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Role Of Cai (Computer Assisted Instruction) In Teaching Of Mathematics At School Level

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Abstract: Mathematics is considered as an exceptionally difficult subject by majority of the students. The pass percentage of high school examination in this subject is very low in comparison to other subjects of the school curriculum. Normally in a classroom it is difficult for a teacher to reach to all the students due to heterogeneous group of students and student teacher ratio. Hence there is a need of using innovative teaching methodology alongwith in classroom teaching. Therefore, this paper is an attempt to highlight the role of CAI (Computer Assisted Instruction) in teaching of mathematics.

Keyword:CAI, Mathematics, SSA and CAL

A.INTRODUCTION:

Education being an important instrument of social development has its own history since the beginning of the civilization and has been considered as an important agency for the development of an individual and the society, at large. All the disciplines have their own importance for the development of nation but Mathematics, Science, Bio-Technology and Technology are expected to play the key role for the development of the nation. There is no aspect of man's life that has remained untouched and unaffected by the use of Mathematics in particular. Therefore, the need of Mathematics is felt right from the beginning by all individuals.

Mathematics is taken as a chest filled up with so many valuable tools concerning with the operations like measuring, weighting, counting etc. and help in proper understanding of the nature's work and complicated problems of life by converting them into language of signs and symbols. Mathematics helps in drawing conclusions and interpretation of various ideas and themes. It helps in solving the problems of our life. Today, whatever society enjoys in life that is the result of scientific inventions and the same is not possible without the application of Mathematics. Scientific knowledge, tools and techniques also can not be used safely and economically without the aid of Mathematics. Therefore, there is a great weight in Young's saying “whenever we turn in these days of iron, steam and electricity, we find that Mathematics has been the pioneer. If its backbone removed, our material civilization would inevitably collapse. ”

Therefore, it is evident that Mathematics, being a purest science, is very essential for giving us a system, organization and essential abilities for leading a successful life.

We will remain too much handicapped in our life in case we remain ignorant of mathematics. Highlighting the importance of Mathematics Kothari Commission (1966) has also wisely remarked,

“Science and Mathematics should be taught on a compulsory basis to all pupils as a part of general education during the first ten years of schooling. In addition, there should be provision of special courses in these subjects at the secondary stage, for students of more than average ability”

But the present day scenario is different as majority of the students study Mathematics as a subject upto the secondary school stage but thereafter majority of them choose the subjects of Art Stream such as History, Political Science, and Philosophy etc. at senior secondary stage as the students are generally apprehensive about this subject.

COMPUTER ASSISTED INSTRUCTIONS (CAI) IN EDUCATION

Computers and related technologies are being used now in most of the schools. Innovations in technology are certainly reflected in educational systems. In most of the developed countries education has been supported by information technologies (IT); schools have computers, a large numbers of teachers use computers and new technologies while teaching, and moreover textbooks have some areas devoted to new technologies. Most of the educators and researchers are trying to use technologies in various subject matters, and this integration help in changing the nature, concepts and methods in each subject. For example, in mathematics education, the process of teaching and learning, the roles and functions of the most of the concepts have been changed with the use of technology.

Meanwhile with the beginning of the personal computers during the mid-1980s, computers have swiftly become one of the key instructional technologies used in both formal and informal education. The computer's role has changed because of two factors: first, it can provide rich learning experiences to the students, and secondly, computer helps the students to manipulate depth and way of their learning. Furthermore, for managing the classroom activities

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teachers can use the computer as an aid; it has a multitude of roles to play in the curriculum which can range from tutor to student tools.

APPLICATION MODES OF CAI

Computers are being increasingly employed for class room instruction and also for individualized and distance education. There are several types of application modes of computer Assisted Instruction (CAI) designed for education. Basically these application modes of CAI are:

Drill and Practice:- In drill and practice mode, the Computer Assisted Instruction (CAI) uses the computer to present the learner with a series of exercises which he/she must complete by giving some response or answer. The response is processed by the computer and it reinforces all the correct responses. In case wrong response, the computer either asks the learners to try again till it is right or provide a chance to read it again or just states the right answer

Tutorial:- Tutorial uses the computer to deliver whole instructional sequence similar to a teacher's classroom instructions on the topic. In this method, topic to be studied is divided into a series of steps. Students learn the lesson by taking their own time in small steps.

Simulation:- Another mode of learning involves the student studying real-life phenomena. Simulation differs from tutorial and drill and practice activities by providing learner organized activities. Simulation can be an aid in visualizing abstract concepts. They serve as a bridge between reality and student's mental model of reality.

