, make teaching learning real, concrete and nearer home". In this era of electronic revolution which gave birth to sophisticated hardware and software, educational technology has taken steps to integrate into the educational scenario the innovative technological devices (media) such as computer, internet system, e-mail, radio and microwave, television and satellite, video phone system, telephone and wireless application protocols, teaching machine, duplicating machine, public address system, tape recorder, video tapes, audio cards, films slide, transparencies, flash drives, CD-ROMs, floppy disk/diskette, and magnetic disk. The introduction of these technologies into the school system is a significant contribution to educational innovation. These innovative media brought notable changes in education industry. They are creating substantial impact on education generally and on the instructional practices by increasing efficiency and effectiveness in education. They bridge the gap between theory and practice.

The itemized newer media if well integrated into teaching and learning in tertiary institutions will promote quality education for national development by providing needed information to both teachers and students which led to the production of graduates who are capable of contributing their quota in building and sustaining the economy of their society.

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Tertiary institution is a study centre for students after secondary school such as universities, colleges of education, polytechnics including those institutions offering correspondence and course (National Policy on Education, 2004).

Tertiary education aims at:

- contributing to national development through high level relevant manpower training;
- developing and inculcating proper values for the survival of the individual and society;
- developing the intellectual capacity of individuals to understand and appreciate their local and external environments;
- acquire both physical and intellectual skills which will enable individuals to be self-reliant and sufficient and useful members of the society;
- promote and encourage scholarship and community service;
- forge and cement national unity;
- and promote national and internal understanding and interaction.

To achieve the set aims and goals of tertiary institutions, effective teaching generation and dissemination of knowledge should be done through appropriate media which calls for this study.

Computer

Computer is an electronic machine which accepts, processes, stores, retrieves and transmits data (information) with a high speed. Computer is one of the educational technological innovative media. For Anakwe (1991), computer can be seen as an object and vehicle for instruction. According to Nwoji (2002), it is used to present instructional content that are designed, developed and produced for an individualized learning situation. Akinyemi (1988) stated that computer has now been found to be the most suitable, reliable and versatile medium for individualized learning because of its immense capacity as a data processor and the capacity to perform numerous mathematical and logical operations without any intervention by men.

Nwoji (2002) and Aggarwal (2007) listed some of the ways computer can be used in instruction. They are:

- Computer Assisted Instruction (CAI)
- Computer Based Training (CBT)
- Interactive Computers Assisted Learning (ICAL) or Computer Conferencing System (CCS).
- Computer Managed Instruction (CMI)
- Computer Assisted Learning (CAL)
- Computer Managed Learning (CML)

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- Computer Assisted Training (CAT)

Computer Assisted Instruction (CAI): Some scholars refer to it as Computer Assisted Learning (CAL), Computer Scheduled Education (CSE) or Computer Based Learning (CBL) (Okonkwo and Ozurumba, 1980). Computer-assisted instruction (CAI) provides individualized self-paced instruction. It provides immediate feedback which motivate the learners. Thus, it is used for individualized instruction lesson. The computer functions as a teacher. The student reads or studies at his/her own pace. CAL is good and necessary for slow learners as they can consult or interact with the computer to get what they lost in the class activities with the teacher. In this case, they rehearse the lesson content thought in the class with computer to get more information for clarity. The computer can perform these functions, according Roblyer (2003), through instructional software such as:

1. Tutorial
2. Drill and practice
3. Simulation
4. Instructional games
5. Problem-solving

It is noteworthy to state that computer is multi-functional in nature. It has the ability to receive, process, store, retrieve, display and transmit information no matter the time and place.

In tutorial activities, students receive direct teaching from the computer courseware without the use of resources outside the course ware. The computer course ware is self-explanatory. It is an independent study, though teacher can guide the slow learners.

Drill and practice activities are the type of instruction in which the computer software provides exercises, such as assignment or test for students to work with. It also supplies feedback on their corrections. This type of computer assisted instruction gives students the opportunity to practice the exercise at their own pace until they are able to solve the problems. This instructional computer exercise saves the teacher's time and energy.

Simulation and games are models of real or imagined concept. Computer software and courseware model real or imagined concept to facilitate instructional effectiveness. Simulation and games is another way computer can assist students' instructional process. In this situation, students consult designed instructional computer simulation/game to gain learning experiences from what they observe. This type of instructional technique is used to model character and develop skills.

