CHAPTER - II
REVIEW OF RELATED LITERATURE

2.1.0 INTRODUCTION
The rationale along with Objectives and Hypotheses has been given in the previous chapter. This chapter deals with the review of related literature. This has been given under headings, like, Print Media & Scholastic Achievement; Audio Media & Achievement; Audio - Visual Media & Achievement; and Sumup.

2.2.0 PRINT MEDIA & SCHOLASTIC ACHIEVEMENT

**Bhushan (1973)** studied the effectiveness of a linear program in Educational Statistics at B.Ed. level in terms of achievement. The objectives of the study were: (1) to prepare a linear program in Educational Statistics using Hindi as the medium of presentation, (2) to study the workability of the program for various levels of qualifications, age, motivation, intelligence and for different sex; and (3) to prepare a manual for the guidance of the consumers of the program. The sample consisted of forty-two (twenty-seven males and fifteen females) B.Ed. student
teachers taken from a College of Education situated in an urban setting in the jurisdiction of Meerut University. The final draft of the program was analyzed with the computation of the three measures of density. The mean value of the density as measured by the ratio of different frames was found to be 0.263. The mean value of density as measured by the ratio of the number of different frames to the total number of response was found to be 0.194 approximately. The third index of density formed the ratio of the first two. As for techniques used, the frame sequence was studied with a pictorial representation and the sequence progression was studied with the help of scaleogram. Product moment coefficient of correlation, t-test, and Point Biserial coefficient of correlation were used to analyze the data. The findings were: (1) The mean of the attainment scores on posttest was found to be seventy-eight percent. (2) The percentage of mean of modified gain scores was obtained as 76.8. (3) The average performance of students at the knowledge and application levels was almost equal in amount and identical in composition. (4) The correlation ratios of posttest scores on pretest scores, performance errors and the ages of the students were found to be highly significant and dependable. (5) The posttest scores were neither related with sex variable nor with the initial levels of the students in mathematics. (6) The posttest scores were significantly correlated with intelligence and attitude scores and were independent of time taken by the students in covering the program. (7) The Pearson’s coefficients of correlation between time taken and intelligence scores revealed a significant and negative relationship, whereas the same between time taken and attitude scores indicated a marginal relationship. (8) Average attainment score of female group was found to be higher but less variable than the male group. (9) The students of lower qualifications performed equally well on criterion test when compared with their counterparts. (10) The value of t-ratio for posttest scores was not significant, whereas it was significant for the criterion of time taken.
Gupta (1973) developed a self-instructional program in basic sentence patterns of English for under-graduate students. The final version of the program was evaluated in terms of program density, error rate and sequence progression separately for the two major parts, viz., definitions and structures. The program density for the frames on definitions ranged from 0.4 to 3.4. The program density for the frames on structures ranged from 0.4 to 0.08 and the error rate for the same ranged from 1.4 to 3.2. The average density and error rates for the complete program taking the parts on definitions and structures together were 0.06 and 2.0, respectively.

Singh (1973) compared Formal and Thematic prompts in Linear Program in Geography on Map Reading for class VII. The objectives of the study were: (1) To analyze the relative effectiveness of Formal and Thematic Prompts. (2) To find out the effect of Formal and Thematic Prompts at different levels of intelligence. (3) To find out the effect of Formal and Thematic Prompts for different taxonomic categories. The hypotheses were: (1) There would be a significant difference between Formal Prompts treatment and Thematic Prompts treatment. (2) There would be a significant difference between Formal Prompts treatment and Thematic Prompts treatment for different taxonomic categories for the attainment at Memory Level, and for the attainment at Understanding Level. (3) Thematic Prompts would be more effective at higher level of intelligence, whereas Formal Prompts would be more effective at lower level of intelligence. The sample consisted of two sections of class VII randomly drawn from the local institutions of Meerut City. The sample consisted of students with high, average and low levels of intelligence. The study was a (2 x 3 x 2) factorial design. Achievement of students was taken as dependent variable while intelligence levels and taxonomy categories as independent variables. The prompts were the primary independent variables. The reliability coefficient of the final draft of the criterion test was found to be 0.83 when computed by K-R formula. Analysis of variance and t-test
were used for analyzing the data. It was found that: (1) Thematic Prompts were effective as compared to Formal Prompts. (2) The achievement of students having high intelligence was superior to those of average and low levels of intelligence in both the treatments. (3) Thematic Prompts were more effective at high level of intelligence as well as at average level of intelligence as compared to Formal Prompts. (4) The attainment of students at understanding level in Thematic Prompt was superior to Formal Prompt; and (v) Formal and Thematic Prompts were equally effective for the attainment at memory level.

Dewal (1974) conducted a study regarding difficulties in teaching English and effectiveness of Programmed teaching of class VIII students. The objectives of the study were: (1) to study teachers’ perception of difficulties which hampered effective teaching, and learning of English. (2) To study the effectiveness of Programmed teaching. For the first part of the study, ninety-three English teachers of Udaipur constituted the sample. A total of 160 students of class VIII of four Government schools of Udaipur city were employed as the sample for the second part of the study. As for tools, a questionnaire was administered to the teachers for the purpose of data collection. A pretest, program and the posttest were administered to the students. The findings were: (1) The difficulties hampering effective teaching and learning of English were due to shortage of trained teachers, lack of subject competence in teachers, dearth of good teaching-learning material, lack of individual attention, and poor socio-economic background. (2) Programmed teaching overcame some of the felt difficulties of the teachers and helped students to perform significantly better than those who were taught by conventional method. (3) The strategy proved useful in a situation where teachers were under qualified and untrained in teaching English.

Pandya (1974) studied the effectiveness of Programmed Learning Strategies in learning Physics in class X. The aim of the study was to see the relative effectiveness of the Traditional Method without home assignment and grading, a
Programmed Text with regular home assignment and grading in teaching Mathematics at the primary level. The sample consisted of sixty students of class IV studying in the Central School at Samchi (Bhutan). The subjects were randomly divided into three groups to whom the three methods were randomly assigned. The three groups were tested for homogeneity with regard to prerequisites and age. The Programmed Text prepared for the purpose consisted of 2557 frames divided into thirty units to be covered in thirty working periods. The findings of the study were: (1) The experimental group achieved more in all the four tests. (2) The gain of the students in experimental group at the posttest was significantly greater than the pre-test scores. (3) Learning through Programmed Learning Material benefited students with high, middle and low IQ. (4) When the effect of Motivation was partialled out, the adjusted mean scores showed that the experimental group achieved higher than the control group. (5) The developed program gave enough challenge to low motivated pupils than to highly motivated pupils.

Chandrakala (1976) conducted an experimental study of different methods of teaching Sanskrit Grammar at higher secondary level. The objective of the study was to evaluate the functional effectiveness of the program on Sanskrit Grammar at high, average and low academic achievement. Three alternative treatments, viz., Programmed Instruction (PI), Lecture Method (LM) and Traditional Method (TM) were tried out at three levels of achievement. The sample of the study constituted 172 students from standard IX. A factorial design of 3 x 3 model was applied. The findings were: (1) the three treatments, viz., Programmed Instruction (PI), Lecture Method (LM) and Traditional Method (TM) were equally effective in terms of students’ performance. (2) High and low achievers learnt equally well through Programmed Instruction. (3) Average achievers learnt better than high and low achievers through Programmed Instruction. (4) High achievers learnt better than average and low achievers through Lecture Method and Traditional Method.
Govinda (1976) developed a Programmed Text on Educational Evaluation for B.Ed. students and studied its effectiveness. The objectives were: (1) To develop a Programmed Text for the course, ‘Educational Testing and Techniques of Evaluation’ as specified in the B.Ed. syllabus of the M.S. University of Baroda. (2) To experimentally validate and study the effectiveness of the program. (3) To develop an attitude scale and measure students’ attitude towards programmed learning. (4) To study the relationship of achievement with attitude towards programmed learning, intelligence, academic motivation and English Language Comprehension. (5) To study the relationship of attitude towards Programmed Learning with intelligence and academic motivation. A matched group design was adopted for conducting the experiment. The study was conducted on sixty-nine B.Ed. students of the M.S. University of Baroda of 1973-74 session. The group was divided into a thirty-five members experimental group and thirty-four members control group. An attitude scale of Thurston type was prepared. The scale was administered after the students had completed two units of the Programmed Text. The mean percentage of all the six criterion tests was computed and correlated with the scores on attitude scale, intelligence test (the Raven’s Progressive Matrices), achievement motivation (JIM scale) and the English Language Comprehension test developed by the investigator on the basis of the Michigan Test of English Language Proficiency. The statistical techniques employed were Rank correlation, Product-moment correlation, Chi-square and Time Series Analysis. The findings were: (1) A Programmed Text was as effective as structured lectures. (2) Eighty percent of the students had favorable attitude towards Programmed Learning. (3) Students with more favored attitude achieved higher scores. (4) Intelligence and achievement motivation had no significant relationship with attitude of students towards Programmed Learning. (5) There was no significant relationship between attitude of students towards Programmed Learning and their academic motivation.
Shitole (1976) developed a Programmed Learning Material for Agricultural subject in Marathi medium for different categories of students of Secondary schools. The objectives of the study were: (1) To develop Programmed Learning Material regarding a few difficult concepts from the Agriculture syllabus for standard VIII of Marathi medium schools. (2) To evaluate these programs. (3) To compare achievements through this program and through the traditional methods. (4) To find out how effective one has been over the other. The study adopted an experimental approach. It was conducted in Sholapur district and involved four secondary schools teaching Agriculture as a subject. The sample comprised of 48 girls and 352 boys. The experiment involved three phases, viz., construction of the Programmed Learning Material, its administration and its evaluation. Mean, SD, t-test and analysis of variance were employed to analyze the data. Results showed superiority of Programmed Learning Material over the Traditional Method, irrespective of the category and sex of the student. The study also showed that Programmed Learning Material required less time than the Traditional Method.

