MULTIMEDIA INSTRUCTIONAL APPROACHES AND SCIENCE AND TECHNOLOGY EDUCATION IN RIVERS STATE

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Abstract
In the present dispensation, science and technology teachers are expected to explore modern teaching approaches and effectively utilize them during instructional development. It becomes necessary for them to do so in order to accommodate learner’s peculiarities and facilitate teaching – learning encounter. This paper takes a look at multimedia interactive instructional approaches and its place in science and technology education in Rivers State.

The present dispensation requires individuals to embrace science and technology for a better tomorrow because since the creation of the human race, man has grappled with problems of various kinds including poverty. Science and technology have got useful roles to play to stem this tide. The quote by Julius Nyerere (1975) that “while some nations of the world are going to the moon, we, the African nations are still trying to reach the villages” is actually considered apt to describe the state of development in the fields of science and technology in the third world countries (Asia, Latin America and Africa), Nigeria inclusive.

Advances in these two fields of study, science and technology, determine the standard of living or who rules the world as a matter of fact. Such advances, according to Osia (2007), determine the amount of respect accorded a country in the committee of nations. For example, in spite of the fact that Japan is a small Island nation in the pacific, she is highly respected due to her commitment to and breakthrough in science and engineering technology.

Interestingly enough, science and technology education are fields through which a nation can be enabled to produce skilled manpower or human resources who will in turn work to produce essential goods and services required to reduce the level of poverty amongst the people.
In recent times, the Federal Government of Nigeria has come to realize the importance and the place of science and technology education in bringing about poverty alleviation and national development hence she has taken adequate steps to redress her former policy of neglect through:

1. Enshrining Science and Technology Education in the National Policy on Education

2. The establishment of eleven Federal Technical Colleges of Education and


There is need for teachers of science and technology Education to explore emergent instructional delivery strategies and techniques of enhancing students’ academic performances in these fields of study. This paper examines an aspect of information communication technology known as multimedia technology and explicates its relevance in facilitating understanding of concepts in science and technology.

**The Concept of Multimedia Communication Technology**

Multimedia, which happen to be one of the modest and innovative communication technology approaches in this jet age, is about the use of two or more different types of instructional media in a presentation. An instructional delivery involving the use of VCD or power point or 16mm film, for example, is a multimedia presentation in that still pictures, text, graphics, motion picture, background sound as well as some narrations are synchronized and/or combined at the same time in order to enhance learners understanding of concepts in various fields of studies including science and technology education (Gbasibo, 2007). In this approach, time keeping and coordination of different media are involved. It is an effective means of communication (Mayer, 2001 and Bartsch, 2009).

**The Concept of Science and Technology**

The idea of science started when people began to observe and understand their environment. Nathaniel (1993) posited that in the early history of man, scientific knowledge was acquired through observation of everyday happenings.

Many writers and scholars have given different definitions or meanings to science. According to the Advanced Learners Dictionary by Hornby and Co. “Science is the knowledge arranged in an orderly manner especially knowledge obtained by observation and testing or facts”.
Writing in the same vein, Conant (1991), an eminent American Scientist, defined science as “an interconnected series of concepts and conceptual schemes that have developed as a result of experiment and observation”.

It is pertinent to know that science tries to explain how and why things happen and that it fights against the forces of darkness, poverty, ignorance and knowledge of cause and effect. Science could be described as a process which consists of identification of a problem or hypothesis, observation, data collection, data analysis, experimentation or test, verification and result. Modern science is made up of many branches. The branches of modern science include:

1. Biological science
2. Physical science
3. Social science
4. Mathematics and logic

The term ‘Technology’ means the ability to supply the needs or necessities of mankind through the use of tools and machinery. In other words, when we talk about ‘Technology’, it has to do with the application of the ideas of science in solving practical problems that plague and puzzle mankind.

One of the strategies for the development of science and technology is the creation of an indigenous manpower in science and technology through education and research programmes. In fact, in the words of Osia (2007) “Our local games, architecture, farming practices, goldsmithing, work, curving, and pottery, dyeing and weaving should form the basis for the teaching and learning of science and elements of technology in our primary schools”.

In order to achieve the above objectives, the Federal Government created the National Council for Science and Technology in 1970 which eventually evolved into the Federal Ministry of Science and Technology and which was merged with the Federal Ministry of Education, but in 1985 it was separated from it. The science unit of the Federal Ministry of Education which was created in 1976 remained with the Ministry. The science unit of the Federal Ministry of Education has become a whole department and has been sub-divided into three divisions. They are:

1. The Technology Education Division
2. The Science Education Division
3. The National Education Technology Division.

These three divisions are further sub-divided into nine branches and each one of them is responsible for the development of science and technology by embarking on educational and research programmes.
Nkweke (2012) identified various multimedia equipment that can be relevant in facilitating teaching and learning of various school subjects including, science and technology education. These include: VCD, television, video, interactive video, sound slide system, video camera/video tape, Sound filmstrip, Cine film projector, and dictionary audio package. Others are: Power point software, communication satellite, multimedia projector machine, closed circuit television, the tele-conference systems, computer equipment; DVD and multimedia kit.

