CHAPTER 1
INTRODUCTION
CHAPTER - 1
INTRODUCTION

1 INTRODUCTION

In today’s competitive as well as technological world, after food, clothing and shelter, education has become the fourth necessity for man. It is education only that has been proved to be a powerful tool to combat the cut-throat competition that man is facing at every phase in life. The significance of education in India is indeed getting higher with the passage of time (Smith, 1993). India has always been a great source of learning. Tremendous amount of work has been done in the field of education, but still there is quantitative improvement in education and a lot of work is there to be done in the field of qualitative education. In spite of great advances in knowledge and investment of tremendous amount of time, effort and money, our schools still have not moved towards the goal of increased learning or knowledge for all students (Dewey, 1916). Still schools are pressurized to prove that all of their students can learn and achieve at higher levels. So it is one of the most important challenge before educationists to make the learning qualitative, interesting and exciting, so that all students can perform well. Education involves the transformation of knowledge or learning between two sources i.e. from teacher to the learner (Dorasami, 1996). According to Atherton (2011) the factors that ultimately shape the psyche of the students are the quality of education, the underlying philosophy of the school, the usefulness of child- friendly methods, strategies and aids being used and the overall attitudes towards the students. What remains even after the child forgets what he had crammed for his exams, can be called as education.

After a lot of researches in education it has been observed that the present system of classroom instruction have become too aversive, boring, negative and improperly sequenced. To make the students work at their own pace and for their active participation in the learning process flexibility in instructional strategy is must (Smith, 1993). For effective teaching, teacher should select proper methods, strategies, techniques and teaching aids wherever the selection of these strategies, methods and techniques depends upon the nature of task, learning objectives, learner’s abilities and student’s entry behaviour (Joyce & Weil, 1986). Beside that teacher should keep in mind three salient features of effective teaching i.e. instructional objectives, teaching strategies and evaluation.
Experts in the field of education, all over the world are seriously thinking of the variety of approaches to teaching learning to achieve different instructional objectives. Teaching is an activity that is designed and performed for multiple objectives in terms to bring desirable change in the behaviour of the learner (Joyce & Weil, 1986). It is the instructional strategies that decide the learner achievements of pre-specified outcomes (Arredondo & Block, 1990). Many researches hits out at the conventional methods of teaching and observe that in these methods the children are totally dependent on their teachers which breed hostility and to reduce hostility, the opportunities should be provided for self education. In other words, the effective and result oriented teaching takes place when students are given opportunities to participate in their own learning. It is teacher only who can evolve teaching plans in the behaviour of the learner and can bring out desire able changes. Elaborate and systematic plan of action in teaching is must. So the major objective of teaching is to cause learning and the very heart of learning resolves around the strategy of teaching which is to be used (Smith, 1993).

1.1 **TEACHING**

Teaching is a process by which teacher can facilitate student learning through a proper management and can create interrelationship among the students interest, the content for learning, the methods and materials he or she intend to use in the teaching and learning of the content materials. It can be like giving instructions to students on knowledge, skills and attitudes, with the intention that the students will be able to know the information or to do something or act in a particular way that is compatible with the instruction (Dorasami, 1996). To execute knowledge impartation good technique is always needed and one can say that learning has taken place only when knowledge is imparted through good technique and one makes sure that the learner has gained something useful which can make his/her experience relatively permanent. Right from the past time, our teachers used to use the conventional method for imparting knowledge but it did not help them to bring out positive results. That is because the relevance of this conventional method and its criticism are what have given educators sleepless nights and make them to think of other better techniques or strategies of imparting knowledge (Ferreira, 2005).

1.1.1 **TEACHING STRATEGY**

Teaching strategy is an art of contemplating or a way of presenting the subject which keeps in mind the psychological and physical requirements of children. The teaching strategy can be called a generalized plan which includes composition, desired learner behaviour in terms of goals of instruction and it gives an outline of planned tactics necessary to implement
the strategy (Salvin, 1994). Main aim of teaching strategy is to make attempts to achieve maximum in terms of desired change in learner’s behaviour and can be classified into two main categories such as autocratic strategy and permissive style of teaching strategy. Autocratic strategy is such type of strategy in which teacher remains more active and student behaves like a passive learner and another one is Permissive style of teaching strategy in which both student and teacher remain active in teaching process and their interaction reaches at maximum. This strategy helps to encourages creativity of the learners (Atherton, 2011).

Mastery learning strategy with multimedia teaching in combination can be a good attempt to impart knowledge to the students. The technology helps to transform education from faculty centered to learner centered and to make instructions better by replacing the “Sage on the stage” with interactive individualized learning possibilities (Kelly & Schorger, 2002). Today’s school age generation know much more about technology from the very starting of their childhood. The interaction between student ability and teaching strategy has great importance. The teaching strategies are not equally effective for each learner. Atherton (2011) the following are the major findings in this regard:

(i) The bright students learn better through permissive style of teaching strategies.
(ii) The superior students prefer permissive style of teaching strategies.
(iii) The students having low intelligence are most benefitted by autocratic style of teaching strategies.
(iv) The learner of low level of intelligence like more autocratic style of teaching strategy.

In selecting teaching strategies, the main emphasis remains on some learning objectives rather than student’s interests. The learning objectives and learning conditions can be considered as main criteria for choosing appropriate teaching strategies.

1.1.2 TEACHING OBJECTIVE AND TEACHING STRATEGIES

The review of related literature on different teaching strategies reveals that different strategies can be effectively used for realizing different objectives. According to Joyce and Weil (1986) the following useful generalizations have been drawn:-

(i) Cognitive Objectives: Cognitive objectives can be achieved by using teaching strategies. Lectures and lesson demonstration can prove helpful in achieving low order cognitive objectives. The teaching strategies like programmed instruction and computer assisted instruction can prove helpful in achieving higher order cognitive objectives.
Introduction

(ii) **Affective Objectives**: Affective objectives can be achieved by using all teaching strategies. Low-order objectives can be achieved with the help of all teaching strategies while higher order affective objectives can be best achieved by group discussion, tutorials, role-playing, brainstorming, independent study, leaderless group and sensitive training.

(iii) **Psychomotor Objectives**: Lesson demonstration, practical tutorials and independent study can prove helpful in achieving low and high order of psychomotor objectives. Even an appropriate teaching strategy helps to bring out the teacher’s effectiveness.

In present study online mastery learning strategy has been used. Online mastery learning is an electronically supported medium that provides all children with the appropriate and comfortable learning conditions so that they can learn properly. It is the information and communication system that serves as the assigned media to implement the process of learning. In online mastery learning programme the study material is delivered through different via medias like internet, audio/video tape, satellite TV and CD-ROM etc. It can be through self-help or instructor and it can be in the form of text, image, streaming video and audio or animation. These types of online learning programmes provides the basis to the students to learn on their own as well as able to match face to face courses in respect of academic quality and effectiveness (Adepoju, 2002).

1.2 **MASTERY LEARNING STRATEGY**

Mastery learning strategy is a new approach to student-learning which provides successful and rewarding learning experiences to almost all the students (Okey, 1977). In last sixties and early seventies a new concept of mastery learning came to light which gave deviation to teacher- propelled and teacher-centered instruction. According to Ritchie and Thorkildsen (1994) the main startling feature of the strategy is that it is self paced and self directed or selected procedure which focuses on the consolidation of a given learning task by the student before he proceeds to the next one. Master learning strategy is a technique of giving teaching and learning exercise to bring all or almost all students to a level of mastery in the learning of a particular subject of choice.

Adepoju (2002) considers mastery learning strategy as an innovation which is designed towards making learners perform successfully in given academic task. It includes various steps like frequent assessment of student’s progress, provision of corrective instruction and emphasis on cues, participation, feedback and reinforcements. The theoretical model of mastery learning strategy was prepared by Carroll (1963) and practical implication
was done by Block (1971). In mastery learning strategy students are given ‘study units’ i.e. the study material comprising of small learning sequences. During its implication the students consolidates on their on-going study unit at their own pace. The students are not allowed to move on to the next study unit unless they pass a criterion test. During this whole process the students are also provided individual guidance and corrective feedback to enable them to achieve mastery. Bloom (1971) has classified the mechanics of mastery learning strategy in fig. 1.1

![Fig 1.1: Mechanics of mastery learning strategy](image)

The basic philosophy of mastery learning is that all children can become achievers if they are taught at a level of their own proficiency and if they are encouraged to progress at the rate of their ability. Mastery learning declares that all children can learn and bring positive results if they are provided with the appropriate learning conditions in the classroom (Fehlen, 1976).

Mastery learning strategy is one of the models of teaching under the behavioural systems family of models (Joyce & Weil, 1986). Main aim of mastery learning approaches is to modify the instructional settings so that students having a number of entering abilities, skills, knowledge, attitude and values can perform successfully (Deshpande, 1966). Moreover, mastery learning approaches primarily depends on human being for their success rather than machines or other technical devices (Arlin & Webster, 1983). It divides the subject matter into units having predetermined objectives on which students, alone or in groups, work in an organized fashion. During all this process students must demonstrate
mastery on unit exams, in other words they should achieve 80%, before moving on to new material. Students who do not achieve 80% mastery they have to receive remediation through peer monitoring or small group discussions or additional homework. So, students with minimal prior knowledge of material have higher achievement through mastery learning than with traditional methods of instructions (Davis & Sorrell, 1995).

In contrasts to traditional approach; the mastery learning strategy begins with the assumption that most students can attain a high level of learning capabilities (Bloom, 1968).

• If instruction is approached systematically.
• If students are helped when they have learning difficulties.
• If students are given adequate time to achieve mastery.
• If there is some criterion of what constitutes mastery.

So, mastery learning strategy stresses on the idea that teaching should be organize learning through ordered steps. Mastery learning strategy engages the learner in multiple instructional methods, learning level and multiple cognitive thinking types (Okey, 1974). Two assumptions are considered to be the basic of mastery learning. First assumption is that all students can learn all important content to the level of excellence and the second one is that the primary function of school is to define learning objectives and to help all students to achieve them. In mastery learning programme some steps are important to follow such as use of differentiated and individualized instruction, progress monitoring, formative assessment, feedback, corrective procedures and instructional arrangement to minimize achievement gaps (Bloom, 1971; Zimmerman & Dibenedetto, 2008). This strategy endeavours to improve the process of mastering it rather than focusing on changing content.

According to Guskey (2001) mastery learning is a philosophy which asserts that it is only teacher who can help virtually all students to learn excellently, quickly and self confidently. With the help of such strategy the teacher can motivate students as well as can help slow students in becoming smart, fast and perform better. Such type of learning improves student as well as teacher’s chance for long term social and personal prosperity. The core theoretical idea of mastery learning strategy is the aptitude, length of time that a person takes to learn. It does not depend on how bright a person is. Everyone can learn if given right circumstances (Bloom, 1987). The philosophy asserts that under appropriate conditions, virtually all, rather than some students can learn most of what they are taught (Block, 1974).
According to Torshen (1977) mastery is a name given to a structure and design curricula so as to maximize the likelihood that each student will reach performance levels essential for competence.

Page and Thomas (1979) described mastery learning as a school of thought that rests on the assumption that mastery of a topic, field of human knowledge or behaviour is theoretically possible for all individuals provided that each learner is given the optimum quality of instruction which is appropriate for his/her particular make and that each learner is given the time that he/she needs.

1.2.1 BLOOM'S MODEL OF MASTERY LEARNING

Using Carroll’s model as a basis, Bloom (1968) developed this conceptual model of school learning into working model for classroom instruction. His theory tries to explain school learning in terms of a small number of interdependent variables. The three interdependent variables which Bloom’s model takes into account are:

(i) The extent to which the learner has acquired the basis prerequisite for further learning (cognitive entry behaviour).

(ii) The extent to which the learner is motivated to undertake the new learning assignment (affective entry characteristics).

(iii) The extent to which the instruction to be imparted is made appropriate to the needs of the learner (quality of learner).

Major variables in theory of school learning are learning task, cognitive entry behaviour, affective entry characteristics and quality of education, affective domain, rate of learning, level and type of learning (Anderson & Krathwohl, 2001). These interdependent variables can prove helpful to schools to build up an error free system of education. This theory aims at explaining the interaction between an individual learner, the interaction, learning task and the learning finally accomplished. In order to achieve the goal of rising teaching and learning at the optimum level, Bloom (1956) and his associates develop mastery learning strategy. The sequence of activities is shown in the fig.1.2
Introduction

Phase-I
Selecting content to be taught. Developing sequential teaching units. Deciding goals in terms of specific objectives deciding mastery level.

Teaching for learning task: pre-requisites

Pre-requisite available

Pre-requisite non available

Necessary assistance in terms of reference

Phase-II
Core teaching session

Performance assessment administrative unit formative test-1

Phase-III
Group not attaining desired mastery level

Different teaching sessions

Self study with different materials 60-70%

Peer tutoring 40-59%

Peer tutoring 40-59%

Teacher tutoring 0-19%

Phase-IV
Group not attaining mastery

Not attaining mastery

Performance assignment unit formative test-3

Special tutoring by teachers

Fig 1.2: Activities of mastery learning programme
The studies indicate that mastery learning has proved most effective in those subjects which require previous learning which most learners already possess (Bloom, 1968: Block, 1971). Furthermore, Bloom (1971) describes student characteristics in terms of cognitive and effective entry behaviour. According to him the instructional components of the model includes specific task to be learnt and the quality of instruction, especially with respect to presentation, feedback and corrective instruction, learning outcomes including level and type of achievement, rate of learning and effective outcomes. Instructional components of Bloom theory of mastery learning has been given in the fig. 1.3

![Fig. 1.3: Blooms theory of mastery learning](image)

Bloom (1971) suggests the following steps for implementation of the mastery learning strategy i.e. the course should be in small units covering one or two weeks of instructions and the instructional objectives should be clear. Thus, in this mastery learning strategy students interact at fast pace with the printed study units.

**1.2.2 SIGNIFICANCE OF MASTERY LEARNING**

Now a days conventional method of classroom instruction is under fire from all side. Today, it has become interpretative to look for a method of instruction without involving new technology and extra expenditure. Mastery learning strategy is being advocated as evitable alternative to the conventional method of instruction. Salvin (1987) have enlisted the following plus points of mastery learning strategy for its viability to the lecture method of instruction.

(i) It has the individual variability in terms of rate of learning.
(ii) It lays emphasis on the consolidation of learning.

(iii) It involves a constant interaction between the learner and learning material. Therefore, the learner is always alert and busy.

(iv) The self testing exam under the mastery learning procedure enables the students to check his performance.

(v) It minimizes failures and maximizes the chances of success.

(vi) It lays emphasis on independent study and self direction.

(vii) It increases the student motivation and procedure greater resourcefulness on the part of students.

(viii) It results in better retention of subject matter.

(ix) It involves team learning in the form of pre-tutoring and individual guidance and hence builds up students self concept.

(x) It provides immediate reinforcement of the student and hence results in effective learning.

(xi) It results in better mental health of students as the failure in the mastery test does not count against the students.

1.2.3 ESSENTIAL FEATURES OF MASTERY LEARNING

Anderson (1959) quotes six essential features of Mastery Learning and the last seventh added to the list by Guskey and Gates (1986) are as follows:

(i) Clearly specified learning objectives.

(ii) Highly valid assessment procedures.

(iii) Present master performance standards.

(iv) A sequence of learning units each comprised of an integrated set of facts, concepts, principles and skills.

(v) Provision of feedback of learning progress of students.

(vi) Provision of additional time and help to correct specified errors and misunderstanding of students who are failing to achieve the present mastery learning standards.

(vii) Need of consistency among all of the previous six features.
1.2.4 HOW TO INSTRUCT FOR MASTERY

Guskey and Gates (1986) explained major objectives representing the purpose of the course or unit.

(i) The learning material should have its own objectives and assessment and must be divided into relatively small learning units.

(ii) Method of teaching; modelling, practice, formative evaluation, re-teaching and reinforcement and summative evaluation should be identified according to learning materials and instructional strategies.

(iii) Each unit should be preceded by brief diagnostic tests.

(iv) The results of diagnostic tests should be used to provide proper instruction to help student to solve their problems.

Carroll (1963) has pointed out two things:

(i) Mastery Learning is an optimistic theory.

(ii) Mastery Learning is an effective set of individualized instructional practices that consistently help most students to learn excellently.

