CHAPTER I

TECHNICAL INNOVATIONS IN EDUCATION
AND INSTRUCTIONAL STRATEGIES

As far back as the history of education could be traced, it emerges as a natural characteristic of all human societies. In primitive societies education was complex and continual. It aimed at forming the character, aptitude, skills and moral qualities of an individual who educated himself through a kind of symbiotic process, rather than being educated. Life in the family or clan, work or play, rites and ceremonies were all day-to-day opportunities for learning. From motherly care to lessons from the hunter father, from observing seasonal changes to watching familiar animals, or listening to tales told by the elders and chants of the tribal shaman, all were eternal sources of learning. These natural, uninstitutionalized forms of learning have prevailed to the present day in many a region of the world and they even today continue to be the only form of education for many.

The adoption of a school structure in education, however, is a much later process and it appears essentially to be linked with the systematization and steady increase in the use of written language and its reading. Learning to read naturally entailed a master with a number of young men around him as they were all in appreciation for scholarship. Thus, in course
of time, writing and much later the printing press conferred on man an immensity of new powers. Consequently education which was so far predominantly oral, as it involved direct contact with things and people, had now given way to written words or books. Books replaced these direct methods of transmitting knowledge and nurtured the prejudice that the written word and its oral repetition was the embodiment of all knowledge. This form of knowledge came to be recognised as something much superior to that which was learnt from daily life. Writing became more prevalent and with it increased the importance of the master. He started handing down the growing store of knowledge and tradition to his pupils accompanied by strict authoritarian, scholastic discipline. This set the pattern for the authoritarian master-pupil relationship which still prevails in most schools in the world.

However, contemporary needs, the force of circumstances, social and intellectual demands expect educational institutions to shed themselves of these characteristics and adapt themselves more dynamically to the realities and needs of a rapidly changing world. This demand started in a humble way with the commencement of renaissance and continued through the subsequent series of events like reformation, industrial revolution etc. which brought rapid progress to humanity. Meanwhile economic progress created by the industrial revolution created an increasing need for personnel capable of reading, writing and counting
which, in turn, started the spread and popularization of education. With this grew a greater demand for change in the way of imparting education.

Soon came the age of science and scientific discoveries and inventions and they exerted a powerful influence on the development of civilization, opening up vast horizons for knowledge, unleashing new social forces and redefining humanism. Philosophic thought, the new vistas in psychology, and the promotion of living languages to the dignified status of academic disciplines did enlarge the horizon. These brought an extraordinary increase in human knowledge. Then came the age of electronics and computers bringing dizzying speed in the advance and knowledge of man and it left virtually no aspect of the physical or social universe unmodified. As a result of this, many complex changes, varying greatly in nature, took place. With these came the problem of increase in population and the subsequent competition in all walks of life. Now it is felt that man should be better equipped to stand the strain of this competition, to live up to his expectation and to project his personality. Education, therefore, has a much greater responsibility now than it had a few decades ago. As the report of the International Commission on the Development of Education (1972) has put, education has now the basic duty of teaching men the art of living, loving and working in a society which they must create as an embodiment of their ideal. To enable this, it was
commonly felt that the existing rigid and authoritarian patterns of instruction are to be replaced by structures allowing more participation which alone, it is thought, would help in imparting knowledge and higher order cognitive skills like critical and analytical thinking and bring in abilities of application, synthesis and evaluation which are deemed to be of utmost importance to-day. This has necessitated more than ever the need for restructuring education. More and more educational thinkers and practitioners got involved in this process of instruction and as a result they have advocated many a techniques that would enhance learning on the part of the student. This has been sought to be achieved by making the learner more active in the instructional process. This learner centered instruction has led to the devising of different techniques of presenting the instructional material in the ways that would reinforce the learning at various stages on a continual basis. Auto-instructional devices are the latest ones in this direction. Scientific efforts for devising these techniques, with empirical evidence for the effectiveness, were initiated by Skinner (1954) in terms of programmed learning and teaching machines. What has been initiated by Skinner is now being carried on further by others who followed him.

**Programmed Instruction**

Programmed instruction, although attributed to Skinner, has some tenuous links with the ancient Greeks and strong ancestral
ties with the 19th century Russian psychologist Pavlov and an American, Thorndike. The Socratic discourses were nothing but an attempt in this direction. Pavlov's contribution was to study conditioned reflexes in dogs while Thorndike contributed through his 'law of effect'. This law said that the connection between a situation (stimulus) and behaviour is strengthened only if some success or satisfaction follows the response. Thorndike said bluntly that if the connection between stimulus and response was followed by an annoying state of affairs, then, the strength of the connection decreased. This principle of rewards through success or satisfaction has come to be known as reinforcement which is the cornerstone of programmed instruction.

