



## Rising Trends of Computer Assisted Learning

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**Abstract**— CAL creates many opportunities to illustrate information regarding various topics in an interactive way. Multimedia for CAL, which combines audio and visual data in an interactive form, has proved to be an effective tool in education. CAL has the potential to help students develop skills and knowledge. Students, staff and professionals consider CAL stimulating and motivating. In CAL, learners can decide what they want to learn and in what order. CAL brings many benefits. These include self-paced learning, self-directed learning, and the ability to represent content in a variety of media. In our proposed method, System will show different style of presentations to students. Program will also check the grasp of the student by taking some tests. Computer will show next topics to qualified students only. In between students can also communicate with other students to gain more knowledge. They can communicate through chat, e-mail, audio and video conferencing. There will be competitive exams for qualified students so that students will become more interested in topics. There will also be a procedure through which only qualified students and experts can upload their own best topics. If still student can't grasp the topic, then they can also communicate with expert of the same topic.

**Key terms:** CAL, CAI, CD-ROM

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### I. INTRODUCTION

Computer assisted learning is a technique where a computer is used to present the instructional material and monitor the learning that takes place. It is also called computer- assisted instruction, computer based education, computer-assisted learning, instructional applications of computers and computer based instruction. Computer assisted learning is defined as learning through computers with subject wise learning packages/materials.

Users can interact during the learning process on multiple levels. User can interact with the content and the learning material (for example with topics on a CD-ROM). On another hand, student/user can interact with the tutor or other members of learning communities.

It provides an effective way of learning. CAL is a technique in which a computer contains a program which guides the student by giving instructions, checks the grasp of the student and test the student until the specific level of proficiency is reached.

The program in the computer guides the student through an interactive document that integrates text, 2D, 3D-images, video, sound, animation and individual interactions. The student can follow a given path or can design his individual path within the learning material, according to his own learning objectives. After that, the program finds the grasp of student depending on what facts have been accessed by the student.

Studies have shown that students who are using CAL have better results than groups using traditional learning. Studies have also shown that students using CAL needed shorter time to reach the learning objectives, achieving better final results than students who did not use computer assisted learning. They prefer to start with the simplest concept or they break the problem into easily achievable parts, each of which would be rewarded when performed correctly. At the end of each part, there is a simple test of the previous topic, and then user has to qualify the test before going to next topic. If the user gives the correct answers, then computer gives feedback in the form of messages like: "Keep it up!", "Very Good!", "Well done!" and "Superb!" etc. This is intended to encourage the student for more learning.

### II. MODELS OF CAL

#### 1. Drill and Practice

It is a program which helps the student to remember the concepts that the teacher has already taught, by repetitive reviews. Experience with multiplication tables is a simple example of drill and practice. It improves the knowledge level of the students.

#### 2. Tutorials

It is the presentation of the new topic which is unfamiliar to the student. It includes a user interface between the student and the computer in the form of information presentation, objective type questions, true/false, fill in the blanks, etc. The decision, to move on to the next topic or to revise the previous topic again, is made on the basis of the answers given by the students in the tutorial.

#### 3. Instructional Games

It presents the topic in entertaining and competitive manner to maintain a good level of students's interest in learning. Some students get bored of textual data and reviews. Reading the same text again and again would lack the students's interest in learning. But, learning through games would be very helpful for those kind of students.

#### **4. Simulations**

It presents the topic as a “virtual reality” environment. Simulations are basically used for the practical topics which simulates the real world situations. The simulators mimic the real activity very well with a little difference between the simulated activity and the real one. The simulators work on the basis of input given by the users. The simulated environment must be changed according to the action of the student. For eg. In a laboratory when a student tries to perform any experiment, then the simulated environment must be changed on the basis of the chemicals mixed by the student so that accurate results can be produced. Simulators are also good from the safety point of view for the students as compared to actual lab experiments. Simulations can also be paused unlike real situation. Pausing gives students more time to understand the activity. Simulations involve students as participants because decisions are being made according to the input fed by the student.

#### **5. Problem solving**

It means to convert current state into a desired future state. Problem solving includes mathematical operations and individual's highly critical thinking skills. It involves three functions: Seeking information, generating new knowledge and making decisions. Students can take actions to solve problems, resolve conflicts, discuss other alternatives, and focus on problem more sincerely. Students can use their newly gained knowledge in meaningful and real-life activities. It allows the students to think beyond their limits. They try their different ideas to generate the new knowledge and solve the problem.