Educators have established two major premises for mastery learning strategy, which have been validated by many. First premise of the mastery learning strategy is that there are individual differences among the children. They learn at different rates, age and level and are in no way guide to the appropriateness of learning task. A task which is right for one learner may be wrong for another. A student should not be allowed to the next step unless he has mastered the previous one and is ready for next task. Second premise is learning increment in most cases is different. The child builds up his learning block by block like a wall and some learning acts as fundamental or basis for other learning. It is impossible to achieve a complex learning without having mastered the simple learning (Carroll, 1989).

Mastery learning strategy lays emphasis on structuring and sequencing the subject matter which has been advocated strongly by Bruner (1966) in his learning theory. In his report, he maintains that it is necessary to understand how a student perceives what he or she is learning. According to him an economical mode of instruction is to divide learning into series of steps. It is always worthwhile for a student to achieve a good level of performance for a learning task prior to his moving on to second one. For this one can easily make the classroom instruction rate-centered. According to Levine (1985) mastery learning strategy dispenses with the lecturing situation and can be thought for producing better understanding.
1.2.5 MAJOR VARIABLES INVOLVED IN MASTERY LEARNING

It is well known fact that mastery learning is an effective strategy to raise student’s achievement to optimum level. The major variables in mastery learning based on work of Carroll (1963), Bloom (1971) and supported by the ideas of Morrison (1926); Skinner (1954) and Bruner (1966) are:-

(i) **Aptitude and Rate of Learning**: The core idea in the theory of mastery learning is based on Carroll’s (1963) perspective on the meaning of aptitude. Traditionally, the concept of aptitude has been associated with student’s characteristic that correlates with his or her achievement. It is stressed that more aptitude one has, the more one is likely to learn. However, time consumption for learning can be different from person to person.

(ii) **Quality of Instruction**: The second important variable is mastery learning is quality of instruction. Carroll (1963) defined quality of instruction in terms of the degree to which the presentation, explanation and ordering of elements of the task to be learned approach the optimum for a given learner. Bloom in his definition of quality of instruction, lays emphasis on interaction between instruction and students. The major components of quality of instruction are cues, participation, reinforcement and feedback. These four elements of instruction account for 20-25 present variation in achievement.

(iii) **Ability to Understand Instruction**: The third variable, the ability to understand instruction may be defined as the ability of the learner to comprehend the precise nature of the learning task he is to learn and the procedure he is to follow in its learning. There are a number of instructional techniques and aids that may be employed to meet appropriately the different requirements and characteristics of the learners.

(iv) **Perservance**: The fourth variable is the perservance which is defined by Carroll (1963) as the time the learner is willing to spend in learning and perservance is not static, it can be increased by increasing the frequency of reward and evidence of learning success. Perservance is related to student’s attitude towards and their interest in learning.

(v) **Time Allowed for Learning**: Time allowed for learning is the fifth important variable. According to Bloom (1971) individual differences in learning rates and time needed to learn, like differences in achievement, are infect of the schooling process. According to him when students begin to learn a new unit without having mastered prerequisites, their learning rates become progressively slower.
Introduction

According to Morrison (1926); Skinner (1954) and Bruner (1966) mastery learning provides the greatest opportunity for the students who are with their coursework to catch up, to accelerate their high school programme. Mastery learning requires a pre-determined level of knowledge which is understood and agreed by the cognitive introduction behaviour tests or the skill to be attained by gaining this mastery is the goal of student effort. Bloom’s mastery learning theory is based on the idea that Cognitive Introduction Behaviours (i.e. pre-learning which is assumed to be necessary for learning a unit), Emotional Introduction Features (the level of motivation to learn a unit) and the quality of teaching activity are the basic indicators of learning output. The variables clue, reinforcement, student’s participation, feedback and correction have been describes as the quality of teaching activity, which a teacher prepares to enable the students to do mastery. The variables of mastery learning given by Wong (2002) has been shown in fig. 1.4

![Image of Fig. 1.4: The variables of mastery learning]

1.2.6 BASIC ELEMENTS OF MASTERY LEARNING STRATEGY

The following core elements of mastery learning are evident in many more recently developed instructional models and interventions. Researchers have consistently linked these elements to highly effective instruction and student learning success (Guskey, 2009).

(i) Define What is to be Defined- The primary task of the school is to define what should be learned and to see to it that all students reach that level. Here both teacher and students understand and focus on objectives.

13
Introduction

(ii) **Teacher Teaches the Material**- Initial teaching in a classroom where mastery learning is going to be used is like that of an effective teacher. Material may be presented through lectures, demonstration and discussion or whatever approach the teacher find most appropriate.

(iii) **First Formative Test**- After presenting all the material of the unit teacher gives a formative/practice test to see what the student have and have not learned. This step provides the feedback needed and identifies the error in group instructions.

(iv) **Learning Alternatives**- Students are provided with learning alternatives. Those who had trouble with formative test will be re-taught in new ways to correct the errors of the group instructions. Those who have already mastered the material will participate in enrichment activities or help the other students.

(v) **Second Formative Test**- After the completion of leaning alternatives teacher gives a record test on the same material, assuming that most of the students have mastered it and the class is ready to move on to new material.

(vi) **Summative Test**- In the end a summative test designed to test student's overall learning. It will help the teacher to know many students have retained the learning material.

Mastery learning has been associated with interest and student achievement (Lysakoweki & Walberg, 1982) and has become a prevalent alternative to traditional pedagogy (Salvin & Karweit, 1984). Lai and Biggs (1994) suggests when the students are provided with instructional support sufficient to acquire the mastery of the objective they will feel better about school, teacher, Subject and the self, learn to preserver to perform complete task at a high level and feel better prepared cognitively and emotionally for subsequently learning tasks (Bloom, 1974).

1.2.7 **COMPARISON BETWEEN MASTERY LEARNING STRATEGY AND CONVENTIONAL TEACHING STRATEGY**

Difference pointed by Sharma (2000) between mastery learning strategy and conventional teaching strategy has been given below in table.1.1
Introduction

Table 1.1 Difference between mastery learning and conventional teaching strategy

<table>
<thead>
<tr>
<th>Mastery Learning Strategy</th>
<th>Conventional Teaching Strategy</th>
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<tbody>
<tr>
<td>(i) Content is divided into units and arranged sequence wise.</td>
<td>(i) Content is also divided into large units or topics are arranged in logical sequence.</td>
</tr>
<tr>
<td>(ii) The objectives are formulated for each unit separately.</td>
<td>(ii) Main emphasis is given for presentation of the content rather than objectives.</td>
</tr>
<tr>
<td>(iii) The instruction and teaching are organized in view of the content unit and its objectives be realized.</td>
<td>(iii) The instruction and teaching are organized to present the content effectively.</td>
</tr>
<tr>
<td>(iv) After each unit, a unit test is given to evaluate the mastery level and diagnoses the learning difficulties.</td>
<td>(iv) There is no such provision in this type of learning.</td>
</tr>
<tr>
<td>(v) On the basis of the causes of learning difficulties remedial instructions research prepared to remove the difficulties.</td>
<td>(v) No remediation is given for the learning difficulties.</td>
</tr>
<tr>
<td>(vi) Different type of remedial devices is employed so that mastery level is attained by every student.</td>
<td>(vi) An achievement given to grade the students’ performance, but not to diagnose the learning difficulties.</td>
</tr>
</tbody>
</table>

Source: Advance Educational Psychology by Sharma, 2000.

1.3 ONLINE LEARNING

As the great aim of education is not knowledge, but action and online learning has been considered best way to convert the gained knowledge into action. Online learning has been considered as an excellent medium of transmission and retrieval of information, which takes place through course notes. The objectives of learning of all are same. Even the materials, textbooks and syllabus also remain same but the difference lies in the method of teaching. Online learning based on Internet solutions gives flexibility because the Internet has made it possible to change, search, save, distribute and share information fast (Brown, 1997). Online learning involves the use of a computer or electronic device (e.g. a mobile phone, tabs) to provide educational or learning material. Online education is a type of distance education.
learning-taking courses without attending traditional school or university where the teachers interact online through the internet. Online education has been defined as the use of online technologies in education for teaching and learning (Allen & Seaman, 2010). It helps the students to increase the interaction between student and teacher. It also proved helpful in student centered teaching as well as peer to peer learning. Online learning as one of several models demonstrating that focus on learning and learning issues. It can be considered as new-age mantra which believes in accepting the new, going with the trend and keeping up with change. Education through online is a potion of relief from the monotony of attending regular classes, visiting real-life libraries and reading at fixed hours. Actually internet in itself is a kit of communication tools (Allen & Seaman, 2010). Through online instruction the interaction between students and the teachers become more realistic and result oriented. Online learning helps best in making resources available to the student as well as to teachers. Online processing is designed to answer the questions and provide services with in very short units of time. As telecommunication and internet technologies have rapidly developed; the opportunities for online teaching and learning have been increased (Goldberger, 2001). Many theories have contributed to the foundation of online group based learning. Online learning environment supports flexible time and space for assessing learning.

According to Kelly and Schorger (2002) online communication system offers a potentially rich social learning environment and flexibility in accessing online discussion, which can support and facilitate active group based online learning. In online instructional system learners discuss a common agenda as a group and get online instruction, they are encouraged to construct their own knowledge by acting on the common agenda, creating their own understanding of it and exchanging ideas to come up with better solutions. He discusses that until now education computer conferencing has been approaching from one of the two traditional prospective i.e. as a variant of distance education and as an extension of classroom activities. The key attributes characterizing this new domain are many too many interactive communications at one time, independent time and independent place. This combination helps to make online education a new and unique domain, distinct from that of face to face and or distance education. This type of education is quite flexible and is not dependent on place and time, it is predictable on a broadcast (one to many) or tutor (one to one) mode rather than a many to many mode of interaction (Liu, 2003). Modes of interaction have been given in the fig.1.5
Introduction

Online instructional system has been considered as an ever increasing mean of acquiring knowledge. That is why educational institutions worldwide are trying to keep pace with the demands and even faculty is being urged or mandated to move their curriculum online. The online instruction system has positively promoted self directed learning in the students. Now a day, when a person leaves school, he or she must have a foundation of knowledge. It has become important that schools should focus on developing skills for inquiry, reasoning, memory, creativity, interpersonal relation and perceptual control. After the development of all these skills self-directed learners will thus have a powerful hold on learning for the rest of their lives a goal only hoped for by educators in past, but achievable now if we choose on-line instructional system (Liu, 2005).

Kegan (1994) described that online education is about gaining information via the network communication on the teacher and students side. It is an aid to the classroom and lets classroom to interact so that, best resources are made easily available and the existing ones improved.

According to Lebec (2003) the online system of instruction is basically outlined according to Gagne (1977) conditions of learning as each of this methodology as nine externally observable events of instructions associated with a corresponding internal process.
Introduction

According to Anne and Christine (2005) online learning and teaching is conveying information or concepts to the learner via the computer network system, internet or web based learning environment.

In educational system, the online education can be given by two modes of network communication i.e. by internet and by LAN (Local Area Network).

1.3.1 INTERNET

Internet is a system in which computer connected with internet allows your desktop computer to exchange data, message and files with any of the millions of other computers that is why it is called network of networks. Internet is a very general data transmission standard through which any kind of data can be transmitted that is why education community has always remain close to the internet. It not only proved helpful for commuters to reduce a lot of travel and communication costs and lets you to do the same thing which is otherwise not possible but also has made communication more effective as it has a combination of speed, instant and massive information, search tools and multimedia as extension (Gagne, Briggs & Wager, 1992). It is only internet that has benefited education positively and removed the independence of geographical location. It is because of internet only students and teachers can interact freely, can share information and can access new recourses, virtually anywhere in the world instantly. Use of internet enables the teachers to explain things better since it includes sound and pictures and it helps to make the presentation interesting one. Interactivity allows students to get feedback and to do discussion. Internet can carry many forms of information. Services through which information can be made available are:

- World Wide Web (WWW)
- Electronic mail (E-mail)
- File transfer protocol (ftp)
- Remote login (telnet)
- Bulletin board services (network news)
- Advanced web technologies
- Automated web search (search engines)
- Audio and video communication
- The global digital library
The internet is that exciting area, where you can find information almost about every topic or any type. On internet, there are a lot of books, encyclopedias, magazines, articles and every other type of reference material. In addition, you have access to expert opinion on various topics. Three types of online communication via internet have been given in Table 1.2.

Table 1.2: Types of online communication via internet

<table>
<thead>
<tr>
<th>Communication method</th>
<th>Tools</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) One to one</td>
<td>E-mail, talks</td>
<td>Individual communication</td>
</tr>
<tr>
<td>(ii) One to many</td>
<td>WWW, Gopher</td>
<td>distributed communication</td>
</tr>
<tr>
<td>(iii) Many to many</td>
<td>Usenet news, IRC</td>
<td>collaborative communication</td>
</tr>
</tbody>
</table>

1.3.2 LAN (LOCAL AREA NETWORK)

Local Area Network is a network when one master computer is used to interconnect computer in a single room, in a building or building in one site. These types of networks can be found installed in schools, colleges, offices, factories etc. for sharing information and exchanging between systems (Kilburn, 2006). In Local Area Network, there is one master computer with its control facilities such as disk storage, printer etc and it is linked to other computers of the institutions by cables and other micro-computers have only screen and keyboards. Each such network has a file server and a print server. It provides a form of auxiliary storage which can be used by any other computer on the network and also receives data from other computer and prints it.

In most of the educational institutions, the local area networking is used for on-line teaching where a teacher interacts or teaches students through the master computer and students learn through their micro computers. Now it has become easy for students to load lessons or learning material from the central disc into any micro computer of the school and to review the lesson and solve his/her problems. Local Area Network has been considered best utilization for remedial instructions as well (Kilburn, 2006).
1.3.3 CHARACTERISTICS OF ONLINE INSTRUCTIONAL SYSTEM

Online instructional system is a perfect educational medium as it has certain characteristics and advantages than other educational mediums. Characteristics given by Kilburn (2006) can be described like this:

- A reliable, well supported and maintained centralized infrastructure, optimally safe technical delivery system.
- Clean guidelines and faculty student agreement, regarding times for completion of assignment and faculty response including timely constructive feedback to students.
- Good online teaching encourages, student- faculty contact, cooperation among students, active learning, communicates high expectations, respect diverse talents and learning styles.
- It provides mediated experience rather than direct and indirect one. The stimulated three-dimensional moving objects lead to more learning.
- Online instruction can cope with the needs of thousands of students simultaneously and meet their needs both in terms of quality and quantity.
- Online learning helps the individual to learn at his own pace, by receiving immediate individual feedback and help the individual to choose freely the content and its sequence for instruction.
- Online instruction system includes quality content. It provides pedagogical driven instructional design with well defined objectives, website usability factors and technological factors with delivery support system for instructors, administrators and students.
- Reflecting the vast differences in the student’s ability and performance online instruction helps to attain individualization and flexibility.
- As the programming of personalized instructions is graded in small steps, it provides more positive and effective climate for individuals especially for slow learners. It also provides feedback to the learner, so that, he can improve his style of studying.
- Online students take responsibility of their own learning and this leads to development of the habit of self-directed learning.
Introduction

- Sources of online instructions are designed to demonstrate the skills of analysis, synthesis and evaluation as well as the methods of effective research.
- There is no need of repetition by the teacher and no serious concern about the problem of absentees as it can be solved by on-line instructional system. The color, music and animated graphics add realism and appeal to drilling exercise and lab activities raises the motivation of learners. It relieves the teachers from his daily life routine because the performance of learners during the course and on the test is recorded automatically.
- It helps in providing feedback to the teacher so that he may be able to evaluate the performance of the students properly and thus be able to use the data in designing the best teaching design for the learner in future.
- It also provides feedback to the learners, so that he can improve his style of studying.
- The teacher can also devote his time to research and other professional activities.
- Facilitates interaction among students and between students and faculties.
- Online instruction provides prompt feedback to the teachers about the achievement of the students.
- It creates self motivation, and self learning commitments among the students to participate in the programme.
- It develops skills of inquiry, reasoning, memory, creativity, problem solving, decision making, meta cognition, interpersonal relations, communication and perceptual control.
- It trains to students to access electronic librarians and to obtain necessary information .it provides equal access and equal instructions to all students.
- It provides equal access and equal instructions to all students.
- It allows learners to form both informal and formal web-based learning communities.