Whatever may be the basic root of the principles behind this auto-instructional technique, it was Skinner who for the first time, came out with this auto-instructional technique called programmed instruction which is based on his operant conditioning theory of learning. This theory is based on the assumption that a response or operant gets strengthened if it is followed by positive reinforcement. This involves the idea that learning behaviour can be shaped and encouraged by 'rewarding' the correct or useful responses a student makes, at the same time causing undesirable performance to be weakened or extinguished by providing no reward. Skinner has attempted to interweave this and other sound principles of teaching and learning into the texture of this technique. Leith (1964) has listed down the various criteria of sound teaching method which programmed learning materials satisfy. They are:
(i) the learner makes active response to the material;
(ii) teaching matter is carefully arranged and organized;
(iii) the sequence and content of the programme have been progressively altered until the children for whom it is intended learn successfully and efficiently; (iv) few mistakes are made in learning; (v) knowledge of result is given immediately and (vi) learning is self-paced. As a result of the inclusion of all these, a linear programme emerges to be a sequence of small steps of instructional material (frames) most of which require a response to be made by completing a blank space in a sentence. To ensure that expected responses are given, a system of cueing is applied, and each response is verified by the provision of immediate knowledge or result. Such a sequence is intended to be worked at the learner's own pace as individual self-instruction.

Not much later came in Crowder (1959) into the field of programmed instruction with his branching form. The monopoly which Skinner held unquestionably so far, was now questioned. Crowder provided multiple choice answers and the answer the student selects directs him to a different page in the programme. The programme of this category is thus a 'scrambled one' which is read most irregularly. The correct answer leads to a page on which the next bit of information is given, with new alternatives. An incorrect answer is pointed out, with some comments as to why this might have been selected and then the learner is sent back to make another choice. Crowder believes
that students who are ill prepared should always have a way to go back to simpler materials and those who are well prepared should be able to bypass some of the material. Hence, he provided alternative paths through the material.

The arrival of Crowder gave rise to a controversy as to linear or branching form is more effective. This controversy had its impact everywhere. Different people came out with different format and style. More recently efforts have been made to present programme learning material in several other forms and contexts. Whatever might be the format, the sound teaching principle it possessed, and the effectiveness it has so far proved, paved the way for its acceptance as one of the most powerful, effective means for imparting knowledge. The effectiveness of programed instruction has been studied vis-a-vis traditional approach by Shah (1964), Sharma (1966), Mehta (1973), Pandya (1974) and Reddy (1975) and it was proved beyond doubt that programmed materials taught as well or better than the traditional approaches. Because of this, the technique has now achieved a tentative acceptance by both professional educators and the general public. At this point a careful consideration of the roll of programed interaction in the total instruction system has been necessary to identify its potentional and utilize it maximally under real teaching learning conditions. More recently efforts have, therefore, been made in this direction. Now programed learning material is used in different
contexts and formats. Yadav and Govinda (1977), Menon (1978), Ravindranath (1982), Vardhini (1979) and Seshadri (1979) are a few examples of this category.

**Instructional Strategies**

It has been found, of late, that programmed instruction in its pure form cannot prove effective in all teaching situations for instructional objectives range from the simple objectives of knowledge and comprehension to the complex analysis, synthesis and evaluation. It has been, therefore, found that certain modes of instruction found effective in some situations, were ineffective in other situations. Moreover it has been noticed, as already mentioned, that there are different levels of objectives to be achieved in learning any particular unit and as such a single method alone may not suffice in realizing all those objectives. In fact, such learning situations require several techniques of instruction in order to provide the learner with the various activities and experiences needed for the realization of all the instructional objectives laid down for the course. Hence, what is feasible is to organize all the activities and experiences selected for the occasion in question into a meaningful whole to form a system of instruction. When an organisation of the sort mentioned above is done, emphasis is to be laid on the objectives to be achieved, learner characteristics and other practical considerations. In such
an attempt, programmed instruction will not have a separate entity. It is to be utilized in combination with other educational methods and devices. This means the integration of auto-instructional techniques with other educational techniques so as to take full advantage of their demonstrated efficiency to produce the desired student performance. Hence, research efforts are to be made in integrating programmed instruction with other educational methods so as to make instruction most effective under different conditions.

An organisation of such suitable components of instruction, as stated above, with their functions specified in relation to the definite objectives to be achieved would lead to the evolvement of an instructional strategy. An instructional strategy thus composed, should be visualized as an organized system of activities which works for the attainment of certain specific goals. A system of this type, as already seen, is made up of a number of components that, although different in their nature and operation, function in a co-ordinated manner resulting in the achievement of goals or objectives. In an instructional situation, the components of the system are the input learning materials and they range over a large number of techniques and media such as P.I.M., lecture, discussion, seminar, radio, television, etc. Therefore, an instructional strategy involves selection and organization of suitable instructional components with their functions specified in
relation to the specific goals to be achieved. This forms the process aspect of the instructional system aiming at the achievement of the objectives of the system which should be seen in terms of actual learning outcomes of the students. These learning outcomes form the output of the instructional system.