Kuruvilla (1977) conducted an experimental study in the use of Programmed Learning Material in the class VIII. The objectives of the investigation were: (1) To study the relative effectiveness of the four forms of program viz., Linear Overt, Branching, Skip, and Response Prompt in terms of (a) performance of the students on the posttest, and (b) time taken to complete the program; (ii) to study the difference in mean achievement of students when adjusted for their reading comprehension. (2) To study the relationship between performance of the students on posttest and reading comprehension, academic motivation, dependency, and total adjustment. (3) To study the relationship between performance of the students on posttest and program time, and their attitude towards Programmed Learning. The population under study consisted of VIII standard students of English medium schools of Baroda. For tryout, 54 students of a school were taken and divided into four groups randomly. For final study three schools were selected.
randomly and all the 301 students of VIII standard in these schools constituted the sample. All the students of each school were divided into four groups and random replication design was used for the study. The tools used for the study were: Frymer’s Junior Index of Motivation Scale; the Pre-Adolescent Adjustment Scale by Pareek et al.; the Pre-Adolescent Dependency Scale by Pareek et al.; Reading Comprehension Test; and an attitude scale. The data obtained were analyzed through analysis of variance, t-test, percentiles, partial correlation, and product moment correlation. The findings were: (1) Eighty percent of the students who had learnt through different types of programs scored eight percent or above. (2) The Branching Form was significantly more than other forms when students’ performance and time were taken as criteria. (3) There was positive and significant relationship between performance of students on posttest and reading comprehension on each form separately. (4) There was no significant relationship between performance of students on posttest and academic motivation on Linear Overt, Branching and Response Prompt Forms; but Skip Program had a positive significant relationship. (5) Most of the students had positive attitude towards programmed learning.

Patel (1977) developed and try out Auto Instruction Programs in Geometry for class IX. The objectives of the study were: (1) To develop Programmed Learning Material (PLM) in some units of Geometry for class VIII. (2) To compare achievement in Mathematics of students having different reading abilities, and learning through PLM and Traditional way of teaching. (3) To compare the Achievement in Mathematics of students having different study habits, and learning through PLM and Traditional way of teaching. (4) To compare the achievement in Mathematics of students with respect to anxiety and n-Ach. when taught through PLM and traditional way of teaching. The sample consisted of 810 students of class VIII studying in fourteen schools of Kaira district. The sample was selected keeping in view the following criterion: the strength of the school;
the area whether urban or rural, type of school and SSCE results. The achievement of the students was measured through teacher made tests. Calculating mean, SD and t-values studied the differences between groups. The findings were: (1) The Programmed Learning Material (PLM) proved to be more effective than Conventional Method. (2) High IQ groups of students performed better with PLM than with Conventional Teaching. (3) The average time taken by the group learning through PLM was less than that of the group taught by the Traditional Method. (4) Students from different strata of the society performed better with PLM than with Conventional Teaching.

Sodhi (1977) compared Lecture Method and Programmed Learning Material in Chemistry at the higher secondary level. The hypotheses of the study were: (1) Different modes of instruction do not account for any significant differences in respect of overall achievement in Chemistry. (2) No significant differences in achievement exist among different categories of educational objectives. (3) No significant effect due to the interaction between taxonomic categories of educational objectives and modes of instruction exists in respect of achievement in Chemistry. (4) Intelligence is not a correlate of overall achievement and achievement in any of the categories of educational objectives. (5) Personality traits are not correlated with overall achievement in any of the categories of educational objectives. The sample consisted of 135 grade XI science students. The Programmed Learning Material (PLM) and criterion tests were developed for the study. The first hypothesis was tested using a factorial design. t-test and product moment correlation were also used in the analysis of data. It was found that: (1) The PLM through Branching Frames was superior to Lecture Method in terms of total achievement and category wise achievement of four topics. (2) The PLM of Linear Style was superior to Lecture Method in respect of overall achievement in categories of application, analysis, synthesis and evaluation, but no significant difference was marked for knowledge and comprehension categories.
(3) Branching Program was superior to Linear Program in case of total achievement and achievement in application, comprehension, analysis and evaluation categories. (4) Branching Program was superior to Lecture Mode in total achievement and in all the six categories of cognitive educational objectives. (5) Intelligence facilitated achievement only on four topics. (6) Many of the personality traits behaved as redundant variables but certain of them significantly correlated with achievement.

Verma (1977) studied effects of Schedules of Reinforcement and Extroversion on achievement through Programmed Instructional Material at class XI level. The objective of the study was to investigate into the interaction effect between Schedules of Reinforcement and Extroversion dimension of personality on achievement. A stratified sample of 81 extroverts and 81 introverts – both boys and girls of class XI from Meerut and Saharanpur Cities were selected. The Eysenck’s Personality Test adopted by Jalota and Kapoor was used to identify extroverts and introverts. The neurotics and stable boys and girls were also located on the basis of neuroticism scale scores. Programmed Instructional Material on Hindi ‘Alankar’ was developed to provide three types of Schedule of Reinforcement, namely, Continuous, Intermittent (variable ratio) and no Reinforcement, 3 x 2 x 2 factorial design of independent measures was employed. In the three treatments 27 extroverts and 27 introverts were assigned. The same criterion test was used as pre and post-test. The obtained scores were analyzed by employing analysis of variance and covariance techniques. The findings were: (1) the performance of extroverts was significantly higher than that of introverts through Intermittent Schedule of Reinforcement. (2) The introverts learnt better than extroverts through Continuous Reinforcement

Sansanwal (1978) studied the effectiveness of the Instructional Strategy for teaching Research Methodology course in terms of students’ performance on criterion tests and a comprehensive test. The objectives of the study were: (1) to
develop the Instructional Material for each of the components for teaching the
course on ‘Research Methodology’ as specified in M.Ed. syllabus at the M.S. 
University of Baroda. (2) To study the effectiveness of individual components of 
Instructional Strategy as a whole in terms of students’ performance on criterion 
test and a comprehensive test. (3) To study the effectiveness of individual 
components of Instructional Strategy in terms of students’ reaction to each of its 
components. (4) To study the relationship between achievement through the 
Instructional Strategy and the following students’ characteristics: intelligence, 
academic motivation, and English language reading comprehensions as covariates. 
(5) To compare the achievement of students of (a) high, average and low 
intelligence by taking academic motivation and English language reading 
comprehension as covariates; (b) high, average and low academic motivation by 
taking intelligence and English language reading comprehension as covariates; 
and (c) high, average and low English language reading comprehension by taking 
telligence and academic motivation as covariates. (6) To study the students’ 
reactions towards instructional strategy with respect to their level of 
achievement, intelligence, and academic motivation. (7) To study the trend of 
change in students’ reactions towards instructional strategy and their academic 
motivation over the period of experimentation. The sample comprised of 24 M.Ed. 
students of CASE and 43 M.Sc. students of Faculty of Home Science who had 
 opted Research Methodology course. The tools used for the study were Raven’s 
Standard Progressive Matrices, An English Language Reading Comprehension 
Test developed by Govinda, the Junior Index of Motivation Scale, and a Students’ 
Reaction Scale developed by the investigator. The data were analyzed with the 
help of percentiles, and ANCOVA. The findings were: (1) The Instructional 
Strategy was found to be effective in terms of students’ achievement on criterion 
tests. (2) Individual components and Instructional Strategy as a whole were found 
to be effective in terms of students’ reactions. (3) Achievement of students
through Instructional Strategy was found to be significantly related with intelligence but was not significantly related with academic motivation as well as English language reading comprehension. (4) The mean achievement score of students belonging to high intelligence group was significantly higher than that of average intelligence group; the average intelligence group was significantly higher than that of low intelligence group. These were the results when the mean achievement scores were adjusted with respect to their academic motivation and English language reading comprehension. (5) The mean achievement scores of students belonging to high, average and low academic motivation groups did not differ significantly when the achievement scores were adjusted with respect to intelligence and English language reading comprehension. (6) The mean achievement scores of students belonging to low English language reading comprehension group was significantly lower than those belonging to high as well as average English language reading comprehension groups. (7) A large majority of students from high, average and low achievement groups had favorable reactions towards individual Instructional components and hence towards the Instructional Strategy as a whole.

Mullick (1979) conducted a study of relative effectiveness of Linear Book Style Format and Multi-media Programs. The hypotheses of the study were: (1) There will be sample gain in the scores of students taught by the Book Format Program (BFP) and Multi-media Programs as measured from pretest and immediate posttest or retention test on the identification of terms and recall of terms. (2) The Multi-media Program and Book Format Program will teach differentially with reference to the objectives measured by the comprehension and application, drawing and teacher-made tests. (3) The Multi-media Program group is expected to do better insofar as the objectives measured by oral tests are concerned. (4) The Book Format Program group is expected to commit fewer spelling errors than the Multi-media group. (5) The students who achieve high scores in the tests of intelligence,
English and general science will score high in all criterion measures and vice-versa. (6) The students will show a positive attitude towards the programs. The sample consisted of 444 children studying in three English-medium schools of Delhi, of whom 204 children belonged to class V and 240 to class VI. These children were administered the pretests, viz., Coloured Progressive Matrices, the identification and recall of terminology test, and the battery of posttests, viz., the test of Identification of Terms, Recall of Terms, Comprehension and Application, Drawing, teacher-made test and attitude questionnaire, after having conducted the BF and MM Programs of instruction which were randomly assigned to different sections of classes V and VI. In order to investigate the relative effectiveness of these programs, six pairs of matched groups with respect to intelligence were formed. Besides, a retention test with respect to all the criterion measures was administered to the children after fourteen days. An analysis of variance design of six cells (2X3) was used for analyzing the gain achievement scores of the children. The findings of the study were: (1) the Multi-media Program was superior to the Book Format Program when the gain was measured by the tests of identification and recall of terms, comprehension, application and drawing and teacher-made test and also when the time for completion was taken as a criterion. (2) The Book Format Program was superior to the Multi-media Program when the number of spelling mistakes was considered. (3) These programs did not differ when the number of mistakes in pronunciation in the oral tests was considered. (4) The Book Format and Multi-media Program did not teach differentially, the different levels of students in intelligence, English and general science in so far as the learning effects as measured by the scores in the tests of comprehension, application and drawing and teacher-made test were concerned. (5) The Multi-media Program was particularly suitable for average-level groups in intelligence and general science when the teacher-made test was used. (6) The Book Format Program was particularly found suitable for low-level students in English of Class
VI when the teacher-made test was used. (7) When the criterion measures were the gain scores on the test of identification and recall of terms, the Multi-media Programs was particularly suitable for high-level groups in intelligence, English and general science, but not so suitable for low-level groups in English; the Book Format Program was particularly suited to high-level groups in intelligence and English; the Book Format was particularly not suitable for low-level students in English of class V; the Book Format Program was particularly suitable for low-level students in English of Class VII and the Book Format Program was particularly suited to average-level groups in general science. (8) No interaction effects between the levels of intelligence, English and general science and the treatments among Class V children were evident when the criterion measure was the number of spelling mistakes. Similarly, no interaction effects were evident in the case of Class VI children when divided into high, average and low levels in intelligence. No trend in the interaction effects of the levels in general science was evident.