1.3.4 IMPACTS OF ONLINE INSTRUCTION

According to Zhang and Kenny (2010) online education system has an impact on the various fields of education i.e. economic, political, social, psychological, and cultural environment. The impact of online education system can be summarized as follows in table 1.3
Table 1.3: The impact of online education system

<table>
<thead>
<tr>
<th>Fields of Education</th>
<th>Impacts of Online Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on education</td>
<td>(i) Impact on teacher and his teaching methods.</td>
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<td></td>
<td>(ii) Impact on students and their learning styles.</td>
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<td></td>
<td>(iii) Impact on administration.</td>
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<td>(iv) Impact on economics of education.</td>
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<td>(v) Impact on quality of education.</td>
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<td>(vi) Impact on diversity of education.</td>
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<td>(vii) Impact on equality of educational opportunity.</td>
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<tr>
<td>Economical impacts</td>
<td>(i) Impact on educational financing.</td>
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<td></td>
<td>(ii) Impact on scholarships and stipends.</td>
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<td>(iii) Impact on cost of education.</td>
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<td></td>
<td>(iv) Impact on employment.</td>
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<td></td>
<td>(v) Impact on knowledge economy.</td>
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<tr>
<td>Political and legal impacts</td>
<td>(i) Impact on privacy.</td>
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<td></td>
<td>(ii) Impact on authors and authorship.</td>
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<td></td>
<td>(iii) Impact on control of education.</td>
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<td>(iv) Impact on access of education.</td>
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<td>(v) Impact on control of curriculum content.</td>
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<td>(vi) Impact on rights and duties of teachers and students.</td>
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<td>(vii) Impact on citizen diversity.</td>
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<td>(viii) Impact on freedom of information.</td>
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<td>(ix) Impact on commercial rights.</td>
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<tr>
<td>Social, psychological and</td>
<td>(i) Impact on cultural impacts.</td>
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<td>cultural impact</td>
<td>(ii) Impact on individual behaviour.</td>
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<td>(iii) Impact on cultural diversity.</td>
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<td>(iv) Impact on values.</td>
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<td>(v) Impact on rural-urban flows.</td>
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<tr>
<td>Physical and environmental</td>
<td>(i) Impact on health.</td>
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<td>impacts</td>
<td>(ii) Impact on public facilities.</td>
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<td>(iii) Impact on transportation patterns.</td>
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<td>(iv) Impact on new construction, architectural forms.</td>
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<td></td>
<td>(v) Impact on environmental problems and pollutions.</td>
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</table>
1.3.4 NEED FOR ONLINE INSTRUCTION

At present teaching, most of the people concentrate on given information, which is not only the sole objective of education. Along with the information Zhang and Kenny (2010) have given some other objectives of education, which are given below:

(i) To develop reasoning and thinking powers.
(ii) To develop judgment and decision making activity.
(iii) To improve comprehension, speed and vocabulary.
(iv) To develop self concept and value clarification.
(v) To develop proper study habits.
(vi) To develop tolerance, ambiguity, capacity and scientific tempers.
(vii) To develop communication and social skills.
(viii) To develop global thinking.

So, it is only online instructional method which can fulfilled both objective of education and the emotional needs of student. Online system is the only system that can provide information correctly, as comprehensive as possible, in different formats, with different examples. Interaction system that is available in online learning provides flexibilities, better understanding, long retention and lead to development of various skills of reasoning, problem solving, decision making, judgment, communication, cooperation, tolerance, discipline etc (Zhang & Kenny, 2010). Online instruction leads to mastery and quality learning that’s why online instruction programme has been considered the basic need in the present scenario as it fulfills all the needs and objectives of modern education and social system of the whole globe. It is quite different from our conventional teaching.

The role of instructor and information technology in the new paradigm may be defined as below:

• Instructor will spend more time in interaction rather than lecture theater. By doing this the instructor will be able to focus on the structuring of information, demonstrating process and will be able to spark insights in the students.

• The instructor will spend less time in the preparation of traditional lectures and more time in the structuring of material in a format. There it can be presented in an interactive manner through the use of information technique. For this purpose the
Introduction

teacher also used information technology as well as commercially available multimedia instructional package which follow his objectives and can be mould according to the requirement of his student.

- In information technology system students can interact to pursue the acquisition of information and to participate in interactions with simulating system which gives students experience in process formulation i.e. virtual reality.
- Information technology provides basis to the interaction among instructors and it doesn’t need to be confined to a single geographical location. It can be conducted through visual and verbal interaction from physically disjoint location.
- Information gained through this course can be applied to enhance and increase communication between the student and the instructor. This, in fact is the most traditional and perfect use of instruction technology at the current time.

1.4 ONLINE MASTERY LEARNING STRATEGY

Online mastery learning strategy is starting to be considered as not just a via media of transfer of information but as an excellent medium for learning. Originally in education the internet was for the transmission and retrieval of information, principally for the course notes and assessment details. The interaction resulted positive when it results in submission of assignment of the students and teachers gets comments to their lessons in return (Liu, 2005).

By 1996, the internet and World Wide Web were being referred to information and computer technologies, emphasizing the importance that communication plays in online learning. In educational environment, this communication is getting importance where student interaction often considered to be the key to good learning (Page, 2001).

When teaching and learning take place in a fixed sequence through computer network it can be defined as online mastery learning. This computer network can be of any kind, it can be local Bulletin Broad System, global internet, World Wide Web, a Local Area Network or internet with in a particular organization. With the help of this online facility people from their own home or workplaces can easily connect to each other, can easily transfer the text and data files and obtain information from computer databases. It helps them to save time. For its successful application all that is required is a telephone line, a micro computer modem, suitable word-processing and communication software. Three types of online services such as electronic mails, computer conferencing and online data bases are currently being used in education. The most famous service of online education is electronic mail that allows students and teachers to exchange messages to each other. In addition, online networks also provide conferencing facilities that let participants to conduct multi person discussion. Online education also involves access to databases in the form of text files or
multimedia webpage, as well as the exchange of information via file transfer (Zhang & Kenny, 2010). The design of online mastery learning programme used is according to the fig: 1.6

**Fig 1.6: Design of online mastery learning programme**

1.4.1 CHARACTERISTICS OF ONLINE MASTERY LEARNING

According to Allen and Seaman (2010) online mastery learning differs from the others due to following characteristics:

(i) Individualization and Flexibility: All of us know that a film or a video programme has a fixed sequence. By changing its sequence it is impossible to understand it even the pace cannot be controlled. But a highly branching programmed just like mastery learning can
provide different learning sequences to each students but still it has some restriction. A good educational programme delivers many types of information and each student can have unique learning experience and has his own pace to adjust with it. It can prove itself the best media that offers flexibility to a student.

(ii) **Stimulation:** It is only online mastery strategy that can suggest real and imaginary world. It provides direct experience to the students which have been considered as a critical component of learning. A computerized programme inspires a good student to interface great experiences in a short time and to learn more about the three dimensional experiences available online.

(iii) **Economic:** Most of the components in education prove costly in comparison to computer based teaching. The computer technique is in a period of rapid evolution much more slowly. A single computer can be used for many purposes. It has made the work of teachers too much easier as a teacher can use it in place of various other teaching aids without needing other aids like video, film, slide projector etc. Such type of online mastery learning programmes can also helps students to visualize objects that are difficult or impossible to view.

(iv) **Realism in Experiences:** With the help of computer one can generate audio and visualized effects together. As color, music and animated graphics can add realism and appeal to drilling exercise/mastery the reading material.

(v) **Record Maintenance:** The memory capacity of computers allows student’s past performances to be recorded and used in planning the subsequent steps. The record keeping ability of the computer makes individualized instruction feasible, individual perception can be prepared for all students and their programmes can be mentioned.

(vi) **Monitoring Actions:** The originality of working with a computer raises the learner’s motivation and high speed personalized responses to learner’s personalized instruction graded in small steps. It gives positive results especially for slow learners.

(vii) **Allow Communication:** With the help of computer tools such as processors, spreadsheets and databases collect communication among students and between students and instructors can be analyzed or organize. In the present study the online mastery learning programme used, was prepared on the principles of mastery learning and mentioned by the
investigator with help of the school teachers. The star topology was used to install the LAN system and remediation with the permission of the teacher at the prescribed time.

### 1.4.2 ADVANTAGES OF ONLINE MASTERY LEARNING

(i) Designed to be extremely user-friendly and simple to understand.
(ii) Learn and relearn the part is possible if you cannot follow it the first time.
(iii) Convenience of time.
(iv) Affordable courses.
(v) Easy access to a wealth of information.
(vi) Saves time waste in consuming and waiting for faculty.
(vii) Saves money

### 1.5 BLOOM'S TAXONOMY

Understanding that ‘taxonomy’ and ‘classification’ are synonymous terms that help uneasiness with the term (Bloom, 1956). Bloom’s taxonomy has been considered as a multi-tiered model of classifying the six cognitive levels of complexity. Throughout the years, these six levels have often been depicted straightway, leading many teachers to encourage or to support their students to “climb to a higher thought”. Knowledge, understanding, application have been considered as the highest three levels and analysis, synthesis and evaluation have been considered as the lowest three levels (Morshead, 1965). The taxonomy is hieratical where each level is subsumed by the higher levels. In other words, a student functioning at the application level must have mastered the knowledge and comprehension levels. Due to its long history and popularity, blooms taxonomy has been considered as condensed, expended and reinterpreted in variety of ways (Krathwohl, 2002).

#### 1.5.1 CLASSIFICATION OF BLOOM'S TAXONOMY

To formulate systematic organization of objectives in taxonomy a number of attempts have been made and the best known of these is associated with the name of Bloom. Bloom constructed taxonomy of educational objectives to facilitate communication mainly. With the help of this method one can improve or exchange the ideas and material. It has proved helpful to text works as well as to other persons concerned with educational research and curriculum development. Bloom (1956) divided educational objectives into three domains. Atherton (2011) has classified the new terms of Bloom taxonomy model such as:

**(1) Cognitive Domain:** Cognitive domain involves not only knowledge and the development of intellectual skills but also the recall or recognition of specific facts, procedural patterns and concepts that serve in the development of intellectual abilities and skills. It has been divided in to six major categories, starting from the simplest behaviour and ending with the most complex. The categories can be thought of as degrees of difficulties and one must mastered
the first before going to the next one. Old and new version of intellectual capability i.e. knowledge or think has been shown fig. 1.7

![Fig1.7: Intellectual capability, i.e. knowledge or think](image)

(i) **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long term memory.

(ii) **Understanding**: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

(iii) **Applying**: Carrying out or using a procedure through executing, or implementing.

(iv) **Analyzing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.

(v) **Evaluating**: Making judgments based on criteria and standards through checking and critiquing.

(vi) **Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning or producing.

(2) **Affective Domain**: Skills in the affective domain describes the way people react emotionally and their ability to feel another living thing’s pain or joy. Affective objectives typically target the awareness and growth in attitudes, emotions and feelings. Affective objectives has been shown in fig. 1.8
Introduction

Affective domain

Fig 1.8: Affective objectives

(i) Receiving: is willing to notice a particular phenomenon.
(ii) Responding: makes response, at first with compliance, later willingly and with satisfaction.
(iii) Valuing: accepts worth of a thing.
(iv) Organization: organizes values; determines interrelationships; adapts behaviour to value system.
(v) Characterization: generalizes certain values into controlling tendencies; emphasis on internal consistency; later integrates these into a total philosophy of life or world view.

(3) Psychomotor Domain: Skills in the psychomotor domain describes the ability to physically manipulated a tool or instrument like a hand or a hammer. Psychomotor objectives usually focus on change and/or development in behaviour and/or skills. Psychomotor objectives has been shown in fig. 1.9

Fig 1.9: Psychomotor objectives
Introduction

(i) **Reflex**: objectives not usually written at this 'low' level.
(ii) **Fundamental movements**: applicable mostly to young children (crawl, run, jump, reach, change direction).
(iii) **Perceptual abilities**: catch, write, balance, distinguish, manipulate.
(iv) **Physical abilities**: stop, increase, move quickly, change, and react.
(v) **Skilled movements**: play, hit, swim, dive, use.
(vi) **Non-discursive communication**: express, create, mime, design, and interpret.

So, the taxonomy is hierarchical; each level is subsumed by the higher levels. In other words, a student functioning at the 'application' level has also mastered the material at the 'knowledge' and 'comprehension' levels. One can easily see how this arrangement led to natural divisions of lower and higher level thinking. Bloom (1974) concentrated on the study of cognitive domain. He assumed that in thinking about a problem or topic a hierarchy of cognitive process is involved. The cognitive skills commonly referred to as intellectual ability and skills may be also be described as including the behaviours like remembering, reasoning, problem solving, concept formation and to be limited extent, creative thinking. According to Bloom (1974) taxonomy of cognitive skills have six categories as discussed below:

(i) **Knowledge**: as defined here emphasizes the psychological processes or remembering.

The process of learning also involved in that a knowledge test situation requires the organization and recognition of a problem such that it will furnish the inappropriate signals for the information and knowledge of the individual process. For measurement purpose, the recall situation involves, little more than bringing to mind the appropriate material. The term knowledge covers:

(a) **Knowledge of specific**: this refers to the recall of specific and isolated bits of information. The emphasis is on symbols with concrete references. Knowledge of terminology: knowledge for the specific symbols (verbal or non-verbal).
(b) **Knowledge of specific facts**: knowledge of dates, persons, places etc.
(c) **Knowledge of ways and means of dealing specifics**: knowledge of ways of organizing, studying, judging and criticizing.
(d) **Knowledge of conventions**: it includes behaviours of knowledge of characteristics, ways of treating and preventing ideas and phenomenon like conventional symbols, dictionaries, rules, styles and practices.
(e) **Knowledge of trend and sequences**: it includes behaviour like knowledge, of process, directions and movements of phenomena with respect to time.
**Introduction**

(f) *Knowledge of criteria:* it includes the knowledge of the criteria by which facts, principles, opinions and conduct as tested or judged.

(g) *Knowledge of methodology:* it includes behaviour related with knowledge of methods of inquiry and technology.

(h) *Knowledge of the universals and abstractions in a field:* knowledge of the major schemes and patterns which phenomena and ideas are organized.

(i) *Knowledge of principles and generalization:* the sub category includes behaviours regarding knowledge of particular abstractions which summarize observations of phenomena.

(j) *Knowledge of theories and structures:* knowledge of systematic view of a complex phenomena, problems or field.

(k) *Cognitive operation at knowledge level:* recalling, recognizing, acquiring and defining.

(ii) *Comprehension:* includes those objectives, behaviours or responses which resent an understanding of the literal message contained in a communication. During this process the student may change the communication in his mind. It covers - translation, interpretation and extrapolation.

(iii) *Application:* the use of abstractions in particular and concrete situations. The abstractions may be the form of general ideas, rules of procedures or generalization methods. The abstractions may also be technical principles, ideas and theories which must be remembered and applied. Cognitive operations used in this category includes: applying, employing, predicting, choosing, organizing, structuring and classifying.

(iv) *Analysis:* the ability to breakdown of communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and the relations between the ideas expressed are made explicit. Analysis of elements, of relationships, of organizational principles is the cognitive operations that are used at this level.

(v) *Synthesis:* the putting together of elements and parts to form a whole. This involves the process of working with pieces, parts, elements etc and arranging and combining them in such a way as to constitute a pattern or structure not clear before. It includes production of a unique communication, production of a plan, or proposed set of operations and derivation of a set of abstract relations. Cognitive operations used at this level are: writing, telling, relating, producing, sequencing, modifying, documenting, designing, specifying, developing, synthesizing and formulating.
Evaluation: ability of judgment about the value of material and methods for given purposes. Qualitative and quantitative judgments about the extent to which material and methods satisfy criteria and use of a standard of appraisal. It includes judgments in terms of internal evidence and of external criteria.

1.6 BLOOM'S NEW TAXONOMY

Developing higher order skills in students is not an easy task. Historically, teachers have looked to Bloom's taxonomy (1956) for assistance. Bloom's model divided thinking skills into lower-order and higher order knowledge, understanding and application as lower level skills and cast higher level skills as analysis, synthesis and evaluation.

Revised Bloom taxonomy (RBT) and changes in terminology between the two versions are perhaps the most obvious difference and can also cause the most confusion (Krathwohl, 2002). Basically Bloom's six major categories were changed from noun to verb forms. Additionally the lower level of the original, knowledge was renamed and become remembering. Finally, comprehension and synthesis were re-titled to understanding and creating. In an effort to minimize the confusion comparison images appears below in fig.1.10

![Comparison of Bloom's Taxonomy](image)

**Fig 1.10: New version of Bloom taxonomy**

The taxonomy was revised to incorporate new learner-centered paradigms into its structures. Constructivism, for example assures that students must discover, construct and transform knowledge if they are to make it their own. So, in order to address the weaknesses in the original taxonomy and respond to the resent educational and psychological development a group of cognitive psychologists, curriculum and instructional researches and testing and assessment specialists revised the original taxonomy (Anderson, 1959).
As history has shown, this well known, widely applied scheme has provided the educators with one of the first systematic classification of the processes of thinking and learning. The taxonomy has provided the measurement tool for thinking. With the dramatic changes in society over the last five decades, the revised bloom taxonomy provided an even more powerful tool to fit today’s teacher’s needs. The structure of revised taxonomy table matrix provides a clear, concise visual representation of the alignment between standards and educational goals, objectives, products and activities (Krathwohl, 2002).