#### **6. Discovery learning**

Discovery learning allows the learner to generate ideas about a topic and then allows to explain their thinking. Discovery learning takes where the learner draws on his own experience and prior knowledge. It is a method of instruction through which students interact with their environment by performing experiments. The student can determine specific information presented during each session.

### **III. TYPES OF LEARNERS**

#### **1. Linear learners**

They often will understand in part before understanding the whole. They prefer to start with the simplest concept or part of a problem, and work through to the more difficult parts until the whole solution is found. Many teachers and instructors follow a linear progression.

#### **2. Holistic learners**

Holistic learners are the students who are deep and thoughtful. These types of students like to take their time learning, make constant mental comparisons when they got new material. They like to compare new concepts to concepts they already know, even as they read, using mental pictures, similes or analogies.

### **IV. LEARNING CHARACTERISTICS**

#### **1. The environment**

Learners are exposed to a challenging context for learning that mimics real world situations, displays ambiguity and conflicting information and offers large degrees of freedom.

#### **2. The learning activities**

Learning activities involve complex decision making, problem solving strategies, intelligent reasoning and other higher order skills. They are based on professional or academic role adoption and modeled after expert behavior. Learners can deal with complex problems according to professional or scientific standards.

#### **3. Multi-user**

Complex real world problems are likely to involve several participants. The games should thus allow multi-user scenarios. Single user solutions are possible, when some of the actor roles are covered by the computer.

#### **4. Methodology**

Expert behaviour is framed by one or more methodologies or strategies, which can be used to counter trial and error behaviours, to control complexity and to act as a reference for generating relevant feedback during the game.

### **V. EXISTING INSTRUCTIONAL SYSTEM**

- I. An instructional system comprises a computer that stores programs, which present topics to students and find the student's grasp of the topic.
- II. An instructional system comprises communicators for allowing the student to select the topic, run selected program and check the students whether they are linear or holistic.
- III. An instructional system comprises repository means for storing downloadable lessons in multiple computers.
- IV. An instructional system comprises other communicators for establishing a communication link with the repository means in a specific computer, for ordering a lesson to be executed from a respective computer as per the selection of a topic by a student. Communicators also accept input from a student and gives output based on the input given by the student.
- V. An instructional system stores a profile of each student, which contains information about the learning style i.e. linear and holistic learning; and the style of presentation in which students want to take output.
- VI. An instructional system comprises administrator means, which according to plan, presents first topic to a student based on student's profile, finds if the student grasps the first topic :
  - If yes, presents a new topic

- If not, presents the first topic according to a second plan i.e through drill and practice, games and simulations etc.
- After executing all the plans i.e. limit of presentation of same topic, if still student can't grasp topic, then video calling will be started between the student and expert of that subject.