Problems Related with the Choice of Instructional Components

As has already been discussed, the modern educational practitioner has a multiplicity of instructional components intended to help him in his educational mission. However, many of them, as they are utilized today, have been criticized as they overlook the complexity of the educative process, fail to learn from research and are not sufficiently directed towards training minds and attitudes. Many methods still retain the traditional aspects of inflexibility and authoritarianism. Hence, the first question which arises here is that of the choice of the various media for specific instructional purposes. The choice, of course, as noted, depends on the objectives to be achieved, nature of the content to be taught and the characteristics of the pupils etc.

Apart from the aspects discussed above, there are yet two other causes that stand in the way of selection of the instructional components delimiting their chances of choice. The first of these causes arises from the fact that many of the newest media available now are the byproducts of research
conducted by scientifically oriented professionals whose primary interest lies more in technically demonstrating the feasibility of media and their accompanying devices than employing them in actual teaching-learning situation. Hence they gave little thought to the administrative and operational problems arising from their use. So, it is very difficult for the educational practitioner to put into practice those recommendations and research findings supplied by the professionals in actual classroom situation. The second of these causes springs from those agencies who are concerned with development of devices for teaching basing on the principles arriving at by empirical research findings. In carrying out their task, the extent at which these agencies give weightage to the research findings, makes their products less operationally feasible in the context of the real classroom situation. These new devices planned to operate in certain instructional context, have an inbuilt non-flexibility and therefore, they cannot meet the demands of several instructional situations because such situations are of high dynamic character. As a result of this, many of these devices cannot be integrated into most school situations as they often demand creation of new conditions under which they may operate effectively. This would necessitate research and development activities to be carried out to ensure feasibility of utilizing research findings under real conditions.
Instructional Strategies - Problems and Scope

It should be noted that educational technology took shape mainly drawing from researches in the field of psychology. It is the researches on learning, especially those pertaining to various conditions for effective learning that gradually paved the way for the process of instruction to be systematized into a technology. Programmed learning as an outcome of such researches marks off one of the significant developments in the initial stage of educational technology. As the process of programmed instruction was being empirically perfected, numerous researches were carried out to look into various aspects of the process. Any report on these studies would show that the approach taken was mainly of a type found in laboratory researches and that they mainly concentrated on identifying specific aspects of teaching learning situations with an attempt to develop reproducible instructional situations. Thus, it is in respect of specificity and reproducibility of these aspects through the application of necessary controls that these studies are akin to laboratory researches. The researches under this approach have led to the identification of relationship of teaching learning behaviour that are too specific to be considered in a generalized way. This fact would be apparent when looked into the controlled situations under which these experimentations were carried out. These researches as a whole, therefore, provide only limited application and as such they cannot be applied in the actual teaching learning situations which involve a
multiplicity of complex factors and their interactions. Again, it should be noted that these complex factors and their interaction vary from situation to situation making each educational situation unique. Such being the case, there exist vast differences between the experimental and actual classroom situation.

The uniqueness of each instructional situation can be seen vividly when a number of such situations in a particular subject is brought under scrutiny. This will show in all their details how the various factors interact in each instructional situation making each distinct from the others. Each instructional situation may differ from the others from the point of view of level of initiation of instruction, instructional requirements, methods and techniques employed for instruction, learner characteristics, etc. All these factors that interact in an instructional situation could be better highlighted when each of these is elaborately studied in connection with the medium of instruction or the language used in the instructional situation. This is because the language used in the instructional situation determines the extent to which the instruction can be effective. In any instructional situation, the factors mentioned above would be distinctly varied in nature and their interaction would make it more complex. In such a complex situation, the language through which communication is made, plays a vital
role and so the individuals involved in the instructional situation must have to acquire a minimum proficiency in the language through which they learn if the instruction has to obtain optimum effectiveness.

