

Technology in Education: The 21st Century Teaching and Learning Materials

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Abstract

The paper examined the concept of technology in education and its advantages. It highlighted some of the technological devices that can be used in teaching and learning such as multimedia, synchronized sound-slide sets, multimedia kits, power point, among others. The paper explained clearly some of the constraints in the use of technology in education such as poor funding of education, shortage of qualified teachers, high cost of education media, epileptic power supply and conservatism. It concluded that teachers should shift from the traditional methods of teaching and embrace modern technology in education as a tool for teaching. The paper recommended the need for adequate funding of education, training and re-training of teachers in the use of modern technologies in education, among others.

Key words: Technology, Education, Teaching, Learning

Introduction

The 21st century teachers and learners should be technology compliant; they should be acquainted with various technology of learning in a modern classroom. They should be able to use ICT materials, multimedia systems such as video projectors, video cassette, video camera, television monitors, microcomputers, radios, and more recently, the multi-media projectors, compact disc players etc for effective teaching and learning. However, the reverse is still the case, traditional method of teaching ‘chalk and talk’ dominate our educational institutions. According to Nnachi (2007), “traditional methods of teaching have failed to improve the academic achievement and interest rating of students”. According to him, “traditional classrooms which are characterized by chalk and talk, story-telling, are seldom useful for changing attitudes or attaining the higher cognitive goal”. He further expressed that “the traditional approaches of teaching and learning which is devoid of use of modern technology do not give students an opportunity to explore, to think or to interact, they tend to make students gullible receivers of knowledge”.

King (1994) opined that classroom instruction warrants a refined traditional approach for better students’ academic achievement. Okafor (2012) stressed that emphasis should shift from rote learning to opportunities for students’ exploration and discovery learning. He further maintained that 21st century classroom should be well equipped with modern technologies in education such as ICT, multimedia projector, video camera, etc.

Conceptual Analysis

According to Akude (2004), technology in education embraces every possible means by which information can be presented. This implies that we can make appropriate use of hardware along with suitable software, it is often possible to improve the efficiency or quality of learning in a given situation. The idea of technology in education metamorphosed from such names like teaching aids, audiovisual aids, instructional materials, educational resources and even curriculum materials.

Technology in Education and Its Advantages

- **Computer in Education:** Basically, a computer can be defined as a device which is able to accept information, apply some processing procedure to it, and supply the resulting new information in a form suitable to the user (Percival and Ellington, 1998). There are many ways in which the computer could be used in education. These include, Computer Managed Learning (CML), Computer Supported Learning Aids (CSLA), Computer Based Education (CBE) and Computer Assisted Instruction (CAI). Suppes (1975) and Akinyemi (1988) identified the following as some of the areas in which computer may be used for instruction: Tutorial and dialogue, dull and practice, games, simulation and the use of information handling. The use of computer in education has the following advantages:
 - It could be used as a direct aid to teaching and learning process both as a ‘substitute tutor’ mode and as a simulated laboratory mode.
 - It can be used in administrative or managerial role, especially in such areas like overall administration of the system; time table planning, budgetary control, management of teaching/learning process.
 - It is an effective tool for educational research.

- It is used as data-base, especially because of its ability to store and facilitate the subsequent retrieval of information (Percival and Ellington, 1988).

Inspite of the basic functions and importance of computer, there are still basic problems associated with its application. Some of the basic problems as highlighted by Akinyemi (1988) include the following: Lack of finance, dearth of personnel, teachers' resistance to change and constant power failure.

