# COMPUTER MANAGED LEARNING (CML)

Unlike CAI, where in computer is used in tutorial work, CML makes use of the computer in a different role in instruction. In CML the main role of the computer is record-keeping and it does not provide any direct instruction to the learner. It takes over the other responsibilities of the teacher like evaluating the response sheets of students, gathering and sharing information about each learner and updating the same periodically, finding the resource options available for every individual student to learn a topic, monitoring the learning of the student while he is making use of the instructional programme selected to suit his potentials and directing the learners what to do next (i.e. Evaluation, Record-keeping, Retrieval of reports, Find resource options, Prescribe and Control lessons). This type of instruction, though indirect, helps to assess the learner's present level of knowledge, weakness or gaps in his learning and remedial action possible.

**Comparison of CMI with Conventional Instruction**

As compared to conventional classroom instruction, the computer Managed Instruction (CMI) developed by Daniel Davies appears to have many superior features.

In conventional instruction, the teacher must make the decision instead of the computer. He must decide what to teach (objectives) to whom (entering behaviour) and how (procedures). And he must determine the extent of the student's success (performance assessment). All decisions are interrelated and interdependent. The teacher must be very careful when he makes decisions in his pre-tutorial phase. Very often the teacher has only one programme available for students of widely varying entering behaviour in conventional instruction. But the professor function in the computer model has access to a store of knowledge and alternative programmes which the teacher cannot have. Hence Stulurow and Davies believe that only computers have the capacity to make all the decisions and accommodations and enlightened pedagogy requires.

Further, due to self-learning, students attain higher level of proficiency. As student's learning is monitored continuously, requisite changes are incorporated in the instructional programme then and there so as to make it more effective.

The Computer Managed Learning is an electronic management information system of a student learning. It is a significant application of computer technology for accountability and documentation of student progress by electronic filing, sorting, and reporting of his learning outcomes.

## Definitions :

a. Acc to Hofmeister : " The systematic control of instruction by the computer, characterized by testing, diagnosis, learning prescriptions, and thorough record-keeping"

b. CML is an electronic learning management system that allows data from tests to be analyzed, providing information which can be the basis of educational decisions"

c. Acc to Hartmann ( 1989 ) CML as a record keeping system or information management system is a significant improvement over manually based operations.

From the above the following can be said about CML

CMI in its most sophisticated levels provides the following instructional functions.

(1) Assesses the learner's present level of knowledge,

(2) Diagnoses weakness or gaps in the student's learning,

(3) Prescribes learning activities to remediate the identified weaknesses, and

(4) Continuously monitors progress of the learner.

5. CML an improvement over Manual Performance Record system:

6. CML is the use of computer technology to collect, analyze, and report information concerning the performance of students in an educational program

7. It is a system to monitor student progress and the effectiveness of their instruction

## Characteristics of Computer Mediated Learning

There are two basic characteristics of CML.

The first is that the computer can evaluate a learner's responses instantly and indicates whether the response is correct or incorrect on the basis of predetermined key words identified within it. Where the student's responses correspond to the anticipated incorrect answers, then the computer gives corrective hints or offers general hints when the answer does not relate to any of the anticipated incorrect answers. It would also call for modified incorrect answers. In this way, every student is involved in the learning process as different from a conventional classroom where only a small

percentage of the students respond to the teacher's questions. Each student responding and receiving necessary feedback through CML is led towards the goal of effective learning. Secondly, the computer can individualize instruction in a number of specified ways. Instruction can be individualized according to differential aptitude, achievement and interest. The computer makes note of the learner's performance and progress in learning a unit and on the basis of the evaluation of his ongoing achievement and as per his needs, it can modify his program for further learning. The great asset of the computer is its instant response and its flexibility to suit the learner's needs and requirements through tutorial interaction and dialogue.

## Different Modes of CML

There are different modes of CML available in teaching-learning process through computers. Application of different modes is possible according to the purpose for which it has been used.

Some of the important modes of CML are briefly explained below.

• Problem Solving Mode • Drill and Practice Mode

• Inquiry Mode

• Simulation and Gaming Mode

Tutorial Instruction Mode

 • Dialogue systems Mode

(a) **Problem Solving Mode:** A CAL technique is that in which the computer primarily performs as the computational aid for the student to solve problems. The student indicates the type of problem to be solved and the raw data. The computer selects the appropriate formula, performs the calculations and gives the student the answer to the problem.

b) **Drill and Practice Mode:** Drill and practice is a computer program which presents a controlled sequence of events designed to reinforce previously taught concept or skills. The most common use of computers in educational settings is software designed to provide drill and practices. A good drill and practice program can be very effective in providing elaboration on topics already learned or partially understood. As science teacher with access to a computer world find a wide assortment of programs that could be used by students to learn dimple facts or statements of concepts. Everything from a flashcard approach which merely shows an example or a definition for the student to respond to, and then respond to the student input to more complex software which analyses student responses in drill and practice sequence and then provide specific reinforcement or remedial work. This involves using computers for student's practice of skills, whose principles are taught by the teacher in traditional ways. In this form a list of simple problems is stored in the computer and the student communicates with the

computer through a terminal. The computer presents a problem and if the student gives the correct answer, it gives the next problem in the list. If the student gives a wrong answer, the question is presented again. If the student again gives a wrong answer, depending on the program, he is given the right answer or some supplementary information and then presented the next problem. The computer can be used in this way for drill and practice and mathematical problems, spelling and grammar in language etc., Moreover, the computer keeps track of the student's performance and can give a summary of his/her performance to the teacher when ever asked for.

