INTRODUCTION

“The art of teaching consists making the pupil wish to learn”

Rousseau

It is our experience that increase of population and explosion of knowledge are not only affecting the pattern of human life but also inflicting their full impact on education. The population is increasing in geometrical proportion and now frontiers of knowledge are being opened up almost daily. The explosion of population and knowledge has raised the serious question, of both quality and quantity of education.

Educationists are of the opinion that the educational problem relating to quantity and quality could be tackled by the development of an educational technology. Therefore, there has been a rapid development all over the world in recent years in the development of communication technology in education at all levels with purpose of extending educational facilities and upgrading instruction.

Thomas Edison was one of the most colourful and vocal proponent educational technology. He quotes –

“Teach the children everything from mathematics to morality …… Sort o’ swing the education to them so attractively that they’ll want to go to school. You’ll ha to lick’em to keep them away”.

Our instructional process has more often concentrated on subject contents rather than on the learners himself. There is nothing more basic in education than the child himself his mind which observes and reasons, the mind which creates new ideas and new patterns out of observations. His curiosity leads him to discover, create, to produce, to develop relationships between what he learns, what he observes and what he creates. If the entire instructional process at the school lev
is guided by this understanding, it will open up for our teachers the most productive and creative potentials of teaching a career. Every child has a way of exercising and developing his own peculiar talents. But unfortunately, all this is not duly recognized by classroom teachers. The aim of classroom teachers, in our present context, should be to encourage thinkers and not more learners.

The same viewpoint has been emphasised by D. Wolf (1954).

“...The brains of its citizens constitute a nation’s greatest asset. From the minds of man will come the future scientific discoveries, future works of art and literature, future advances in statesmanship, technology and social organisation, in short all future program. Since there can be no argument over this proposition, the practical problems becomes one of devising the best means of nurturing the talent which exists in the population.”

Science explores, art expresses and technology facilitates life by applying science artistically. Technology in instruction is the most primitive concept as well as the most modern writing on the video display unit (VDU) with tablet and stylus and picking from VDU by a light pen are extensions of our finger and eyes. Learning resources as progressively in various forms, such as, cassettes—audio and video film strips, sound films and video, floppies, hard disks, cartridges and compact disk read only memory (CD-ROM), interactive video disk etc. Subject matter software are designed and developed through advanced technologies.

A computer is a machine especially designed for the manipulation of coded information an automatic electronic machine for performing simple and complex operations. Almost all the audio-visual resources are, by themselves, passive in nature and provide one-way communication. But a computer can make the learning process interactive, the way a teacher does. Some teachers believe that computer can be better used to organize the subject matter to present or project the same to the students. They call it computer assisted teaching (CAT). They design and create suitable projection, materials such as key points, cues, visuals
and other forms of graphical using different colour combination and employing different techniques of presentation.

1.1 ORIGIN OF STUDY-

While it has long been recognized that we learn through the traditional five senses with the resultant imagery visual, auditory, tactile etc, the school has restricted its largely to the auditory. Through various researches it has been proved that, abstract word symbols rather than concrete aids to learning have been most extensively used by the teacher. Psychologists have long recognized that some people are able to think abstractly, while others are more dependent upon concrete materials as aids to thought. It has been generally recognized that the more brilliant the individual, the greater his power of abstract thought, and conversely, the lower the mentality, the greater the dependence upon visual imagery as a vehicle of thought.

It was impossible to transfer to the mind of another identical imagery through word symbols that caused Rousseau to voice this dictum: “In general, never substitute a sign for the thing itself.”

Kinder has suggested the sources of learning might be listed in the following descending order of their effectiveness:

1) Things one experiences directly.
2) Seeing something through media of pictures, films or models.
3) Hearing about it from someone who has experienced it at first hand.
4) Reading about it- least effective.

In the procedural part when the non human media are included, scope of the instructional devices or methods is immensely enhanced. In India, methods suited to large classes are also to be arrived at by research. Gradually by the impact of educational technology on traditional method of teaching are going to be changed. More dynamic method of teaching is going to be evolved day
by day. Using computer may increase the effectively of a method many times more

Teacher is the king pin in the education process. Traditionally education was always sought to be obtained through an eminent teacher in a gurukul. This has been accepted in modern times to that no machines replace a teacher. Thus, the view now formed by educationists that use of educational technology is making teaching effective but to make use of educational technology effectively depend on teacher. Thus, using educational technology and also managing proper teaching methods, strategies & techniques can make teaching most effective.

1.2 NEED OF THE STUDY-

EDUCATIONAL DELIVERY MODELS

Traditional Model: Figure 1 depicts the model traditionally used by educators for educational delivery of concrete course material.

Figure 1: Traditional educational delivery model.

One of the crucial and oldest problems in teaching and learning situation is the problem of individual differences. There are various type of teaching methods that have been devised and individual differences may be attributed to several factors or variables. Using the best predictive measures we now have grouping techniques presently available, we still end up with considerable mislocation of
students in and out of our schools. Application of instructional technology in teaching learning situations is ideally considered to free the teacher. So the teacher may make the learning environment more motivating. It would require some mechanistic actions for the teacher. Educators should know about the use, desirable of those methods which will maximum the benefits of the students.