Problems solving course ware exposes the students to learn by doing directly from the computer the skills in problem-solving. The course ware provides the students with the opportunity to solve problems that are specific to instructional content area or focus on general content-free skills. It does this through explanation and/or practice by doing. This helps learners to acquire the problem solving skills. The software provides explanations and practice on how a particular teaching skill in a subject or general skill can be achieved.

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Computer managed instruction (CMI) is a tool for organizing instruction. Computer managed instruction software is used in testing, record-keeping and reporting instructional process. In record-keeping, the following are considered:

- Students' admission-mode of admission, particulars of the students, qualifications
- Students' assessments in academic and behavioural domains
- Events in school - their dates and time
- School Resources – material, human, financial, time, environment.
- School rules and regulations.

Now that we are in computer age, it is believed that if teachers should design, package and deliver their instructional contents through computer software, it will reduce their workload to some extent as it will aid students study on their own.

Internet

Internet is the abbreviation of inter-network system and is described as network of the computer system. In a general sense, internet is defined as "a global pool of information and services, accessible by means of locally executed interface software (Aggarwal, 2007). Internet has made on-line computer activities such as e-mail, e-banking, E-commerce, virtual Library visits, downloading and uploading of files possible. Therefore, this innovative media in education has made available the required information, data, experts and knowledge for both teachers and students, as both can browse and access instructional information of their choice any time and any where. Teachers uploading their instructional content, into internet will help students have access to them as many time as possible.

E-mail

E-mail stands for "Electronic Mail". It is a new version of "Post Office Box" (National Teachers' Institute PGDE 206 Module 1). This might be the reason why it is one of the most popular ICT devices. People send and receive information through e-mail. One can also send picture or other items that are not printed material through the "multi-purpose internet mail extension (MIME). e-mail stands as one of the fastest innovative technological device for transmitting information. On this note, e-mail is classified as a channel of communication.

In teaching-learning process, teachers can send instructional contents to the students and also receives their response through e-mail, distance and time notwithstanding. This medium of communication makes instructional process easier and fasters.

Telephone

Telephone is popularly called phone. According to Wikipedia (2014) telephone is derived from the Greek word tele. This stands for "far and phone", meaning voice. The two words combine together means "distant Voice". It is a telecommunication device that permits two or more users to conduct a conversation when they are not in the same vicinity to be heard directly.

Alexander Graham Bell was the first person that invented telephone in 1876 while many others further developed it. It is the first device in human history that enabled people to talk directly

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with each other across large distances (Wikipedia, 2014). Currently, telephone is used in every field of life including education.

Types of Telephone

Currently, three types of telephone exist; they are:

1. Classic corded telephone (land line rotary dial telephone invented by Bell in 1876
2. Cordless or wireless phone
3. Cell phone (most in use now invented by Cooper in 1973)

(http://www.computer.com/jargon/t/telephone.htm

Telephone is an instrument with a mouth piece and an earpiece for transmitting human speech in form of electrical signals or radio waves, enabling people to communicate with each other over a distance (Robinson, 1996).

Phones, no matter the type, are means of communication as information, data or pictures can be sent and received through them. Phones are used for instructional purposes. Teachers and students use it to link up each other as the need arises, in form of text messages, vocal expression, browsing, accessing of information from experts in far distance, taking and sending pictures. According to Makinde (1988), telephone is a very useful medium for distance instruction, tutoring and counseling. Now that all most everybody (teachers and students, inclusive) have phone(s), teachers in tertiary institutions can use their phones for instructional purposes especially when the information to be passed across is urgent.

Video Phone System

Video phone system is a combination of computer and television devices. This system of communication gives people in different places the opportunity to see each other face-to-face as they are interacting. Galo and Nenno (1985) stated that it was the German government that first used video phone and it was successful.

In this present decade, communication with audio-visual compabilities device is a key to effective and meaningful communication. Videophone is an innovative media that appeals to the senses of sight and hearing. It gives both the teacher and learner the opportunity to see each other as they are interacting as if they are in classroom situation. This arouses the students' consciousness and attention while the discussion is going on. It is good for distance learning programme.

Video Conferencing

This is a type of conference that involves video. It is a teleconference that involve video communication (Aggarwal, 2007). It has visual and audio characteristics. Based on its attributes, it transmits voice, graphics and images to people. It also show the image of the speaker and other three-dimensional objects, (Aggarwal, 2007). As a result, it gives room for face-to-face interaction.

Video conferencing operates in two ways; thus:

1. Two-way video and audio

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2. One-way video and two-way audio

In "Two-way video and audio" video conferencing, the teacher and students can see and hear each other. While in "one-way video and two-way audio" video conferencing, the students see and hear the teachers but the teacher only hears the students. Video conferencing is useful for distance learning programme and group discussion class as it allows groups of people at different locations to meet face-to-face as in real teaching-learning situation with the teacher.