India being a multi-lingual country, many languages are used for instructional purposes. However, as far as the higher education and other national competitive fields are concerned, a high proficiency in English language is essential. This shows the importance of learning English even at school level. Moreover the teaching of English undoubtedly has something to do with the progress and prosperity of a country like India. The evergrowing knowledge of science, technology, philosophy, literature, etc. is tremendous and is mostly communicated through English. Hence no serious student can afford to neglect its knowledge without impairing his personality. Not only that, in this world of competition in the search for progress and excellence, not to be left far behind, but to go par with. If not ahead of other nations, a knowledge of English is of paramount importance. It is a language of international communication, a link language, a language of practical importance. So, children who aspire higher education cannot go far without it for it is the medium of instruction at higher levels of education. Again, its role as a library language cannot be denied. Moreover, the study of English brings a wider vision of the world and perhaps the same knowledge would serve as a stepping stone to greater
success. Often, the lack of knowledge of English has stood as a stumbling block in the case of many. No wonder that the Education Commission (1964-66) realized these facts and recommended the study of English as an essential feature of education at the school stage. The Commission in its report says, 'World knowledge is growing at a tremendous pace, especially in science and technology. India must not only keep up this growth but also make her own significant contribution to it. For this, study of English deserves to be specially strengthened.'

However, the teaching of English, as practised in India today, differs in the matter of the stages at which instruction of it is initiated. In some cases, it starts at the nursery level where little kids are made to memorize a few of the nursery rhymes, the alphabet of the language, etc. In some other cases, it starts either from the K.G. level or Std. I level. This early exposure to English is made mostly in the case of English medium schools. However, this is not the case with schools with different medium of instruction. These schools introduce English at a later stage, say at the stage of Std.V, or VI or even at Std. VIII. This fact shows that students even within a state are exposed to this language at different stages, and so the period of exposure to English language differs considerably among the students. As a matter of fact, the more one is exposed to the language, the better one's chances of
Picking up the language, therefore, the students who start learning English at an earlier stage, are in a more advantageous position than the ones who are introduced to it much later. This causes much disparity among the pupils in the matter of English language ability which would be the base for higher education and national competitive fields. Therefore, any student who would like to attain the minimum proficiency in English language, which is expected of him at his stage, should be given a chance through the instructional system to attain it. This calls for the introduction in the instructional system of certain inputs which are very flexible in nature so that the learners can be benefited to the optimum level by using these inputs at their convenience.

However, before discussing any further about flexible inputs, it would be worthwhile to analyse the present situation of English instruction as it would lead to a better understanding of the need for flexible inputs. Hence, it would be of great relevance to see under what various conditions English is learnt, what different methods and techniques are employed for this purpose, what limitations they have and what restrictions are laid on the teaching of English because of the instructional and administrative requirements, etc.

If one probes into the background of the students of a particular instructional situation, it will not take long to realize that they differ considerably from one another. This difference could be clearly marked between students of urban and
rural origin, between high socio-economic and low socio-economic group, between literate and illiterate family. Naturally a student belonging to the high socio-economic and literate family background is bound to have better knowledge in English as he has much more chances to get exposed to the language than a student belonging to the illiterate and low economic background. Similarly an urban student might process better chances than his counterpart from a village, for in villages one comes across very few educated persons. For such a student, perhaps, classroom is the only place wherein he can pick up the language. Thus, the background of the students in an instructional situation differs considerably and the extent of their knowledge in the language also differs accordingly. If the group an instructor faces is heterogeneous as discussed above, a common input given to all would fail since it can cater to the needs of only a few unless the instructor has a variety of inputs at his disposal so that he can utilize them accordingly to the needs of the learners.

The objectives of teaching English also may vary from one instructional level to another. At the pre-primary level, the objectives of teaching English might be to get the students familiar with the phonology of the language, acquaintance with its alphabet, and familiarizing them with the names of a few objects and animals in their situational contexts. At the primary level it might be expected of the students to master a few
structures, a number of vocabulary so that they should be able to listen to the language with understanding, read with comprehension and speak with clarity and write with grammatical correctness and precision. At a still advanced stage, literary appreciation, evaluation, etc. are expected of its students. This shows that different objectives are aimed at different stages and this makes the instructional situations to differ from one another.

In order to achieve the various objectives mentioned in the above paragraph, students are exposed to different materials through different techniques and methods. Starting with the grammar translation method where the rules of grammar are taught along with an attempt to translate the foreign phraseology into the child's own language, a number of methods like direct method, Dr. West's New Method, etc. had been employed in teaching English. The most prevalent methods of today in the matter of teaching English are the structural approach and the situational method. Again, in some schools, especially in English medium schools, the method of teaching employed is that of reading and explaining the unit followed by asking a few questions. In some exceptional cases, there are schools which make use of hardware materials like tape-recorders, film projectors and other audio-visual aids in the matter of teaching English. Rarely are these schools that make use of language laboratory to make the instruction of English all the more perfect.
All these carry ample testimony to the fact that many techniques, methods, aids, etc. are used in the matter of instruction of English thereby making each instructional situation differ from the others.