- **Multimedia:** It is the combination of media such as video and audio with text that makes them multimedia. There are five main types of multimedia that are commonly used for teaching and learning in either group learning or individualized learning. They are: synchronized sound-slide sets, multi-image presentations, multimedia kits, interactive video and computer-multimedia. The following are briefly explained:

- **Synchronized sound-slide sets:** In this mechanism, the sound from tape recorder is synchronized with vision from a slide projector or a filmstrip projector. There are strip projectors that are specifically designed to operate in conjunction with a record player. The synchronized could be done locally by the teacher to produce the audio-visual effect. That is, the resourceful teacher combines the 5cm-by-5cm slides with audio tape so as to produce the needed audio-visual effect. This method of instruction has its advantages and disadvantages: synchronized sound slide programme may be used for individual or group instruction. The individual could use it and manipulate it to suit his own pace while it could also be adapted for use in the classroom, and it could have a far-

reaching impact on the learners. However, synchronization of the slides and audiotape depends on the accuracy of the user. Any slight mistake may cause confusion to the learners and the teacher may need to start again.

- **Multimedia Kits:** These are the learning packages that have been specifically prepared for individualized instruction as well as for group presentation. Multimedia kit is seen as a collection of teaching/learning materials which may involve the use of more than one type of medium. The kits usually contain such items as transparencies, slides, filmstrips, audiotapes, records, still pictures, charts, maps, posters, graphs, booklets etc. The multimedia kits could be commercially made by companies or locally prepared by teachers or media specialists. The multimedia kits are said to be multi-sensory because they arouse the interest of learners. However, teaching and learning with multimedia kits can be very expensive when we realize that the gadgets involved need to be energized before they can function.
- **Power Point Presentation:** According to Zetti (1992), power point is an amazing tool for learning in both a student and a teacher directed situation. It is believed that it can add new dimension to learning, thus allowing teachers to explain abstract concepts while accommodating all learning styles in schools. Usually, the instructor prepares his lesson/lecture note with emphasis on the salient issues – such highlights of essential points may be made using ‘bullet’ signs. The lecture notes are broken down and written in ‘slides’ or ‘templates’. The major projection equipment for the power point presentation is the multimedia projector.

The projector is connected to a laptop or a desktop computer with a cord (coaxial cable). The power point presentation has numerous advantages such as enhancement of communication, step by step presentation, makes students to be active participants in teaching and learning, arouses curiosity of learner, among others. The major weakness of using power point for teaching and learning is the epileptic nature of electricity and the high cost of the laptop computer.

Constraints in the Use of Technology in Education

Poor Funding of Education: Poor funding of education has negatively affected teaching and learning and research work. This scenario poses a major limitation to the use of technology in teaching and learning.

Shortage of Qualified Teachers and Lecturers: Professional trained teachers who can handle various technological facilities are in short supply. This gap has to be filled through re-training of lecturers and teachers in the use of multimedia materials.

High Cost of Education Media Materials: The high cost of laptops computers, video machine, tape recorder, etc are very serious constraints in the use or application of technology in education.

Epileptic Power Supply: Power supply in Nigeria is not reliable and very epileptic in nature. This condition had hindered the use or application of technology in education.

Conservatism: Most teachers find it difficult to accept change and embrace the modern technology in teaching and learning. As a result of this ugly development, Ebenebe (2006) warned university lecturers to move away from traditional teaching

styles to creative teaching styles which will make students move from traditional learning goals to subject assimilation to becoming critical, creative individuals.

Conclusion

The 21st century teachers should shift from the traditional methods of teaching story-telling, chalk and talk and embrace modern technology in education as a tool for teaching. Teaching can be very interesting and creative if technology in education such as computer education or multimedia is applied to teaching and learning. Therefore, classroom should be well equipped with modern technologies such as ICT, multimedia projector, video camera, etc as a catalyst for achieving the goals of education in Nigeria.

Recommendations

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

1. Government, corporate bodies and individuals should assist in funding education.
2. Teachers should be trained and re-trained in the use of modern technologies in education. Teachers should be exposed to seminars and workshops for capacity building.
3. The government should subsidize cost of educational media such as laptops, television, projectors, etc.
4. There is need to improve power supply in Nigeria. Educational institutions should compliment public power supply with private generator or use of solar energy to power their facilities.

5. Technologies in education should be made an integral part of teaching and learning in Nigeria.

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