INTRODUCTION
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1.1 Academic Achievement

Educationists, teachers and guidance counsellors have long been besieged with the distressing problem of underachievement and failure among students of various levels. Thus, the effectiveness of the educational system is often questioned and an apparently inbuilt inefficiency leads to underutilisation of already meagre resources available for education in India. In this context a serious probe is called to analyse the causes of under achievement and failure so that means could be devised to grapple with the enormous problem. The importance of intellectual ability in academic achievement cannot be denied, yet a large number of personality factors have been found to loom large in academic achievement. Since the present educational system in the country is not always geared to synchronise the process of personality development with scholastic growth, the personality variables seriously and in a very erratic manner, creep into the system and undermine academic achievement of the students.

Academic achievement is, in general, referred to the degree or level of success or proficiency attained in some specific area, concerning scholastic or academic work. Academic or educational age, accomplishment quotient or
achievement quotient are the most commonly used means to interpret the level of academic achievement of pupils in general or in a specific given subject matter.

Good (1959) referred to academic achievement as the knowledge attained or skill developed in the school subjects, usually designated by test scores or marks assigned by the teachers. Trow (1956) defined academic achievement as "the attained ability or degree of competence in school tasks, usually measured by standarised test and expressed in grades or units based on norms, derived from a wide sampling of pupils' performance." Thus academic achievement is the competence the students show in the school subjects in which they have received instruction.

Attempts have been made to understand the importance and impact of personality variables on academic achievement by many psychologists but with only limited success. In this study, an attempt has been made to study some of the vital personality factors that might probably be linked with academic achievement.

1.2 Instructional Design

Education in India became a major enterprise after independence, reaching into every community and almost every home with the declaration of constitutional provision for compulsory primary education. The advanced countries have made considerable improvement in their instructional system by using the new concepts of educational technology.
Research of the past has pointed out to the fact that individuals have varying personality traits, consequently they differ in their learning styles and they need to be taught by different instructional designs to get maximum out of them. Teaching strategy has been systematically designed and successfully used. Educational technology has the main assumption that teaching is not only an art but also a science. According to Good (1945) instruction is an act of providing situations, conditions or activities designed to facilitate learning on the part of those who are engaged in learning.

The desired objectives could not be achieved on the basis of learning theories. Therefore teaching learning structures, teaching theories and structure of the content have been developed. Instructional designs are the sum of these things. Glaser (1965) states that professional skill and efficiency can be developed with the help of instructional designs. Unwin (1966) has given a comprehensive definition of instructional design, "Instructional design is concerned with the application of modern skills and techniques for the requirements of education and training. This includes facilitation of learning by manipulation of media, methods and the control of environment in so far as this reflects on learning".

Educators have employed different designs of instruction from time to time. The early educators taught
by adopting lecture method. The socratic method of instruction was based on the assumption that knowledge is inborn and it can be withdrawn by inquiry with right type of questions. Europe scholastic method came into existence during twelfth and thirteenth centuries. Comenius (1933) adopted a systematic understanding of the teaching learning process. Froebel (1826) laid the foundation of a new system of early education in kindergarten which consisted of three aspects: (i) Games and songs (ii) Construction and (iii) Gifts and occupations. Herbart (1935) believed that content to be studied has to be broken up into small details which could be associated with already known related facts. So, he formulated a systematic method with four logical steps, clearness, association, system and method. Pestalozzi (1874) psychologised the instructional techniques. However, the beginning of the twentieth century saw the emergence of science and technology of instruction. It is imperative that if we want to make an improvement in the standard of education, we have to pay proper attention to raise the quality of instruction. The traditional methods of instruction are to be replaced by new instructional methods. Thorndike (1913) gave us laws of learning which provided a base to the technology of instruction. These laws are: the law of exercise, the law of effect and the law of readiness.

Project - method was developed by Kilpatrick (1919). Parkhurst (1922) developed Dalton Plan and Morrison (1931)
evolved another instructional proposal. His formula for teaching was 'pre-test, teach, test the result, adapt procedure, teach and test again'. Skinner (1954) introduced programmed instruction and teaching machines into the world of education. Washburne and Sidney (1963) evolved a plan called Winnekta Plan. According to this plan different learners proceeded at different rates and a learner proceeded at different rates in different subjects. Joyce and Weil (1972) in their book 'Models of Teaching' talk of various models of teaching. One of these models is 'operant conditioning model' which is derived from Skinner's (1954) behaviour modification theory. According to him, behaviour is something that can be manipulated by bringing a change in the external conditions. The teaching model drawn from this theory is widely known as 'Programmed Instruction'.

For the present investigation, the instructional design has been conceived in terms of the programmed instruction.

1.2.1 Programmed Instruction - An Overview

Programmed instruction is an application of principles of behavioural sciences and technology in the field of education.

The first systematic breakthrough came in the era of 'testing'. Pressey (1926) is credited for developing a self teaching machine called 'Drum Tutor' which could teach as well as test.
Despite difficulties in the nature and make up of the classroom, Skinner (1954) proposed that much more efficient techniques were possible with a consequent increment in acquisition, not to mention attitudes of pupils. Essentially, reinforcement must become the dominant device used in the classroom. Its appropriate scheduling is most effective in terms of the design of material to be learned. When the elements of complex behaviour are broken down into small successive steps, frequency of reinforcement can be maximised while error (an aversive stimulus) is avoided. Because current classroom organisation is not conducive to this procedure, some form of mechanical contrivance is necessary. Skinner (1954) formulated his theory of behaviour based on conditioning and created a revolution in the field of learning. His approach is called 'behavioural engineering' because Skinner is more interested in determining how to control behaviour than in devising theoretical explanations of the processes that underlie behaviour. The successful teaching machine of Skinner provides immediate knowledge of results which acts as reinforcement for the correct answer and the students while working on it, invariably emit appropriate behaviour. The important component is the programme, not the machine.