With regard to the above methods and techniques, it should be noted that most of them take care of some objectives and not all of them. Moreover, many of them do not provide enough scope for interaction and student involvement which are essential for the attainment of various skills for which English is being taught. Many of them continue to be content oriented. They, therefore, often turn the students into passive spectators. Subsequently most of these methods have turned out to be uninteresting and ineffective and have become obsolete. Similarly most of these methods take care of content, matter and do not pay much emphasis on the acquisition of skills for which English is mainly taught. As the XIV Annual Conference report of the English Language Teaching Institutes in India (1979) has put it most of the methods and techniques of teaching English 'Continue to be content oriented rather than skill oriented.' Even the most prevalent methods of teaching English today namely the Structural Approach and the Situational Method are found to be imperfect in the sense that they do not take enough care of the instructional objectives in their totality. Experts who met in Delhi for discussing matters regarding the teaching of English (N.C.E.R.T., New Delhi, Report of the
Conference on the teaching of English in Schools, 1963) found that the structural approach is being misconceived and misused often by both teachers and students. 'Too often', say they, 'do we see the drilling of structures, the dry bones of the language substituted for the presentation of the living thing.' Similarly, the final report of the Regional Meeting of Experts on Teaching of English in Asia (1971) has remarked that the structural approach is 'too mechanical' and that it required 'strong motivation and sophistication more often found in adults' to learn through it successfully. The same experts found the effectiveness of the situational method 'left too much to chance and to the competency and versatility of teachers.' All these remarks show that methods of teaching English as they are applied today are ineffective and need improvement. In such a situation, the direction in which the improvement could be made, may be by selecting the appropriate features of the above mentioned methods or approaches, thus, formulating an eclectic approach which would lead to the maximum attainment of the instructional objectives.

The factors discussed above namely the differences in the initiation stages of English instruction, the heterogeneity of learner population, the multiplicity of methods and techniques of instruction, failure of different approaches of teaching English to achieve different instructional objectives are only a few among the varied factors which demand for an attempt
at increasing the effectiveness of the instructional situation. A few more factors involved are mentioned in what follows.

As for the teaching of English, instructional situations also change from the point of view of administration, fixed syllabus, quality of teachers, instructional liabilities of having to prepare the pupils for public examinations, overcrowding of the classrooms, etc. These factors also contribute to the diversity aspect of the instructional situations. Thus, inadequate technical skills and technical devices or machines to help the teacher in his classroom instruction, imperfect instructional methods, lack of proper teaching aids, the overcrowded classrooms, all these, often force the teacher to resort to the hit-or-miss sort of instruction which often fails to click.

Under these circumstances, the pupils, who have the aspiration to learn English, are to be provided with the maximum opportunity to learn it at their own pace, time and convenience so as to take the optimum advantage out of it. When any attempt at providing an opportunity for the sort of instruction is made, a number of factors other than the ones seen, are also to be taken into consideration. An insight into the recent developments in the learning of foreign languages, some acquaintance with the process of learning and the role that a learner plays in it — his interaction, participation — would take over a long way towards making his attempt more fruitful.
In this connection, the recalling of certain recent developments towards the teaching of foreign languages is of paramount importance. Recently there occurred a tremendous change in the prevailing notions regarding the study of languages. In the past learning a foreign language had often been treated as if it were an 'elitist, academic or intellectual activity' which only the most gifted children or adults hoped to succeed. This belief, however, has fortunately been proved false. 'Now,' says Strevens (1971), 'we realize that... to learn to understand a foreign language, speak it acceptably, read it within the limits of his education, and interests and write it for simple, practical purposes is within the capacity of all who can achieve literacy in their own languages.' This shows that anyone who can pick up his own mother tongue, can easily learn a foreign language, if, as Strevens puts it, he is 'given the opportunity to do so.' Such an opportunity can be provided to the students only if flexible inputs are made available because the instructional demands are varied in nature as discussed earlier.

Another idea that is widely accepted by all that are concerned with the teaching of a language is that learning a language means acquiring various skills concerned with its usage and that these skills can only be learnt through student involvement - through drills, exercises, discussion, etc. In short, one must work for the acquisition of the various skills
as Clifford (1969) puts it, 'until it (language) becomes as familiar to you as the habits of dressing or driving a car.' This means that the pupil should be given the opportunity for exposing himself to it. Accordingly, the task of everyone who is concerned with the teaching of English is to provide the learner with the best opportunity for learning and reducing failure.

