

COMPUTER ASSISTED INSTRUCTION (CAI) AS A MULTIMEDIA SUPPLEMENT TO LECTURE METHOD: CHALLENGES OF CAI ADOPTION IN NIGERIA'S CLASSROOMS

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Abstract

The paper analyzes the efficacy of computer assisted instruction (CAI) packages and made a comparison with the lecture method of instruction in Nigerian classroom. Ways by which CAI packages appeal to students with different learning styles were brought to fore. The classifications and forms of CAI were examined. Some advantages of CAI were highlighted viz-a-viz the limitations of lecture method of instruction. Major challenges of CAI adoption particularly in Nigeria were discussed. It was concluded that, though CAI may appear to be useful and better for instructional purposes than the lecture method, it should only be used to supplement the lecture method were available and necessary.

Introduction

Traditionally, the learner has been regarded and treated as a passive receiver of instruction, while teaching has still retained the old conservative approach which is in most cases; the teacher acts a repertoire of knowledge and the student the dominant recipient. There is over reliance on textbooks and with occasional demonstrations and experimental classes.

In an average classroom, one finds a teacher at the blackboard jotting down important facts, with students furiously copying all that is written and said, expecting to memorize the facts and spit them out on an examination (Bello, 2008). Computer assisted instruction (CAI) development is a relatively new field in third world countries. The pioneer work on CAI started in the 21st century, and quite a sizeable number of works have been carried out globally.

Abimbade (1998) defined CAI as an automated instruction in which the computer is used to deliver instruction to the learner through interactive process. Similarly, Spencer (2004) also defined CAI as the use of computers to provide course content instruction in forms of drills and practice, tutorials, simulation and animation. It could be rightly inferred that, CAI is an educational method which uses the computer as an environment in which learning occurs, makes strong the education period and students motivation and can be useful for students with different learning speed. Farooq (2001) opined that, CAI is more interactive than programmed (conventional) instruction because the learner can select from a wider range of options and may be required to make more complex interpretations and take decisions. This approach can be simulated for multimedia; the use of text, music, animation, moving images and sounds to entertain the learner while educating him. Akos (2000) defined multimedia technically as a plural noun describing the combination of visual and audio display from different sources delivered in the same presentation. It satisfies the constructivist approach to learning which encourages complex interactions between the learner and the content.

Today's students are born and maturing with visual devices like television, computers, digital cameras, Internet facilities and cell phones. It is not possible to attract these students interest by using traditional method alone because the world is now driven by science and technology

particularly Information and Communication Technology. Schools must therefore embrace information technologies, if they must effectively tackle issues of infrastructure, population explosion and varying student's complexities within and outside the classroom in this 21st century.

The quest for quality instruction cannot be compromised, especially in this age that is dominated by digital technology. The quality of instruction in the case of Nigeria's classrooms leaves much to be desired. So, since digital technology is influencing all aspects of human life, the education enterprise cannot be an exception. Now, technology is in the process of changing from digital to photon (Sansanwal, 2009). Photonic technology is capable of transferring 50 Gbps over a distance of 100 meters. It is expected to provide higher speed interconnection than what is currently available. The technology is scheduled to be released sometimes in 2015, it promises to deliver faster data transfer (Haris, 2010).

CAI as a Multimedia Tool for Instruction

CAI packages for instruction usually present learning task using the combination of text, sounds and moving images. These attributes of CAI makes it a multimedia package that should be seen as a revolution for education in the way information for learning is been communicated to the learner, which puts information in a more relevant and meaningful perspective. Educational multimedia for learning is usually customized software developed by commercial enterprises and individuals. The power of this hypertext environment lies in its ability to utilize the immediacy and intimacy of television and radio coupled with moving images. This capacity for expanding and conveying detailed explanation of abstract concepts lays the strength of CAI. Multimedia packages can be further classed into two; presentation multimedia and interactive multimedia. Presentation multimedia is used mainly by the business world. The computer is used to control various media such as sound, graphics, animation and video to produce a presentation which is used for business promotion or advertisement. While the use of such multimedia is usually confined to the business sector, some see it as having a role in education, not as a means of instruction, but as a means of presenting information to be studied. The type of multimedia most commonly used in education is the interactive multimedia. Information about learning content is accessed in a non-linear fashion.