Educational benefits of video Conferencing:

Video conferencing has the following advantages

1. Video conferencing enhances the learning process.
2. It increases students' motivation and participation
3. It encourages cultural diversity.
4. It provides access to Variety of information and resources to better meet students' individual needs.
5. It develops students' ability to understand difficult or abstract concepts easily through the face-face interaction.
6. It promotes positive relationship among students.
7. It increases students' academic achievement

Demerits of Video Conferencing

1. It is expensive (capital intensive)

Software innovative technological media

Softwares are those media that contain information to be used by hardwares. Information on some of the softwares can only be used with the aid of hardware; while others can be used without the hardwares; for instance, the printed media. Software media are referred to as secondary storage devices, such as diskette, films, CD-ROM, slid, flash drives, etc.

In teaching-learning situation, learning contents can be inscribed and stored on these software for future use. Learning contents can also be taped or copied into these devices and transferred to people elsewhere for instructional purposes. As some of these innovative educational technology media have the potentials of audio and visual, they are very necessary for teaching and learning purposes. They are also very useful for individualized instruction.

It is noteworthy to state that most of these innovative technological media are like bringing a classroom into one's room as they often look rich, interesting and effective as if one is engaged in spontaneous face to-face instructional delivery with the teacher in the classroom.

Teaching Machine

To meet the challenges of the increase of school population, a lot of innovative technological media including teaching machine have been introduced in education sector. Teaching machine is a device designed to be operated by an individual student which creates room for an

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interaction between the machine and the student (Aggarwal, 2007). Pressey was the first to develop teaching machine in 1920s followed by Skinner.

Types of Teaching Machine

Aggarwal (2007) classified teaching machines into two broad categories. They are:

1. Constructed response devices.
2. Multiple choice machines

Constructed response Devices

The constructed response devices are based on Skinner's principles; namely, that emission of a response is considered more effective in learning than simple recognition.

These machines according to Aggarwal (2007) include:

i. Slider machine, first developed by Skinner
ii. Disc type
iii. Typewriter input computing machine
iv. Audio-visual combination such as television

Multiple-Choice Machines

This type of machine makes it possible to prepare reply for a given question. They are according to Aggarwal (2007):

i. Pressey's machines consisting of a revolving drum and the programme printed upon the face of the drum.
ii. Audio-visual machine.
iii. Electronic computer and multiple choice programmes.
iv. Non-mechanical multiple-choice devices such as punch cards consisting of small cards that contain multiple choice items.

Principles of Teaching Machines

Teaching machine, according to Aggarwal (2007) operate on the following principles;

1. Instruction is individualized.
2. Learner is allowed to learn at his own pace.
3. Content to be learnt is presented in a small doses.
4. Media (machine) may be operated electrically or manually.
5. There is logically ordering of the subject-matter.

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6. The machine demands the active participation of the student

The for mentioned newer media if well integrated into teaching and learning in tertiary institutions will promote quality education for national development as they have the characteristics of receiving, storing and providing information to both teachers and students not minding the time and place.

Constraints to the use of instructional media in tertiary institutions

The following and more factors obstruct the use of instructional media:

1. Poor power supply
2. Time factor
3. Technophobia
4. Finance
5. Shortage of ICT teachers

CONCLUSION

The relevance of appropriate media for teaching and learning in tertiary institutions cannot be over emphasized. It is a proven fact that now that we are in technological age, teachers in tertiary institutions should integrate new technological media such as computer, internet, e-mail, telephone etc in delivering their instruction. These media have the capacity of reaching the students at any point in time and place. These newer media otherwise referred to as educational technology devices have made instructional delivery easier, faster and more convenient for teachers and students as they have the capacity but not without some challenges.

RECOMMENDATIONS ON THE WAY FORWARD

Based on the major constraints to the use of instructional media in tertiary institution, the following recommendations were made:

1. Most of the new media are electronic devices. As a result, tertiary institution management should endeavor to install stand by generator for proper use of them as Nigerian power supply cannot be trusted.
2. Tertiary institution teachers should expose themselves to in-service training on the use of these new media in education as most of them don't have proper knowledge of how to use them.
3. All electronics are capital intensive which makes it difficult for school management to supply enough of them for instructional delivery. As a result, the federal government should budget enough money to the education sector to enable them purchase required facilitates for schools.

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4. Teachers should create time to design and package their instruction using these media for use by students.

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