With further research, Skinner (1961) reported more specific features necessary to successful programming. In nearly every instance, for example, a student should compose
his own response rather than attempt to recognise a correct response among incorrect ones. The reason for this emphasis is both the active nature of recall and the avoidance of wrong responses even for discrimination purposes. Additionally, where it is expected that some students will 'miss' some points in a lecture or in reading a text, progress in the programme is dependent upon a response which is overt, correct and reinforced.

Robert (1961) gave a new concept known as 'learner controlled instruction' which is a kind of Socratic dialogue in reverse, where the learner led the instructor. The main theme of the learner controlled instruction is that the learner is one of the best sources of information about himself. The task of the instructor is responsive rather than directive. The instructor remains silent until the learner stimulates him with questions that suggest the needed illustrations, demonstrations or some other help.

Mager (1961) conducted a study to find out whether the learner generated sequence was more efficient than the instructor - generated sequence. It was concluded that learner-controlled instruction was very effective.

Writing a programme is more difficult than might seem possible. One estimate, at least, states that the material covered in one hour lecture will require 100 to 150 hours to programme (Crowder, 1959). Behaviours to be acquired must be identified and an efficient procedure for reaching them with
an adequate programme established. Apparently, few classroom teachers would be competent for programme writing even if time and money were no problem. Much more pertinent may be ability to recognise an effective programme related to the behavioural outcomes in the classroom. For this purpose, an increasing number of volumes have appeared (Galanter, 1959; Green, 1962; Deterline, 1962; Brethower, 1963; Mager, 1961; Dececco, 1964; Smith and Moore, 1962 and Cram, 1961). Such works are helpful to teachers in writing some limited programme of their own and possibly adapting elements of purchased programmes, as well. The point is that, in most instances, the possibility of the teacher’s preparing an extensive library of programmes for different types of materials and different types of students is not feasible. This should not mean that programmed instruction is not usable in the classroom. Lysaught (1961) has discussed programmed instruction in terms of its theoretical base and its implications and meanings for the classroom teacher. As far as the latter is concerned, Lysaught believes that such an approach assures mastery of material by all to the same level, better use of classroom time, an increase in interest for school since students recognise progress and find it rewarding, and the freedom it gives to the teachers to be creative. All positions on implications of programmed instruction are not positive, however. In programming, Fitzgerald (1962) points to the danger of rigidity in a
world of rapid change, the oversimplicity in the behavioural approach of a form of conditioning, and perhaps most of all a humanistic loss of interaction between student and teachers. Either the optimism of Lysaught or the pessimism of Fitzgerald can represent a closed avenue, not worthy of the critical position of a teacher. Perhaps the most pointed argument comes from Lysaught: Programmed instruction has a future only in so far as the teacher permits structures, and uses it. Tobias (1963) for example, used the semantic differential with fifty experienced classroom teachers.

He found that these teachers expressed more negative attitudes towards terms involving programmed materials than toward terms reflecting conventional classroom procedures. Burns (1971) explained, "Individualising Instruction is nothing more than applying logic to the learning act and then by careful planning and organisation, providing an efficient method, whereby learners have the opportunity to acquire behaviours in their own way at their own rate".

Mayer (1981) as a result of her experimental study, where she tried to evaluate the effectiveness of programmed instruction and traditional instruction, concluded that both types of instructions had benefits to offer. She stressed the need for both types of instructions in a proper mix.

Desai (1985) compared the programmed learning approach with learning through experiments, slides with
discussion and the traditional way of teaching science. He concluded that the programmed learning approach was better than the traditional method. Jaya Lakshmi (1985) found programmed learning material as a basic component of the modules as a successful strategy.

No doubt, the purpose of programmed instruction is to increase the educational effectiveness by affording better communicative facility between the student and the instructional material.

1.2.1.1 Concept of Programmed Instruction

The word ‘programme’ means a logic, predetermined order and fixed relationship of independent functions or actions to be performed. The word ‘instruction’ is different from teaching. ‘Teaching’ is a broad, vague, ill-defined term and ‘instruction’ is a purposeful, orderly, controlled sequencing of experiences to reach a specified goal. All introduction involves teaching but all teaching cannot become instruction. Programmed instruction is a sub head under instruction and represents a more rigorous attempt to develop a mastery over specified goals to secure ‘insured’ learning. Programmed instruction involves controlled, carefully specified and skillfully arranged learning experiences. They are self-instructional and self corrective.

The fundamental idea of programmed self instructional materials was described by Thorndike (1913) in these words,
"If by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one, would page two become visible and so on, much that now requires personal instruction could be managed by print." Programmed instruction is a technique of self instruction in which all of the instructional load is carried by teaching machines or programmed texts. Programmed instruction is a new path towards automation and individualised instruction. According to Klaus (1962) programmed instruction deals with orderly and controlled development of an individual’s skills in much the same way as the good tutor might do. By presenting lessons in small, carefully sequenced steps, complicated skills can be developed by gradually progressing from the very simple to the very complex level of performance. Since the subject must perform actively at each step during training, it is possible to guide the development according to the correctness of each response.

Programmed instruction is a special type of teaching technique which brings out desired behavioural changes in the learner with the help of physical environment.