Today’s teacher must make tough decisions about how to spend their classroom time. Clear alignment of educational objectives with local, state and national standards is a necessity. According to Morshead (1965) the revised Bloom’s taxonomy table classifies the fit of each lesson plan’s purpose, goal and objectives. In almost all circumstances when an instructor desires to move a group of students through a learning process utilizing original framework bloom taxonomy can prove helpful.

- it helps to analyze the objectives of a unit or a syllabus
- it helps a teacher not to confuse activities with objectives.
- it helps the teacher to realize the relationship between the assessment and teaching/learning activities.
- examine curriculum alignment.

The taxonomy table provides a framework within which prospective teachers as well as teacher can model not only the way they teach but also the way they examine and analyze their teaching.

1.7 CONVENTIONAL TEACHING STRATEGY

Conventional education refers to long-established customs found in schools that society has conventionally approved appropriate. According to our educationists the conventional teacher centered methods focuses on rote learning and memorization. However, even today also many parents and conservative citizens are concerned with the maintenance of objective educational standards based on testing only which favors a more conventional approach. Conventional education focuses on teaching, not learning (Fehlen, 1976). It incorrectly assumes that for every ounce of teaching will turn in an ounce of learning by those who are taught. However, most of us learn many things before, during, and after attending schools. A child learns such fundamental things as how to walk, talk, eat, and dress, and so on without being taught these things. Adults learn most of what they use at work or at
leisure. Most of what is taught in classroom settings is forgotten, and sometimes what we remember proves irrelevant.

Conventional teaching is concerned with the teacher being the controller of the learning environment. Power and responsibility are held by the teacher and they play the role of instructor (in the form of lectures) and decision maker (in regards to curriculum content and specific outcomes). They regard students as having 'knowledge holes' that need to be filled with information. Little attention was being paid to the eagerness, curiosity and capabilities of students. In short, the conventional teacher views that it is the teacher that causes learning to occur (Fehlen, 1976).

In the previous century children were taught in an inflexible and labeled way. At that time education was conceived as a process of transmission of factual knowledge only. The teachers used to adopt an authoritarian attitude. The main emphasis was on testing the memory of the students. But now the present day classroom instructions are based on chalk and talk. Lecturing has been considered as the heart of this method i.e. imparting large amount of factual information to a large number of people in a short time. But the drawback of this method is that lecturing through this method cannot be retained by students for a long time. Lecture method leads to the habit of cramming and isolation from real life situations and this sort of situation will be endured by the students as long as teaching is merely based on this conventional method of teaching.

Skinner (1954) lashes out at the lecture model of instruction and suggests its substitution with properly structured small learning steps and students advancing through the steps at their own pace. He felt that in the conventional system of instruction, the teacher teaches a set of students at the same rate which is unfavorable to the students who can pace himself faster in a course of study than a slow learner. With a properly structured self paced course is needed.

Dewey (1963) philosophy of education urged that free, self directed activity for learner be encouraged and that externally enforced controls be delimited that learning be through firsthand experience and not too sought exclusively from text books and teachers.

In the conventional teaching classrooms the children are totally dependent on their teacher and this dependency breeds hostility. To reduce hostility, the opportunities should be provided for self education. The more the autonomy, the lesser is the hostility and more the self dependence, lesser the hostility. Thus, the effective teaching takes place when students
are given opportunities to participate in learning process. In order to achieve necessary improvement, new methods of instructions must be introduced and this will meet the challenges of the changing scenario of the world. The quality of education is to be ultimately reflected through the behaviour of learners (Dewey, 1916). The focus of teaching learning process should be shifted from teacher centered to student – centered, keeping in view the individual standards. Different researches are going on the various teaching methods has been categorized as under:

• **Lecture Method:** in this method only the teacher talks; the students remain passive learners and they do not participate actively. Pupils listen, get bored, yawn and sometimes go to sleep as well. The teacher acts like a chatter box, talking and talking all the time without ascertaining whether the students are following him or not. The students are given spoon feeding and their power of observation and reasoning, the exercise of which is so essential in the learning process are not stimulated.

• **Project Method:** it is based on the philosophy of pragmatism. In this method, connected facts are developed round a central theme which may be any matter of scientific interest, a scientific principle or a topic of immediate interest to the pupils.

• **Concentric Method:** it mainly deals with an organization of the teaching material and evolving out a scheme of works rather than actual teaching. In fact, it is a system of spreading the whole course over a number of years.

• **Discussion Method:** certain topics in science, which are in explicable to be through demonstration or other techniques, can be made understandable through well-planned discussion. In this method, teacher tells the students well in advance about the topic and date of discussion. He gives a brief introduction about the subject matter of the topic and poses some key questions in suitable heuristic environment and makes the students think. When proper motivation is complete, the teacher encourages the students to give their views one by one.

• **Inductive and Deductive Methods:** in inductive methods the rules are induced out of the examples. The pupils draw the rules himself from the given examples. Students are encouraged to examine them, to reach a conclusion and then to formulate a rule or definition. For example, while teaching nouns the teacher will give example and then help the pupils to frame a definition. In deductive method, the teacher first gives rules and definitions. These are then applied to particular examples.
• **Assignment Method**: assignment method is the best suited for teaching of experimental science because, it involves a harmonious combination of training at the demonstration table and individual laboratory work.

• **Heuristic Method**: in this method the teacher allows the students to learn or discover something for themselves.

Out of these methods, lecture method is the method most commonly used in which information is imparted through a speech. It is one man show in which the speakers give ideas and the listener takes them. The lecture is an exploration of knowledge of facts, principles or other information’s which a teacher wishes to present to his students using a process having sufficient background and ability to understand the lecture. The key features of this process are based on human information possessing. There is a huge gap between the intention of lecture and reception of information of the learners. This gap is to be bridged by the teacher. This method is purely teacher centered and does not expect any question or responses from the students. This is the method that laid too much stress on rote memory. The rate of imparting information is too rapid and students don’t have any continuity of thoughts. There is no provision for any kind of experimental work, where students can exercise their intelligence, capabilities and abilities. This method is useful merely to cover lengthy syllabus in short time and impart factual information easily.

1.8 **LEARNING OUTCOMES**

The term learning outcomes refers to the acquisition of behaviour being developed by the new S-R Connections. It is relatively permanent behaviour, changed tendency and is result of reinforced practice (Kimble & Germazy, 1965). The process of learning begins from the birth of child and continues till the death. When interaction between individual and environment occur the foundation of learning is laid down. Learning outcome may be defined as a relatively enduring change in behaviour, which is the function of prior behaviour usually called practice (Marx, 1970). It is just like simple events that happen under certain conditions. It occurs when certain observable changes in human behaviour take place that justify the inferences of learning (Gagne, 1977). Gagne’s distinguished ten types of learning outcomes acquired by pupils such as skills, knowledge, concepts, understanding, application, activities, appreciations, attitudes, interests and adjustments. Thus, learning outcomes is the specification of what a student should learn as a result of the period of specified and supported study.
University of Manchester Institute of Science and Technology defines a learning outcome as: the acquisition of the knowledge, skill or understanding that is the desired outcome of a learning process.

According to Adam (2004) “a learning outcome is a written statement of what the successful student /learner is expected to be able to do at the end of the module or course unit or qualification”.

According to credit common records learning outcomes are the standards of what a learner can be expected to know, understand and do as a result of learning experiences.

Learning outcomes based education focuses on educational practices by ensuring that student master those learning outcomes and it asserts that all students can succeed. All round development of the personality is the ultimate goal of education and therefore the learning experiences provided in the school should contribute towards the achievement of this end (Anderson, 1959). Accordingly, the expected outcomes of learning cannot be limited only to cognitive domain rather it is necessary to delineate learning outcomes expected in the affected and psychomotor domains also. In contrast to cognitive aspect, non cognitive aspect cannot be specified as tangible terminal behaviours, since they comprise elements of personality which manifest transfers in interest, attitudes, personal and social behaviour and value system. In the present study, learning outcomes of students in English will be studied in terms of achievement at knowledge, comprehension and application categories of objectives.

The term academic achievement is made of two words: academic and achievement. This term has been derived from the word academy which means a school where special types of instructions are imparted. It refers to the level of success or proficiency attained in some specific area concerning scholastic or academic work.

So when a student attains the knowledge and skills in school campus with the prior help of their teachers is known as academic achievement. It is achievement that encompasses student’s ability to perform better. It is multidimensional not related to single instance. It occurs throughout the student life in school and later in working life also (Morrison, 1926).

According to Crow and Crow (1961) Achievement is the extent to which learner is profit from instructions in a given area of learning. In other words, achievement is reflected
Introduction

by extent to which a person from the training imparted to him has acquired the skill of knowledge. It is the general and specific learning experiences.

Kerlinger and Pedhazur (1973) define it as an abstraction formed from the observation of certain behaviours of children. These behaviours are associated with the mastery or learning of school tasks, reading words, doing arithmetical problems, drawing pictures and so on.

Page and Thomas (1979) Achievement is performance in school/College in a standardized series of educational task. The term is used generally to describe performance in the subject of the curriculum.

According to Mccombs and Marzano (1990), “Achievement outcomes have been regarded as a function of two characteristics, skill and will. They must be considered separately because possessing them will alone may not ensure success if the skill is lacking.”

According to Steinberger (1993), “Achievement encompasses student ability and performance, it is multidimensional, it is intricately related to human growth and cognitive, emotional, social, and physical development; it reflects the whole child; it is not related to a single instance, but occurs across time and levels, through a student’s life in public school and on into post secondary years and working life.”

Megargee (2000) stated that achievement test is how well students have mastered the subject matter in a course of instruction.

According to Craighead and Charles (2001) academic achievement may be defined as ‘a measure of knowledge, understanding of skills in a specified subject or group of subjects’. Achievement has been described as the ability of an individual, which can be used for performing the task with essential knowledge.

Anand et al. (2004) defines achievement as the quality and quantity of a student’s work. They describe academic achievement as the attained ability or degree of competence in school tasks usually measured by standardized test and expressed in percentage and grade units based on norms divided from a wide sampling of pupil’s performance.

In short academic achievement is related to the quality and quantity of learning attained by a particular student in a particular subject and after a period of specific time. From an early age, a sense of achievement is a source of good feeling and self-esteem and failure of a source of anger and self approach. It signifies successfully carried out
performance of an individual or a group assessed after the completion of a task whether it can be academic, manual, personal, social or extracurricular.

1.8.1 CHARACTERISTICS OF LEARNING OUTCOMES

According to Anderson (1959), the following characteristics of learning outcome have been described such as:

(i) It describes something which the learner does or produces.
(ii) It states the behaviour which is observable.
(iii) It states the conditions under which the behaviour is to occur.
(iv) It states the standards which defines whether or not the specification has been attained.

Thus, learning outcomes is a specified activity, behaviour, ability or attitude that we want students to manifest in measurable or observable ways, indicating whether desired learning has occurred and to what degree it has occurred.

1.8.2 FACTORS AFFECTING LEARNING OUTCOMES

According to Lim and Morris (2009) the following factors affect learning outcomes:

(1) Cognitive and Meta Cognitive Factors: cognitive and meta cognitive factors are those that pertain to the intellectual aspect of an individual. These factors affect the learning outcomes in the following way.

(i) Goals of the Learning Process: the strategic nature of learning is that the students should be goal directed. To conduct useful representation of knowledge and to acquire the thinking and learning strategies necessary for continuous learning process, success across students must guarantee and pursue personally relevant goals. Thus, the learning outcomes are enhanced if the learners are active, goal directed, self-regulating and assume personal responsibility for contributing to their own learning.

(ii) Construction of Knowledge: the learning outcome of students is improved if the students link new information with accessible knowledge in meaningful ways. The nature of these links can take a variety of forms, such as adding, modifying or recognizing existing knowledge or skills.

(iii) Strategic Thinking: successful learners use tactical thinking in their approach to learning, reasoning, problem solving and concept learning. Learning outcomes can be enhanced if the learners develop, apply and assure their strategic learning links.

(iv) Thinking About Thinking: successful learners can reflect on how they think and learn set reasonable learning or performance goals, select potentially appropriate teaching
strategies or methods and monitor their progress towards these goals. These higher order or meta cognitive strategies can enhanced student’s learning outcomes and personal responsibility for learning.

(v) **Context of Learning**: learning does not occur in vacuum as it is influenced by environmental factors such as culture, technology and instructional practice etc. the classroom environment, particularly the degree to which it is nurturing or not, can also have significant impact of students leaning outcomes.

(2) **Psychological Factors** (personal factors) psychological or personal factors are those that lie within the individual and affect one’s performance.

(i) **Developmental Influences**: Learning of individuals take place when material is appropriate to their developmental level and is presented in an enjoyable and interesting way. Thus, learning is most effective when differential development within and across physical, intellectual, emotional and social domain is taken into account.

(ii) **Individual Differences**: Every individual is born with his own capabilities and talents. They have their own capabilities and talents. They have different strategies, approaches and capabilities for learning that are a function of prior experience and heredity. In addition, through learning and social acculturation, they acquire their own performance for how they like to learn and pace at which they learn. Thus, the interaction between learner’s differences, curricular and environment conditions is another key factor affecting learning outcomes.

(iii) **Motivation**: motivation is an important factor that influences both the quality of thinking and information processing as well as an individual’s motivation to learn. Positive emotions, such as cruelty, generally enhance motivation and facilitate learning and performance while negative emotions, such as anxiety, insecurity panic and rage generally detract from motivation, interface with learning and contribute to low performance.

(3) **Social Factors**: social factors are linked with the force of environment lying outside the individual and affect one’s performance externally.

(i) **Social Influences**: learning outcomes can be enhanced when the learner has an opportunity to interact and to collaborate with others on instructional tasks. Such context help learners feel safe to share ideas, actively participate in the learning process and create a learning community.
Learning and Diversity: Learning is most effective when differences in learner’s linguistic, cultural and social backgrounds are taken into account, as the language, ethnicity, race, beliefs and social-economic status etc. all can influence learning outcomes. Careful attention of these factors in the instructional settings enhances the possibilities for designing and implementing appropriately learning environment.

Sharma (2000) gave the list of some factors that affect the achievement of students is like this:

(i) Affecting Factors: Study habits, values, interest, need, stress, adjustment, curiosity, anxiety, level of aspiration, attitudes, achievement motivation, self efficiency, cognitive style, emotional maturity.

(ii) Miscellaneous Factors: Age, gender, caste, culture, local.

(iii) Home Related Factors: Social economic status of family, educational environment, child rearing practices, family size, birth order, gender biases, parental deprivation, parental support, working and non working parents, parents’ attitudes, expectations.

(iv) Time Factors: Time spent, time allowed, time required.

(v) School Related Factors: Teacher’s personality, expectation, attitude, strategies, and experiences, medium of interactions, teacher behaviour and competency, personality, school climate, type of school, homework.

(vi) Cognitive Factors: Reasoning ability, problem solving, creativity, intelligence, attitude, ability. Factors that affect academic achievement can be studied under two broad categories as given in fig. 1.11

![Fig 1.11: Broad categories of the factors that affect academic achievement](image-url)
So, achievement is that particular knowledge, skill or behaviour that a student is expected to exhibit after a specific period of study. As the areas of affective and psychomotor domains are not sufficiently exposed, it is generally a custom to resist the term learning outcomes to the level of achievement of pupils in the cognitive areas of various school subjects. There are many students who pass the examination, yet they fail to achieve as much as they can in terms of their abilities. These students are known as underachiever. They are the persons who are quite capable, but fail to achieve in conformity with capacity for several reasons, perhaps certain non-intellectual factors, which facilitates better achievement.