Teaching with educational technology research has shown that the more senses used, what is presented. In other words, it is better to use both eyes and ears that ears alone, many studies have been conducted and all agree that substantial retention of facts after three days is obtained by supplementing the verbal presentation of facts with the visual reinforcement of pictures.

Many types of audio-visual aids are available to the teacher. The effectiveness of aids depends on the techniques used and material provided. It has already been proved by various researches that use of technological machines such as computer in education can make it effective and easy; but on the other hand it has also been proved that no machine can replace a teacher. Hence here arises a question that when only machines can not be sufficient and a teacher should also be part of teaching, then what methods of teaching should be used mostly by a teacher when he is already using an audio-visual aid like computer.

Therefore, the investigator is interested to evaluate the effectiveness of different teaching methods in relation to learner’s achievement, used after computer assisted instruction (CAI) strategy which is used to involve technological machine in education, there investigator hope to formulate some empirical basis for the effectiveness of these methods by which both teachers & students will be benefited.

*An attempt has been made at the research design to seek the answer the following question.
“Is there a significant effect of teaching through computer assisted instruction strategy followed by various teaching methods such as discussion method, demonstration method and activity method on learner’s achievement?”

In view of the question the study has been designed to investigate the effect of these different teaching methods after teaching lesson through CD-ROM.

1.3 RATIONALE OF THE STUDY –

Very often, it is misconstrued that educational technology with all its gadgets can be a panacea to all our educational melodies. What matters really is how systematically now media like the radio, television, cassette, recorder, computer etc are yoked to the teaching learning process. Henry Diezaeide has observed that, “Instead of continuing to let the machines do only what teachers cannot do, we should ask ourselves what is the teacher should do that the machines can not do Skinner puts it, “Almost all our major problems involve human behaviour and they can not be solved by biological technology of behaviour.”

A great variety of research of McConnell, Hutchinson, Got kin and Massa Grover indicates that when we change teaching methods, new class or classes of star learners emerge. We can derive support for this and the idea of differentiating teaching methods for different kinds of learners not only from the studies of Hutchinson, Got kin and Massa Grover & others, but from observations concerning changes in individuals that have resulted in field tests of materials such as the recordings and the ideas books. It is a common observation that some of the isolates and maladjusted children, who do not ordinarily respond, suddenly become aliv...
and excited about learning when new methods are introduced. Bloom (1953) writes, “The discussion method is conductive to eliciting higher level of reflective thinking or creative problem solving than is the lecture method”. Thompson reported (1957), when measured by objective test administered up to six months after course completion; information learned through discussion is retained better than that learned through traditional teaching. Thus discussion method not only facilitates higher order cognitive skills, but the learning is likely to be retained for longer period. Robert Travers (1971) had pointed out that, “Information is not satisfactorily stored when a passive learner is passively exposed to inputs, though some learning may occur”. In 1972, ILO mentions, “essence of systematic method is that man should learn from each other and should contribute their own experiences the fullest. Vernon S. Gerlach (1994), recommended use of instructional media for designed use of systematic and effective instruction which shall assist learner to acquire learning outcomes or objectives efficiently and effectively.

1.4 STATEMENT OF THE PROBLEM –

Thus on the basis of above discussed origin and need of the study, the problem undertaken may be stated as under:

“A STUDY OF EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTION STRATEGY FOLLOWED BY VARIOUS TEACHING METHODS IN TERMS OF ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS.”
1.5 DEFINITION OF TERMS –

Terms are the key words used in the study. In the present study, the terms such as teaching methods, effectiveness, achievement, Computer Assisted Instruction (CAI) strategy, Discussion method, demonstration method, and Activity method were used. Thus they are defined below.

The “Effectiveness” means the advancement towards perfection rewarding to ideal teaching. It is the indicator to evaluate the standardized achievement criteria test of Secondary school students for teaching of “science” by three methods following computer assisted instruction strategy i.e. discussion method, demonstration method, and activity method and comparing them to judge the indication in the form of effectiveness.

A “Method” is a body of pedagogical principals and procedures. “Teaching Methods” are patterns of teacher behaviour that are recurrent, applicable to various subject matters, characteristic of more than one teacher, and relevant to learning. Teaching methods so defined refer to a human teacher and may be considered a subcategory of educational methods, which also include instructional devices (educational methods that employ non-human media), such as teaching machines, conventional and programmed textbooks, simulators, films, and the like.

The main focus on teaching is to bring about the behaviour of the learner. It is brought about by the teacher using teaching methods to achieve the objectives. B. O. Smith considers teaching as
system of action involving as agent, a situation, an end—in—view, and two sets of factors in the situation—one set over which the agent has no control and one set which the agent can modify with respect to the end—in—view is achieved. The elements of teaching (B. O. Smith)
Computer Assisted Instruction (CAI) Strategy:

According to Burke (1982) CAI is “The Systematic control of instruction by computer. It is characterized by testing, diagnostic, learning, prescription and through record keeping.”