CAI packages share common features like:

- (i) Drills and practice: A drill and practice programme typically deals with materials that have already been taught. The student is presented with a learning task, often selected randomly, and feedback is given immediately when it is completed. A well constructed programme of this nature in Nigeria will keep pace by with the student by offering remedial or advanced level when the student proves better.
- (ii) Tutorials: A typical tutorial programme presents information and then questions to ascertain level of learning achieved. But, from a practical point of view, computer tutorials are very limited in its ability to assess the level of understanding. In a classroom situation, when a teacher ask a question, he assess level of understanding by listening, observation, degree of hesitation which he could probe further, body language and so on in judging the student. However, computers will respond to small number of possible answers and to a large extend cannot cope with ambiguous answers.
- (iii) Games: games have a role to play in the classroom especially as a means of increasing motivational levels of students. However, computer educational games must be used with care. While games have the format of simulation, the major difference between the

two is that a simulation normally models a real life situation whereas a game gives an imaginary one.

- (iv) Simulation and Modeling: since simulation models a real life situation, its justification is in its capacity to enable students manipulate and experiment with it, in situations where the real life mode (experience) is too expensive, too dangerous or time consuming.

(Source: Rabia, 2004)

Multimedia package takes care of students with different learning styles with its unique blend for displaying and organizing information. Ayersman (1996) posited that, the format attributes of multimedia, such as recorded language, graphics, video, and music, accommodate a variety of learning styles. The lifestyle of people affects their learning style and even determines how they learn and develop. In a paper entitled learning styles (n.d.), the author submits that learning styles are simply approaches or ways of learning? These types of learning styles are; visual learners, auditory learners and tactile or kinesthetic learners.

- (i) Visual learners: they learn through seeing. These learners need to see the teacher's body language and facial expression to fully understand the content of the lesson. They tend to prefer sitting in front of the classroom to avoid visual obstructions. They think in pictures, visual display, video, and transparencies and so on.
- (ii) Auditory learners: they learn through listening, verbal lectures, discussions, talking things through and listening to what others have to say. Auditory learners interpret the underlying meanings of speech through listening to tone of voice, pitch speed and other nuances. These learners often benefit from reading aloud and using a tape recorder.
- (iii) Tactile/kinesthetic learners: they learn best through a hands-on approach, actively exploring the physical world around them. They find it hard to sit for long periods and may become distracted by their need for activity and exploration.

Therefore, provisions of educational and instructional materials that have more visual content is necessary in order to teach the person of this time who lives visually and is constantly bombarded with visual knowledge (Cepni, 2004). This visual knowledge is sometimes passed to the learner through computer assisted instruction packages in schools. For more than two decades now, science educators have hoped that computer would help provide more efficient and effective instruction (Weller, 1996). There has been a dramatic increase in the capabilities of computers, along with reduced cost, that has influenced an increase in the various forms of computer delivered instruction (Brown, 2001). This increase has been seen in education as well as in other disciplines (Passerini, 2000) as cited Michael and John, (2002).

Some Advantages of CAI

CAI can help us deliver a deep and solid education to a specific subject (Avouris, 2001). Students taught with CAI may have some degree of control of what they are learning. Kinnaman (1990) is of the view that, CAI students have more of an internal locus of control/sense of self –efficacy than conventionally instructed students. The format is portable and transferable and can be used even outside regimented computer laboratory. Students receiving CAI learn better and faster than students who are lectured, and they also retain what they have learnt better (Bangart, Kulik and Kulik, 1998). In a study conducted by Capper and Copple (2003) CAI users sometimes learn as much as 40 percent faster than those receiving traditional, teacher-directed instruction. The use of CAI leads to a more positive student attitude to learning (Bangart, Kulik & Kulik, 1998). It is cost effective when viewed from the perspective of its timelessness and long time effect compared to conventional approach. The use of CAI as a

supplement to traditional method produces achievement effects superior to those obtained with traditional method alone (Bangart, Kulik and Kulik, 1998). This finding holds true for students of different ages and abilities and for learning in different curricula areas. Fagbemi (2004) found that pupils taught social studies with CAI performed better than those taught with conventional teaching method.