1.9 INTELLIGENCE

Many efforts have been made time to time to define the term 'intelligence'. The word 'intelligence' is said to be the literal translation for Aristotle's term 'diagnoses'. Plato was the first to begin the discussion on intelligence with his tripartite division of the 'nous' which covered the soul, mind, spirit and thinking as well as that of mental ability (Smith, 1993). Intelligence has been considered the common factor to affect the achievement of the learner. The two terms intelligence and ability are used interchangeably. With the help of them the powers or capacities of an individual can be explained that differ from one individual to another or from one species to another in terms of the range and depth of their operations. The term intelligence is considered to be vague and ambiguous in its meaning. It is a descriptive concept. A psychologist presents it as a theoretical construct which may vary from very low to very high. Generally intelligence conveys three messages: (i) Ability to adjust, (ii) Ability to learn, (iii) Ability to carry on abstract thinking. So, intelligence has been described as the general ability of the organism acting as a whole to utilizing understanding gained in past experience in dealing with a new or similar situation, to adjust or adopt quickly and readily to the environment, to learn without difficulty or to form new behaviour pattern to meet a new situation by modification and readjustment of those already acquired.

Thorndike (1927) intelligence is to make good responses and is demonstrated by thy capacity to deal effectively with novel situation of an abstract.

Freeman (1960) gave a comprehensive three-fold definition of intelligence i.e. the adaptation of adjustment of individual to his environment, the ability to learn and the ability to carry out abstract thinking.
Garrett (1966) states that intelligence is the ability demanded in the solution of problems which require the comprehension and use of symbols i.e. words, numbers, diagrams, equations and formulas. The dimension of individual differences that has received maximum attention of psychologists is intelligence or ability.

Sternberg (1985) defines it as a capacity of an individual consciously to adjust his thinking to new techniques. So, Intelligence is the ability to learn, understand and make judgments or have opinions that are based on reason.

So, intelligence can be considered as the form of mental and cognitive abilities available within an individual that enables him to handle his environment in term of adaptation to face situation as effectively as possible. It is clear from above definitions that intelligence is not a simple entity but a complex function; it is not the knowledge but capacity to acquire knowledge. One more thing is that intelligence is the capacity to do a thing and it is not the actuality. It is not the knowledge but capacity to acquire knowledge. Intelligence in the present study will be measured through Raven’s Standard Progressive Matrices Test (2000), which is based on the assumption of the correctness of Spearman’s principal of no genesis. It provides a suitable measure for comparing people with respect to their immediate capacities, observation and clear thinking.

1.9.1 IMPORTANCE OF INTELLIGENCE

So now intelligence can be considered as a key factor in life of an individual (Arnold & Fonseca (2004). The importance of intelligence can be highlighted in the following manner:

- Intelligence helps an individual to adopt himself adequately to relatively new situations in life.
- It helps an individual to adjust his thinking according to new requirements.
- Intelligence is very helpful in making readjustment to relatively novel situation by organizing new psychological combinations.
- Intelligence helps in making judgments, good sense, initiatives, comprehending and reasoning and in adapting an individual according to circumstances.
- It is only Intelligence through which an individual acquires the techniques for processing information supplied by his senses.
- It helps in carrying out abstract thinking.
- It helps an individual to behave effectively with the people.
Introduction

Through an individual can be divided into normal, sub-normal, dull or bright etc. and a proper caring treatment can be given to dull for making a positive improvement in him.

Achievement of an individual can be calculated through.

It helps the teacher in providing the right or vocational guidance to their pupils.

It is only which helps in emphasizing the necessity of providing the superior individual with adequate opportunities for proper development.

It helps in problem-solving, choice making, advancing the arguments, academics and reasoning etc.

Thus, Intelligence is an important factor, which contributes to the success in life. Intelligence in present study has been measured through Progressive Matrices which is based on the assumption of the correctness of Spearman’s principle. It provides a suitable measure for comparing people with respect to their immediate capacities, observations and clear thinking.

1.10 ACADEMIC STRESS

Education is the complete development of the personality of the child. It is a self-motivated process through which an individual is helped to clarify his potentialities and change them for better knowledge, enlightenment and self realization (Ghaderi, Venkatesh & Sampath, 2009). In schools the child is viewed as an achiever from the time of admission to school to the time of leaving, so it is clear that the process of education itself creates educational stress around the child. Beside that scientific and technological progress all over the world has made man highly sensitive, critical and creative. It has given birth to the never ending race of competition. Even from an early age a sense of achievement is sources of good motivation and self-esteem and failure is a source of anger and frustration i.e. stress (Lakshminarayanan & Prabhakaran, 1993). When the learner face failure, not only feels frustrated but ridiculed by other and become more prone to stress.

According to Cannon (1928) stress is a broad process that involves complex biochemical, physiological, behavioural and psychological dimensions, many of which are directly or indirectly related to health. Cannon (1935) defined stress as physiological as well as emotional or psychological response to various dangers in the environment. Seley (1956) defined stress as the state manifested by specific syndrome which consists of all the non-specific induced changes within a biological system. According to him it is an applied force that tends to strain or deform a body. The resulted deformation of the body is called “strain”. He called it the body’s reaction and can be positive as well as negative and it is generally
Introduction

considered to be negative. He developed the concept of General Adaptation Syndrome (GAS), which consist of their three stages of responding has been given in fig. 1.12

Fig 1.12: Three stages of Seley’s general adaptation syndrome

In the first stage, termed the alarm reaction, the organism becomes aware to the stress and prepares to resist the stressors by mobilizing and activating physiological functioning. In the Second stage i.e. state of resistance; the various coping mechanism are employed in order to achieve suitable adaptation. In the third stage i.e. exhaustion stage; the adaptive reserves are depleted by long term or repeated conflict with stressor and resistance is then no longer possible.

Lazarus (1966) pointed out that stress is a threat, real or implied to the psychological or physiological integrity of an individual. Stress involves a stressor as well as stress response and stressors are generally psychological.

Mechanic (1970) purposes that stress arises when there is some type of discrepancy between individual’s perception of environment demand and his/her perceived ability to meet or cope with demands. Stress occurs when an individual confronts a situation where his usual modes of behaviour are insufficient and the consequences of not adapting are serious.

Cox (1978) perceives stress as a mismatch between demand and coping. Demand is an internal or external stimulus, which is product of our own value system and expectations.

According to Lazarus and Folkman (1984) stress is inharmonious fit between person and the environment, one in which the person’s resources are taxed or exceeded, forcing the
person to struggle, usually in complex ways and to cope with. According to him stress is a feeling of tension that is both emotional/physical. It can occur in specific situations.

According to Cohen and Wills (1985) stress is mental and physical strain resulting from anxiety, work, adjective demands or challenges.

Baum (1990) defines stress as a negative emotional experience accompanied by predictable biochemical, physiological, cognitive and behavioural changes that are directed either towards altering the stressful events or accommodating its effects.

Chrousos and Gold (1992) define stress as the state of disharmony or threatened homeostasis.

Furman (1995) stress is anything that imposes an extra demand on child’s ability to cope with something that is new and different.

According to Papaila, Old and Feldman (2008) stress is one’s physical emotional and mental response to change, weather it is positive or negative. It is the extreme physiological and emotional arousal a person experiences when confronted with threatening conditions.

Stress is often termed as a twentieth century syndrome, born out of man’s race towards modern progress and its ensuing complexities. The term stress has become a part of everyday vocabulary. Stress may be explained as demand made on an organism to adjust, to cope and to adopt. Although stress is not the sole cause of many disorders, it is a significant contributor to their developments. Stress is a general term used to describe tense situations and reaction to them and usually has a very strong emotional content. It implies a rupture in an individual’s capacity to engage in the world.

1.10.1 SOURCES OF STRESS

Stress is caused by lack of control over mind, which becomes prone to senses and impulses. It results from an imbalance between environment demands and personal adequacies to meet those demands. Stress can originate from a variety of sources. Three main sectors from which stress may originate are jobs and organizations, social sectors and intra psychic sector. While Brown (1997) has listed following sources depicted through the fig. 1.13
1.10.2 TYPES OF STRESSORS

Stressors are psychological or physiological circumstances that increase susceptibility to the physical illness such as heart disease as well as psychological problems such as anxiety and depression (Lakshminarayanan & Prabhakaran, 1993). Sometimes they prove more chronic, more disruptive in comparison to any disease. Usually distinction has been made among three types of stressors namely: Catastrophic events: due to earthquake, hurricane etc, Major life changes, positive or negative: marriage, death or divorce and minor hassles: standing in lines, traffic jams or noise etc. These stressors can be primary or secondary. Primary stressors are those, which are likely to occur first in people’s experience such as death of a loved one, involuntary job loss, or injury. Secondary stressors come about as a consequence of the primary stressors. Secondary stressor independently may become capable of producing even more intense stress than those considered to be primary. Although individual situation may differ, certain sources of stress are common for almost everyone; these sources are most often associated with work, time and life events. The stressors have their own specific characteristics of their own. Apart from physiological and hormonal changes, new societal and environmental expectations too become a source of stress for adolescents. Stressors have been divided into broad areas each of which can be applied to more specific situations.
Introduction

(a) **Optimum Arousal Level:** Some people deliberately ignore their limit of stress tolerance and push themselves too hard; others may pass beyond this level without realizing they have done so. Whatever the reason, the consequences are the same: a tendency for the individual to develop a physical or psychological sickness, including headaches, insomnia, fatigue, hypertension, depression etc.

(b) **Life State Changes:** The expression “a change is as good as a rest” may have some relevance here. Quick changes in life can create a lot of stress in individuals’ life. Sometimes a person fails to adapt quick changes of his life and this failure can lead to psychological breakdown.

(c) **Motivation:** When two motives conflict and are not resolved, frustration will occur. The satisfaction of one motive may frustrate the other. Stress may be imposed on greater or lesser degree depending on the three categories of conflict situations i.e. approach-approach category, avoidance-avoidance category and approach avoidance situation.

(d) **Disruption in the Circadian Rhythm:** The circadian rhythm is a biological clock with a natural orderly rhythm of biological process which follows a cycle of 24 hours and which coincide with events in the environment. Serious disruption of a person’s circadian rhythm can be contributory factors to stress.

(e) **Social Stressors:** Stressors, refers to the experimental circumstances that give rise to stress. It can be divided in to two parts such as: (i) **Life events as stressors:** Major life events generally do not tend to be related to the health problems that accompany stress (Krantz, Grunberg & Baum, 1985). Under some circumstances major life events can be a source of stress whether they involve positive or negative feelings. Major life events that are positively stressful actually have beneficial effects, but major life events that are associated with medical problems.(ii) **Daily hassles as stressors:** Daily hassles are little or annoyances hassles that occur practically every day, such as having to make decisions, arguing with friends and family, trying to meet deadlines at work etc. Although a wide variety of daily hassles can be a source of stress, they often involve conflicts between the behaviours of people.

Raina (1983) listed some of the important behavioural psychology and health effects, which have been suggested be linked to the experience of stress and have placed in the following table. 1.4
Table 1.4: Behavioural, physiological and health effects of stress

<table>
<thead>
<tr>
<th>Effects</th>
<th>The Experience of Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Effects</td>
<td>Anxiety, aggression, fatigue, depression, frustration, low self-esteem, threat and tension.</td>
</tr>
<tr>
<td>Behavioural Effects</td>
<td>Accident proneness, drug taking, emotional outburst, excitability, impulsive behaviour and restlessness</td>
</tr>
<tr>
<td>Cognitive Effects</td>
<td>Inability to make decisions and concentrate, frequent forgetfulness and mental blocks.</td>
</tr>
<tr>
<td>Physiological Effects</td>
<td>Increased blood and glucose level, increased heart rate and blood pressure, sweating</td>
</tr>
<tr>
<td>Health Effects</td>
<td>Asthma, chest and back pains, diarrhea, frequent urination, headaches, nightmares, psychometric disorders, ulcers and weakness.</td>
</tr>
<tr>
<td>Organization Effects</td>
<td>Absenteeism, high accident rates, poor productivity</td>
</tr>
</tbody>
</table>

Excessive stress, over a long period of time, has been linked with such ailments as headaches, stiffness, pains, tiredness, lack of energy, skipping of meals, emotional outbursts and an increasing dependence upon smoking, alcohol and loss of appetite etc. On the basis of different stressors, the stress has been divided into different categories depicted in fig. 1.14:

![Fig 1.14: Types of stress](image)

Stress is the internal response of the individual to pressure, when the pressure experienced is greater than normal abilities, stress is there. In the school situations, this pressure may be accountable for individual's success and failure hence. His kind of stress i.e., academic stress is an important factor accounting for variation in academic achievement.
Introduction

Students are constantly under the stress of studies and examinations. Academic stress is more renounced among students in high school levels because of transmitted values of docility, passivity, conformity and lack of interest, adding to their level of frustration while they are in process of preparing themselves to step out of schools and compete for admissions to professional colleges (Cofer & Appley, 1964). They get caught in a race of cut throat completion for getting college seats during this crucial year for better paying jobs as today's society wants only the best.

Academic stress among students is an outcome of many factors such as socio-economic status, number of siblings, ordinal position in the family, IQ of the child, attitude of family towards him, school and education perceived self confidence and competence, atmosphere to studies and social support provided etc. Children suffering from academic stress show signs of emotional disabilities, aggressive behaviour, shyness, social phobia, psychosomatic illness, such as constibution, vomiting, fever, chest pain, abdominal pain dizziness etc (Calaguas, 2013). Academic stress occurs when there is substantive imbalance between environmental demand and response capability of organism. The term academic stress in physical sciences means, a force and pressure exerted upon a person who resists the force /pressure in his effort to maintain his original state and in the process suffers some degrees of discomfort (Cofer & Appley, 1964).

Academic Stress has been defined as mental stress with respect to some anticipated frustration associated with academic failure or even an awareness of possibilities of such failure (Gupta & Khan, 1987). The stress is an outcome of the number of factors like negative consequences of failure, future life and self responsibility of failure. Some of the factors responsible for academic stress have been shown in fig. 1.15

Fig 1.15: Factors responsible for academic stress
According to Bisht (1987) academic stress reflects subject’s perception as well as his way of coping with academic events: it reflects subjective feelings of distress or interpersonal perceptual responses. Stress scale given by her include following components such as (i) Frustration items are based on delays, lack of resources, loss and failures. (ii) Conflict items relate to three types of conflict: approach avoidant, double approach and double avoidant conflicts. (iii) Pressure items are on competitive achievement, sustained concentration of efforts and rapid changes. (iv) The worry items of anxiety are concerned with the conscious concern about consequences, negative expectation and negative self-evaluation. The factors like writing term papers, test anxiety, poor study skills, excessive academic load, professions and classroom environment were reported to be the cause of academic and achievement stress in adolescent students (Edmonds, 1984; Archer & Lamin, 1985).

Academic stress is a mental distress with respect to some anticipated frustration associated with academic failure, anticipation of such failure even on awareness of the possibility of such failure (Gupta & Khan, 1987). In the context of school, academic stress means a pervasive sense of urgency to learn all things, which are related or prescribed by the school (Shah, 1988).

According to Chrousos and Gold (1992) academic stress is that imposes an extra demand on child’s ability to cope often something that is new and different. They considered stress as a reaction to an event or a perceptual phenomenon arising from a comparison between the demand on the person and his ability to cope with it.

No doubt that scientific and technological progress all over the globe has made man highly sensitive, critical and creative. Associated with this growth is the emergence of academic stress. The term has become a part of everyday vocabulary. The concept of academic stress may differ according to the individual’s state of contexts and interpretation. Academic stress may damage person’s self and ruin his life (Rajendran & Kaliappan, 1991). Life of the present student is quite stressful. According to psychologists a student is caught in a dynamic technological whirlpool and seems to be precariously poised on the brink of disaster. In school situation the pressure may be accountable for individual’s success or failure.

1.11 REVIEW OF RELATED LITERATURE

The term ‘review’ means to organize the knowledge of specific area of research and to evolve an edifice of knowledge. It saves us from stagnation, brings about changes and
advancement in the existing patterns of the society in all spheres. Information about the findings of various research studies get accumulated over a period of time in the form of books, abstracts and other forms of records. Block (1971) explained that to make our research effective and presentable adequate familiarity with all the research works done up in that field of study is very important. Review of related literature provides guide lines to hypotheses, suggestive methods of investigation and comprehends data for interpretive purpose. The review of related literature helps the investigator such as: to define the limits of the field. It helps the researcher to define and to delimit his problem, to avoid unfruitful and useless problems areas, to avoid unintentional duplication of well established findings, to know about the tools and instruments that proved useful and promising in the previous researches, to know about the recommendations of the previous researchers for further studies, to formulate an appropriate research design and to locate the sources of data and to collect the pertinent data useful in the interpretation of results.

