



COMPUTER ASSISTED INSTRUCTION (CAI) AS A POTENTIAL TOOL FOR AN INDIGENOUS PEDAGOGY

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Abstract

The paper reviews the uses of computer assisted instruction as a tool for indigenous pedagogy teaching and learning as it is to aborigines. The review shows, among others, that computer assisted instruction gives room for learning experiences as well as doing by observation. It can also serve as a medium of passing information as indigenous heritage, beliefs and respects from generation to generation. The paper then recommends that government should ensure that indigenous knowledge is respected and promoted in all funded education programmes. It also recommends that emphasis should be placed on designing CAI, which accommodates a whole person perspective, encourage rich and

active learning, promote emotionally sound learning and meet the needs of learners from different groups.

Keywords: Computer Aided Instructions, Tool, Pedagogy

Introduction

The approaches and methods used for teaching and learning in our schools have an impact on how much students learn in the classroom, as well as on the quality of the learning that takes place. Suitable teaching methods could make improvement in students' level of understanding by helping them to master rules and procedures. The methods used influence how students approach and enjoy the learning, which in turn affects indirectly how much and how well the learning takes place. Teaching method supports all learning in the classroom. It also determines the nature of the interactions which take place in the classroom, such as those between the teacher and the class, between the teacher and individual student or between the teacher and some groups of students. Students cannot become effective problem-solvers unless they have opportunities to engage in problem-solving activities in hypothetical or real contexts (Roy, 2007). In other words, students learn problem-solving talks by doing it, under experts' supervision and guidance. One cannot learn the problem-solving skill by simply talking of or about a problem. A student will write down words dutifully on paper or type them on a computer, but that will not prepare the student to solve

problems. We can, therefore, not solve problem by talking or writing. Results from international surveys suggest that education outcomes are related not only to students' family background, but also to the quality of teaching and to certain structural and organisational features of education systems (Eurydice Network, 2011). Educators should endeavour to meet the educational needs of their students in every practical way; it would go a long way to improved attendance, retention and in the long run workplace participation.

This paper, therefore, looks into the use of computer assisted instruction as an indigenous teaching method under the following subheadings;

- a. Indigenous education
- b. Indigenous teaching methods (Pedagogy)
- c. Computer assisted instruction
- d. Types of computer assisted instruction
- e. Benefits of computer assisted instruction
- f. Potential of computer assisted instruction as indigenous teaching method (Pedagogy)
- g. Challenges in implementing computer assisted instruction
- h. Conclusion and
- i. Recommendations

Indigenous Education

Indigenous education is defined as nurturing the holistic person whose identity is enhanced by cultural values (Hampton, 2000). It involves holistic approaches to teaching and learning. In the indigenous education setting, the individual is viewed as a whole person with intellectual, spiritual, emotional and physical dimensions. Each of these aspects must be addressed in the learning process. Holistic education is the term used to describe the kind of education used by indigenous people. Such education is organized to develop all the aspects of the individual (Royal Commission on Indigenous people, 1996). Indigenous education is designed to attain two goals. First, it is to ensure indigenous students at all levels participate in education to achieve appropriate positive outcomes. Second, it is to develop programs that assist the wider community to increase their understanding of indigenous culture and history. The aim is to remove prejudice or racial intolerance (Aussie Educator, 2012).

Indigenous teaching methods (Pedagogy)

The distinctive features of indigenous knowledge and other various teaching methods (pedagogy) are learning through

- a) Observation and doing
- b) Authentic experience and
- c) Individual instruction.

Indigenous pedagogy accepts students' cognitive search for learning process they can internalize and their teachers allow for a lag period of watching before doing. Indigenous knowledge is both empirical (that is based on experience) and normative (that is based on social values). It embraces both the circumstances people find themselves in and their beliefs about those circumstances in a way that is unfamiliar to the western knowledge system, which distinguishes clearly between the two. As a system, it constantly adapts to the dynamic interplay of changing empirical knowledge, as well as changing social values. Caution is, therefore, advised before oversimplifying the indigenous knowledge system by stressing their normative content only (Battiste, 2002).