Modeling:- This mode of Computer-Assisted Instruction (CAI) is similar to the simulation mode in which both help the student to learn by working with an analogue of a real life phenomena expressed as a set of rules within the computer. However whereas in simulation the analogue is specified by the tutor, but in modeling it is the student who must construct the analogue.

Games:- In such type of Computer assisted Instructions, students are provided with a variety of well-designed computers games. The purpose of such type of games is only to provide intellectual challenge, stimulation of curiosity and serve as a source of motivation to the individual student. This method is especially meant for young children.

BASIC PRINCIPLES FOR DEVELOPING CAI

CAI is one of the styles of Programmed instructions. Hence basic principles of programmed instructions are used for developing CAI. These principles are explained below:

(i) Active learner response

According to this principle, a learner learns better if he actively participates in the lesson. In programmed instruction the learner learns best if he/she is actively responding while learning. Therefore, a good programme should actively involve the learner in the learning process. It should be so formed that the student may not feel much difficulty in moving from one step to another step and thus acquiring knowledge step by step in properly sequenced way.

(ii) Immediate feedback

According to this principle a learner knows whether his/her answer is correct or incorrect immediately. Give the learner the subsequent question after he/she knows whether his/her response is right or wrong.

(iii) Small steps

According to this principle the subject matter which is to be programmed is divided into meaningful small steps in order to prevent a learner from stumbling as much as possible. When he/she makes a mistake, there is the risk of being labeled a failure.

(iv) Self pacing

According to this principle the learner decide the speed of learning so that he/she can learn at his/her own pace. Consider that an appropriate speed varies from learner to learner. The gifted learners naturally learn more rapidly then the slow learners.

(v) Learner verification

Whether the program is good or bad is judged not based on a specialists' opinions, but whether learning is actually established or not. To that end, get learners who have yet to learn the subject matter to try the program under development. Based on the trials, improve the material as necessary.

Benefits of Effective Use of CAI

Immediate feedback to the student and the instructor
Self-paced learning opportunities
Automatic adjustment to ability levels of students
Continuous interaction

SIGNIFICANCE OF CAI IN TEACHING LEARNING PROCESS

CAI enhanced students' attitude towards several aspect of schooling. Those are:

1. Increase in Motivation and Reinforcement
2. Increase in level of Satisfaction
3. Increase in learning ability
4.Improvement in Thinking Skills
5. Positive attitude towards Self learning
6.Reduction in Time and Cost to Tolerable level

Computer-Assisted Instructional activities should be incorporated into national mathematics curriculum in order to have the benefits of CAI.

ROLE OF MATHEMATICS EDUCATORS IN CAI

The assimilation of the new technologies in the context of education can be measured on the different bases; disciplines, teachings, teachers, learning, education environment and teacher training. The mathematics teachers play a major role to the integration of computers in mathematics education and teaching. Therefore, there is a need to prepare teachers to integrate technology in their teaching activities.

In the existing programme of Sarv Shiksha Abhiyan (SSA 2000) of our country, Computer Assisted

Learning (CAL) is also one of the components/provisions and computer facility are being provided to school system by MHRD, Government of India through State Government. Regardless of many research articles reporting the effectiveness of integrating instructional technologies with mathematics teaching, teachers are still not consistently using the technologies. The teacher training programs are expected to produce computer literate teachers since the effective use of technology in the classroom has received much attention in education. Therefore, to encourage the use of computers for students' conceptual development, mathematics teachers should learn how to use widely available software, such as spreadsheets, as a conceptual teaching and learning tool.

LIMITATIONS OF CAI

Even though the computer-assisted instructions are being used in the educational systems of developed and developing countries over twenty years, but still there are some limitations which restrict the effective use of computers due to finance, lack of hardware and software, lack of teacher preparation and competency, limited number of educational software's, and the lack of curriculum integration.

Implications for Policy Planners, Government and Directorate of Education

The school system should be provided not only the facility of computers but equally important requirement is of the technicians to ensure that the computers are in working state and proper maintenance of these gadgets in the existing school system. It also indicates the necessity of the availability of trained personnel for the successful implementation of CAL (Computer Assisted Learning) under SSA at School level. Further, the In-Service teacher training programmes should be organized in such a manner so that the teachers are not only trained just to get acquainted with computers (technical know-how) but should be trained in innovation teaching methodology through CAI.

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