**Flow Chart of Existing Instructional System of CAL**

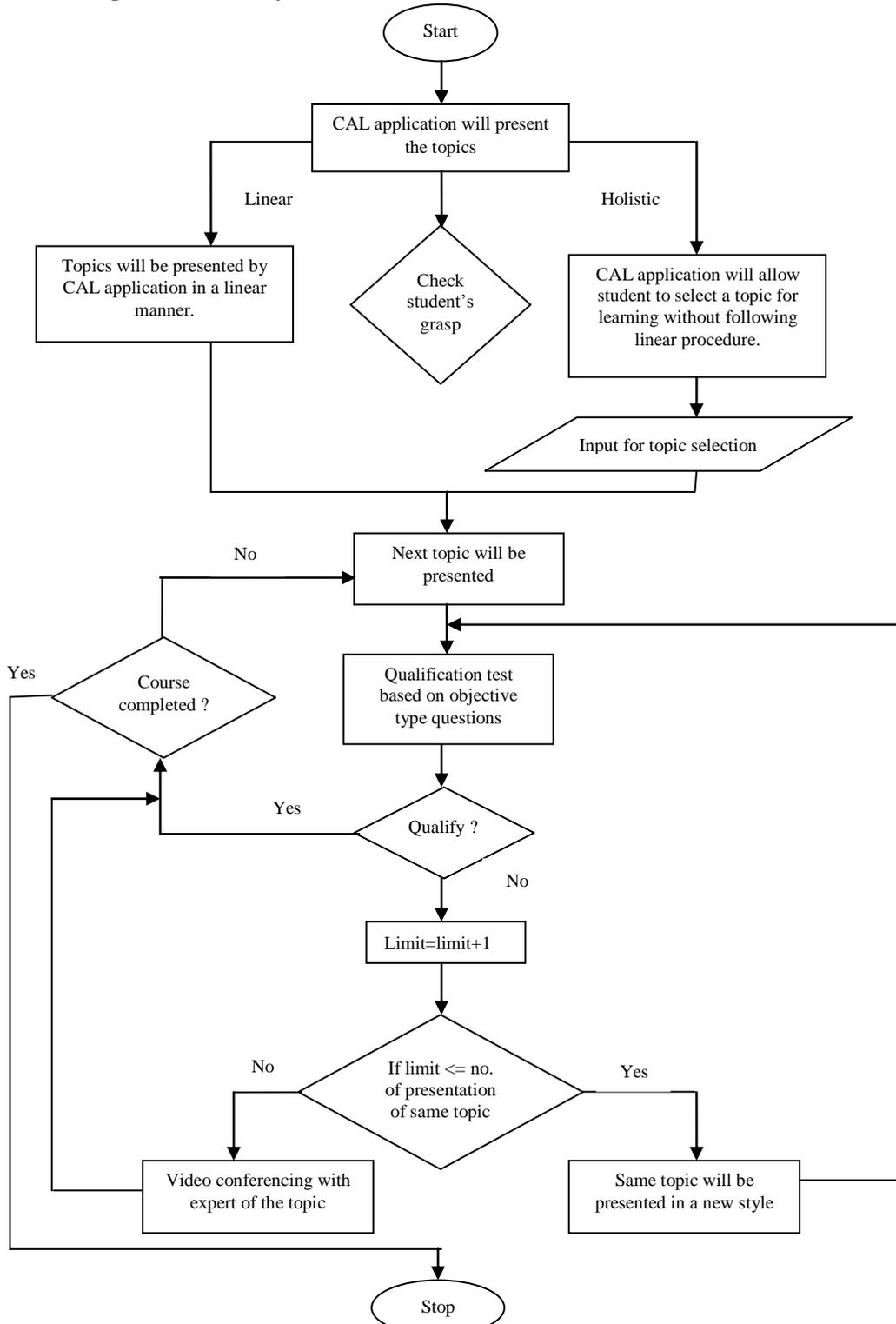


Figure: Previous proposed method

**VI. NEW PROPOSED METHOD**

In previous computer assisted learning, content may become outdated. A very high cost is involved in the development of these packages. If the content is outdated, the resources involved in its development will be a waste. So there should be a tool in the application to upload new topics, presentations and methods of teaching in the computer assisted learning system.

There should be a procedure so that students can also communicate with other students to share ideas and concepts. There should be some means of computer assisted competitive exams between the students to test and rank their skills and abilities. It'll encourage students to learn more and more. There should be some type of software through which students can communicate in a more convenient way like: chatting, mailing, audio and video conferencing etc.