Computer Assisted Instruction (CAI)

Computer assisted instruction (CAI) is an instructional technique whereby a computer is used to present and monitor the learning that takes place. CAI uses a combination of text, graphics, sound and video in enhancing the learning process. Computer assisted instruction has many purposes in the classroom and can be utilized to help students in all areas of the curriculum (Kolajo, 2012). CAI also refers to the use of the computer as a tool to facilitate and improve instruction. A CAI program uses tutorials, drill and practice, simulation and problem-solving approaches to present topics and also to test the student understands. It is a self-learning technique, usually offline/online, involving the

interaction of the students with programmed instructional materials (Kyaw, Stan and Juvenna 2002).

Types of Computer Assisted Instruction

The following are different types of CAI, according to Kyaw, Stan, and Juvenna (2002).

- (i) **Drill and practice:** Drill and practice provides a series of tasks or exercises that can be repeated over and over and provides immediate feedback on the response of the learner. This gives room for the mastery of the concept. It serves as a complement to classroom instruction.
- (ii) **Tutorial:** Tutorial provides information on certain concepts using exercises and assignments. In this type of CAI, computer direct the instruction based on the level of learner's achievement.
- (iii) **Games:** Game software often creates a contest between the learner and the computer or between the learner and others in order to achieve the highest score or beat the computer.
- (iv) **Simulation:** Simulation has to do with the creation of a model (representation or imitation) of a process or system. Laboratory experiment may be too difficult, expensive or dangerous to perform in a school environment; it can be achieved with simulation.
- (v) **Discovery:** the discovery approach provides a large database of information specific to the course or content

area and challenges the learner to analyze, infer and evaluate based on their explorations of the data.

- (vi) **Problem Solving:** This approach, when performed frequently, will help learners develop specific skills and the strategies of solving problems.

The Benefits of Computer Assisted Instruction (CAI)

There are many advantages to using the computer in educational instruction. They provide one-to-one interaction, instantaneous response/immediate feedback to the answer elicited, freedom to experiment with different options, motivation and multimedia. This helps learners to understand difficult concepts through the multi-sensory approach. In Self-directed learning, students can decide the place and time and what to learn. It allows individualized instruction and attention and provides self-pacing. It also encourages privacy. This helps the student that is slow and shy to learn. It also gives room for the teacher to devote more time on students that are weak academically.

The potential of computer assisted instruction as an indigenous teaching method (Pedagogy)

Looking at what is obtained in indigenous pedagogy and comparing with what computer assisted instruction has to offer, one can infer that there is a great correlation. Some studies have found a positive impact using CAI. Burril in the Eurydice Network (2011) synthesised the findings from 43 studies and found that, with the right supportive classroom environment,

CAI can help students to develop a better understanding concepts, improve performance in assessments and improve problem solving skills. CAI also utilizes all the senses to build symbolic meaning in support of learning new concepts in classes. It uses diagrams or visualizations to map out processes for students to follow. This is an indigenous pedagogy, which involves the use of both concrete and abstract imagery (Bindarriy, Yangarriny, Mingalpa and Warlkuni, 1991). In optimal indigenous pedagogy, the teacher and learner enjoy “.... a concrete, holistic image of the tasks to be performed that image serves as an anchor or reference point for the learner” (Hughes and More, 2004).

Indigenous pedagogy involves testing knowledge non-verbally through experience, introspection and practice, thereby becoming critical thinkers who can judge the validity of new knowledge independently (Wheaton, 2000). CAI gives room for learning experience as well as doing by observation. Indigenous teaching method avoids dichotomies by finding common ground between diverse viewpoints (Wheaton, 2000). Likewise, CAI can also search out different views on the same concepts to find common ground.