Parlikar (1979) studied the suitability of Programmed Learning in Home-science Education for adolescent girls. The objectives were: (1) to develop a duly validated the Linear form of Programmed Learning Material (PLM) on ‘Saving’. (2) To study the suitability of the Linear form of PLM in Home Science as Self-instructional and Aided Methods of study for selected adolescent girls opting for Home Science. (3) To study the effectiveness of the Linear form of PLM in Home Science as compared with the selected Conventional Methods of study when used as Self-instructional and Aided Method of study. (4) To establish the suitability of the Linear form of PLM in Home Science for selected adolescent girls varying on the basis of selected input variables such as intelligence, overall achievement, achievement in home science and socio-economic status. About 135 students of class IX studying in Maharani High School for Girls at Baroda and opting Home Science were selected as sample. The students were divided into three groups. The
three groups were taught through three different methods, viz., the Conventional Method of study using Lecture-cum-Discussion, PLM for self-study and PLM as an aid to the lecture method. The pre and post-achievement was measured through achievement tests. Intelligence was measured through Desai-Bhatt Intelligence Test. Achievement in the previous years was obtained from their cumulative record cards. Socio-economic status (SES) was measured through an inventory prepared by the investigator. Data were collected in terms of immediate and delayed retention tests given on the completion of each sub-unit as well as the whole unit. Data were analyzed in terms of frequency and percentages, mean, median and standard deviation. Analysis of variance was also used to study the variations on immediate retention test (IRT) and delayed retention test (DRT) scores. The findings of the study were: (1) the Programmed Learning Material was suitable for promoting Home Science Education amongst adolescent girls. In general, it was most suitable as a self-study method. (2) The use of Programmed Learning Material was more suitable when compared to Conventional Method of study, viz., the Lecture-cum-Discussion. (3) Its use as an aid to the Conventional Method was more effective than the Conventional Method alone as far as immediate retention was concerned. (4) Intelligence, overall class achievement as well as achievement in Home Science and time taken to go through Programmed Learning Material were responsible for variations in immediate retention test (IRT) scores. (5) The methods of study independently affected the delayed retention test scores when the analysis of data was done by controlling the scores according to the extent of preparation, adjustment to school and SES. (6) Time taken to go through the Programmed Learning Material independently affected the variations in the delayed retention test scores on subjective items significantly. (7) Programmed Learning Material for self-study was suitable for above-average students and its use as an aid was suitable to the average students. (8) High-achievers found the use of Programmed Learning Material for self-study most
suitable. (9) Students belonging to high and middle SES achieved the highest mean scores on immediate retention test. For them, the use of Programmed Learning Material for self-study was more suitable than its use as an aid.

Shah (1979) developed Multi-media Package on effective questioning in the context of Microteaching. The objectives of the study were: (1) To develop Self-instructional Multi-media Package on effective questioning which would be helpful to pre-service and in-service secondary schools teachers. (2) To try out the package by experimentation and to explore the feasibility of the Self-instructional Multi-media Package. The sample consisted of thirty-two teachers selected randomly, out of whom sixteen were in-service teachers teaching in secondary sections of Gujarati-medium schools of Surat City and sixteen were teacher-trainees from a College of Education. The researcher developed the Multi-media Package on questioning skill. Data were collected through tools such as the background information sheet, attitude scale, behaviour coding system, evaluation guide for raters, perception of the teachers about Multi-media Package, and interview schedule for qualitative evaluation of Multi-media Package. The experiment was conducted by using single group design. The data collected were analyzed by using t-test and chi-square test. The findings were: (1) The teachers who were exposed to the treatment of the Self-instructional Multi-media Package course showed significant improvement in all the skills except one. (2) As regards the percentage of pupil talk, there was significant improvement. (3) Sixteen of the seventeen measures showed significant difference at 0.01 level between the pretest scores and the retention scores. The teachers could not retain the gain after three months for the skill of refocusing. (4) The self-rating scores of the teachers showed that they had a feeling of improvement in the use of eleven questioning skills out of the twelve. (5) The results about the opinion of the teachers revealed that they did realize the utility of the Micro-teaching technique for practicing the skills. (6) The results obtained on the package course was quite interesting for the
participants. (7) The qualitative evaluation of the package led to the conclusion that the teachers were quite satisfied with the package course so far as its educative importance was concerned.

**Pandey (1980)** studied the relative effectiveness of Traditional Method without home assignment and grading, a Programmed Text and Traditional Method with regular home assignment and grading teaching Mathematics at the primary level. The sample consisted of sixty students of Class IV studying in the Central School at Samchi (Bhutan). The subjects were randomly divided into three groups to whom the three methods were randomly assigned. The three groups were tested for homogeneity with regard to prerequisites and age. The Programmed Text prepared for the purpose consisted of 2,557 frames divided into thirty units to be covered in thirty working periods. The findings were: (1) the group following the Programmed Text differed significantly from the other two groups both in respect of immediate and delayed achievement. (2) The group following the Programmed Text was significantly superior in retention to the subjects following the Traditional Method without home assignment and the Traditional method with home assignment and grading.

**Seshadri (1980)** conducted an experiment in the Use of Programmed Instruction in secondary schools. The objectives of the investigation were: (1) To identify different components of the Instructional Strategy. (2) To develop software material to be utilized under different components. (3) To study the effectiveness of each component in terms of students’ and parents’ reactions and teachers’ observations. (4) To study the effectiveness of the Instructional Strategy as a whole. (5) To study the relationship between achievement through Instructional Strategy and certain selected personality variables. The methodology included the process of identification of the components that would constitute the strategy. This process was based on the instructional objectives of mathematics, the learners’ characteristics, and certain other factors like feasibility of preparing instructional
materials, available time, administrative support and the number of students. The components identified were: introduction by the teacher, Programmed Learning Materials, exercises or assignments, tutorials, summary, mathematical games or group activity, posttest and discussion of performance of posttest and feedback sessions. Software material related to each component was developed. The syllabus of mathematics for class IX was divided into thirteen units. On each unit Programmed Material of Linear style was prepared. In all, there were 2075 frames. The strategy was validated on a sample of fifty-one students of class IX of a school in Vasco-da-Gama. The experiment was conducted for a complete academic year. Internal criteria for validation consisted of the performance of the students on criterion tests pertaining to each unit and two comprehensive tests at the end of each semester. For external validation, the criterion was the performance of the students on the question papers set by the Headmasters’ Association of the Union Territory of Goa, Daman and Diu. The tools of data collection were the criterion tests. Headmasters’ Association examinations, semester and comprehensive examinations, questionnaires to know learners’, parents’ and school authorities’ reactions. Other tools used were the Raven’s Standard Progressive Matrices, Junior Index of Motivation (JIM Scale) and Palsane’s Study Habits Inventory. The statistical techniques used were t-test, product moment coefficient of correlation and partial correlation. The findings were: (1) A duly validated Instructional Strategy having reproducible Programmed Learning Material as the major component and with established long-range effectiveness and feasibility for using in classroom situations was developed. (2) Achievement had a positive correlation with intelligence, but not so with the scores on JIM scale and Study Habits Inventory.

**Shah (1980)** developed a teaching strategy for the course on Educational Evaluation at B.Ed. level and studied its effectiveness. The objectives of the investigation were: (1) To develop software material for four components of the
strategy, viz., library reading, Programmed Learning Material (PLM), discussion and practical work. (2) To study the effectiveness of developed strategy in terms of students’ performance on criterion tests and comprehension test and also in terms of instructional objectives related to knowledge, comprehension and application. (3) To study the effectiveness of each component and feasibility of the strategy during the regular course of instruction. (4) To study the relationship between achievement through the strategy and intelligence, reading comprehension ability and academic motivation. The sample for the study consisted of all the thirty students of B.Ed. class of the college of Mahila Mahavidyalaya, Baroda, affiliated to S.N.D.T. Women’s University, Bombay. The experimental validation was conducted for two succeeding years. Data were collected with the help of Observation Schedule for discussion session, criterion tests and comprehension test, Reaction Scale, Desai-Bhatt Group Test of Intelligence, Junior Index of Motivation and Gujarati Language Reading Comprehensive Test. The data obtained with the help of these tools were analyzed by calculating mean, standard deviation, skewness and percentiles. In order to study the relationships, product moment and partial correlations were computed. The t-test was employed to study the difference between mean achievements at three levels of intelligence. The findings of the study were: (1) The developed strategy was effective in terms of students’ achievement on criterion and comprehension tests. (2) The achievement of knowledge, comprehension and application objectives was to the extent of 80 percent. (3) out of the four components of the strategy, three components, namely, Programmed Learning Material, discussion and practical work were effective whereas one library work was not satisfactory. (4) The students’ reactions were favorable for the strategy. (5) The strategy proved feasible in respect of time needed and with regard to coordination with other scheduled B.Ed. programs. (6) Achievement was significantly related with the intelligence of students whereas it was not
significantly related with Gujarati language reading comprehension and academic motivation.

**Trivedi (1980)** studied the use of Branching Programmed Learning Material as diagnostic and remedial tools. The objectives of the study were: (1) To develop Programmed Learning Materials of the Branching type in Mathematics for classes V, VI and VII. (2) To compare the achievement of the students studying by the Traditional Methods of teaching with that of the students studying through Programmed Materials. (3) To diagnose students’ weakness in mathematics. (4) To use Programmed Materials as remedial measures. It was an experiment study using experimental control group design. The subjects in the two groups were selected randomly. For each class, there were 40 students in the experimental group (20 boys and 20 girls) and an equal number in the control group. The two treatments were the use of Programmed Learning Materials of the Branching type and the Conventional Method. The tools of research used were Programmed Materials developed for the selected units of Mathematics, pretest, posttest and the Bhatt Test of Intelligence. The teachers who were trained to use the Programmed Materials conducted the experiment. Two-way analysis of variance was used for data analysis. In the design, pretest score and intelligence were used as the covariates. The findings of the study were: (1) For class VI, the Programmed Learning Material was more effective than the Conventional Method of teaching whereas for Classes V and VII, both the methods were equally effective in terms of pupils’ achievement. (2) In the case of class VI, girls learnt better than boys through the use of Programmed Materials, whereas in the case of classes V and VII, there was no significant difference between the mean scores of boys and girls learning through Programmed Materials.