In the light of all factors that have been discussed, there is a positive need for devising certain strategy for teaching English which would provide the learners with the maximum opportunity for learning at their own pace, ensuring active participation of the learners and gradually leading them to the development of a concept, principle or teaching point. One such input which has the above mentioned characteristics is programmed learning. PLM with its carefully arranged and organized teaching matter, with its inbuilt capacity for active participation and reinforcement, with all its prompting techniques and self-paced learning can be a suitable method for solving many of the problems met with in the instruction of English. Moreover, as Skinner remarked, PLM has many good qualities of an efficient tutor. Some of these qualities found common to a good tutor and PLM as put down by Skinner (1958) are given below:

1. A good tutor begins where the pupil is, and does not insist on moving beyond what the pupil can comprehend.
(2) A good tutor moves at the rate that is consistent with the ability of the pupils to learn.

(3) A good tutor does not permit false answers to remain uncorrected.

(4) A good tutor does not lecture, instead by his hints and questioning he helps the pupil to find and state answers for himself.

As indicated above PLM has many qualities of a good tutor and, therefore, it can help instruction of English to a great extent by personalizing instruction in the overcrowded classrooms.

Programmed learning as a method of instruction, as already seen, took concrete shape as a result of the efforts made by Skinner (1954). The method advocated by Skinner moves step by step through a single set of materials and is called linear programming. After the introduction of the linear form, a number of forms other than linear, has been used in the matter of instruction. Branching deviated linear, etc. are some of them. In all these forms of PLM, the basic characteristics namely active participation, immediate feedback, and gradual approximation remains the same.

As already seen, although all the programmed learning materials are based on sound principles of learning, their format of presentation may significantly differ. For example, the classical linear programme has got frames of very small size each of which contains small bits of information followed by a question. The teaching point is very gradually approximated in
this type of programme form. It, therefore, may work well with slow learners but learners whose ability is above normal may find it too mechanical and therefore boring. Another form of PLM with larger frames, is not as mechanical as the classical linear form. This type is referred to as deviated linear programme. Students with a fair amount of ability may be able to get maximum benefit out of such a type because this may not appear to them as very boring in contrast to the classical linear programme. In the types mentioned above, the response called for at the end of each frame is unidirectional and so gives less scope for divergent thinking. The branching type of PLM offers opportunity to the learners to think of alternative responses and thus, giving scope for divergent thinking. Thus, different forms of PLM may also take care of individual learners with varying characteristics.

However, as already noted in the earlier part of the chapter, PLM in its pure form would not be able to take care of all the instructional goals because in gradually approximately a teaching point, the learner will not get the opportunity for seeing the set of teaching points together as to enable him apply his knowledge to solve content problems. For example, a learner taught through PLM the analysis of complex sentences, has to exercise the acquired ability so that it becomes a part of him such an opportunity is not there in PLM. Hence a number of other techniques which are capable of exposing the learners
to various activities and experiences are to be selected, incorporated, developed, sequenced and integrated into a whole texture of instruction to make a strategy which is feasible and effective. Further, such an attempt for systematization of instruction should be so directed towards the application of the scientific generalizations of the earlier laboratory studies, as mentioned earlier, in such a way as to fit them in the actual setting that teaching-learning situations can be made more specific and reproducible in the light of the concrete referents in terms of instructional material, learner behaviour, and other inputs with specific role for each in the sequence as to yield predetermined learning outcomes.

Thus, as already noted, instructional situations differ in nature in terms of student heterogeneity, varied physical environment, varied characteristics of instructors, etc. and they, therefore, call for the evolvement of a number of strategies so as to fit the various levels of instructional situations in the matter of teaching English. However, when looked into the Herculian task behind them, the cost involved, time consumed in their evolvement, and the number of subject as well as methodology specialists required, such a venture of developing instructional strategies for all levels of instruction becomes next to impossible for an individual or an institution within a short span of time. Hence, what is more feasible is to take up a particular level, and evolve an instructional strategy so that in the light of which further attempts could be taken up later.
In this context, the secondary stage is found best for the purpose for it is at this stage educational system demands of its pupils to pick up most of the language skills. Moreover it is at this stage pupils are prepared for acquiring language by which higher education is made possible. Education Commission (1964-66) puts it: 'As English will, for a long time to come, continue to be needed as a library language in the field of higher education, a strong foundation in the language will have to be laid at the school stage.' Moreover, it is at the high school level that children are marked off by the characteristics of independence, self-respect, challenge-taking, recognition, etc. So they would naturally opt for something that is novel, that would bring independence, recognition, etc. for them. In addition, pupils at this level will have sufficient knowledge in the language to go through the auto-instructional and respond to it satisfactorily so as to bring about the desired result. Hence Stds. IX and X were selected for the experimentation in the instruction of English.