Espich and Williams (1967) have defined it as "Programmed instruction is a planned sequence of experiences, leading to proficiency, in terms of stimulus response relationship that have proven to be effective".
The purpose of programmed instruction is to increase the educational effectiveness by affording better communicative facility between the student and the instructional material. It presents the instructional material to the student according to his need and his rate of learning. It confirms or corrects the response constructed by the student as soon as it is given.

1.2.1.2 Elements of Programmed Learning

Skinner (1954) gave four characteristics of programmed learning: (i) Small steps (ii) Active responding (iii) Self pacing (iv) Immediate knowledge of the results.

Holland (1961) proposed that programme learning depends upon three principles: gradual progression, control of students' observation, mediating behaviour and variations in materials.

According to Johnson and Ruskin (1976) fundamentals of programmed instruction are:

- Specifying course objectives.
- Active involvement of the student in the learning process.
- Managing contingencies to ensure a positive environment.
- Frequent assessment and immediate student knowledge of performance.
- Small sequential material presentation.
- Mastery of each unit before further progression.
- Written materials.
- Student control over the speed of progression through course content.

Hence, programmed instructional material has certain basic characteristics or principles in common. The principles are important because they bear on the effectiveness of the programme. The length of time devoted to acquisition, the degree of involvement of the learner, and the extent of the programme necessary to achieve the behavioural objectives are implicit to these principles.

1.2.1.2.1 Small Steps

They focus the student’s attention on a limited amount of material at one time which is usually called a ‘frame’ or ‘didule’, i.e. the subject matter is broken down into small steps and arranged sequentially. Skinner (1954) originally took the view that smaller the frame, the better it is and he considered proper sequencing of steps to be one of the important features of a good programme. Homme and Glaser (1960), Larkin and Leith (1964), Silberman (1961) supported the view that smaller the step size, the fewer the errors and greater scores on post-test. Silberman (1961) conducted three studies for comparing logically sequenced with randomly sequenced programme, the first two showed no difference between them in amount of learning or in time taken to complete the programme and the third favoured an ordered sequence. Smith and Moore (1960) and Fry (1963)
could not find any significant difference in the effect of small and large step size on the amount of learning. Thus, the characteristic of small step with logical sequence, is not a necessary condition of programmed text. It depends upon the learners and the learning situations. Holland (1965), Leith (1966) and Markle (1969) concluded as a result of separate studies that step-size is a matter of experimental determination. It is the function of ability of learners, who are using the programme.

1.2.1.2.2. **Self pacing**

It permits each student to respond at his own pace, thereby providing for a degree of individualism of instruction. It makes sure that the learners are not forced to move beyond their natural speed. Skinner (1954) and Gilbert (1962) favoured this notion. However, Gropper and Kress (1965) found as a result of their experiment that learners worked at approximately the same speed despite the varying difficulty of the programme, with which they were working. Hartley (1968) found no significant difference on the test performance of two groups. So, these studies make it clear that self pacing is not an essential feature of programmed learning in all situations.

1.2.1.2.3 **Overt or Covert Responses**

Skinner (1954) and Gilbert (1962) were of the view that learners should actively interact with the subject matter and should overtly respond. Programmed instructional
material requires a response to each segment of material, that is, usually, partially visible. Active responding results in concentrated learning. Holland (1965), Leith (1966) and Anderson (1967) indicated that overt responding was superior to covert responding. However, Koromondy and Van Atta (1962) found no significant difference between overt and covert responding groups.

1.2.1.2.4 Immediate Knowledge of Results


1.2.1.2.5 Empirical Testing

The important feature of a programme is that it is an empirically tested material. It is tested at three levels: individual, small group and field level. By the end of field testing, all the flaws and drawbacks of the programme are removed and the programme is now in the final, improved state. According to Lumsdaine (1964) the programmer tries to see to it that the student does learn and it takes the blame for the student's failure. Programme is not a textbook as there is no possibility for pre-determined interaction between the book and the reader in the form of required responses and feedback. A programme is actual
instruction itself and the student’s success or failure depends on the programme.

1.2.1.3 Types or Styles of Programmed Instruction

Modes of preparation of programmes are called the types or styles of programming. There are four types of programming:

- The Linear Programming developed by Skinner (1954).
- The Branching Programming developed by Crowder (1955).
- The Mathetics Programming developed by Gilbert (1962).
- The Adjunct Auto Instruction developed by Pressey (1963).

1.2.1.3.1 Linear Programme

Skinner (1957) and his associates are the originators of the linear type of programme. It is also called a straight line programme as the learner starts from his initial behaviour to the terminal behaviour following a straight line. Subject matter is broken down into very small steps and each step is presented in proper sequence. The student proceeds from one frame to the next until he completes the programme. The responses of the student are immediately reinforced in the succeeding frames. In each frame, a small amount of information will be presented; the student will be required to make an active response; positive reinforcement or feedback is given and prompts or
cues are provided that enhance the probability of correct responses and eliminate errors. The linear programme can be presented either in a book form or through a machine. In both cases the correct answer will be concealed until the student makes a response. This is to ensure a genuine attempt by the student to answer the question correctly. Linear programming involves active participation on the part of learner as he has to construct responses for every frame. Every learner proceeds at his own speed through the programme without being forced to work with the speed of other members of the class.