**Inamdar (1981)** studied the effectiveness of Programmed Learning Strategy in the subject of Mathematics in standard VII. The topic for study was the unit on Simple Interest. The material was developed and validated. The researcher selected seven
students from three schools, of whom three were bright, three averages and one dull, according to their achievement in the previous examination. The material was tried on thirty students of standard VII. An entering behaviour test was given to the students. The experimental and control groups were formed on the basis of this test. The sample consisted of 108 boys and 100 girls in the experimental group and the same number of boys and girls in the control group. The experiment was conducted in twelve periods. The performance of the group was studied in relation to some psychological correlates such as general ability, reasoning ability and motivation towards school. Analysis and interpretation of the data were done to find out the relation between general ability and performance in achievement in the PLM, the relation between reasoning ability and performance in achievement in PLM and the relation between motivation towards school and performance in achievement in PLM. It was found that the Programmed Learning technique was superior to the Conventional Technique.

Man (1981) conducted an experimental study whose objectives were: (1) To study the differences in retention, measured in the form of performance on the criterion test at different intervals, of the group of students following Programmed Instruction Material with unit tests. (2) To study the differences in retention, measured in the form of performance on the criterion test at different intervals, of the group of students following Programmed Instruction Material without unit tests. (3) To study the difference in retention measured in the form of performance on the criterion test immediately after the completion of the Programmed Instruction Material with and without unit tests. (4) To study the difference in retention measured in the form of performance on the criterion test one week after the completion of the Programmed Instruction Material with and without unit tests. (5) To study the difference in retention, measured in the form of performance on the criterion test six weeks after the completion of the Programmed Instruction Material with and without unit tests. The experimental
method was used for the study. A sample of 762 male students was drawn from the schools of Meerut City. The subjects were matched on the scores on the criterion test (pretest), the socio-economic status scale and the achievement motivation test so as to obtain two groups each of seventy subjects, one group designated as the experimental group and the other as the control group. The experiment was carried out in four phases. In the first phase, pre-pretest and general mental ability test were administered to the two groups. The subjects who scored less than 100 per cent marks on the pre-pretest were provided remedial help through classroom instruction till they attained the level of prerequisite behavior necessary for taking the program. In the second phase of the experiment the program was administered to the two groups. The experimental group was given a unit test after the completion of each unit of the program and the control group was not given any such tests. Immediately after completion of the program the criterion test was administered to the two groups to get the measure of immediate retention. In the third and the fourth phases, the criterion test was again administered to the two groups to get the measure of immediate retention. In the third and the fourth phases, the criterion test was again administered to the two groups, one week and six weeks after the completion of the program to obtain the measure of one week and six weeks’ retention. The t-test and analysis of covariance were applied to analyze the data obtained at different phases of the experiment. The scores on the general mental ability test of the two groups were used as a measure of pertinent control variable (covariate) in the analysis of covariance. It was found that: (1) The immediate retention of the group using Programmed Instruction Material with unit tests was significantly superior to its one-week retention. (2) The immediate retention of the group using Programmed Instruction Material without unit tests was significantly superior to its one-week retention. (3) The one-week retention of the group using Programmed Instruction Material with unit tests was not significantly different from its six-week retention.
On the other hand, one-week retention of the group using Programmed Instruction Material without unit tests was significantly superior to its six-week retention, implying that there was no further significant loss in the retention of the group using Programmed Instruction Material with unit tests whereas there was a significant loss with retention of the group using Programmed Instruction Material without such tests during the said interval. (4) The immediate retention of the group using the Programmed Instruction Material with unit tests was found to be superior to that of the group using Programmed Instruction Material without such tests. (5) The one-week retention of the group using the Programmed Instruction Material with unit tests was found to be superior to that of the group using the Programmed Instruction Material without such tests.

Mavi (1981) developed Programmed Text in Physical Geography for high school students. The objectives of the study were: (1) To develop Programmed Learning units in Physical Geography. (2) To empirically validate the Programmed Learning units. The sample consisted of 124 students of class IX. The entire program consisted of eighteen units that covered Geomorphology and Climatologic. The programs were in the English language and had a linear format. In all, 1391 frames were developed, out of which 1294 frames were of constructed response type and 97 of selection response type. The program was tried out with individual, group tryout and field tryout. The final program was evaluated in terms of error rate density on the criterion test and sequence progression. The program was further evaluated by obtaining the reaction of the students on the reaction checklist consisting of 100 items. The findings were: (1) Ninety-five percent of the learners were able to respond correctly to 95 percent of the frames. (2) The cumulative density calculated by taking into account the number of frames and the number of responses expected did not exceed 0.50. (3) Sequence progression for information through the frames was fairly normal. (4) On unit tests, the success
reached by learners ranged from 85 to 91 per cent. (5) The opinion expressed by
the students was found to be favorable towards the program.

Suthar (1981) conducted a study on Programmed Instructional Material in
relation to psychological characteristics. The objectives of the study were: (1) To
develop Programmed Learning Material (PLM) in algebra for class VIII. (2) To
compare the achievement in algebra of students with different study habits,
learning through the PLM and the traditional way of teaching. (3) To compare the
achievement in algebra of students with different reasoning abilities. (4) To
compare the achievement of students having positive and negative attitude towards
mathematics. (5) To compare the achievement of students with high and low
motivation towards school learning through PLM and the traditional way of
teaching. The sample consisted of 500 pupils of standard VIII from representative
secondary schools of Kaira District. The investigator developed and tried out PLM
in algebra for standard VIII in all the units such as set theory, rational numbers,
real numbers, powers and indices, equations and problems, graphs, real numbers,
etc. The investigator used the Study Habits Inventory Scale, Attitude towards
Mathematics, Reasoning Ability Test, Motivation towards school and self-
prepared entering behaviour test and terminal behaviour test in algebra for
collecting data. The finding of the study was that the Programmed Learning
Material was superior to the Traditional way of teaching irrespective of different
variables.

Davies (1982) studied the effect of different modes of pairing in Programmed
Learning of Mathematics at IX class level. The objective of the study was to test
the differential effects of the three pairing modes in Programmed Learning,
namely, mixed ability pairing, pairing based on teachers’ choice and pairing based
on students’ choice on the achievement of underachievers in Mathematics. The
sample consisted of 1092 students of standard IX drawn from ten randomly
selected schools, nine from the city of Madras (urban) and one from Arkonam
town (semi urban). A Programmed Learning Booklet in the Linear Style on the unit ‘statistics’ in Tamil was prepared and validated. The underachievers in Mathematics were identified by using the predicted scores in Mathematics based on the intelligence test scores and the actual scores on the achievement test in Mathematics. The students whose actual achievement in Mathematics fell short of their predicted scores by at least two stanines were designated as underachievers in mathematics and 242 underachievers were thus identified from the 1092 students. Of these, 105 underachievers were involved in the experiment. The underachievers were grouped with able achievers in three ways, ‘mixed ability’, ‘teachers’ choice’ and ‘students’ choice’ pairings. The underachievers and their partners learnt the programmed unit in the ‘dyads’ formed. The underachievers were helped by the able peers whenever necessary. The experiment went on for two weeks in each school. A posttest was administered after the paired Programmed Learning of the unit was over and again after a lapse of three weeks without prior intimation to test their retention. An achievement test in Mathematics, questionnaires on interest in Mathematics, participation in extra curricular activities and academic self-concept (developed by the investigator) and a general intelligence test, study habits inventory, personality test, socio-economic status scale and adjustment inventory (adaptations of standardized tools) were used to collect data. Apart from descriptive statistics, t-ratio, ANOVA, chi-square, analysis of covariance, multiple regressions and factor analysis were used for data analysis. The findings were: (1) Underachievers had 78 percent individual gains. (2) Underachievers in ‘teachers’ choice’ and ‘mixed ability’ Paris gained significantly in the posttest and had significant residual gains (favorable shift) over the predicted level of performance in Mathematics. (3) Underachievers in the ‘student choice’ pairs had a mean gain ratio 0.49 and they missed the significance level by a very narrow margin. (4) In the semi-urban school, underachievers in all the three pairing modes gained significantly. (5) Among the urban school groups, only those underachievers who
were in ‘teachers’ choice’, and ‘mixed ability’ pairs gained significantly. (6) When intelligence and school background were controlled, the different pairing modes were themselves effective in improving the performance of underachievers in the posttest with the teachers’ choice and the mixed ability modes being significantly more effective than the students’ choice mode. (7) There were significant differences between the gains due to (a) the pairing modes, in favor of the semi-urban school group, and (b) the interaction effects, in favor of the ‘teachers’ choice’ pairing in the semi-urban group. (8) Similar analysis of the effects of the pairing modes and sex indicated that there were significant differences in the gain ratios of the underachieving boys and girls in ‘mixed ability’ and ‘students’ choice’ pairing in the urban schools in favor of girls. (9) The able partners in the dyads had not only maintain their originals attainment levels in Mathematics but had also significantly gained over these in ‘mixed ability’ and ‘teachers’ choice’ groups. (10) Underachievers and their able partners had developed positive attitudes towards the dyadic approach to Programmed Learning.