Teaching of English Grammar

Of all the sections of English, its grammar deserves more attention than any other. This is because grammar is all embracing and hence, it has its sway over all the other sections of English, be it prose, poetry, drama, or novel. Grammar, therefore, is the base of everything. In this connection, an authority in the teaching of English, Dixon (1960) remarks that it is: 'Grammar which forms the real basis of the language. It is grammar structure,
primarily, that serves to distinguish one language from another.' He further puts it: 'Grammar provides a basis upon which the foreign students can build.' As grammar is so important, it is thought that this aspect of English deserves special attention.

However, in this connection, it should be noted that, of late, there had been a controversy as to the utility of teaching grammar at school stage. The anti-grammarians argued that even without formal teaching of grammar, a native speaker can use the language with as much ease and skill as or even better than the one who learnt grammar. Hence, they stood for the rejection of grammar, altogether from the school syllabus. In this connection, it should be remarked that this argument may be all right in the case of a native speaker who is always exposed to the language and its structure. To him learning of grammar, therefore, may be an analytic approach of what he has been using correctly without being conscious of it. But in the case of a foreigner this argument is totally inapplicable for he is seldom exposed to the language. To him grammar is unavoidable. It is a base for him to build the language and in the absence of which he would be in utter confusion as Dixon puts it: 'without guidance which grammar gives him, the student is adrift on a vast sea of complex language forms which makes little sense to him. Grammar serves to reduce these forms to set patterns.' On this
instance, the opinion expressed by Morris, (1960) another experts in the field, is worth quoting. After observing the whole area of argument for and against grammar teaching, he concludes: (i) A consideration of grammar is imperative; it dare not be left to look after itself (ii) A systematic course calls for grammatical progression concurrent with vocabulary progression. Hence, every foreign student is expected to have a systematic knowledge of grammar in the absence of which, as Handschin puts it, 'he (the student) cannot remember the multitudinous facts except in grouping governed by principle.' Hence, the teaching of grammar is of paramount importance when English is taught in schools.

When it comes to the question of grammar, again arises the problem of the type of grammar is to be taught. There are formal grammar, Structural grammar, generative transformational grammar. All the three grammars deal with the same English grammar. The only difference among them is that they vary in their approach in expounding the language. Formal grammar is prescriptive in nature. It expects of everyone to stick to the accepted structures and patterns. It thus stands for correct usage in communicating content to others. It prizes standard English, the English officially accepted as correct, in all situations involving oral or written communication. This is the grammar which almost all the text books deal with. Structural grammar, on the other hand tries to see English with all its diverse patterns of
sentences. It is the result of the attempt made by Fries (1952). He built the structural grammar by extracting the natural structures of the language. Meanwhile Chomsky (1957) came forward with his generative transformational grammar in which he brings a set of rules for generating the sentences of the language. He deals with the language in terms of kernel (basic) sentences and their subsequent growth (transformation) to complicated structures. Thus, the basic assumption of transformational grammar is that a language is a set of sentences and that a grammar is a series of rules which describes as simply as possible how all the sentences in the language can be formed.

It should be noted in this connection that these developments arose in the field as a result of renewed interest in linguistics. Some of these developments are yet in their state of infancy and therefore, have not stood the test of time to show their worth. Just as Frie's work was criticized by Noam Chomsky, his work, in turn, is time and again criticized by the present linguists. Some of them, says Currie (1973) 'would like to 'shoo' Chomsky off their paths.' Esper (1968) attributes Chomsky as 'a latter day Cartesian' who 'has revived antique views of language, and other moribund doctrines, mentalism, nativism, instructionism and cognitive theories of psychology.'

Therefore, it is perhaps too premature to expose foreign pupils to these linguistic exercises before they have been expanded clearly and proved their worth sufficiently. What is
expected of a foreign student is the acquisition of certain skills which would help him in utilizing the language for his daily purpose. In this connection what Wardhaugh (1971) remarked is worth noting. "We are no longer," says he, "so exclusively concerned with linguistic issues in foreign language instructions... We are wrestling with the problem of finding methods that work... and we try a variety of methods in the knowledge that no single solution ever works at all time." So what is ideal under the present condition is to expose the learner to formal and functional grammar which always sticks to the correct usage - be it in spoken or written form. It is in this form of grammar usually school grammars are found. Hence the present study has employed formal grammar for its experimentation.

So the present study attempts to develop an effective instructional strategy with a proper sequencing of the latest available scientific techniques that can be utilized along with the existing school resources with the feasibility of scheduling. So an instructional strategy for teaching the students of standards IX and X grammar was planned, evolved and experimented upon so as to introduce individualization of instruction into the existing classrooms and blending it with the prevalent educational system.