c) Inquiry Mode: In Inquiry mode of computer assisted learning, the student asks questions of system using a typewriter. The CAL system provides the student with the answers it has stored in its files to the extent that the algorithms content provide access to that information. In other words, it is a mode of information retrieval from some form of organized bank of information or database. However, if the database is organized to supply all the information necessary to achieve certain groups of educational objectives and if the learner is given a set of specific objectives to be achieved, then we have a form of instructional system indeed, a very flexible set-instructional system .Inquiry designs stimulate learning by enabling the learner to solicit information or explanations related to unique needs. Hybrid designs have been developed to utilize the advantage or to lessen the disadvantages of the various design options. Many consider problem-solving and inquiry-designs as hybrid designs because they incorporate the functions of two or more basic designs rater than developing a separate CAL design.

 d) Simulation and Gaming Mode: According to Piaget, children have a natural gift for learning on their own; they learn to talk, get around and think without formal training. In Papert's vision the computer can provide an environment that makes learning mathematics, science and the arts as effortless as learning French in France. Many simulations used in education today are based on the same ideathat children learn best through exploration and invention. These simulations, allow students to explore artificial environments, imaginary or based reality. Educational simulations are metaphors designed to focus student attention on the most important concepts while most educational simulations have the look and feel of a game, they challenge students to learn through exploration, experimentation and interaction with other students. With a simulation, the students are in control of the learning environment, it is up to them to find and use information to draw conclusions. Students can experience the consequences of their actions without taking real world risks. Simulations allow students to have experience that wouldn't be possible otherwise. Instead of simply spewing facts, simulations provide a context for knowledge. Students love playing well-designed simulation, but many schools don't use simulations because there's no room for them in the formal curriculum. It is difficult to prove the effectiveness of simulations games because they generally are not designed to teach simple, measurable facts. In spite of our culture's age old tradition of learning through games, many educators question the educational value of games in the classroom. Of course, educational

simulations, like all simulations, come up short as substitutes for reality. But when field trips are not possible, computer simulations can offer affordable alternatives. To implement this mode of CAL the teacher must define the model sufficiently to permit it to be programmed. A computer program has to be written to process the student's input and then he/she gets a meaningful output. The output is determined by what the student does in the model. In this model, the student uses his/her initiative in reacting to the system. The teacher prepares the students for using the system. The student interacts in his/her natural language. Simulation can stress the importance of pupils developing communication skills effectively in collaborative situations (Ediger, 1998).

e) Tutorial Instruction Mode: Tutorial CAL is sometimes offered as a substitute for tutors and resembles a dialogue between a teacher and student. The tutorial program extends the drill and practice type by first providing information or a demonstration to learners and requiring them to perform some input. It also provides feedback on the input. Effective tutorials provide appropriate feedback and remediation and strategies for making instruction more meaningful to the learner. Another aspect of tutorial applications is Computer Managed Instruction (CMI) in which the computer assesses student mastery by directing the learner to appropriate materials in other media such as print, audio or video. Some of the major problems with tutorial CAL are that they are difficult to develop, there are few good tutorial programs available, and it is very costly.

f) Dialogue Mode: A CAL technique aimed at permitting the student to conduct a genuine dialogue with the computer. The dialogue systems at the present time exist primarily at the conceptual rather than the operational level. We would like the learner to be able simply to ask the computer program question. To permit this interaction, we must be able to recognize the meaning of the questions he/she is asking. It will be some time before we will be able to do either one of these things with any efficiency and economy.

## Main Uses / Benefits of CML systems

### A ) For Teachers :

1 CML system treats every student as an individual and helps teachers to follow suit

2. allows students to be extended or remediated as required

3. makes computer software accessible and relevant

4. gives back huge amounts of time from testing and marking that is better spent on creative student learning

5. provides previously unknown data on which to constantly refine and improve the teaching method

### B) For School Principals and Management the CMLS

1. provides accurate measurement and analysis for informed decision making

2. provides accountability and control

3. traps, retains and shares valuable resources developed by teachers over time

4. facilitates quality control of the teaching process

5. allows for new goal setting in measurable education outcomes.

### Uses For Governments   CMLS

1. Leverages the productivity of teachers .

2.  collects data on computer usage

3.   fully utilises technology resources
4.   Allows policy to be formed and funds allocated based on previously unobtainable data


### Some Cautions

Educators must be aware that the ease with which electronic data bases manage information poses the possible dangers of:

1. The volume of information can present problems for teachers, providing too much

material to use in reasonable ways.
2. What kinds of controls exist to assure
3. the accuracy of the information?
4. • Increased impersonalization.
5. Not enough well trained educators computer literate to assure proper use or systems.
6. The system controlling the user
7.  Too much emphasis on data not enough emphasis on  instruction.
8. System "over-kill" - system far too elaborate for the need.
9. Possibility that the maintenance or the system may take more time than the instructor realizes.


### CML and CAI are Different :

1.    CML does not refer to direct instruction, it is on the other hand the management of instruction.
2.    The computer functions as a teacher in CAI format while it functions as a manger in CML format

3.    **CML is an instructional management application that utilizes the computer to direct the entire instructional process while CAL is Instructional delivery system through the means of Computers.**

4.    **CML refers to directing the application of CAL while CAL is the actual operation of CAL**

5.    **CML has developed a step behind the developments in CAL . It is one of the most rapidly growing areas in computer-based education.**

6.    **CML concerns with storage of data (personal, vocational, and academic) of individual while CAL concerns with creation of this data .**

7.    **CML  has the objectives of record-keeping, instructional decision making, report writing, and satisfying academic , political and government requirements. CAL in contrary concerened with the objectives of making learning process individualised , effective and easy.**