The review of literature has been considered as a very significant aspect of the research process. It helps the researcher by giving him information about the status quo of knowledge in the area he intends to study. To review the literature, for conducting research is a must for every research workers, so as to build the background for the project in hand. A review of some of the researches related to the variables under the study has been discussed under these sub headings:

1.11.1 Studies Related to Mastery Learning Strategy and Achievement
1.11.2 Studies Related to Online Mastery Learning and Achievement
1.11.3 Studies Related to Intelligence
1.11.4 Studies Related to Academic Stress

1.11.1 STUDIES RELATED TO MASTERY LEARNING STRATEGY AND ACHIEVEMENT

Block (1971) explained that in spite of the unstable backgrounds possessed by the subjects, mastery learning strategy proved effective in bringing most of the students to a high degree of achievement by the end of the course. In his research he found that mastery learning strategy helps the students to have same performance of students learning under conventional, group based instructional approaches. He studied that the effects of mastery and aptitude on achievement in an introductory college Geography course. The study was strongly in favour of the evidence indicating that mastery treatment had some impact on achievement scores of the students.
Introduction

Block and Burns (1976) submitted that the students who learn in an mastery learning environment exhibit greater content learning then to the students involved in more traditional environment.

Denton and Seymour (1978) tried to establish if the acquisition of higher order intellectual processes is reasonable for secondary level teaching candidates when the independent variables are unit pacing and different remedial strategies are there for mastery learning. The result of this study indicates that the remediation strategy which specifies in detail how to correct deficiencies appears to the most appropriate for time compressed programs. He indicated that students taught through traditional method did equally well in terms of achievement as the students taught using mastery learning and a tutorial laboratory strategy.

Singh (1983) studied and compared the effect of Bloom’s mastery learning strategy, programmed instruction and conventional methods of teaching on certain non-cognitive variables of high school students. 181 students of grade 9th were matched on the basis of general mental ability and divided in three groups of 30 each on the basis of subject to subject matching. The three groups were assigned to different teaching strategies at random. The data revealed that Bloom’s mastery learning strategy, program learning and conventional method of teaching did not significantly affect the self concept of students. Bloom’s mastery learning strategy performed significantly better than programme learning for increasing achievement motivation than programmed learning and conventional group.

Dunkelberger and Heikkinen (1984) studied the influence of repeatable testing on retention through mastery learning programme. Achievement was compared between subjects who were allowed to repeat tests and the subjects who were allowed only one attempt at the test. Results of the study revealed that there was no significant correlation found between achievement and repeatable testing meaning thereby that achievement gains obtained from mastery learning are related to a combination of remediation and retesting and not retesting alone.

Yadav (1984) explained the effects of mastery learning strategy in teaching mathematics. In the study the experimental group was taught by mastery learning strategy and the control group by using the conventional method of teaching mathematics. The results of the study revealed that the group of pupils taught through mastery learning strategy showed significantly higher gain scores on criterion achievement test than the group of pupils taught through conventional approach.
Fuchs, Fuchs and Tindall (1986) studied the effect of mastery learning procedures on performance among high and low achievement students. 49 students were assigned to alternative mastery learning treatment and 39 students were assigned to typical mastery learning group. The study reported that within the regular education classrooms DBI resulted in better outcome scores than did the use of typical mastery learning procedure for low but not for high achieving pupils.

Salim (1988) calculated the effect mastery of learning on the achievement in chemistry of secondary school students. The result of the study shows that mastery learning students have significant achievement gains in chemistry across all achievement tests.

Sangwan (1992) in her study on 6th class students revealed that students taught through mastery learning have significantly higher mean gain score on the criterion test of general science than the pupils taught by conventional method.

Deshpande and Bhat (1994) studied the effectiveness of mastery learning strategy on students of low and high social economic status. Two groups of 8th standard students classified as low and high on social economic status were taught through mastery learning strategy. The results indicated that when intelligence is controlled mastery learning strategy proves effective for both the groups but more so for the high social economic status group. The study revealed that mastery learning strategy helped the low social economic status students to raise their self concept significantly.

Salvin (1994) studied a theory connecting four alterable elements of classroom organization and instruction to instructional effectiveness. Those elements were the quality of instruction, appropriate levels of instruction, incentive and time. Evidence on classroom strategies and behaviours that contribute to each element was reviewed, and the quality of instruction model was applied to discussions to see the effects of individualized instruction, ability grouping, and tutoring.

Lazaowitz, Baird, Bowlden and Lazaowitz (1996) examined the effect of using group mastery learning on the achievement of high school students. The results of the study revealed that group mastery learning students did better in some topics as compared to individualized mastery learning, although their method stressed more on students cooperative skills than mastery of the content.

Banerjee, Vidyapati and Vidyapati (1997) worked together on a comparative study to see the effect of lecture and cooperative learning strategies on achievements at the undergraduate level was undertaken with 68 first-semester students in a teacher preparation
Introduction

course. The results of the study revealed that the overall achievement scores were similar in the two classes of different learning strategies.

Pezeshki (1998) investigated the effect of an innovative approach of teaching college algebra on the achievement of Mexican-American students as compared to the traditional approach. A total of 213 students participated in this study. Results indicated that cooperative learning and mastery learning were effective teaching strategies. These two strategies were used by the investigator as the innovative approach to teaching college algebra to Mexican-American students. Studies conducted to see the achievement effects of mastery learning and cooperative learning found significantly better achievement in treatment classes than in control classes. The mean scores on the post-test of the students enrolled in the treatment groups were higher than the mean scores on the post-test of those enrolled in the college groups.

Sharma (1998) compared the effect of Bloom’s mastery learning strategy and Keller’s personalized system of instruction on learning outcomes in relation to stress. In the end of the research the investigator concluded that both mastery learning strategies were effective than traditional classroom teaching. Though Keller’s personalized system of instruction was found better for longer retention as compared to Bloom’s mastery learning strategy and conventional instruction. Students who achieved positive results through mastery learning strategy were not found affected by stress in any case.

Kohli (1999) studied the effectiveness of self learning models on achievement in geography in relation to mastery and non mastery teaching strategies, intelligence and study habits. 200 senior secondary students were computed through $2 \times 2$ factorial design. The findings of the study proved that mastery strategy was superior to non-mastery strategy in teaching geographic concepts. Intelligence was found to be directly proportional to achievement in mastery learning strategy instead of non mastery strategy.

Mckenzie (2000) examined achievement and affective domains of high school Algebra- I in traditional or self paced mastery learning program. Anxiety and student's attitude towards mathematics were also investigated. Two classes of Algebra- I were taught using traditional methods of instruction and two classes were taught using a self paced mastery learning program. The results of the study indicated that students in the traditional classroom scored significantly higher than the students taught through the self paced mastery learning programme.
Vibha (2001) investigated the consequence of mastery learning strategy on achievement and self-efficacy in English in relation to their entry behaviours. The investigator took the total sample of 235 students and concluded that three levels of entry behaviour was adequate, average and inadequate entry behaviour resulted in almost equal achievement gain means of students.

Bineeta (2002) studied the effect of mastery learning on achievement in environmental science, self concept and classroom trust behaviour of grade 5th class students. The result of the study shows that mastery learning students have significant achievement gains across all achievement tests.

Dutt and Kumar (2002) studied the efficacy of mastery learning strategies on achievement in Economics in relation to cognitive styles. It was found that Keller’s personalized system of instruction was found better then to the Bloom’s strategy.

Kaur (2003) investigated an experimental study on 75 students in experimental group and 75 students in controlled group studying in 10+1 class of senior secondary school of Moga district of Punjab. After conducting the study the investigator found that systematic program of self concept boosting plan increased the academic achievement of experimental group to a significant level.

Saini (2004) conducted a study on efficacy of modular instructional strategies of teaching English in relation to achievement motivation and cognitive style of secondary school students. After the successful completion of the study the investigator found that three instructional strategies proceeded significant variation among the mean achievement scores and retention scores of the learners of three groups. Thus, after the experiment it was found that the achievement and retention of students is affected by different strategies adopted by teacher.

Kazu, Kazu and Ozdemir (2005) together studied the effect of mastery learning model on the success of the students who attended ‘Usage of Basic Information Technologies” Course. The findings of the study illustrate a significant difference in favour of the experimental group instead of the control group.

Kalina (2005) conducted a study to see the effectiveness of mastery learning strategy and inquiry training model on pupil’s achievement in science. The study was conducted on a sample of 90 students of class 8th from a school of Rohtak. Pre-test post-test was intervened
by instructional treatment. In the end of the investigation the study indicated that mastery learning group did significantly better than inquiry training and control group.

López and Tashakkori (2006) studied the consequence of two types of bilingual programmes on the academic achievement of fifth grade students. After conducting the two programmes the investigator found that despite of some similarity in effects, each of bilingual programme also has unique effect.

Adeyemi (2007) in his study tried to apply mastery learning approach on student's to judge their performance in social studied. A unit of peculiar to degree students in social studies was taught. The research design was the protest only that controls group design, which allows research to be conducted without any pretest. Results showed a clear-cut conclusion on the effectiveness of mastery learning approach on student's performance as students in the two categories performed better in social studies compared with conventional approach to learning.

Wambugu and Changeiywo (2008) conducted study to find out the effects of mastery learning on student's achievement in Physics. The results of the study shows that mastery learning teaching method resulted in higher achievement and a physics teacher should be encouraged to use and should be implemented in all teacher education programme in Kenya.

Komolafe and Yara (2010) the study investigated the impact of sentence combining instructional strategy on primary school pupils’ achievement in written English in and attitude to composition writing. The study adopted a pre-test, post-test control quasi-experimental design. The results showed that there was significant main effect of treatment on pupils achievement in written English expression and there was significant main effect of gender on pupils’ attitude to written English expression. There was significant interaction effect of treatment and gender on pupils’ attitude to written English expression.

Frick, Frick, Renee and Dey (2011) studied stress and stress-relieving mechanisms among second-year pharmacy students by using a Mastery Learning educational Model and to compare findings with those from a 4-year program. Second-year PharmD students in a 3-year program were asked to complete a series of questionnaires including the Perceived Stress Scale (PSS) regarding stress and stress-relieving activities. Students in a 3-year PharmD program with a unique educational model experienced more stress than students in a traditional 4-year PharmD program. Questionnaires including the Perceived Stress Scale (PSS) regarding stress and stress-relieving activities were used. Students in a 3-year PharmD
Introduction

program with a unique educational model experienced more stress than students in a traditional 4-year PharmD program.

Lubna and Arshad (2011) this study aimed to find out the effects of mastery learning strategy on students’ achievement in the subject of mathematics at elementary level. The study was of pre-test post-test equivalent group design. Finding of the study reveals that the students exposed to mastery learning strategy performed better then the students taught through conventional strategy. The result was found significant at 0.05 levels. The researcher concluded that mastery learning techniques is an effective teaching technique at elementary level in the subject of mathematics and it should be implemented in all subjects.

Sakiz (2011) this study explored the associations among achievement approach goal orientations, academic self efficacy beliefs, and academic help seeking behaviours of Turkish college students. The findings showed that mastery approach goal orientation was significantly positively associated with college students’ perceived academic self-efficacy beliefs and academic help seeking behaviours. Performance approach goal orientation, on the other hand, was not significantly related to academic self-efficacy beliefs but significantly negatively associated with students’ academic help seeking behaviours.

Sadeghi and Sadeghi (2012) explained that the main purpose of the study was to gather, analyze and interpret the perceptions of the students about mastery learning held by 240 students randomly selected from each of the population of different faculties in Guilan University. The finding of the paper indicate that mastery learning promotes better quantitative results in English for surface learners, there are dangers. One of the main aim of learning to increase higher level cognitive processes seems actually to be discouraged in this mode.

- Review of Researches

indicated that students taught through traditional method did equally well in terms of achievement as the students taught using mastery learning and a tutorial laboratory strategy. Singh (1983) and Sangwan (1992) Bloom’s mastery learning strategy performed significantly better than program learning for increasing achievement motivation than programmed learning and conventional group. Fuchs, Fuchs & Tindall (1986) and Salim (1988) found that students in the mastery environment performed significantly better. Salvi (1991), Deshpande & Bhat (1994) and Salvin (1994) recommended the use of mastery learning technique as a better method of teaching English language syntax. Banerjee, Vidyapati & Vidyapati (1997), Pezeshki (1998), Mckenzie (2000) and Lazaowitz, Baird, Bowlden & Lazaowitz (1996) found that group mastery learning students did better in some topics as compared to individualized mastery learning, although their method stressed more on students co-operative skills than mastery of the content. Kalia (2005), López & Tashakkori (2006), Adeyemi (2007) and Wambugu & Changeiywo (2008) indicated Mastery learning group performed significantly better than Inquiry training and control group.

1.1.1.2 STUDIES RELATED TO ONLINE MASTERY LEARNING AND ACHIEVEMENT

Cotte (1992) conducted a study to see the effect of local area network computer linkage on student performance during computer based instruction. In this study the investigator investigated various performance and achievement effects of an experimental system which were designed to enhance social instruction during computer based instructions. Using a local area network in which subjects used individual computers, each computer and programme was linked to all other computer in the network. The investigator found that the system was effective and allowed student to share information through the medium of network.

Clayton (1993) studied the effect of computer assisted instruction on reading and mathematical achievement and attitude for low socio-economic students. Findings if the study revealed that computer assisted instruction improved reading for students at the fourth grade level and increased positive attitude towards reading. The computer assisted instruction in grade 2, 4 and 5 made significant improvement.

Smith (1999) conducted a study to see the effectiveness of traditional methods in an online learning environment. In this investigation all the students participated in both traditional and online interventions. The results of the investigation revealed that overall, there was no significant differences between experimental and control groups on overall
scores. Traditional methods, such as those used in this study, produce similar academic outcomes when delivered through online learning environment.

Smith, Smith and Boone (2000) together compared the effectiveness of online instruction and traditional classroom instruction. For successful conduction of the research 58 re service education students were taken who were a part of the course on educational technology integration using three traditional instructional methods such as : lecture, guided instruction and collaborative discussion. Student academic outcomes were the same in both online and traditional settings. Some advantages were found to online discussions in contrast to face-to-face discussions.

Rothman (2000) compared the impact of computer based verses traditional textbook science instruction on selected student learning outcomes. The study was designed to examine the impact of computer based science instruction. At the end of the study it was found that non-traditional, computer based instruction in science significantly improved student’s attitude towards science learning and their level of English language development.

Page (2001) studied the effect of online instruction into a Kansas Community College. It was a naturalistic study. The study conducted with on-line instruction at the community college was developed through an experimental approach. The study also found that many facilities base their judgment of the quality of on-line instruction on its ability to replicate a traditional classroom experience rather than a more objective outcome of teaching effectiveness.

Goldberger (2001) conducted a study to see the effects of an online instructional program on content mastery in Kinesiology. The purpose of this study was to compare the effects of two instructional approaches on content mastery in college students. Two intact groups of 30 college students were presented a unit of Kinesiology content using either a traditional lecture approach or an online approach to learning. The finding of the study revealed that both groups mastered the content, but the online group performed at a slightly higher level.

Dara -Abrams (2002) examined whether the theory of multiple intelligence can be applied in a similar manner to an online learning environment. The study was conducted in
three stages. Findings of the formative evaluation indicated that further application of the theory of multiple intelligence, the entry point and framework.

Kelly and Schorger (2002) explored the educational personality traits and learning performance in relation to perception of online learning. Results of the study indicated that the majority of students in the on-line section learned more than the traditional section.

Neuhauser (2002) conducted a study to see the effectiveness of learning style through online and face-to-face teaching. Both sections were taught by the same instructor and used the same instructional materials. The results of the study revealed that there was no significant differences in test scores, assignments, participation grades, and final grades, although the online group's averages were slightly higher. Ninety-six percent of the online students found the course to be either as effective as or more effective to their learning than their typical face-to-face course.

Salsbury (2002) studied on-line instruction to teacher directed instruction for teaching elementary geographical place new vocabulary. During these online instructions, students were taught to use drill and practice strategies via the two methodologies to identify and label geographical places on world maps. Over all data analysis of the study revealed the significant difference between the two methods of instruction when compared two each other. Gain in pretest to posttest scores for on-line instructions was greater from teacher directed instructions.

Beard (2003) conducted a study to see the differences in the performance of Taxaus high school students in online courses and traditional classroom. In the study non-experimental, ex-post facto study, two nonparametric tests were employed to conclude that if a significant difference exists between the performance of students groups. In the end of the study he found that there exists no significant difference between the performances of students groups.