Formulation of the Problem: The present investigation, in the light of what has been discussed earlier, is attempted for 'Evolving a Strategy for Teaching English Grammar at High School Level.' The study has made use of FLM in combination with a number of other instructional techniques to solve an instructional
strategy for teaching the students of Stds. IX and X a few units of English grammar (prescribed by C.B. S.E., Course A.) The study involved the identification of a number of components, their sequencing and integration in such a manner as to provide the learner at appropriate places with ample opportunity for interaction, exposure, drilling and exercises so that the various goals laid down could be achieved. The present study also involved the validation of the strategy in terms of the students performance in the criterion tests and the reaction of both students and experts towards the various instructional components with which the strategy was constituted.

Apart from the evolvement and validation of the strategy, the study also attempted to find the comparative effectiveness of the three forms of Programmed Learning namely linear, deviated linear and branching so that their effectiveness could be seen in actual classroom situation. Some studies have already been done on this aspect. Shah (1971) and Krishnamurthy (1972) paid attention more on response mode, step size etc. than on the general comparison aspect. Studies of Kuruvilla (1977) and Verma (1977) although paid emphasis on different forms of PLM, they do not give a clear picture as to the superiority of a particular form over the others. Hence the present study seeks to establish the relative effectiveness of the three forms of PLM mentioned above in connection with the teaching of English grammar. The study, thus, aims to find whether different forms
of PLM with varying characteristics have differential effect on learning.

Although all the three forms of PLM under consideration, have the same characteristics namely active participation, immediate feedback, and gradual approximation, they differ significantly in the matter of style of presentation, frame content and question and response mode. The linear, the first of these forms, is associated with Skinner and it uses small bits of information averaging perhaps two sentences in length. These bits of information are followed by a question usually requiring an answer in the form of a blank to be filled in. The learners are guided in making the correct responses, thereby reducing the possibility of error to a minimum level. In this form of PLM, the teaching point is very gradually approximated and therefore, it may work well with slow learners. However, learners whose ability is above normal may find this form too mechanical and so boring. The form of PLM, with larger frames and with approximation of teaching points through gradual but not as mechanical as in the linear form, is known as deviated linear. Students with a fair amount of ability might be able to get maximum benefit through this form as it might appear to them not very boring in contrast to the linear programme. In the two forms mentioned above, the responses called for at the end of each frame is mostly unidirectional. So these forms of PLM do not provide the learners with much scope for divergent thinking. The branching type of PLM, with its comparatively
bigger frames, with its capacity for explaining why a response is either correct or incorrect, with its scope for providing remedial measures and with the question posed at the end of each frame requiring choice among alternative answers, offers opportunity to the learners for divergent thinking. Thus, the three forms differ in format and style. An application of the three forms of PM in actual classroom situation would show whether forms of PM with varying characteristics have differential effect on learning. Moreover the three forms of PM in the present study are not administered in their pure form. They are combined in a uniform manner with a number of other techniques so as to give the learners scope for necessary activities and experiences to achieve the instructional objectives. Hence it would be worthwhile to learn the comparative effectiveness of the three forms in combination with the other techniques. An establishment of the relative effectiveness of the three forms of PM might thereby lead to their increased and relevant application for instructional purposes at school level.

In addition, the study also attempts to find the relationship between student achievement through the strategy on the comprehensive test and their personality characteristics namely attitude and intelligence. The study, as already seen, is an attempt at evolving a strategy for teaching grammar at high school level. PM, in the present strategy, is only a component. It is used in combination with a number of other techniques of
proven worth incorporated and integrated at appropriate places so as to expose the learners to various activities and experiences with a view to achieving the various instructional goals laid down for teaching the specified units of English grammar to a population having specified characteristics as entering behaviour. In that way the strategy evolved is unique and hence there arises a need for highlighting the relationship between student achievement through it on the comprehensive test and their personality characteristics, namely attitude and intelligence. This aspect of the study is deemed important because it would lead to a clearer understanding of the effectiveness of the strategy thereby throwing much light on as how learner attitude and intelligence affect the learners in their learning. This knowledge, in turn, would help in improving the strategy in terms of the mode of presentation of the content matter or from the point of view of difficulty level. In the same way, it would also help in introducing alternative methods or providing remedial work by which learning can be made more effective.

Objectives of the Study

1. To evolve a strategy for teaching English Grammar at high school level.

2. To validate the material (strategy) in terms of (i) students' performances in criterion tests and comprehensive test. (ii) students' reaction towards the multi-media instructional strategy,
(iii) Experts' reaction towards the multi-media strategy.

3. To find out the comparative effectiveness of the three forms of presentation of programmed learning material namely linear, deviated linear and branching.

4. To find out the relationship between the pupils' attitude towards the multi-media and their achievement in the comprehensive test.

5. To find out the relationship of the pupils' intelligence on their performance in the comprehensive test.

Details regarding the sample chosen, methodology adopted, results obtained and discussion of the results of the study would be presented separately under different chapters.