Martinez (2000) contends that computer assisted instructions takes into cognizance a “whole-person perspective”, which takes into account individual learning differences. This means that learning can be personalized to meet the need of different learners. Martinez says that CAI makes this possible, as it

enables the adaption of content to meet different learners' needs. In the indigenous education setting, the individual is viewed as a whole person with intellectual, spiritual, emotional and physical dimensions. CAI encourages prosperous and active learning. This involves a full loaded instruction set, which include worked examples, demonstrations, simulations, games, challenges, exercises and exposition (Cumming, Finch, and Thomason, 1999). This also describes the indigenous pedagogical concept.

One of the goals of indigenous education is to develop programmes that assist the wider community to increase their understanding of indigenous culture and history (Aussie Educator, 2012). For the protection and preservation of our heritage, beliefs and respects, there should be an archival system where such important documents can be kept for future generation. CAI can serve as a medium of passing such information from generations to generation of learners and the community at large by using different software. Kolajo (2012) states that the application of CAI in our schools could make the students and the entire community reclaim and revalue their traditions and that will prevent erosion and loss of indigenous knowledge through the process of globalization and modernization.

Challenges in implementing CAI as an indigenous teaching method (Pedagogy)

There are many hindrances confronting the implementation of CAI. According to Richard and Augustine (2012), the most important factors affecting implementation are:

- (i) **Availability of software:** One factor that is identified by teacher respondents is the lack of availability and access to software that is subject content appropriate. This factor is perceived by teachers as being a serious barrier that has a negative effect on their using computers in the classroom.
- (ii) **Time factor:** The time factors surrounding the implementation process is viewed by teachers as being a major barrier in their using computers. The teacher needs adequate time to review the software and makes sure that all facilities are in place before the classroom session. This usually takes more than the normal time allocated for a particular subject.
- (iii) **Availability of hardware:** This involves limitations of computer laboratories and sometimes the issue of scheduling computer time. Computers should be situated in classrooms or laboratories where they can be easily accessed by students and used in a meaningful and pragmatic way. The barrier of poor or limited accessibility prevents true integration of the computer process.
- (iv) **Attitude of administrators:** Individual teacher initiatives account for much of the implementation of

computer technology in schools. Lack of supports by administrators is a significant barrier towards implementation. Successful implementation of computer technology can only be feasible with the administrators' supports.

(v) **Teacher education and training:** Lack of in-service training and workshops with respect to computer literacy is another stumbling block in the integration of computer assisted instruction in the classroom. Teachers who are not conversant with computers and are not trained or sent to attend workshops in computer uses cannot support the use of CAI as an instructional medium.

(vi) **Dwindling power supply:** With dwindling nature of electrical power supply and the higher cost of diesel, many educational institutions could not afford to have functional computer laboratories. Therefore, CAI implementation is near the impossible.

(vii) **Technical support:** Lack of technical personnel to maintain the hardware and software is another important inhibiting factor. Computer hardware and software faults occur frequently and solving these problems is both time and money consuming. Sometimes it requires the attention of an expert.

Conclusion

CAI holds a great potential as an indigenous strategy in a well supported environment. Its integration has tremendous potential

to effect changes in indigenous education in terms of pedagogy. The benefits of CAI are vital for functional education to take place. With the recent introduction of Computer-Based Test by Joint Admission and Matriculation Board examination (JAMB UTME), it's a clear indication that all students must learn how to use the computer for them to move further in the area of accruing higher education.

Recommendations

Therefore, based on the above discussions and for the need to make computer assisted instruction (CAI) a tool for indigenous pedagogy in schools, the following recommendations are being forwarded;

1. The government should ensure that indigenous knowledge is respected and promoted in all funded education programmes.
2. Emphasis should be placed on designing CAI, which accommodates a whole person perspective, encourage rich and active learning, promote emotionally sound learning and meet the needs of learners from different groups. Designers of CAI should contact subject teachers for the proper coordination and integration of CAI programmes.
3. The government should provide a well supported environment for the implementation of computer assisted instruction.

4. Administrators should support and encourage the use of computer assisted instruction for effective teaching and learning.
5. Train the trainer programmes should be organized for teachers regularly on how to use computer assisted instruction.

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