Lecture as an Instructional Technique

According to Swanson and Torracco (1995), the lecture approach was established formally centuries ago as a teaching process that began with a literal reading of important passages and then interpretation of the text. Teacher is highly involved and responsible for providing materials and organizing the data that facilitates learning. Ruyle (1995) describes the lecture simply as an oral presentation of instructional materials, usually with very little exchange of ideas between the instructor and his students.

Limitations of Lecture Method

1. Students who are weak in note taking skills will have trouble understanding what have been learnt after the lecture
2. Some find the lecture periods boring causing lose of interest and the teacher may not true feedback of learning outcome.
3. Lecture does not lead to maximum achievement in certain subjects areas
4. Lecture does not provide teachers with an opportunity to estimate accurate student's progress to determine what has been learned.
5. Too often, the lecture makes no provision for student's participation in the learning process.
6. The greater burden for the lesson rests on the instructor
7. The instructor needs to be skillful speaker or an orator to accomplish his task.

(Source: Rabia, 2004)

Challenges of CAI adoption in Nigeria's Classrooms

Computers have become an influence that not only shapes our daily life but also shapes our curricula in formal educational settings. Technological advancement has found computer applications useful for classrooms in response to challenges to aspirations and needs of students and teachers. The following factors may hinder CAI adoption in Nigerian classrooms;

Erratic power supply is a major impediment to CAI adoption. Power supply in the last two decades has degenerated in the urban centres while villages that are connected to the national grid receive better power supply may due to their low energy consumption rate. While it is almost impossible to use CAI packages in schools located in towns, village schools lack human expertise to utilize this innovation for education.

Low level of computer know-how among both teachers and supporting staff in schools is another setback to CAI adoption. Few schools benefited from School-Net programme in Niger state; even then not all teachers have utilized the presence of the computers.

While CAI package may be effective for teaching over-crowded classes and for individualized learning, ratio of students' number to a computer is almost unmanageable. Therefore, class control becomes a serious problem

The National Policy on Computer Education (2004) demands that Nigeria education should bring about a computer literate society and produces a generation of school children who will appreciate the potential of computer and be able to use it in various aspects of life. Successive governments have not shown commitment to the policy pronouncement and policy implementation in Nigeria (Jeter, 2002). The then minister of Science and Technology, Professor T. Isoun, was mindful of the gap between formulation of IT policy to about 20% and IT implementation in the country to 80% (2001). The euphoria and national expectations that came with the policy has died down in government institutions while, private schools are making steady progress towards attainment of the national goal.

High poverty level among Nigerians populace as corroborated by Central Intelligence Agency (2007) placed Nigerian populace below poverty line as 70%, this has negated the possible realization of computer literacy especially among Nigerian public school going children.

Tech-phobia is situation where a person expresses unwillingness/fear for using/learn the computer himself. This is common among the aged elites even though they have them in their offices. Cultural factors and coupled with harsh environment have aggravated the problem.

Bad roads network across the length and breadth of the country is a problem. Computer components are (hard/soft ware) highly sensitive and expensive to come-by where they are available.

Conclusion

Having seen the efficacy of CAI materials with features capable of appealing to students with different learning styles over the traditional lecture method of instruction, the writer wishes to conclude that; where possible CAI packages should be integrated into our classrooms especially in the teaching of complex/abstract science concepts in our schools for effective delivery of instruction.

Recommendations

In the light of the issues raised in the paper, the following recommendations were made:

- (i) Researchers should turn their attention to the study and development of CAI packages in all disciplines of study to ascertain its effects and usefulness in Nigeria.
- (ii) The attention of policy formulators for all levels of our educational systems should be geared towards preparation of CAI's for all levels of education. This agrees with the opinion of Maduekwe (2003) for the emergence of a 'policy elite' that would serve as informed lobby group to the government, stressing the need for policy implementation.
- (iii) Public schools in Nigerian should be equipped with computer laboratories with at least 100 students seating capacity. Also, teachers should be encouraged to go for training courses in ICT and be exposed to CAI packages. Chen (1995) outlined the areas of training to include:

Basic computing skills:

1. Up-to-date theories of learning and instruction
2. Wide ranging applications of IT in education
3. IT trends in education and common mistakes of computer use in education

4. Software evaluation methods and classroom technology integration.

National Universities Commission (NUC) and National Commission for Colleges of Education (NCCE) for the interim should designate courses for instruction using computer based teaching and develop CAI courseware.

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