**Uses of Multimedia in Science and Technology Education**

The importance of using suitable synchronized instructional media like multimedia equipment (e.g. VCD, power point, closed circuit television, 16mm film, video-conferencing, etc.) in teaching English Language cannot be overemphasized. Multimedia is required in this new generation for learning, bearing in mind that this is an information communication technology age. It blends varieties of instructional media at the same time in a presentation, to cater for individual learning styles or learners peculiarities (Kelleman, 2004).

Staylor (2002) identified the following benefits or uses of multimedia in science and technology education:

1. Reduced learning time: self-paced, immediate interaction, feedback and personalized instruction can reduce training time 50% (avg.)
2. Reduced cost/students: in the classroom, the major expense is delivery, i.e., the instructor’s salary. More money can be saved by using an interactive system
3. Instructional consistency
4. Privacy: the student avoids embarrassment, and the ‘patience’ of the interactive system encourages the student to ask questions
5. Mastery learning: the instruction won’t move on until the student has mastered the lesson
6. Increased retention: the reinforcement of the interactive lessons increases learning
7. Increased safety: the technology allows exploration of ‘dangerous’ subjects which would be difficult or impossible in the classroom
8. Increased motivation: the responsive feedback and individual involvement makes the student a more willing participant

9. Increased access: student instruction is not confined to times when the instructor is available

10. Learners enjoy interactive learning

11. It is efficient, effective and flexible

Multimedia equipment is capable of conveying information in an instructional environment. They constitute the physical technology that can actually substitute for the live performance of a teacher. For example, a teacher’s lecture can be broadcast on live television to remote audiences. Also VCD recording can be a guide for independent study. However, the live performance of a teacher seems necessary to direct group discussion and tutorial. Nevertheless, with modern information technology, there is now headway in the use of media to replace the live performance of a teacher (Efebo, 1996: 104-111).

Multimedia, if well selected and skillfully utilized can multiply and widen the communication channels between teacher and learners. Gbasibo (2007:140) asserted that, with the use of hypermedia and synchronized interactive multimedia software, students are made to be more involved in the learning process. It makes the students to be in control of the class as against teacher controlled media presentations which are considered passive.

Multimedia technology provides educators of Science and Technology Education with a range of very interesting opportunities for creating resources that allow learners different levels of interactivity. It presents support and reinforcement to learners. Dambo (2003) quoted Davids (1993) as saying that, faculty members are, increasingly, using computers and interactive multimedia to synchronize lesson presentations thereby making their teaching more efficient, effective, powerful and flexible.

Gbasibo (2006) also observed that teachers/lecturers use computers and multimedia technology using power point to present lectures in the classroom and papers in conferences. These tools provide learners with individualized activities that accommodate differences in learner’s level of preparation, engage learner’s in interactive collaborations and bring texts, graphics, animation, sound, and video into the classroom. Therefore, in selecting the appropriate multimedia for the pupils and students, various variables should be taken into consideration, such as:
The objectives to be achieved

The developmental stage of the learners

Individual differences of the learners

The concepts in the subject matter

The background and previous knowledge of the learners

On the other hand, the use of multimedia in instruction is not a panacea to the learners’ academic problems. For students to perform well in academic work or examination, the teacher ought to use:

1. Effective teaching strategies

2. Engage students with the materials that will motivate them

3. Re-teach some concepts where necessary for better understanding of the lesson

4. Get the students involved in the teaching-learning process

5. Fine-tune next lessons to capitalize on the gains made in the previous class (Obomanu, 2008:5)

Conclusion

The present scientific age requires teachers to be conversant with emerging instructional approaches for better instructional delivery. This paper advocates for the use of multimedia in our school system.

Recommendations

In order for the Science and Technology teachers to be able to utilize multimedia equipment effectively, they need to acquire the following competences like:

1. Ability to collect information, organize information and analyze information; and be able to develop recommendations for acquisitions of multimedia materials and equipment

2. Competency for communicating ideas and information and for assessing features of multimedia equipment

3. bility to plan and organize activities including organizing repairs
4. Competency in applying skills in solving problems and for assisting others to use equipment/programmes

5. Ability to use mathematical ideas and techniques when necessary or using numerical features of equipment/programmes

6. Competency in applying technology

7. Ability to use team work and using features and functions of equipment

8. Knowledge of the current range of multimedia options commonly used in the relevant work context

9. Ability to identify the features and general operating functions of different multimedia options

10. Safe and correct operation of multimedia equipment

11. Literacy skills sufficient to interpret multimedia equipment information manuals or skills in incorporating a range of methods to assess performance

12. Ability to determine sources of information on multimedia equipment and programmes

13. Ability to identify common faults and ways of rectifying these in multimedia equipment/programmes used

14. Competency in determining the scope of repair and maintenance activities which can be undertaken without specialist assistance

15. Ability to apply relevant knowledge or theory to the design, development and use of multimedia package (see: http://tpu.bluemountains.net/unit-display.php)

References


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