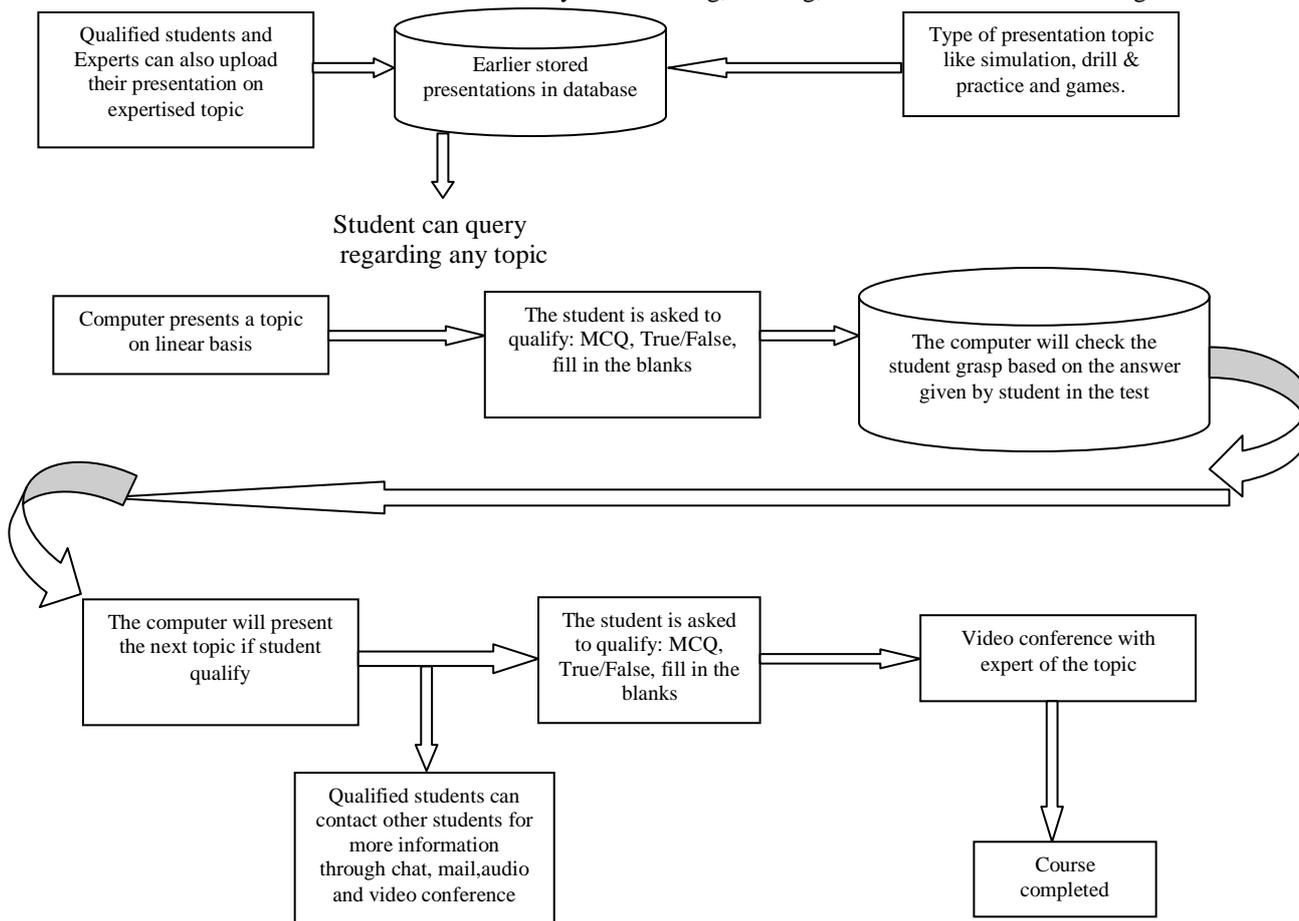


Figure: New proposed method

### VII. ADVANTAGES OF CAL

In CAL, each student is free to work at his own place, totally unaffected by the performance of other students. Student can study of a subject where there is hierarchy of topics, facts and rules. Students can identify the subject areas in which they have improved and in which they need improvement. Student participates very actively. CAL provides information in the form of multimedia as audio as well as visual inputs. It enables the student to understand concepts clearly with the use of techniques such as animation, blinking, graphical displays etc. CAL provides a lot of drilling which can be useful for low aptitude students, so weak students are preferred here. CAL can enhance reasoning and decision-making abilities. The student can choose his own way and speed. The program can be stopped at any time and can be repeated as often as the user wishes. The computer is not judgmental. The student can learn from the mistakes without embarrassment. The computer is very patient and has time. CAL instructs many students at the same time. This method reduces the workload of teachers. It is multiple dimensional learning. It is very interactive method of learning. It gives immediate feedback.

### VIII. DISADVANTAGES OF CAL

Equipments and software are costly. There will be high storage cost. The staff needs to be trained. They may be unwilling to spend extra time for preparation, selection and use of CAL packages. It may also be a threat to their job. Simulation permits execution of chemical and biological experiments but hands-on experience is missing. CAL packages also cannot develop manual skills such as handling an apparatus, working with a machine etc. So there is a lack of personal touch. The students have to be familiarized with the medium. There can be repeated instructions. Development takes time also. There are administrative problems associated with computer installation. The problems are related to the physical location of resources, the cost of hardware maintenance and insurance etc.

### IX. CONCLUSION

In proposed computer assisted learning method, System will present the topics through different styles of presentation. Even if students does not understand the topic, then he/she can communicate directly with expert of that topic through video conferencing. While understanding the topics, students can communicate with other students also through chat, e-mail, audio and video conferencing. We have discussed the various advantages of computer assisted

learning method already. We are not suggesting that CAL should replace human teaching but, rather, it should act as a complement especially since it is not feasible to provide the best level of human teaching support. The extra support of a computer-based tutor should particularly help those students who suffer from lack of confidence more than through lack of knowledge.

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