Ravindranath (1982) developed Multi-media Instructional Strategy for teaching Biology at secondary school level. The objectives of the investigation were: (1) to develop a duly validated Multi-media Instructional Strategy for teaching the course in Biology at standard VIII. (2) To study the relationship between students’ achievement and intelligence. (3) To study the feasibility of the strategy in terms of time and cost. (4) To develop alternative instructional components for teaching a few concepts and study their relative effectiveness. The strategy developed by the investigator covered the prescribed content in Biology for standard VIII through different units. The Multi-media Strategy comprised of twelve instructional components, namely, introduction by the teacher, programmed learning material (PLM), lecture, team teaching, inquiry techniques, pupil activities with teacher demonstrations, discussions, audio-visual presentation, narration of biographical sketches of scientists, summary, criterion test and
feedback, and exercises and assignments. Final validation of the Multi-media Strategy was done through an experiment conducted on ninety students studying in standard VIII of a school in Baroda City. The students were divided into two matched groups and a pretest-posttest design was adopted for analyzing the comparative effectiveness of the Multi-media Strategy and the traditional method of teaching. Effectiveness was assessed in terms of achievement on unit criterion tests and a comprehensive test. Student reactions were also obtained as a measure of effectiveness. Data regarding the intelligence of students were obtained by using Madhukar Patel’s Intelligence Test. Correlation between intelligence scores and achievement scores on the comprehensive test for the experimental group was computed using product moment coefficient. Achievement scores of students with respect to three levels of intelligence were analyzed with the help of analysis of variance. Relative effectiveness of two types of PLM, namely, inductive PLM and deductive PLM was studied in respect of a few selected units. The sample for this included all the forty-five students of the experimental group mentioned above, who were divided into two matched groups of twenty-two and twenty-three students. The findings of the study were: (1) The instructional strategy was effective to the extent that 70 percent of the experimental group students obtained 60 percent and above on all the unit tests and the comprehensive test. (2) The experimental group students performed better than the control group on the comprehensive test and also on the annual examination conducted by the school authorities. (3) Development of scientific attitude was significantly higher for the experimental group students. (4) About 70 percent students expressed favorable reactions to all the components except towards team teaching. (5) There was positive and significant correlation between intelligence and achievement through the strategy. (6) The strategy was quite feasible in terms of time, as it required only ten additional periods spread over the whole year for completing the course.
Both types of programmed learning material, namely, inductive and deductive were equally effective as instructional material.

Menon (1984) evaluated multimedia approach for teaching Educational Technology. The objectives of the study were: (1) To develop a multimedia strategy in organizing a course in Educational Technology for postgraduate and research students. (2) To validate the strategy in terms of students’ performance on criterion tests and discussion sessions, and their attitude towards the strategy. (3) To study the relationship between achievement and intelligence, and achievement and English reading comprehensions. (4) To study the feasibility of the strategy. A single group design was worked out for carrying out the investigation over a long period of time. The sample for the validation study consisted of 21 M.Ed. students, 15 M.Sc. Home Science students and eight research students of Education during the 1977-78 session and a combined group of 22 students from M.Ed. and M.Sc. (Home) students of the 1978-79 session. The instructional inputs of the strategy were PLM, structured lecture, team teaching, seminar, slide-tape commentary, workbook presentation, discussion, library work, assignment, feedback session, practical work and summary. The tools used for the study were the criterion tests, observation schedule, and an attitude scale prepared by the investigator, Govinda’s English Reading Comprehension and Raven’s Standard Progressive Matrices. Descriptive statistics, F-test, partial correlation and product-moment correlation techniques were used for analysis of data. The findings of the study were: (1) In the initial year, around 90% Ph.D. students and M.Sc. students scored 60% and above marks on the Comprehensive Criterion Test, and more than 50% M.Ed. students scored 60% and above marks. (2) In the subsequent year around 90% students scored 75% and more marks. (3) An improvement trend was witnessed with regard to discussion sessions. (4) At different stages of implementation of the strategy, the student’s attitude towards the multimedia approach went on increasing in a favorable direction. (5) During the period of try-out of the strategy
for two years, the relationship between intelligence and academic achievement was found not significant. The relationship between English comprehension and academic achievement was not significant. (6) The unit cost varied from Rs. 47/- to Rs. 32/- for a range of 25 to 50 students. For proper presentation of software, suitable hardware was to be incorporated. The strategy worked within prescribed periods of time.

**Choudhary (1985)** conducted a study related to the preparation and evaluation of Programmed Learning Material in Geography. The objective of the study was to evaluate the program in terms of learning induced among the readers by reading the program. The sample of the study comprised of 300 students (223 males and 77 females) of classes IX and X drawn from ten secondary institutions (six boys’ and four girls’) of Faizabad city and rural areas in the neighborhood. The study was experimental in nature and employed the Single Group, i.e. Pre-Test / Post-Test design. The tool used was an achievement test in Geography. The finding of the study was that students gained significantly the knowledge of the subject by reading the Programmed Learning Material.

**Gautam (1986)** conducted a study whose objectives were: (1) To compare the efficiency of the Linear and Branching Program Formats with reference to performance on the criterion test. (2) To study the interaction effect of creative thinking, level of aspiration and style of programming on the criterion test performance. The hypotheses were: (1) The performance of the students taught through Branching Program is significantly higher on the criterion test than those taught through the Linear Program. (2) There is no significant interaction effects of creative thinking and level of aspiration, creative thinking and style of programming. A sample of 477 students was taken from five randomly chosen higher/high schools of Himachal Pradesh. The study was conducted by employing 2x2x2 Factorial Design. It involved two levels of creative thinking, two levels of aspiration and two styles of programming. The tools used were criterion test made
by the researcher, Mehdi’s verbal and non-verbal tests of creative thinking and three levels of aspiration tasks, namely, letter cancellation test, digit symbol substitution test and computation task. The data were analyzed by employing ANOVA and ANCOVA. The findings were: (1) Both the program formats were equally good in terms of their effect on the performance of the students on the criterion test in a segment of science. (2) High creative performed significantly better than low creative on the criterion test irrespective of level of aspiration.

Joshi (1988) conducted a study whose objectives were (1) to find out the relative effect of Test Anxiety and Intelligence on the performance of students on Criterion Test following Programmed Instructional Material, and (2) to study the effect of interaction among Test Anxiety, Intelligence and Styles of Programming on the performance on the Criterion Test in a segment of Science. The study was conducted on a target population of Class X students of High and Senior Secondary Schools in Shimla (H.P.). The study was restricted to 400 students (200 boys and 200 girls) selected randomly from the Hindi Medium Schools affiliated to Himachal Pradesh Board of School Education. The tools used were Hindi Version of Hundal General Mental Ability Test, Hindi Version of Test Anxiety Inventory by Sharma, Sood and Spielberger, and a Criterion Test prepared by the Researcher. The collected data were analyzed using ANOVA and ANCOVA. The findings were: (1) Low Test Anxious Students performed significantly better than the High Test Anxious Students on the Criterion Test after being taught through Programmed Material. (2) Both Linear and Branching Program formats were equally effective in enhancing the Achievement of Students.

Shrivastava (1990) studied the differential effect of the Motivational Conditions on Scholastic Achievement through Programmed Learning Devices on different types of learners- Above Average, Average and Below Average – in the School Setting. The sample comprised of 257 students of Urban Schools and 286 and 297 students of Rural School Students in Classes IX and X; who were drawn using
Stratified Random Sampling Technique. The tools used included Differential Aptitude Test Battery (Form LH) by Ojha, Teacher-made Achievement Test developed by the researcher, Achievement Anxiety Test by Alpert and Haber, Test Anxiety Scale for Children in Hindi by Nijhawan, State Trait Anxiety Inventory by Spielberger but adopted in Hindi by the Researcher. The findings were: (1) The use of Programmed Learning as a teaching device was particularly helpful for Low and Average Achievers. (2) Knowledge of the result and Praise by the Teacher were good motivators. (3) Motivational condition – reward under competition in addition to the knowledge of result was not very effective in comparison to the other two.

Thaker (1993) investigated the effectiveness of Linear Programmed Material and Branching Programmed Material in the Subject of Economics for Standard XI in relation to certain variables. This study was Experimental in nature. The initial sample of 2452 pupils of Standard XI was selected randomly from 15 randomly selected schools of Ahmedabad city. These pupils were administered Reading Ability Test (Trivedi and Patel), the adapted form of Smith’s N-Ach. Test (Patel and Dhanger) and a datasheet to know their birth order and parents’ education. After scoring, keeping in mind the levels of the independent variables, the final sample was shrunk to 1200 pupils. These were divided into three groups each consisting of 400 pupils. Then the treatments i.e. Textual Material, Branching PLM and Linear PLM were assigned randomly to these groups. The Branching PLM and Linear PLM were developed for two units of the syllabus of Standard XI following the scientific procedure. These units were the ‘Law of Demand’ and the ‘Law of Supply’. After reading the material, the three groups were administered the Achievement tests on the two units, which were prepared scientifically following the steps of standardization. The total of the two tests was taken as a complete score of Achievement for each pupil. The data were analyzed with the help of t-test and three way ANOVA. The findings were: (1) The Linear PLM was
found to be the most effective whereas the Textual material was least effective for
Achievement. (2) The main effects of Reading Ability, Motivation, Birth Order
and Parents’ Education were significant on Achievement in Economics. (3) The
first order interactions between Treatment and Reading Ability; Treatment and
Birth Order; Treatment and Parents’ Education were found to effect significantly
the Achievement in Economics. (4) The Second order interactions among
Treatment, Reading Ability and Birth Order; among Treatment, Motivation and
Birth Order; among Reading Ability, Motivation and Birth Order; and among
Parents’ Education, Motivation and Birth Order were significant on Achievement
in Economics. (5) All independent variables more or less contributed equally to
the Achievement in Economics of Standard XI pupils.