1.2.1.3.2 Branching Programme

The branching technique was developed by Crowder (1959) and is called 'intrinsic programme' because herein the learner within himself makes the decision to adapt the instruction to his needs according to his background of the subject. In this type, each frame is of relatively bigger size and may contain two or three ideas of related sequence. A single question, usually of the multiple choice type is asked at the end. The student selects the response. If the student chooses correctly, he is taken to the next frame in the main teaching sequence. If his response is wrong, he is taken to a remedial frame where his mistake is explained and the topic under consideration is further explained, perhaps using some more examples. In either case, the student is directed to the missed item which he then
persumably, answers correctly. If he again chooses wrong answer, a similar process is followed till he chooses correct alternative. In this type of programme, if the student chooses correct alternative at the first attempt, he is guided to next frame or problem just like a linear programme. Branching programme anticipates the errors of learners. The errors are diagnosed and remedial instruction is provided. Hence, in a programme of this type, all learners do not follow the same path. Crowder (1959) points out that branching programme is like a human tutor and "talks back" to the student.

Branching programme may take the shape of a book or may be produced for use on a teaching machine. The book form is known as the scrambled text book because there is no fixed sequence of presentation of frames as in a linear programme.

The branching programme has a number of tracks or branches. The bigness of the size of frame as well as branching reduces unnecessary repetitions and responding. This saves the amount of the learning time and reduces fatigue. Remedial frames not only explain the subject matter further, but also reason out why some other response is not correct. When a programmer knows that the learners' entering behaviour differs from each other, branching programme is more suitable.
Mathetics Programme

Mathetics comes from the Greek word 'mathein' which means 'to learn'. This technique of programming was developed by Gilbert (1962). In mathetics style, an 'exercise' is the technical unit of learning instead of a frame as in the linear type.

As a technique of teaching, mathetics can be applied to a wide range of subject matter but it is specially suited to teaching of skills. The system includes guidelines for analysis of skills, knowledge to be learned and specific strategies to overcome the deficiencies. The size of the exercise is determined not by breaking the material into meaningful small steps but by determining how big a step a student can take at the moment.

In a task completion, motivation is the most important factor. Mathetics utilises this principle to a great extent. Naturally, the last task or the completion of the task brings motivation. Hence, mathetical programme that utilises this principle starts from the last task or frame in the series and retrogresses. Having completed the last task first, the learner goes to the next one before it in next frame and thus to the introductory part. So the tasks or frames have to be properly connected from the last to the first. Otherwise, the frames will lose relevance, sequence and logic. This procedure is called 'chaining'. Retrogressive chaining technique is the characteristic of
the mathetical style of programming. Chaining has become synonymous with mathetics which is not correct. Chaining is the process of binding the tasks or frames from the last to the first. Retrogressive chaining represents the aspect of the mathetic approach that makes it unique among all the styles of programming.

1.2.1.3.4 Adjunct Programme

Pressey's (1963) programme is known as 'adjunct auto instruction.' A practical approach to programming especially for the individual teacher, is to use the available material as well as a written test. This is then supplemented with a prepared question and answer sheet and with other materials needed, Pressey's machine could teach as well as test. After teaching the subject matter, this self testing machine could be conveniently used for a diagnostic test.

The test material may be used for programmed learning and also for review and reference. Adjunct programmes have a distinct advantage over programmed materials which are self-contained. These materials are generally unsatisfactory for obtaining an overall view of the content. Adjunct programmed materials, however, do allow an overall view of the content for review and serve as a ready source of specific information. An adjunct programme is relatively easy to prepare and modify. The student has all the advantages of the text book including the table of contents and an index.
He can go back into the text for review and to locate specific information at any time. The rapid and experienced learner is not held back by the necessity to read and respond to a large number of small items as found in linear programmes.

In the present investigation linear and mathematical styles of programming were preferred because these models appeared economical and no errors on the part of the learner were committed during the process of learning.

1.3 Achievement Motivation

Motivation has come to be regarded as one of the major domains of psychology and education. It constitutes an integral part of the scientific endeavour to interpret human and infra human behaviour. The psychologists who are concerned with predicting behaviour have realised that prediction of behaviour is possible only when information about motivational and personological factors is taken into consideration.

Achievement motivation is relatively a new concept in the world of motivation. It is essentially a type of motivation that is personal in nature. The basis of achievement motivation is achievement motive i.e. a motive to achieve. Those who engage themselves in a task on account of an achievement motive are said to work under the spirit of achievement motivation. The desire to improve his
achievement at school or to get a good grade or to become an engineer and so on is known as achievement motive.

McClelland (1953) and his associate Atkinson (1964) investigated human motivation through the intensive study of a single motive known as the achievement motive. They assumed that motives arise from changes in emotional states. As such, the term motive was defined as -motive is the readjustment by a cue of a change in an affective situation. Atkinson (1964) stated that achievement motive applies when an individual realises that his performance will be evaluated, according to some criteria, his own or others, and that the resulting evaluation will be favourable (success) or unfavourable (failure).

Some psychologists consider that all human behaviour is intended to reduce tension and reach a state of psychological and physiological equilibrium (balance). But McClelland (1953) concluded that motives, rather than being essentially tension states, are also drives towards action based on expectation. There is a great need to create a need in a child to learn. He has to be motivated for learning. Achievement motivation is the desire to do better, to achieve unique accomplishment, to compete with standard to excellence and to involve oneself with long term achievement goals. Achievement motivation is defined by Murray (1938) as "a special motive to master, manipulate or organise physical objects, human beings or ideas to do this
as rapidly and independently as possible, to overcome obstacles and attain a high standard, to rival and surpass others and to increase self regard by successful exercise of talent". It was Murray (1938) who first of all used the form 'n-Ach' to refer to achievement need.