According to Leib (1982) – “CAI includes all applications of the computer aid to the instruction in instructional management without actually doing the teaching.”

The operational definition for CAI in this study is as according to Leib (1982). In this strategy as soon as the students start the computer, it greets the student and asks him what he would like to study. Getting the answer from the student it immediately connects him with his needed program, a complete package of information, instruction and the logic stored in the CD-ROM. The student works as long as he wishes, seeing, hearing and interacting with the program he is engaged in the CD-ROM may include suitable projection materials such as key points, cues, visuals and other forces of graphics using different colour combinations and employing different techniques of presentation.

Demonstration Method:
Demonstrations help us to focus on steps and procedures involved in executing various manual operations (e.g., bending glass tubes, constructing a pin-hole), in various performing arts (e.g., painting, singing or dancing), in science or engineering and for numerous other purposes.

In this method teacher demonstrates various operations of content material to make the content clear to students. In this method teacher plans and decides everything. He shows The students various activities by performing himself and involves one or two students in that activity to observe and tell the whole class what they are seeing. In this method teacher remains active while the student remains the observers. It involves the style of teaching which can causes “learning by showing”.

**Discussion Method:**

In the discussion method, the teacher motivates the pupils to think over some problems by the way of questioning. After gaining motivation, the pupils answer certain questions of the teacher respond in some or the other way. The teacher develops the lesson by discussions, answers and some responses of the pupils. As the need arises, the teacher helps the pupils in solving the problem. Thus the discussion method is an active oral method which opportunities of interaction arise between the pupils and the teacher. As a result of this interaction, a change occurs in the attitude, feelings and motivation of the pupils. Hence psychologically and sociologically, discussion is an appreciat
method for social learning and development of the pupils.

Discussion is of two types:

1. **Formal:** Formal discussion is adopted to gain pre-determined objectives. Hence, its principle is also predetermined. It is essential to follow these principles in any direction.

2. **Informal:** Informal discussion is not predetermined. There is no need to follow any principle to participate in informal discussion. The classroom discussion is an informal discussion. This discussion is used in present study. It is a teacher centered method. It involves the style of leading which can cause “learning by telling”.

**Activity Method:**

It is a method where students are given opportunity for real experience. It involves the style of teaching which can cause “learning by doing”. It is more a child centered method. In this method, teacher works only as a supervisor. It helps students to develop skills in stating and defining the problems, controlling conditions, making measurements, treating and interpreting data and drawing conclusions. Students work in a group with co-operation & coordination.

The term “**Achievement**” is academic subjects generally refers gain in instructional objectives. It is measured by the terms the marks obtained by students in any achievement test.

**1.6 OBJECTIVES:**
1. To study the effect of discussion method following CAI on achievement of class VII students.
2. To study the effect of demonstration method following CAI on achievement of class VII students.
3. To study the effect of activity method following CAI on achievement of class VII students.
4. To compare the effect of CAI followed by demonstration method and CAI followed by discussion method on achievement of class VII students.
5. To compare the effect of CAI followed by discussion method & CAI followed by activity method on achievement of class VII students.
6. To compare the effect of CAI followed by demonstration method & CAI followed by activity method of achievement of class VII students.
7. To equate the three groups in terms of achievements on the basis of pre-test.
8. To compare the effect of above three methods on gender difference.

1.7 HYPOTHESES-

Objective wise hypothesis were framed null form as follows –

1. There is no significance difference between the achievement of students before and after the treatment of CAI followed by discussion method.
2. There is no significance difference between the achievement of students before and after the treatment of CAI followed by demonstration method.

3. There is no significance difference between the achievement of students before and after the treatment of CAI followed by activity method.

4. There is no significance difference between the achievements of students among groups after the treatment of CAI followed by Discussion Method, CAI followed by Demonstration Method & CAI followed by Activity Method.

5. There is no significance difference between gain scores of group given treatment of CAI followed by Discussion Method & group given treatment of CAI followed by Demonstration Method.

6. There is no significance difference between gain scores of group given treatment of CAI followed by Demonstration Method & group given treatment of CAI followed by Activity Method.

7. There is no significance difference between gain scores of group given treatment of CAI followed by Discussion Method & group given treatment of CAI followed by Activity Method.

8. There is no significance difference between boys and girls achievement after the treatment of CAI followed by discussion method.

9. There is no significance difference between boys and girls achievement after the treatment of CAI followed by demonstration method.
10. There is no significance difference between boys and girls' achievement after the treatment of CAI followed by activity method.

1.8 DELIMITATIONS OF STUDY-

Every student is not complete in itself and it is bound to have some limitations which depend on the resources of the investigator and they are termed as delimitations. The delimitations of the present study are as follows:

a) The present study was delimited to public schools of MuzaffarNagar city only.

b) The study was confined to class VII of three schools namely A. V. Public School, Shardein school, S.D. Public school of MuzaffarNagar.

c) The study includes only the achievement of students before and after the treatment.

d) The study was confined to Science subject only.

e) The study was delimited to the best abilities and efficiency of the investigator.