Agashe (1995) evaluated Programmed Learning Material for ensuring Mastery in
Biology for XI and XII Grade Students. The study was planned in four phases: (1)
Preparation, (2) Writing the programs, (3) Empirical tryouts of the programs using
single group pre-test post-test design, and (4) Evaluation of the PLM. The PLM on
the fifteen units of Biology from C.B.S.E. curriculum was developed. The
criterion tests consisted of fifteen unit tests based on each unit, and a summative
test of mastery for six units (unit II-1 to unit II-6) of Genetics. A Likert-type
three-point attitude scale for measuring the attitude of students towards the PLMs
was also developed. The attributes of the subjects included in the experimental
sample were: Age 15+, middle class Socio-economic status, XI and XII class
students studying Biology from C.B.S.E. or Punjab Board syllabus, English
Medium instruction, at least 55% marks in science subjects at X level, and both
boys and girls. An incidental sample of total 228 students (77 from grade XI and
151 from grade XII) from four schools and two colleges in the Amritsar city were
included in the field tryout. The development and validation of PLMs was carried
out through empirical tryouts for the achievement of mastery. The procedure
consisted of following four stages. I-Preparatory Stage: (1) Selection of the topics
and detailed content-analysis. (2) Specification of instructional objectives in behavioral terms. (3) Specification of pre-requisites and skills in behavioral terms. (4) Development of criterion tests. (5) Evolving core material. II-Writing Stage: It consisted of development of the PLMs on the basis of the core material. The frames were designed, sequenced and the PLMs were reviewed and edited according to the suggestions of the experts. Administration of both the PLMs and the tests was conducted in the classrooms by adjusting it in the school/college routine. While the students read the PLMs at their own pace. On completion of learning a programmed unit, the response sheets were collected and pertinent unit test was administered in the classroom under supervision. The answer sheets were immediately checked and answers discussed. The cycle of learning and testing the units one by one continued till all the programs were tried out. Evaluation Stage: The responses of the students to the PLMs and test items were analyzed for the evaluation of the PLMs on the basis of following criteria: (1) Error rates were used to calculate success percentages which directly reflect the efficiency of the program. (2) Sequence progression: The graphs were plotted and used to identify the frames, frame sequencing and test items that were faulty. (3) Scores on the criterion tests were used to calculate success percentage and gain ratios for assessment of mastery. The findings of study were: (1) The Program Learning Materials (PLMs) of linear style were developed for seven units of Biochemistry for grade XI and eight units of Genetics for grade XII. (2) Empirical validation of the PLMs was carried out by trying out the programs on sample – subjects in three stages. In the field tryout, more than ninety five percent of the learners were able to respond correctly on more than ninety six percent of the subject content. (3) The PLMs for all the fifteen units were found to be valid as a tool for ensuring mastery of the content. The percentage of success of the students of grade IX learning Biochemistry through the PLMs was between 89 and 94 and the percentage of success of the students of grade XII learning Genetics through the PLM was
between 83 and 93 as evident from the values of the success on the test and the gain ratios. The success of the students of grade XII in six units of Genetics (unit II-1 to II-6) was 87% on the summative mastery test. The students were able to attain the desired level of mastery in a single application of the PLMs. Re-teaching sessions or session of remedial instruction were not required at all for achievement of mastery. The affective outcomes of the application of the PLMs measured on the attitude scale showed that majority of the students found the PLM interesting, clear and easy.

**Sharma (1995)** developed an Instructional Material for facilitating creativity among elementary school children. The sample of the study comprised of 160 students of class VII drawn from IDUBSH High School, Bombay. The tools used to collect data included Verbal Test of Creative Thinking and Non-verbal Test of Creative Thinking by Mehdi, General Mental Ability Test of Jalota, Risk-Taking Test by Bhawalkar, Verbal Measure of Tolerance of Ambiguity Test by Bhawalkar, Preadolescence Dependency Scale of Pareek and Venkateshwara Rao, paintings, school records of each students, a Reaction Scale and instructional material developed by the investigator. The collected data were treated with ‘t’ test, analysis of covariance, trend analysis, analysis of variance of unequal cell size, multiple correlation and regression analysis. The findings were: (1) The developed instructional material (DIM) was found to be effective among the students of flexible time group as well as fixed time group on verbal fluency, verbal flexibility, verbal originality, verbal creativity, non-verbal creativity as well as in developing curiosity. But DIM was not found to be effective in the development of verbal elaboration. Both the groups differed from the control group. (2) The DIM with flexible time was found to facilitate significantly more non-verbal elaboration, non-verbal creativity and curiosity in comparison to fixed time group. (3) The increase in duration of treatment of instructional material with flexible time as well as fixed time developed curiosity equally. But it increased
verbal creativity and non-verbal creativity. (4) The students with high self-confidence were found to possess high verbal creativity but it did not influence non-verbal creativity and curiosity. (5) Instructional material with flexible time was found to be best suited to high intelligent students for development of curiosity, but low intelligent students were found to be benefiting from instructional material with flexible time. (6) The popular students were found to possess high verbal as well as non-verbal creativity than isolates but social characteristics did not influence significantly the curiosity of Class VII students. (7) In case of flexible time group, the maximum contribution in predicting verbal creativity was of achievement, and in case of fixed time group, the maximum contribution was of intelligence. (8) In case of flexible time group, the maximum contribution on predicting curiosity was of intelligence and achievement and in case of fixed time group. The maximum contribution was of achievement and intelligence, while in case of control group, the maximum contribution was of self-confidence.

Danikhel (1998) developed Instructional Material for Improving Reading Skills amongst School Students. The study was experimental in nature. It was conducted in two stages, namely, initial tryout and field tryout. The study was conducted on VII class students of M.P. Non – Equivalent control Group design was used. The treatment continued for 30 working days. The investigator developed the Reading Comprehension and Reading Vocabulary tests where as study habits, academic achievement motivation, intelligence, and personality standardized tools were used. Mean, SD, correlated t – test, coefficient of variation, chi – square, ANCOVA and multiple regression analysis statistical techniques were used to analyze the data. The findings of study were: (1) The reading instructional material for facilitating reading skills was found to be significantly effective in terms of reading comprehension, reading vocabulary, reading speed and reaction of students towards instructional material. (2) The instructional material for
facilitating reading skills was found to be significantly superior to traditional approach in enhancing reading comprehension of students when pretest reading comprehension, academic achievement motivation, study habits, verbal intelligence and personality were taken as covariates. (3) The instructional material for facilitating reading skills was found to be significantly superior to traditional approach in enhancing reading vocabulary of students when pretest reading vocabulary, academic achievement motivation, study habits, verbal intelligence and personality were taken as covariates. (4) Academic achievement motivation did not significantly influence reading comprehension of students when groups were equated in respect of pretest reading comprehension, study habits, verbal intelligence, reading vocabulary and personality. (5) Reading comprehension was found to be independent of the interaction between treatment and Academic achievement motivation when groups were equated in respect of pretest reading comprehension, study habits, verbal intelligence, reading vocabulary and personality. (6) Study habits did not significantly influence reading comprehension of students when groups were matched in respect of pretest reading comprehension, academic achievement motivation, verbal intelligence, reading vocabulary and personality. (7) The Reading comprehension was found to be independent of the interaction between treatment and study habits when pretest reading comprehension, academic achievement motivation, verbal intelligence, reading vocabulary and personality were taken as covariates. (8) Verbal intelligence did not significantly influence reading comprehension of students when groups were equated in respect of pretest reading comprehension, academic achievement motivation, study habits, reading vocabulary and personality. (9) Reading comprehension was found to be independent of the interaction between treatment and verbal intelligence when groups were equated in respect pretest reading comprehension, academic achievement motivation, study habits, reading vocabulary and personality. (10) Personality did not significantly
influence reading comprehension of students when groups were equated in respect of pretest reading comprehension, academic achievement motivation, reading vocabulary, study habits and verbal intelligence. (11) Reading comprehension was found to be independent of the interaction between treatment and personality when groups were equated in respect of pretest reading comprehension, academic achievement motivation, reading vocabulary, study habits and verbal intelligence. (12) Reading comprehension was found to be independent of sex when groups were equated in respect pretest reading comprehension, academic achievement motivation, reading vocabulary, study habits, personality and verbal intelligence. (13) Interaction between treatment and sex did not significantly influence reading comprehension when groups were equated in respect of pretest reading comprehension, academic achievement motivation, verbal intelligence, study habits, personality and verbal intelligence. (14) Academic achievement motivation did not significantly influence reading vocabulary of students when pretest reading vocabulary, study habits, reading comprehension, verbal intelligence and personality. (15) Reading vocabulary was found to be independent of the interaction between treatment and academic achievement motivation when groups were matched in respect of pretest reading vocabulary, study habits, reading comprehension, verbal intelligence and personality. (16) Reading vocabulary was found to be independent of study habits when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, verbal intelligence, reading comprehension and personality. (17) Reading vocabulary was found to be independent of interaction between treatment and study habits when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, verbal intelligence, reading comprehension, and personality. (18) Reading vocabulary was found to be independent of verbal intelligence when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, study habits, reading...
comprehension, and personality. (19) Reading vocabulary was found to be independent of interaction between treatment and verbal intelligence, when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, study habits, reading comprehension, and personality. (20) Reading vocabulary was found to be independent of personality of students when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, study habits, reading comprehension, and verbal intelligence. (21) Reading vocabulary was found to be independent of interaction between treatment and personality when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, study habits, reading comprehension, and verbal intelligence. (22) Reading vocabulary was found to be independent of sex when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, study habits, verbal intelligence, reading comprehension, and personality. (23) Reading vocabulary was found to be independent of interaction between treatment and sex when groups were matched in respect of pretest reading vocabulary, academic achievement motivation, study habits, reading comprehension, and personality. (24) Reading vocabulary, academic achievement motivation, study habits, verbal intelligence, reading comprehension, and personality could not significantly predict reading comprehension of students treated through instructional material for facilitating reading skills. (25) Reading vocabulary of students treated through instructional material for facilitating reading skills could not significantly be predicted through reading comprehension, academic achievement motivation, study habits, verbal intelligence and personality. (26) The reaction of students towards instructional material for facilitating reading skills was found to be favorable.

Warute (1998) developed the Remedial Materials in Mathematics for Standards I and II based on M.L.L. and studied their Effectiveness. The two groups pretest-posttest design was used for experimental study. Groups were equated on IQ and
SES factors. ‘Aba Saheb Dtre English Medium School’, Rasta Peth and ‘Bharti Vidyhya Peeth’s English Medium School’ and Paud Road were selected for the study. The treatment was assigned by lottery system. Phatak’s ‘Drawn-Men Test’ for IQ, B. Kuppuswamy’s Socio-Economic Status Scale (Urban) and Criterion Reference Test for Achievement constructed by the investigator were used to collect the data. The remedial programs developed for the study included instructions, games and practice sheets in mathematics. Mean, t-test, and F-test was used to analyze the data. The findings of study were: (1) A large number of students in the conventional classroom situation do not achieve the expected level of performance in mathematics even at the end of the academic year in standards I and II. (2) In standards I and II there are very few students who know absolutely nothing about basic skills taught in the mathematics class. (3) All students learn concepts differently. (4) Concrete materials help standard I and II students in understanding and acquiring mastery over the mathematical skills. (5) Remedial materials help in improving the performance of students in mathematics. In standard I scores improved from 20% to 35%. Similarly, in standard II scores improved from 37.5% to 81.25% after using the remedial program.