Achievement motivation has been referred to as the need for achievement (and abbreviated as n-Ach), a wish to do well. It refers to the behaviour of an individual who strives to accomplish something, to do his best, to excel others in performance. This involves competition with a particular standard of the excellence of performance. Achievement motivation is thus a learned motive to compete and to strive for success. Success becomes a goal which must be achieved in one way or the other. McClelland (1965) who is most noted for his work on achievement motivation, says, "If there is one thing that all this research has taught me, it is that men can shape their own destiny, that external difficulties and pressures are not clearly so important in shaping history as some people have argued; It is how people respond to those challenges that matter, and how they respond depends on how strong their concern for achievement is". According to Garry (1965) motivation can be considered synonym to aspiration. These two are positively correlated. Achievement is synonymous with accomplishment, proficiency in performance or social acknowledgement of one's skill.
1.3.1 Achievement Motivation - An Overview

Theory of achievement motivation has drawn the attention of psychologists, sociologists and educators in recent years. The theory of achievement was developed by McClelland and his associates (1953). He defined motive as "A readintegration of a change in a fact by a cue and anticipation of a future change in a fact contingent upon certain actions." The definition given by him has two important terms which need further explanation. The first term is 'redintegration' which means reinstatement of psychological process in the conscious as a result of the stimulation by an environmental event. The second is 'cue' which is the cause of affect in arousal in the individual. For example, if a boy sees his old teacher after a long time, the perception of the teacher, works as a cue which arouses affective feelings and the whole psychological process is reinstated. Thus, for motivation, two factors are important; environmental cue and affective arousal in the individual. According to him, all human motives are learned in the environment irrespective of their nature.

Atkinson (1964) adopting the concepts of expecting and valence of Lewin (1951) advanced the achievement theory of motivation. Atkinson (1957) originally stated that the goal directed action tendency is a joint function of the strength of the motive and the expectancy of the goal attainment. Later, Atkinson (1957) recognised the influence
of incentives on behaviour and added the incentive variable to his achievement motivation model. Thus, achievement motivation is considered a function of motive, incentive and expectancy. According to Atkinson, the tendency to act or perform is an outcome of the desire to achieve success and the desire to avoid failure.

The achievement theory assumes that people develop both the tendency to achieve success and the tendency to avoid failure at the time of performance. The resultant tendency to undertake a task is positive and strongest when the expectancy of success is intermediate. The incentive value of success is inversely related to the expectancy of success. If the expectancy is high, the value of success will be low because the task does not provide the performer with any challenge. In addition, the motive and the tendency to avoid failure tend to be greater when the task appears to be easy to perform than when it appears to be difficult. Any failure to perform what appears to be an easy task creates a feeling of shame and embarrassment.

When the task appears to be difficult, the expectancy of success will be low. Normally, little or no stigma is attached to any failure to perform a difficult task. However, a person will not be motivated to undertake a task if it has a low probability of success. He may feel that no matter how hard he tries, he cannot achieve success. The tendency to undertake a task will be the highest when the
expectancy of success is about fifty percent or intermediate. At this risk preference level, the performer may feel that his effort can result in task accomplishment.

Several studies empirically support the achievement theory of motivation. Atkinson (1957) found that the level of performance of female college students was significantly higher when the probability of winning a small monetary prize by getting a high score was half than when the expectancy of winning was either very high or very low. McClelland (1958) also found that children in kindergarten and second grade who were judged to be more highly motivated to achieve on a graphic expression measure of need achievement (n-Ach) preferred an intermediate degree of risk than children presumed to be low in n-Ach. The latter group more often than the former group preferred to do the tasks that were either very easy or very speculative. The major findings of Mahone (1960) and Atkinson (1964) confirmed these studies. Atkinson and Feather (1966) and Morris (1967) also reported that persons low in achievement motivation chose as if they were avoiding an intermediate degree of risk.

However, other studies do not support the inverse relationship between incentive value and expectancy of success. For example, Irwin (1953), Edwards (1953) and Feather (1963) argued that the incentive value of success
is an independent function of the expectancy of success. They implied that the incentive value could be determined both subjectively and objectively independent of the probability of receiving the incentive. Another variation is that people have a tendency to overestimate the likelihood of desirable events and underestimate the likelihood of undesirable events. Thus, they perceive the probability of obtaining rewards more favourably when these rewards are valued by them than when they are not valued, Irwin (1953), Crandall et al. (1955) and Edwards (1953).

A possible explanation for these discrepancies may be that the inverse relationship between valence and expectancy can exist in performing achievement oriented tasks where people experience anxiety, shame and humiliation, if they fail to achieve them. On the other hand, the independent relationship and the positively correlating relationship may occur in less distressing task situations where the success or failure does not produce considerable anxiety.

Indik (1966) and Chung (1968) adopted the achievement motivation model to measure the work motivation for job seekers and students respectively. Indik reported that the motivation measures (motives, incentives and expectancies) were significantly correlated with the job seeking behaviour. Chung (1968) also reported that the motivation measures were predictive of students' scholastic performance. Investigating the relationships between the
motivational measures, Chung (1968) found that the motive measure was positively correlated with the incentive and expectancy measures. This result can be interpreted as follows:

1. The stronger the motive or need to perform a task, the higher the incentive value of the task performance outcome to the person.
2. The stronger the motive or need to perform a task, the higher the expectation that the task is likely to be achieved.

The correlation between the incentive measure and the expectancy measure was not significant. However, when subjects were divided into high, middle, and low performer groups, the incentive measure had a significant inverse relationship with the expectancy measure in low and middle performer groups. The incentive value was high, but the expectancy was low. For high performers, all the three measures were high. This finding supports the view that the incentive value can be determined both subjectively and objectively independent of the expectancy of task performance. Also, the differences in performers moderate the relationship between incentive value and expectancy.