Buckley (2003) investigated student's perception of their learning in an online classroom and how it correlates with the seven principals of effective instructions. Findings indicated that an instructor would ultimately acquire as a level of experienced based perception that as an activity has pedagogical value. The implications of the findings were that it is not only important to create an interactive environment for learning but it is also important to design discussion activities that can trigger rich and meaningful online discourse. The seven principles of effective instructions used in an online environment will
have a positive outcome to the learning experience of students. Students responded well to the principles and it established a good framework for the following of instruction.

Lebec (2003) studied the effectiveness of online environment in learning Biology. This investigation examines learning in an online Biology course designed to help teachers preparing for science certification exams. Findings of the study indicated that participants experienced gains in declarative and conditional knowledge.

Liu (2003) conducted a study in which he developed an online course using a modified version of Keller's personalized system of instruction. Keller's personalized system of instruction (PSI) uses small units of instruction, self-pacing, mastery learning, lectures for motivation, and proctors for immediate feedback. This developmental dissertation resurrects Keller's system in its purest form and uses personalized system instruction for an online Master’s program. Experts of personalized system instruction reviewed the product to check for fidelity to Keller’s ideas. Formative and summative evaluation showed that this system of instruction is viable for the online environment.

Mannan (2003) described the learning of students in two online course at a multi-campus, two year technical/community college. The study focused on student learning behaviours and adjustments. The interaction between students and instructors in a technical writing and an online –course through online observation, face to face interviews, time logs, reflected e-mail journals, surveys and analysis of article material. The results showed that although online learning is not for all students but those who adapted to online learning environment they achieved higher and got deep learning experiences.

Zavaraki (2003) studied use of network communication in academic transaction by university teachers and its impact on learning outcomes of post graduate students. The research was conducted on various university teachers of different ages and streams. The result showed that the use of network communication enhances the learning outcomes of the students who were associated with network communication user faculty teachers and performed better on the test of knowledge and applicants of computer as compared to their counterparts who were associated with network communication user faculty teachers and performed better on the test of knowledge and applicants of computer as compared to their counterparts who were associated with network communication non-user faculty teacher.

Cooper (2005) examined the role of learning style, content delivery method and pre-instructional strategy on receipt and satisfaction in online learning environment. This
research indicated a strong relationship between learning styles, recall and satisfaction. Online learning self-efficacy was found to play an important role with recall and satisfaction in the online learning environment. Content delivery method also affected content satisfaction.

Ferreira (2005) studied the effectiveness of teaching basic micro skills and empathy development in an online environment. Results of the study indicated that there is no significant micro skills development when comparing with traditional classroom to the online learning environment.

Liu (2005) studied the process oriented e-learning system from mastery learning perspective. The study focuses on the pedagogical method of mastery learning and proposes an e-learning system architecture which considers the concept of process management and the applications of mobile device for supporting this pedagogical method. This study also offers a scenario to explain how to use this e-learning system to fulfill mastery learning strategy in e-learning environment.

Sooyoung (2005) studied the relationship between enactive mastery experiences and online-course self-efficacy. A total of 94 mid-Illinois university students participated in the research. Pearson's correlation and multiple regression analyses were employed. Among the experiences, only online course experiences were found to be significantly and positively related to online-course self-efficacy.

Ghani, Hamim and Ishak (2006) studied the application of mastery learning model in developing e-tuition science for primary school students. It has been developed in order to help teacher and students in the teaching and learning process. The main aim is to make sure that students get the knowledge transferred by the teachers. This research concludes that the combination of online learning in science and mastery learning proved helpful to the people involved in the learning session.

Grover (2006) studied the impact of teacher-monitored on-line instructional programme on various life skills and academic stress of secondary school students. Findings indicate that teacher-monitored on-line instructional programme strongly impacted the learning of these students in online learning environment.

KarTin (2006) this study explores how an online integrated learning environment (ILE) to cater for individual learning differences is used by teachers in two primary schools in Hong Kong. The findings reveal a positive change in both perception and pedagogy of the
participants. The results indicate that scaffolding activities led to an enhanced ability to engage in independent learning.

Kilburn (2006) explored the student’s participation about online courses and compared online course with the traditional one. The participants consisted of students, taking a course offered online or in the traditional classroom settings. The majority of students agreed that there is frequent student-teacher interaction and instructor proved helpful in online course. However students learned as much in an online course as they did in traditional classroom course and the academic quality and learning experiences is as good as traditional courses.

Brinkman, Rae and Dwivedi (2007) Studied the web-based implementation of the personalized system of instruction through a case study of teaching mathematics in an online learning environment. To examine students’ behaviour, learning strategies, attitudes and performance, both qualitative and quantitative techniques were used as a mixed methodology approach, including in-depth interviews, controlled laboratory observations, surveys, diary studies, classroom observations, recording online usage behaviour, and learning assessments. The finding shows that web-based implementation of the personalized system of instruction helps the students to increase understanding of subject.

Paul, Wade, Janet and Steven (2007) studied mastery with meaning: access to mathematics online. This paper details how the research affected the design, development and implementation of a new online approach developed for the mastery program at Colorado State University.

Boyle (2008) studied effectiveness of online tutorial to improve teacher knowledge of seating for elementary school students. Online instructions improve knowledge, behaviour and attitude towards seating.

Dag and Gecer (2009) explain that this research aims to designed online learning environment based upon learning style increase substantially. In this research both of these research approaches have been examined. After the research it was found that improvement of academic achievements in online learning not only learning styles by itself are utilized online learning and also motivation of the learner, demographic factors, teaching strategies and teaching methods should be considered.
Scrima (2009) studied the implementation of a mastery model through self quizzing in an online learning environment. The study evaluated the effects of adding a mastery learning component to an introductory college course by using an online course management system to facilitate frequent, self-given, chapter review quizzes. Thirty-two first- and second-year college students of similar demographic makeup at a midsize community college were the participants for this study. An alternating treatment design was used to assign students to mastery and non-mastery conditions in two sections of an introductory psychology course. The effectiveness of this strategy was measured by assessing the differences between the treatment conditions using unit and final exam scores compared to the counterbalanced control conditions. No apparent differences between treatment conditions were found.

Zhang and Kenny (2010) explored the learning experiences of three international students who were enrolled in an online master’s program offered by a large university in Canada. Findings indicate that previous education and especially language proficiency strongly impacted the learning of these students in online learning environment.

Chou (2012) explains how engineering student’s self-directed learning abilities relate to their learning achievements in the existing literature. To add knowledge base regarding self-directed learning to current engineering educational research, this research attempts to employ two experimental studies to explore the effect of self-directed learning on engineering student’s online learning. The result of the study reveals that a positive relationship exists between engineering students’ self-directed learning abilities and online learning performances.


1.11.3 STUDIES RELATED TO INTELLIGENCE

Sodhi (1976) in the study of programme learning in chemistry in relation of taxonomy of educational objectives, intelligence and personality found that intelligence was related to academic achievement of students.

Sansanwal (1978) found that the mean achievement scores of students belonging to high intelligence group was significantly higher than that of average and low intelligence group students and also that the mean achievement of average intelligence students was significantly higher than that of low intelligence group.

Sharma and Aggarwal (1980) found in the study that (i) the performance of students on different taxonomic categories of cognitive tasks varied directly with intelligence. (ii) The interaction between intelligence and school achievement had significant impact on the performance in cognitive tasks in Algebra at the knowledge level but not at comprehension and application level.

Dixit (1985) stated that in general intelligence test scores of boys were higher than those of girls. In case of both there was high correlation between intelligence scores and academic achievement. In girls there was average correlation between test scores and academic achievement.

Gakhar (1986) conducted a study on the relation between intelligence and academic achievement of college students undertaking different courses and found significant correlation for science, commerce, arts and home science groups.

Yadav (1987) revealed that intelligent students were found to be having more achievement scores in mathematics than low intelligence students irrespective of mode of instructions, level of thinking and types of personality.
Chadha (1990) reported intelligence and scholastic achievement were found to be highly correlated when creativity was partially out. He concluded that intelligence is having a positive and significant correlation with scholastic achievement.

Balasubramaniam (1993) conducted a study on pupil’s academic achievement in English in relation to their intelligence. The study on 600 class 12th students from 16 high schools and found that intelligence of pupils have positively influenced on the academic achievement in English.

Chopra (1994) conducted a study on 150 students of IX Class and found that intelligence significantly affects achievement of students in English structures. She found that high intelligence group performed better on the achievement test in English structures as compared to low intelligence group.

Bogaards (1996) studied intelligence, social class and social context measureable effect on success in Foreign Language learning at school. The researcher found three influences on language learning that is Intelligence attitude; and independence of teaching techniques. It was found that they have measurable effect on success in foreign language learning at school.

Ojha (1996) studied development of instructional material for teaching economic to class 9th through concept attainment model in relation to achievement, retention, self-concept and attitude of students towards Economics reported that a significant correlation exists in between teaching through concept attainment model and intelligence.

Bajwa (1998) studied academic achievement in Physics in relation to intelligence, creativity and aptitude for physics at the senior secondary stage and found that intelligence was positively and significantly related to academic achievement.

Francisco and Elaine (2000) this study examined whether college students' learning styles and thinking styles were interrelated, and if these could predict academic achievement. A total of 210 college students completed two inventories, one of LS (LSQ, Kolb), and the other of TS (MSG, Sternberg). The results of canonical correlation analysis revealed the presence of a moderate relationship between both types of styles. The results of regression analysis indicated that students' academic achievement was related to students' thinking styles. Students that prefer to work individually (internal), that do not enjoy creating, formulating, and planning for problem solution (Legislative in a negative sense) and those that have adherence to existing rules and procedures (Executive) were those which obtained higher academic achievement.
Diseth (2002) investigated the relationship between intelligence, approaches to learning and academic achievement. Factor analysis supported a one-factor solution of the three intelligence tests as an expression of general intelligence. No relationship between general intelligence and approaches to learning was observed. The WAIS vocabulary test of intelligence and the surface approach to learning were negatively correlated. The WAIS vocabulary test of intelligence and the surface approach to learning predicted academic achievement. A curvilinear relationship between surface approach and academic achievement was observed. Multiple regression analysis showed interaction effects between deep-strategic and surface-strategic approaches to learning as predictors of academic achievement. The findings support the construct validity of approaches to learning due to its independence of intelligence.

Farsides and Woodfield (2003) investigate the roles of intelligence and motivations in predicting academic success are well established. Evidence is, however, mixed concerning the role of personality traits in predicting such success. The current study attempted to overcome various methodological limitations associated with many previous studies to examine the potency of the traits of the ‘five factor model of personality’ in predicting academic success up to 3 years later, both directly and when controlling for intelligence and ‘application’. The impact of Agreeableness on Final Grades was wholly mediated by the main application measure; namely, not missing seminars. Less than one fifth of final grade variance was explained by all the individual difference variables in combination. Several practical, theoretical, and future research implications are explored.

Arnold and Fonseca (2004) in this study Gardner’s Multiple Intelligences Theory is presented as a cognitive perspective on intelligence which has profound implications for education in general. More specifically, it has led to the application of eight of these frames to language teaching and learning. In this study they argued in favour of the application of Multiple Intelligences Theory, using as support some of the major insights for language teaching from brain science.

Kohli (2005) concluded that learning with computer assisted model and concept attainment model changed the aptitude and interest of students. Unlike conventional method, students got feedback and remedial teaching which automatically improved their achievement and promoted their self concept.
Introduction

Mehra and Mondal (2005) indicates that the high intelligence group taught by teacher directed instruction and followed by peer tutoring performed better than the low intelligence group taught by traditional instruction.

Castejón, Gilar and Pérez (2006) this work presents the main theories and models formulated with the purpose of offering a global overview on the acquisition of knowledge and skills involved in the initial development of expert competence. The results obtained in a sample of Master students reveal that the several variables intervening, such as the qualitative organization of knowledge, intellectual ability, motivation, the deliberate use of strategies, and a rich learning environment, contribute in an independent way to provide an explanation for the acquired knowledge.

Diana (2007) writes over the past decade international discussions of pedagogy have increasingly clustered around a few ubiquitous and popular ideas drawn ostensibly from psychological research, multiple forms of intelligence, learning styles, learning preferences, thinking skills, brain functioning, emotional intelligence and neuro-linguistic programming.

Tomporowski, Davis, Miller and Naglieri (2008) studies that examine the effects of exercise on children’s intelligence, cognition, or academic achievement were reviewed and results were discussed in light of (a) contemporary cognitive theory development directed toward exercise, (b) recent research demonstrating the salutary effects of exercise on adults’ cognitive functioning, and (c) studies conducted with animals that have linked physical activity to changes in neurological development and behaviour. Exercise may prove to be a simple, yet important, method of enhancing those aspects of children’s mental functioning central to cognitive development.

Saricaoglu and Arik (2009) investigate the relationship between student’s gender and intelligence type, the relationship between particular intelligence types and students success in grammar, listening and writing in English as a foreign language and the relationship between parent’s education and student’s type of intelligences. No significant gender differences in the intelligence types held by the participants except for that between gender and linguistic intelligence which was positive. Finally no significant relationship was found between parental education and student’s intelligence types.

Bas and Beyhan (2010) investigate the effects of multiple intelligences supported project-based learning and traditional foreign language-teaching environment on students’ achievement and their attitude towards English lesson. The results of the research showed a significant difference between the attitude scores of the experiment group and the control
group. It was also found out that the multiple intelligences approach activities were more effective in the positive development of the students’ attitudes. At the end of the research, it is revealed that the students who are educated by multiple intelligences supported project-based learning method are more successful and have a higher motivation level than the students who are educated by the traditional instructional methods.

Zahedi and Fallah (2011) concluded that enhancing EFL learners’ linguistic intelligence and morphological awareness tend to ameliorate their vocabulary knowledge. This in turn may lead to better academic achievements. Such research findings can help researchers, teachers and education programs in implementing practical strategies and programs for increasing morphological awareness among EFL learners.

Tatlah, Aslam, Ali and Iqbal (2012) studied the influence of intelligence and creativity on the academic achievement of the students. Findings of the study revealed that when intelligence and creativity are combined they effect the academic achievement of the students. It was recommended that they should be taught separately to have positive results.

- **Review of Researches**


### 1.11.4 STUDIES RELATED TO ACADEMIC STRESS

Singh (1983) studied the effect of mastery learning strategy on certain non cognitive variables of high school students. He tested the effectiveness of the strategy with the subject
Introduction

of social studies with students of 9th class and found that it resulted in higher achievement of students.

Salim (1988) studied the effect of mastery learning strategy on the Chemistry achievement of secondary school students as related to their gender and aptitude. The investigator found that the mastery learning students had significant achievement gains in chemistry. Although female and male students did significantly better through mastery learning strategy.

Elias (1989) in a research on school as a source of stress to children: An analysis of causal and ameliorative influences found that major strains of adolescence include over emphasizing of success in schools and lack of support.

Rajendran and Kaliappan (1991) conducted their study on sixth and ninth grade boy’s students to identify the various areas of academic stress and found four main stress factors i.e. personal inadequacy with proportion of variance 29.4, fear of failure 26.8 interpersonal difficulties 21.1, and in adequate study facilities 14.7, the final form of scale consisted of sixty seven items describing the various areas of stressors.

Lemay (1993) in a study entitled stress, temperament and achievement reported that three out of five categories of stress were predicative of achievement. It was the based on stress categories which viewed stress in terms of its potential for emotional impact that emerged more frequently as predictors for achievement.

Frazier and Schauben (1994) investigated the stressful life events and psychological adjustment among adolescents and found that the five most frequently named stresses were the pressures, financial problems, failing a test, being rejected and relationship breakup. It was found that undergraduate are a stressed population.

Bector (1995) in a study of academic stress and compared the Government and Public School children of ninth grade of children and reported that Government school subject do not differ significantly in their levels of academic stress and feel moderate academic stress in the present system of education.

Orschel (1996) investigated the perceived sources of stress of division 11 collegiate track and field athletes in the pre-competitive state. The tools were administered to the 53 members of the men’s and women’s. The finding suggested that teammate rejection and fear of failures item were listed more frequently as source of distress. Performance achievement, team climate and material reward items were chosen the greatest member of times as source of stress removal.
Harvilchuck-Laurenson (1997) in a study entitled the relationship of stress, social competence and health status with adolescents. Academic achievement revealed that stress, social competence and health status was positively correlated with the overall grade point average of each students.

Gera (1998) in a study entitled achievement of 9th graders in relation to classrooms environment and academic stress of students concluded that classroom environment and variable of academic stress i.e. frustration, anxiety, conflict and pressure significantly influenced the academic achievement scores of students.