Ghetiya (1999) compared effectiveness of Lecture Method, Demonstration Method and Programmed Learning Method with reference to student’s academic achievement. The sample comprised of 158 girls of Class VIII of Gujarati Medium Secondary School of Gujarat State. The experimental design was Two Groups Posttest Only Design. The tool used for the study was an Achievement Test developed by the investigator. The data were analyzed with the help of t-test. The finding was that Lecture Method was found more effective than Demonstration Method and Programmed Learning Method.

Shah (2002) prepared and tried out Programmed Learning Material based on the two units of Food and Nutrition of X standard Science textbook in Gujarat State. The PLM was prepared on ‘Balanced Diet and Deficiency Diseases’ with the help
of the Science textbook of Standard X, other reference material and the suggestions of subject experts. It underwent four stages of construction, namely, Planning, Writing the program, Try-outs and Revision and Evaluation of the final draft. The sample comprised of 540 students of five co-education schools of Ahmedabad city. The schools were selected using purposive sampling method. Two classes were randomly selected from each school. It was an experimental study based on Pretest - Posttest Non-equivalent Control Group Design. One class was randomly treated as Experimental Group (EG) and the other as Control Group (CG). The experiment was conducted during July-August 1998. Prior to the treatment, a pre-test and Desai Verbal - Nonverbal Group Intelligence Test were administered. The Experimental Group learned through the PLM in the presence of the investigator while the regular teachers taught the Control Group through the lecture method. At the end of the experiment, a criterion test was administered to both the groups. The reliability of the test established through test - retest method was 0.76. The content validity was established with the help of the experts. The EG was administered a reaction scale also. The data were analyzed by applying t-test and 2 x 2 x 2 x 2 x 2 Factorial Design ANOVA. Intensity Index on each statement was computed for testing students’ reaction towards PLM. The findings were: (1) Both PLM and LM were found to be effective in terms of students’ achievement on the criterion test yet PLM was significantly superior to LM. (2) The main effect of each of the five variables – treatment, sex, intelligence, test and category of caste was significant on students’ achievement. (3) Majority of two-way, three-way and four-way interactions of variables did not produce any significant effect on students’ achievement. (4) The interaction of all the five variables did not produce significant effect on students’ achievement. (5) Intelligence and category of caste worked as influencing factors to determine students’ achievement in both the groups. Sex was the determining factor in the LM but not in the PLM group. (6) PLM was significantly superior to LM in terms
of all selected variables. (7) PLM was found to be very effective in terms of students’ reaction towards it.

**Pandit (2003)** developed Learning Method and Instructional Material to nourish the Language Ability of Multi-level Class. Sample comprised of 33 students of two classes of standard V (one experimental group and one control group) of Mumbai Municipal Corporation and was selected by random sampling. Selection of students was based on cluster sampling method. Experimental design followed equivalent group design. Tools used were- Pre diagnostic test, Post diagnostics test and question paper in language set by the school used as achievement test. Percentage was used for data analysis. Findings showed that 82% of the students scored more than 80% in reading, writing and comprehension by studying the Instructional Material developed by the investigator.

**Dubey (2004)** studied the effectiveness of educational material related to Indian National Heritage for the students of class VIII. The Sample consisted of 100 students (50 male and 50 female) selected randomly. Tools used were - questionnaire for module, and reaction sheet for module. The findings were: (1) The developed educational material in the form of module was proved to be effective for the students. (2) It can be clear from the study that through module based on programmed instruction, specific knowledge can be presented to the students. (3) The students could gain the knowledge related to Indian national heritage – its aspects, Indian festivals, Plants of medicinal values and national symbols through developed educational material. (4) Teachers presented at the time of experimentation also found the module interesting, useful and easy to administer. (5) Students gained knowledge interestingly and the students who were absent at the time of experimentation also expressed the interest and curiosity towards the program.

**Kumar (2002)** studied the effectiveness of Games, Work-Card and Self Instructional Material on English Language Learning. The sample comprised of
146 students of standard IX of Gujarati Medium School. The sample was divided into three groups for experimentation. The Counter Balanced Design was used. Six teaching units were taken from the English Reader standard IX (lower level) published by the Gujarat State School Textbook Board, Gandhinagar. Games Approach was used as the learner centred approach. The Games were based on Grammatical Structures, Vocabulary and Content of a lesson to be given to the students in learning different teaching points. There were Games, like, Magician’s bag, Musical chair, each one choose one, tying the tags, Choose one stick one, Rani Rani, What do you want? Sticking the strips, Word-Game, Spelling – Game, and Quiz. Work-Card Approach was also a learner centred technique where the investigator divided the content in small units and prepared Work-Card. Students were supposed to study the Work-Card & answer the questions. If they cannot answer correctly, they may study the same card again but if their answer is correct than they were asked to go to the next card. Self Instructional Material was developed & its components were: (a) Aims & Objectives, (b) Introduction, (c) Discussion of Learning Point, (d) Activity – 1, (e) Lesson based on learning point, (f) Vocabulary, (g) Activity – 2, (h) Summing up, (i) Aids to Answer and (j) Test. To assess the Achievement in English, six tests were developed and Opinionnaire was used for assessing the students’ reaction to Games, Work-Card and Self Instructional Material. The data were analyzed with the help ANOVA followed by t-test. The findings were: (1) All the three approaches produced similar effect on Achievement of English learning but Games Approach was found to be more effective than Self Instructional Material. (2) Students’ opinion for Games Approach was favorable. For Work-Card approach and Self Instructional Material, the students’ opinions were also favorable but they were not as favorable as Games Approach. For Work-Card Approach they opined that it is boring to study on my own reading Work-Card and I cannot learn carefully while learning through Work-Card by myself. While for Self Instructional Material they opined that I
cannot understand completely by reading the Self Instructional Material and it is not possible to learn reading the material prepared for learning self-effort. 

**Sharma (2005)** studied the effectiveness of an Instructional package in Environmental studies among students of standard VII. The objectives were: (1) to prepare an instructional package on environmental studies; (2) to teach environmental studies with the prepared instructional package to students of standard VII; and (3) to determine the effectiveness of the instructional package in promoting better understanding of the environment. It was a case study research involving standard VII students of St. Xavier’s High School, Gandhinagar. Single group pretest-treatment-post-test design was employed. Achievement test and structured interview scheduled were employed for the study. The instructional package was found effective in promoting a better understanding of the environment. The analysis of the responses of the students through the interview schedule revealed an increased sensitivity towards environmental concerns and a better understanding of the environment.

### 2.3.0 AUDIO MEDIA AND ACHIEVEMENT


**Shrivastava (1974)** conducted a study whose objectives were: (1) to find out the present position of school broadcasts by surveying and studying the various aspects of the system, (2) to make an assessment of the system by obtaining the opinions of various persons involved in the process, (3) to give practical suggestions for improvement so that it may become more scientific and effective,
(4) to review and clarify those fundamentals of psychology which have direct bearing on learning situations in the school broadcasts and to highlight the implications for good teaching practices, (5) to study the role and place of school broadcasts in school education and to analyze the significance of school broadcasts, their contributions to education of students as well as trained and untrained teachers, (6) to find out the difficulties experienced by teachers and students while listening to these programs in the classroom, (7) to examine the validity of these programs through specific evaluation and utilization schedules, and (8) to construct utilization and evaluation schedules together with guidelines for different activities before, during and after the school broadcasts. The sample comprised of 200 schools randomly selected from Madhya Pradesh, Maharashtra and Gujarat who listened to radio programs. Data were collected from All India Radio stations in the Western region, namely, Bhopal, Indore, Bombay, Nagpur, Poona, Ahmedabad, Baroda and Rajkot. Producers, script-writers and directors were interviewed. Educational authorities were also interviewed to collect information about the conditions in respect of the administration, organization and planning of school broadcasts. Data were also collected through the evaluation and utilization sheets, which were prepared by the researcher and circulated to schools for use during the listening of school broadcasts in the classroom. The study employed normative and historical method of research. The data were analyzed by computing correlation, chi-square and percentages. The findings of the investigation were: (1) the Ministry of Information and Broadcasting, Government of India governed School broadcasts. Before the commencement of each session, the producer (AIR) set up school broadcast councils that comprised principals, teachers, experts in the area and the AIR staff. (2) The subject committee only approved the subject matter and content of the subject. The scriptwriters worked only with the producers. The writers made necessary provision for music so as to make the learning process effective. (3) The school broadcasts were related to
languages, social studies, science and general knowledge. (4) The appropriate forms for presentation, such as dramatization, plays, dialogue, conversation, discussion with students, narration and question-answer were appreciated by teachers, educators, and students. These were useful in motivating students, creating interest in them and holding their attention. (5) There were nearly 695 listening schools in Madhya Pradesh, 1,200 in Maharashtra and 1,302 in Gujarat. There were many schools which possessed radio sets but did not provide listening facilities to students. A few listening schools made provision in the regular timetable for school broadcasts. (6) The listening schools were located both in urban and rural areas. The teachers used various devices and sources for supplementing knowledge in different subjects. (7) The quality of reception was fair in Madhya Pradesh while in Maharashtra and Gujarat it was good. The delivery of school broadcasts was, by and large, appropriate. Fast and slow speeds were also reported. (8) School broadcasts were useful in enriching and extending the work of teachers but could not replace the classroom teaching. (9) Some schools had tape recorders but very few made use of them to record and replay the lesson. (10) No attempt was made to associate student with the organization of these programs. (11) There was no uniformity in the lesson in different subjects broadcasts. (12) There was lack of cooperation between the listening schools and the AIR station. Most of the schools did not receive the AIR program booklets on time, especially in Madhya Pradesh. (13) The programs could be improved by adjusting them to the course, better planning, cooperation of the AIR staff, provision of trained staff, regular inspection by educational authorities, etc.