Atkinson's (1966) theory of motivation integrated the three major determinants of motivational behaviour. It recognises the motivational strength of achievement motives, the instigating power of incentives, and the effort -
outcome expectancy. However, it is primarily a content theory of motivation which lists motivational components. It is not at all clear how each component influences the strength of motivation. As it fails to explain the instrumental relationship between motivational components it falls short of a process theory. A process theory explains how a motivational component is related to other components and to motivational effort and outcome in the given area of learning and depth of one's knowledge. These are the indicators of the extent of one's achievement.

Kohli (1974) stressed the fact that motivation is a great source of inspiration to learn or achieve better and quickly.

Atkinson (1964) adopting the concepts of expectancy and valence of Lewin, advanced the achievement theory of motivation. Atkinson et al. (1957) originally stated that the goal directed action tendency is a joint function of the strength of the motive and the expectancy of the goal attainment. Later, Atkinson (1964) recognised the influence of incentives on behaviour and added the incentive variable to his achievement motivation model. Thus, achievement motivation is considered as a function of motive, incentive and expectancy. According to Atkinson (1957) the tendency to act or perform is an outcome of the desire to achieve success and the desire to avoid failure.
Stinger (1966) pointed out that the level of achievement motivation can be increased in an organisation where (1) goal-setting behaviour is encouraged, (2) personal responsibility for task accomplishment is demanded, (3) performance feedback is given to workers, (4) workers are allowed to take moderate risks and (5) rewards are given according to their performance.

Kuklan (1970) found that low n-Ach subjects see failure as arising from lack of ability, a stable factor that is unlikely to change quickly. It is not surprising that they give up. On the other hand, high n-Ach subjects tend to perceive their failure in terms of lack of effort on their part. As a result, they are willing to persist. They are convinced that once they really start trying, they may succeed. High n-Ach subjects tend to approach achievement opportunity, whereas low n-Ach subjects avoid it.

Dutt and Sabharwal (1973) state, "Even at the risk of repeating a platitude, it must be said that the present century has rightly been called, the century of motivation whether in education or in industry, in general learning or in doing a sophisticated job, motivation confronts everyone interested in studying achievement vis-a-vis degree of excellence involved therein."

It may be concluded that achievement motivation is a goal oriented behaviour of the individual with a felt need and power to achieve higher.
Academic achievement is popularly thought to be significantly affected by achievement motivation and other variables like self concept and level of aspiration etc.

1.4 Self-Concept

The 'self' - organised in terms of the individual's unique talents and temperament and moulded by society's conventions - emerges out of social experience. According to Hume (1940) 'self' was a complete illusion. He considered 'self' to be different from reality. But during recent decades, it has received great emphasis (Hall and Lindzey (1957) point out different meaning of self-concept. The first denotes the person's attitudes, feelings, perceptions and evaluation of himself. The second meaning involves a group of psychological processes which govern behaviour and adjustment of the person. According to Jersild (1960) the self is a composite of thoughts and feelings which constitute a person's awareness of his individual's existence, his perception of what he has, his conception of who he is, and his feelings about his characteristics, qualities and properties. â€œ Mead (1934) has explained, "It is comprised of the 'me' (the observed and conceptualised self) and the 'I' (the striver, the self creator). By taking the attitude of others towards himself, the child becomes aware of himself as an object - as a me". Thus, the 'me' is the assumed, organised attitude of others towards the individual. The 'I' is the unique, self assertive, impulsive
doer. It is in the 'I' that our most important values are located. The 'I' in striving for self realisation, seeks personal worth and esteem by worthwhile accomplishments, by acceptance of the moral responsibilities of his society, and by identification with admired people.

Self-concept is a technical expression given to the definition of oneself. It is the concept by which the individual relates himself to his social environment. This concept includes physical and psychological images of the self. While the former is quite positive and apparent, the latter is based on his thoughts, feelings and emotions which give rise to qualities such as courage, honesty, independence, self confidence and aspirations. The physical and psychological images gradually fuse to make a unified self-concept, while the child grows to be an adult.

Good (1959) has defined self concept as the person's set ideas about himself in relation to other persons around him. Dinkermeyer (1962) says that self-concept is the individual's anticipation of his general acceptance or rejection in a given situation. The self-concept represents an organised system of expectancies concerning subjective estimates about what one can or cannot do. The self is one's inner world. It results from evaluational interaction with others, becoming the consistent perception of 'I' and me, the child's perception of the reflected attitude and judgement of those who comprise his world, serves as the
foundation for the formulation of self. It serves to integrate and differentiate variety of learning experiences. Much of the individual's behaviour is an attempt to maintain the consistency of his self-concept. The self permits the child to act, to adjust, to do more than merely respond to a specific stimulus. "It is composite of a person's thoughts and feelings, striving and hopes, fears and fantasies, his views of what he is, what he has been, what he might become and his attitudes pertaining to his worth", comments Jersild (1960).

So the common features of self-concept are: the self is an image one holds of oneself, comprising his physical, mental, emotional abilities and capacities, and that this image gets its shades of colours from the environment of the person. La Benne and Green (1969) are of the view that self concept is person's total appraisal of his appearance, background and origin, abilities and resources, attitudes and feelings which culminate as a directing force in behaviour. We further maintain that the individual's self-concept is that which primarily guides, controls and regulates his performance and action. It is the concept by which the individual relates himself to his social environment. According to Combs et al. (1971) the self-concept, a person's ideas about himself, is one of the most important single factors affecting behaviour.
1.4.1 Self-Concept - An Overview

Beyond early infancy we begin to develop same concept of ourselves, of others and of society as a whole. Our learning of these concepts is dependent first on what is available to learn. At first we are not very discriminating in learning opportunities, so we must learn wisely. The young child's concept of himself, his self-concept, is generally modified by his parents and others. The better his ideas of himself are formed relative to what society expects, the more conforming is his behaviour. We could say that his early personal needs are roughly what society might expect of all children. Here, we must keep in mind that the child's society is limited to his family, school and community, for his interaction with, a possibly his awareness of, a more universal society have not yet been initiated.