Bohannon (2000) in a study on the relationship of school related stresses to discipline referrals, attendance, grade point average and under achievement among high school students revealed that school students revealed that school related stressors had a positive significant correlation with discipline referrals, attendance and under achievement among high school students. However there was no significant correlation between school students. However there was no significant correlation between school related stressors and grade points average of students.

Hesselberg (2000) explored relationship among a set of stress related and demographic variables as predictors of academic achievement in 69 female nursing students. The perceived stress, role strain, role involvement and demographic variables were correlated with examination scores and semester grade point average. Positive correlations were found between perceived stress and role strain, race, grade point average and academic achievement.

Kaur (2000) in a study entitled academic achievement and self esteem of IX grades in a relation to different dimensions of academic stress concluded that academic achievement of secondary school students was different under high, average and low academic stress condition. The mean achievement score of low stress group was higher as compared to that of high stress group.

Misra, McKeen, West and Russo (2000) examined the perception of academic stress among male and female college students and compared academic stress of the faculty and student. The sample consisted of 249 students and 67 faculty members. Results indicated that faculty members perceived the students to experience a higher level stress and display that faculty reaction to stressors more frequently than the students actually perceived. It also supported hypotheses that stress varied across in year, in school and by gender.
Michie, Glachan and Bray (2001) studied the evaluating factors influencing the academic self concept, self esteem and academic stress for direct and re-entry students in higher education reported that if the reason to participate in higher education was for career goals, academic stress levels remain high. One hundred and twelve under graduates direct and re-entry students took part in the study. A six part questionnaires was used to investigate the impact of age, gender, past experiences of school and motivations for participation in higher education on current global self-esteem, academic self-concept and academic stress multiple regression analysis revealed a compiled interrelationship of variables relating to academic self-concept, self-esteem and academic stress.

Satapathy and Singhal (2002) in a study attempted to compare the stress perception and behavioural problems between visually impaired and non-impaired adolescents. Educational level and gender differences were also analyzed. It was found that non impaired adolescents were more stressed and exhibited more behavioural problems than the visually impaired. High stress resulted in more behavioural problems among visually impaired as well as non impaired.

Rani (2003) studied achievement of standard VIII students in Hindi with respect to academic stress and home environment and reported that high levels of academic stress caused low achievement in academic. The male students were less prone to academic stress than the female students and male students achieved better than female students even in equal levels of academic stress.

Archana (2004) in a study, effect of academic achievement on mental health and self esteem of secondary school students found that variables of academic stress and mental health were found to be correlated i.e., when academic stress increased among adolescents their mental health deteriorated and vice-versa.

Kaur (2005) in a study on mental health and personality in relation to academic stress reported that extroverts perceived less stress than the introverts. The good health led to low levels of academic stress. The students with mental health and extrovert personality perceived low levels of academic stress. The students with good mental health and extrovert personality perceived low academic stress than the others.

Manhas and Gakhar (2006) studied relationship of academic stress with emotional intelligence. The study was conducted on a sample of 400 students of 9th classes male and female adolescents from government and private recognized schools situated in urban and rural area of Jammu and Kashmir. She concluded that significant positive correlation exist between academic stress and emotional intelligence.
Calicchia and Graham (2006) in their study examined the relationship between stress, spirituality and social support in a sample of graduate students in a counselor education programme. Result showed that most variables, stress were negatively correlated with social support and spiritual well-being. However, specific domains of stress, social support and spirituality showed no relationship and some complimentary domains were positively correlated.

Malik and Bala (2006) the study was aimed at finding if any relationship exists between psychological stress and academic achievement of high IQ adolescents. Sample of the study was assessed with the help of Bisht Battery Stress Scale. Academic achievement was assessed on the basis of average of marks obtained in last three examinations. Correlation coefficient between stress scores and academic scores were computed. Academic achievement was found significantly correlated with all types of stress except essential stress.

Joost (2007) examined co-relation of students stress in secondary education. The sample consisted of 3300 students with an average age of 16 years 5 months who entered their first year of education. Student cognitive ability levels were assessed by means of a cross-curricular skills test. Results revealed that fear of failure were associated with experienced workload as well as perception of lack of teacher guidance. Cognitive ability was associated with students stress, only teacher age was associated with students stress.

Pane (2007) studied the academic stress of Indonesian students in the United States and for this purpose 132 undergraduate and graduate students studying at various educational institutions trying to cope up with stress. The relationship of stress and coping to demographic variables, relevant skills, social factors and orientation sessions in Indonesia and the United States and their skills were examined. Levels of reported stress and confidence were on the whole moderate and were negatively correlated with each other. As expected, reported stress was found to be related to certain characteristics of the students and their perception of English language ability and academic and problem solving skills.

Kaur (2008) in a study on parental involvement and teacher taught relationship on cognitive skills and stress of adolescents found that the parent involvement and teacher taught relations greatly affect the cognitive skills and stress of the adolescents.

Lakaev (2009) the aim of the study was to establish the academic stress response scale as a valid and reliable measure of stress responses. The sample consisted of 375 Bond University students from several countries and from various levels of tertiary education. Participation completed six-self report questionnaires that related to, acculturative stress, academic stress and general stress in order to determine converged and divergent validity.
Introduction

They found sound psychometric properties and was suggested it to be a sound way of measuring academic stress responses, particularly for Australian students.

Sosa, Barrientos, Castro and Gracia (2010) conducted the study to describe academic performance and the emotional paradigm of the university students. They found that low academic performance was related to stress, depression, distrust, lack of communication, lack of respect, lack of social support etc.

Khanehkeshi (2011) investigated the relationship of academic stress, depression and self-efficacy with academic performance among high school boy students. Using a random stratified sampling technique, 120 students from three academic grades were selected. The results of the study showed that there is a significant difference between academic grades in academic stress, depression and self-efficacy.

Pandya, Deshpande and Karani (2012) studied the impact of academic stress on MBA students of Gujarat technological university. Main objective of the study was to explore the components of academic stress. Three major stressors were identified which affect the performance. The sample comprises of 118 students of MBA. Data was collected through structured academic stress questionnaire.

Schraml, Perski, Grossi and Makower (2012) studied chronic stress and its consequences on subsequent academic achievement among adolescents. 270 students of high school were taken as sample for the study. The results suggested that the early prevention of chronic stress is critical since, it left untreated, it can have serious consequences on young people’s future health and career possibilities.

- Review of Researches

Pandya, Deshpande & Karani (2012) and Schraml, Perski, Grossi & Makower (2012) found academic achievement to be negatively and significantly correlated with all types of stress except essential stress.

The available review of related literature on the present study consisted of both empirical studies and conceptual research papers. There are many studies related to the variable taken for study in hand. Large numbers of evidences are available showing the effectiveness of online mastery learning programme. It is also proved that these types of programmes are helpful in reducing the academic stress of the students.

1.12 NEED AND SIGNIFICANCE OF THE STUDY

An appropriate teaching strategy helps the teacher in solving learner's problems as well as to bring remarkable improvement in their overall behaviour. Review of different instructional strategies gives quite positive results in comparison to conventional teaching strategy. According to Figueroa - Rexach (2004) effective teaching is not a set of every day instructional strategies that are used in specific manner but instead of that it is consistent data, driven decisions that are different every day and dependent on student's individual differences as well as on learning outcomes. In such conditions online teaching can prove fruitful for teacher as well as for students. Online learning is a relatively new concept, which has become widespread in a short time. Dewey (1963) has rightly said “If we teach today as we taught yesterday, we rob our children of tomorrow”. Online is the landscape of education in the present decade and coming decades of the 21st century. The waves of technological revolutions have flooded the field of education leading to online education.

Effective teachers utilize different instructional strategies, technologies and continual reflect on their teaching practices. While planning instruction they consider the material to be learned, the background of their students, and the conditions under which the teaching and learning are to take place. Chalk and talk are the monotonous lectures of the teachers which don’t appeal to the senses of the children (Dewey, 1916). That is why there is truancy, inattentive behaviour, class fight, abuses and damage to class and school property. Therefore, it becomes essential to investigate whether some other method of teaching e.g. mastery learning can be more effective as compared to conventional method so that students can be saved from frustration and anxiety (Smith, 1993).

There is a critical need to restructure the methodology of teaching English language. Innovative instructional strategies when applied in English language teaching can help to motivate and do better in the field of language learning. Online teaching may provide a more
natural constructivist learning environment than the traditional teaching for English language students. Robinson (1992) states a change from traditional curriculum and instructional models and adoption of a new method will require major restructuring of how the schools are organized and how teachers are prepared and empowered. Schools systems have the task of defining success; determine what it requires to be successful in the twenty first century and then evaluating research, outcomes and discussions of which method would best be implemented to meet individuals need. So, need of the hour is to select appropriate model and technology to help the students to learn more effectively and to grow emotionally, socially and intellectually.

In this twenty first century where English medium schools are prevalent and main focus is on the role that schools serve in educating students for a technological world. There is a little doubt that internet has become the technology of choice in learning and teaching (Dabbagh and Kitsantas, 2005). It has been seen that there are technological advancements but students are lacking behind in the field of English language. The recent expansion of broadband access has brought internet in homes and schools and providing students and teachers with the opportunity to exploit the internet as learning and teaching tool (Moore & Kearsley, 2005). In the coming years school life may become harder for those children who are having problems with English language in general. It is absolutely clear after seeing that curriculum being taught in the schools, students cannot progress and achieve desired achievement until unless their teachers adopt appropriate teaching strategies and technologies. In literature classes, students are often told to develop writing skills which can be done better through online teaching because online courses are more writing intensive than traditional classes. Even discussion forum is one of the most exciting features of online teaching. In the traditional classroom, a question is raised by an instructor and same group of bright students respond. In online teaching discussion occur in a new dimension where every student is expected to respond. Teachers can take help of much type of teaching aids such as power point presentation, flash cards and immediate feed back tests etc. Students can use e-mail, chat rooms and discussion boards to establish study groups. Though students do not see a teacher in the classroom every day, online students can access their teacher better. They can pose questions through e-mail and can frequently engage in a dialogue that would be difficult to organize in a face to face system. Online education is a new teaching technology which allows you to attend lectures and classes by sitting in the comfort of your home.
Introduction

So, it is expected that the present study will highlight the need to know the role of online master learning strategies in teaching of English language. The study compares the effectiveness of different teaching methods on student's achievements in English language learning in relation to their intelligence and academic stress. The study will help in finding the answers of questions like as how we can influence students attitude towards language learning. We will be able to provide appropriate learning environment by considering the individual differences of the students, so that there could not be any hindrance in achieving target learning. Findings of the present study will definitely add to the existing quantum of knowledge in the field of educational technology. It will be helpful to students to improve their learning skills in English language. Results of this type of study are likely to broaden our knowledge as to how we can approach towards positive results in English language teaching. It will also be helpful for teachers in understanding and adopting the approach of a model and break the monopoly of the conventional teaching methods. Therefore the investigator made an attempt to enquire in the effectiveness of online mastery learning strategy on learning outcomes of 9th class students in relation to intelligence and academic stress.

1.13 STATEMENT OF THE PROBLEM

EFFECT OF ONLINE MASTERY LEARNING STRATEGY ON LEARNING OUTCOMES OF 9TH CLASS STUDENTS IN RELATION TO INTELLIGENCE AND ACADEMIC STRESS

1.14 OPERATIONAL DEFINITIONS OF THE VARIABLES

(i) **Online Mastery Learning Strategy:** online mastery learning strategy is starting to be recognized as an excellent medium for learning, not just a medium for transfer of information. Online mastery learning refers to any form of learning that takes place via a computer network. Online mastery learning differs from the others due to its characteristics like individualization, flexibility, simulation, reality based, maintainable, allow communication and can monitor actions.

(ii) **Conventional Teaching Strategy:** Conventional teaching is concerned with the teacher being the controller of the learning environment. Power and responsibility are held by the teacher and they play the role of instructor (in the form of lectures) and decision maker (in regards to curriculum content and specific outcomes). They regard students as having 'knowledge holes' that need to be filled with information. In short, the conventional teacher views that it is the teacher that causes learning to occur. Here teacher is generally active.
participant in the teaching learning process and the pupils are the passive ever, it is required. Teacher gives lecture to a class of nearly forty students with the help of some teaching aids, gives some home assignments and administer test periodically. These tests are given only to give marks to the students and have no values in terms of improving the quality of instructions.

(iii) **Learning Outcomes**: Learning outcomes describe what a student is expected to know, understand or be able to demonstrate at the end of a course in order to obtain a passing grade. Learning outcomes and ‘aims and objectives’ are often used synonymously, although they are not the same. Aims are concerned with teaching and the teacher’s intentions while learning outcomes are concerned with learning.

(vi) **Intelligence**: It is the cognitive ability of an individual to learn from experience, to reason well, to remember important information, and to cope with the demands of daily living. It is the global capacity of a person to act purposefully, to think rationally, and to deal effectively with his/her environment.

(v) **Academic Stress**: Academic stress is the stress aroused because of academic pressure. It is a kind of mental distress with respect to some anticipated frustration associated with academic failure or even an awareness of possibility of such failure.

### 1.15 DELIMITATIONS

The present study was delimited with respect to the following:

(i) The study was delimited to 9th class English students of English medium secondary schools of Mohali district affiliated to Central Board of Secondary Education, New Delhi only.

(ii) Fifteen lessons based on online mastery learning strategy and conventional teaching strategy was developed on topics such as determiners, tenses, modals, conjugation of verbs, questions tags, non-finites, prepositions, passive voice, reported speech, word formation: compound words, prefixes and suffixes of English grammar from the prescribed syllabus of Class 9th of English medium schools affiliated to central board of secondary education, New Delhi.

(iii) The experimental treatment was delimited to 40 working days of the academic session.

(iv) The present study was delimited to Bloom’s mastery learning strategy only.

(v) The study was confined to two classified variables i.e. intelligence and academic stress.
1.16 OBJECTIVES
The present study was designed to attain the following objectives:

1. To develop instructional material based on online mastery learning strategy and conventional teaching of English to class 9th at knowledge, comprehension and application levels.

2. To develop and standardized achievement test in English for selected units of English.

3. To study the differences on the learning outcomes of the students through online mastery learning strategy and conventional strategy of teaching at different taxonomy levels such as knowledge, comprehension, application and total learning outcomes.

4. To find out the difference between high and low intelligence groups of students on learning outcomes at different taxonomy levels.

5. To study the differences between high, average and low academic stress groups of students on the learning outcomes at different taxonomic levels.

6. To study the interaction effect of online mastery learning strategy and intelligence on learning outcomes at different taxonomic levels.

7. To study the interaction effect of online mastery learning strategy and academic stress on learning outcomes at different taxonomic levels.

8. To study the interaction effect of intelligence and academic stress on learning outcomes at different taxonomic levels.

9. To find out the interaction effects among the variables of intelligence, academic stress and instructional strategy on learning outcomes.

10. To compute the inter-correlations between instructional strategy and intelligence on learning outcomes of students.

11. To compute the inter-correlations between instructional strategy and academic stress on learning outcomes of students.

1.17 HYPOTHESES
The following hypotheses were formulated for conducting the study such as:

H_0 There exists no significant difference in gain means of students on learning outcomes in English of groups taught through online mastery learning and conventional teaching strategy at
(i) Knowledge level
(ii) Comprehension level
Introduction

(iii) Application level
(iv) Total learning outcomes

H2O There exists no significant differences on learning outcomes of high and low intelligence groups of students at
(i) Knowledge level
(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes

H3O There exists no significant differences on learning outcomes of high, average and low academic stress groups of students at
(i) Knowledge level
(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes

H4O There exists no significant interaction effect of instructional strategy and intelligence on learning outcomes of students at
(i) Knowledge level
(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes

H5O There exists no significant interaction effect of instructional strategies and academic stress on learning outcomes of students at
(i) Knowledge level
(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes

H6O There exists no significant interaction effect of academic stress and intelligence on learning outcomes of students at
(i) Knowledge level
(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes

H7O There exists no significant interaction effect among instructional strategy, academic stress and intelligence on learning outcomes of students at
(i) Knowledge level
Introduction

(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes

H_{0} \null There exists no significant relationship between instructional strategy and intelligence on learning outcomes of students at
(i) Knowledge level
(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes

H_{0} \null There exists no significant relationship between instructional strategy and academic stress on learning outcomes of students at
(i) Knowledge level
(ii) Comprehension level
(iii) Application level
(iv) Total learning outcomes