Self-concept develops in a person as a result of his interactions with the environment. So, it is not hereditary. It is a life long process and develops continuously in a social setting. As a child grows and develops, he learns more and more about himself. As he extends his area of exploration, his self-concept will change according to how he satisfies his needs. If his learning and consequent adaptability enable him to cope with his world, he will feel capable and more confident. If he is too weak or insecure he does not satisfy these needs. He has needs for knowledge,
achievement and competence. If he does not satisfy these needs comparably with his age group, he may alter his motivational pattern. According to Gale (1969) man created his world from experience around him. The development of self is a social product. According to him, self awareness does not happen all at once, but it is dynamic ongoing developmental process that begins during infancy and early childhood and continues until death.

Each person tries to identify himself, some attempting a more complete job than others and each tries to establish some purpose for his being. Further than this, one appraises himself in terms of his capabilities in coping with his surroundings and feels satisfied only if his self-concept is adequate to his perception of need. Watson and Lindgren (1973) suggest that through learning the opinions, attitudes and expectations that others have for him, the child learns about himself. It is believed that the self-concept is built or achieved through accumulated social contacts and experiences with other people. People learn their identity, who and what they are, from the kinds of experiences the growing up processes provide. It is called development learning about self from the mirror of other people: what a person believes about himself is partly a function of his interpretation of how others see him. Since he really has no way of knowing precisely how others see him, he infers this from their behaviour towards him.
Therefore, his concept of self rests in part on what he thinks others think of him.

By the time a child reaches school age his self-concept is quite well formed and his reactions to learning, to school failure and success, and to the physical, social and emotional climate of the classroom will be determined by the beliefs and attitude he has about himself. There is considerable evidence to support this view, Wattenberg and Clifford (1962) studied kindergarten youngsters in an attempt to see if self-concept was predictive of reading success two and a half years later. It was in fact, a better predictor than I.Q. Children with low self-concept as well as children with high self-concept did not learn to read. Other studies affirm the position that self-concept is related to achievement in school. They also indicate that the relationship is particularly strong in boys that it begins to make itself evident as early as the first grade and that learning difficulties experienced in early school years persist.

Psychologists in recent years began to realise that greater progress in understanding human behaviour can become possible through the study of the individual as a whole. It is the concept of self which personifies the individual as a whole. The self concept is the individuals way of looking at himself. It also signifies his way of thinking, feeling and behaving. The self concept is
presented as a construct or living mechanism used by psychologists to infer a process from observable behaviour and to help to explain the causes of that behaviour, we hold that a person’s feelings and cognitive process of which he has a conscious awareness, are the major components of his self-concept.

Self-concept is equally important in the area of scholastic learning. The learner learns well with the involvement of self: the self-concept is responsible for the success and failure of a person in life. It is an important factor which has an unquestioned bearing upon the academic achievement of the learner. Due to its importance in determining the success of a child in academics, it has been selected as a variable along with other variables, for the present study.

1.5 Level of Aspiration

In the light of experience and advice we all set ourselves standard of achievement. These can be referred to as levels of aspiration. Plainly the level at which we set our sights has an important bearing on our level of performance. Children without a challenge are less likely to improve their skills than those who are encouraged to strive for better achievement.

Level of aspiration is a construct which was first used by Lewin (1935) so as to ascertain an individual’s ‘perceived’ goal for personal success in a certain area. One
way in which this was accomplished was to measure an individual reaction to success and failure and to reset his level of anticipatory performance to succeeding task.

Aspiration means the goal the individual sets for himself in a task which has intense personal significance for him or in which his ego is involved. Because of this ego involvement success leads to increased self-esteem while failure brings embarrassment, remorse and a feeling of inadequacy. Level of aspiration is the standard a person expects and hopes to reach in a given performance, because he has not yet reached this goal, his level of aspiration is discrepancy between his achieved and his stated goals. The distance between his achieved and stated goals may be realistic in the sense that he has a good chance of success. On the other hand distance may be so great that his chances of reaching his stated goals are slim; therefore, his level of aspiration is unrealistic. Hoppe (1930) conducted an experimental study, analysed the aspirational phenomenon and investigated the various factors which influenced goal setting behaviour. According to him, individuals are not alike with regard to their level of aspiration. For example, some individuals always have high level of aspiration whereas other persons are realists in this respect who determine their level of aspiration on the basis of past achievement. Many other issues are also involved in the study of levels of aspiration. It is the subjective nature
of individual's goals, the discharge of tension when that goal is attained, the problem of conflict, decision and choice, the problem of frustration, anxiety and motivation and the influence of immediate past experience on the subsequent life space. The more immediate goals an individual sets for himself are typically assessed not by means of a projective test but by asking the individual directly for what level of attainment he or she is striving. According to Hoppe (1930) level of aspiration is the degree of that task chosen as a goal for the next action. For Frank (1935), level of aspiration is the level of future performance in a familiar task which an individual, knowing his level of past performance in that task, explicitly undertakes to reach.

The goals people set for themselves can be measured along a continuum that goes from short range and specific desired outcomes to long range life goals. The more immediate goals are the easier to measure and have received considerable empirical analysis. Far less research exists on the long range goals, partly, research on such a complex phenomenon is far more difficult. A technique which had much use in the study of the factors involved in and the processes of goal setting, the level of aspiration was developed by Lewin (1935) and his students. In this procedure the subject is asked to state what his performance will be on some task on the next trial of the task. The
concept and level of aspiration have been selected to study their effect on academic achievement (dependent variable) of the students for the following considerations:


Gorden (1981), Barki (1982), Chatterji (1983), Pattnaik (1984), Vimla (1985), Tripathi (1986), Kaur (1987) and Swain (1986) as a result of their studies found that achievement motivation and academic achievement were significantly correlated with each other. However, Holt (1960), Sarason (1960), Smith (1964), Bhatnager (1969), Shaver and White (1971), Gokulnathan (1972), Girija et al. (1975), Joginder (1984) and Tripathi (1986) found a negative correlation between achievement motivation and academic achievement.

Fourth independent variable considered significant for the present study pertains to the level of aspiration of the students. Brookover et al. (1964), Moulton (1965), Sewell and Shah (1968), Brim et al. (1969), Mohanty (1972), Edward (1975), Hussain (1977), Pandey (1979), Qureshi (1980), Prince (1981), Jasuja (1983), Parkash (1984), Pal, Jain and Tiwari (1985) and Kumar (1986) as a result of their studies found positive and significant correlation between level of aspiration and academic achievement. However, Muthayya (1961), Sharma (1979), Madho (1977), Tara (1980), Dwivedi (1983), Gautam (1986) and Gupta (1987) found no significant correlation between the two variables.

An overview of the studies given above reveals that some researchers have found positive relationship between academic achievement and n-Achievement, self-concept & level of aspiration while others found either no or negative correlation between academic achievement and these variables. This provides enough justification for making a deeper probe into the relationship of the variables under study.

Out of the various instructional designs, the design of linear paradigm given by Skinner (1954) and mathematical style given by Gilbert (1962) have been taken into consideration. This has been done to see whether progressive chaining of the learning material is better or the retrogressive one in the learning situation.
To justify the problem, taking each variable singly leaves much scope for studying the combined effect of all the variables in various combinations in a factorial frame of reference. The present study, it is hoped, will have significant bearing on the classroom situations wherein the classification of students by the teacher on different variables under study may be used with benefit with the relevant instruction design to ensure maximum help to the pupils. It may be safely concluded that variables of academic achievement, n-Achievement, self-concept and level of aspiration are overlapping factors and if studied together they can throw much light on the realm of academic achievement. The interactions between instructional design, n-Achievement, self-concept and level of aspiration, all taken together or in different combinations of two, three or four way interactions appear to have validity.

1.7 Statement of the Problem

The problem under study is as stated below:

"The Effect of Instructional Design on Academic Achievement of Secondary School Students in Relation to Achievement Motivation, Self-Concept and Level of Aspiration".

Here, instructional design, achievement motivation, self concept and level of aspiration are independent variables while academic achievement of the students is a dependent variable. The independent variables are varied at two levels each.
1.8 Objectives of the Study

Following objectives have been evolved in the present study:

- To find out the effectiveness of instructional design on pupils' academic achievement.
- To find out the impact of achievement motivation on students' academic achievement.
- To investigate the effect of self-concept on students' achievement.
- To study the effect of level of aspiration on pupils' academic achievement.
- To study the interaction effects of achievement motivation, self concept, level of aspiration and instructional design on academic achievement.

1.9 Hypotheses

The hypotheses formulated for the present study are as follows:

- The achievement of the students through mathetrical programme will be significantly better than that of the students receiving instruction through linear programme.
- Students with high n-Achievement will achieve higher than those with low n-Achievement.
- Students with high self-concept will perform better than students with low self-concept.
- Academic achievement of the students with high level of aspiration will be higher than those with low level of aspiration.
- The interaction effects of the variables of achievement motivation, self concept, level of aspiration and instructional design will yield significant results on the academic achievement of the students.

1.10 Delimitation of the Study

The present study has been delimited with respect to variables of the study, content, sample, tools and techniques. The dependent variable of the study is academic achievement of the students. While three out of the four independent variables viz. n-Achievement, self-concept and level of aspiration, are studied at two levels each (high and low) except the fourth variable, instructional design comprising of linear and mathetics programmes.

The content has been taken from micro economics and is restricted to 'competitive equilibrium' covering the following areas:
- Determination of equilibrium quantity and equilibrium price.
- Effect of increase/decrease in demand on price.
- Effect of decrease/increase in supply on price.

The study has been delimited with regard to sample as well. The size of the sample is 1200, drawn from the
different schools of Chandigarh and surrounding areas. The sample has been restricted to +2 class students.

The various tools used for the present study are: n-Achievement test (TAT) by Rao (1974), P.W.L. inventory by Deo (1985), Level of aspiration test by Shah and Bhargava (1971), Linear programme prepared by Kaur (1983), Mathetical programme prepared by Kaur (1983), Criterion test for Linear and Mathetics programme by Kaur (1983). Hence, the results will be governed by the assumptions and limitations of these tools.

The statistical treatment of the data is confined to the use of analysis of variance.

The study of related literature is an essential aspect of the planning of the study, and the time spent in such a survey is a fruitful phase of a research programme. It provides us comparative data on the basis of which to evaluate and interpret the significance of one's findings. In order to create a practical background to the plan and procedure of the study in hand, it is desirable to refer to the related studies pertaining to one's field of work.