Biswal (1980) developed strategies for effective utilization of school broadcasting program in Orissa. The objectives were: (1) to study the School Broadcast Program (SBP) in terms of instructional objectives, number of programs broadcast, content coverage, script-writing and quality of program; (2) to study the facilities provided by the high schools of Orissa for the use of school broadcast;
(3) to develop and tryout instructional strategies for the effective utilization of school broadcast programs; (4) to compare the effectiveness of the developed instructional strategies with the radio broadcast alone; and (5) to study the reactions of students and teachers towards the strategy. The study was conducted in two phases. In the first phase, the survey of the status of School Broadcast Programs (SBP), the development, tryout and modification of instructional materials were done whereas in the second phase, the effectiveness of the strategies was studied. The All India Radio, Cuttack, and the schools listening to the broadcast programs were the samples of the study. In order to study the facilities and reactions, questionnaires were developed and used by the investigator. Criterion tests were developed to measure the achievement of the students. In addition to this, a proforma and unstructured Interview Schedule were also developed and used to collect the data. The data collected were analyzed qualitatively and by employing certain statistical techniques, like, analysis of variance. The findings were: (1) The objectives of different subjects of the school broadcast programs had remained the same throughout the academic years 1975-76 to 1979-80 and the objectives for most of the subjects were not in specific terms. (2) The number of broadcasts for particular grades was less and for Grade X there was no program. Also, several subjects were neglected. (3) Experts were not given training in writing scripts for radio lessons and they felt that teachers in the schools did not know how to make use of SBP. In most of the programs clarity of speech was there but due to the lack of novelty, the programs were not interesting. (4) Among the respondents, 62 percent of the schools had been found not using SBP. (5) Wherever the programs were used, there was no systematic arrangement to sit, and no guidance was given to students about the use of SBP. Even teachers were not trained to make use of SBP. (6) Teachers also expressed that there was need for special radio workbooks. (7) Teachers felt that English lesson were difficult for students to understand. Students had interest in listening
to radio lessons and half of the students expressed the desire to have radio lessons daily. (8) Students’ achievement was found to be above 56 percent in two programs, above 60 percent in ten programs and above 70 percent in four programs that were selected for this purpose. (9) The strategies developed for effective utilization of SBP were significantly effective when compared to the radio broadcast alone. Students and teachers favored the strategies. (10) The strategies were feasible in terms of time, schedule and cost involved.

**Passi, Katiyar, Sansanwal, and Syag (1980)** evaluated radio broadcasts for primary and middle school teachers. The objectives of the investigation were: (1) To study the facilities available for listening to radio broadcasts. (2) To know the time and programs listened to by teachers. (3) To know the opinion and reasons for broadcasting educational programs for teachers. (4) To know, with reasons, duration and time of educational broadcasting for teachers. (5) To study with reasons the difficulties faced by teachers for teaching various subjects. (6) To prepare subject-wise list of topics where teachers faced difficulty in teaching. (7) To know the opinion and reasons of teachers regarding difficulties related to various teaching methods. (8) To prepare a list of topics related to education in general and training in particular on which teachers would like to listen to the radio broadcasts. (9) To study whether teachers would like to take an examination on topics broadcast through radio or like to take some other benefits. (10) To prepare a list of topics on which teachers liked to write lessons for radio broadcasts. The sample of the survey consisted of 524 teachers of primary and middle schools situated both in urban and rural areas of M.P. These teachers belonged to Raipur, Indore, Dhar, Gwalior and Rewa districts of M.P. Data collected through an open-ended questionnaire were analyzed by computing percentages. The findings of the investigation were: (1) Majority of the teachers (96 percent) had facilitates for listening to radio broadcasts. (2) Majority of the teachers (63 percent) listened to different radio programs during evening hours. (3)
Majority of the teachers (88 percent) liked to have separate broadcasts for teachers. (4) The teachers liked to have broadcasts of thirty minutes’ duration in the evening. (5) Majority of the teachers (80 percent) were of the opinion that they had difficulties in teaching languages, science, mathematics and geography. (6) Majority of the teachers (90 percent) expressed the opinion that they had difficulties related to the methods of teaching. (7) Majority of the teachers (78 percent) expressed their willingness to take examination on the topics that were broadcasted, and get certificate, promotion and increment. (8) Sixty-five percent of the teachers liked to write scripts for broadcasts if orientation in writing-scripts and guidance from time to time were provided to them. (9) Subject-wise topics for broadcasts suggested by teachers were: Hindi-grammar, stories, poems, pronunciation, and Kabir Ka Rahasyavad, English-grammar, and pronunciation. (10) The teachers liked to listen to broadcasts related to the ways of motivating and creating interest among students for teaching language and science, maintaining discipline in classrooms as well as in school, administering and engaging students in purposeful learning in single-teacher primary schools, psychology, specially socialization of the child, motivation, problem-solving, etc., the new methods of teaching science such as discovery method, and method of teaching of English through structural approach.

**Singh and Shukla (1980)** conducted a case study of school broadcast in Delhi. The objectives were: (1) To examine the extent of radio utilization in Delhi schools. (2) To understand the conditions that encouraged or impeded radio utilization. (3) To study teachers’ attitude towards school broadcasts. (4) To study the process of program planning and production and liaison between the Directorate of Education and Akashwani in various stages of program planning and production. (5) To study the comprehensibility of radio lessons on the part of students. A structured schedule was prepared containing a few open-ended questions in order to elicit teachers’ comments and suggestions. The field
investigators visited every third school out of 532 schools having listening facility of the broadcast. The investigators collected information from the records as maintained by the schools in respect of school broadcasts. The information was also obtained through observation, informal discussions, interviews, etc. Comprehension of programs was studied by a pretest and posttest design. The investigators administered these tests. The data were analyzed by using percentages and other descriptive statistics. The findings of the investigation were: (1) The Directorate of Education and the Akashwani did little in training script-writers for school radio. (2) Of the schools having radio sets, 14 percent did not utilize the radio programs. (3) Only in 32 percent cases, there was some proximity in time between radio program and the teaching of those lessons in the class. (4) Forty percent of the radio programs were not related to the syllabus. (5) Non-availability of program chart and lack of awareness of radio programs were some of the difficulties in the utilization of school programs. (6) After listening to the programs to the extent of 7 to 17 percent, item analysis of the tests showed that the students gained very little on word knowledge and concept formation. Most gain was on acquisition of the factual information.

Kaur (1981) studied the effectiveness of self-instructional audio cassettes in developing teaching skills among B.Ed. students. The objectives of the study were: (1) To develop instructional materials for the skills of probing, questioning, explaining and illustrating with examples. (2) To prepare audio cassettes of the instructional materials prepared by the investigator for the above mentioned teaching skills. (3) To develop the skills of probing, questioning, explaining and illustrating with examples through self-instructional audio cassettes. (4) To examine the effect of self-instructional audio cassettes on the general teaching competence of student teachers. The sample consisted of thirty-two student teachers taken from Dev Samaj College of Education for Women, Ferozepur City. The tools used were Raven’s Standard Progressive Matrices, Socio-Economic
Status Scale (Kuppuswamy), Junior Index of Motivation (Frymier), a questionnaire for student teachers, self-instructional audio cassettes, Baroda General Teaching Competence Scale prepared at the CASE, and observation schedules for the skills of probing, questioning, explaining and illustrating with examples. The findings of the study were: (1) Teachers of both the experimental groups made continuous progress component-wise and as a whole in the skills of probing questioning, explaining and illustrating with examples. (2) The techniques of teaching also helped continuous progress in the performance of student teachers. (3) Both the techniques of training, traditional and microteaching were effective in improving general teaching competence of student teachers. (4) The experimental groups exposed to both the treatments showed better performance than the control group exposed to the traditional technique only. (5) The student teachers could effectively integrate the teaching skills acquired in simulated conditions into their actual classroom teaching. (6) The self-instructional audiocassettes were effective for developing different teaching skills. (7) Immediate, pinpointed and self-feedback through audiocassettes was an effective way of improving the performance of student teachers in the use of different teaching skills.

Goel (1982) evaluated school broadcasts in India. The objectives of the investigation were: (1) To study the functioning of school broadcast unit with respect to different aspects of the program such as transmission, script preparation, etc. (2) To find out the extent of utilization of school broadcasts in schools. (3) To explore the possible role of colleges of education in the scheme of school broadcasts programs. For studying the functioning of school broadcast units, all the 35 stations of AIR producing school broadcast programs were included in the study. Out of these, eight stations were visited personally for in-depth study. Five script-writers from each radio station were contacted. The extent of utilization was studied by contacting schools in the state of Haryana. Data were collected by
using different questionnaires for producers of school broadcasts, script - writers, students, teachers, headmasters and principals of colleges of education. The investigator for recording observations with respect to school broadcasts developed a school broadcast observation schedule. Unstructured interviews were conducted with producer, students, teachers and headmasters. The data were analysed by using frequency distribution, percentages, etc. The findings of the study were: (1) Coordination between school broadcast units and state departments of education in different states in organizing school broadcasts was not adequate. (2) The objectives of particular programs were not enunciated in most of the school broadcast units. (3) A very limited portion of the syllabus was covered through these programs. (4) The majority of the scrip-writers (78 percent) received no training in preparing scripts. (5) In none of the schools, there was provision for school broadcast period in the time table. (6) The majority of the principals of Colleges of Education thought it advisable for the pupil-teachers to listen to the school broadcast programs and offer suggestions to the AIR for improving these programs.

Nagaraju and Ramkumar (1982) conducted a study on school broadcasting utilization by high schools in Bangalore district. The objectives of the study were: (1) to know the extent of utilization of the school broadcasts, and (2) to identify the problems faced by schools in utilizing the programs along with the opinions of teachers. The study was conducted through mailed questionnaires to all the schools having radio sets in Bangalore district. There were eighty-five such schools. The second stage of the study was taken up after receiving the questionnaires from thirty-five such schools. In this stage, 50 percent of the schools that did not respond to the questionnaires were selected and the schools were visited to administer the questionnaire, a teacher Opinionnaire and an observation checklist. The heads of these institutions and one or two teachers in each institution were asked to fill up the questionnaire and the Opinionnaire
respectively. The schools that had stated that they utilized school broadcasts were also visited. Content analysis and percentages were worked out. The findings of the study were: (1) The utilization of school broadcasting is very low as compared to the number of schools having radio sets; (2) The major reasons given for the non-utilization of school broadcasts was that the radio set was out of order. However, even where the radio sets were in order, the schools were not utilizing the school broadcast. The other reasons were: difficulty in seating arrangements, non-functioning of intercoms, etc.; (3) the reasons for the non-utilization of broadcasts were: (a) problem in arranging the time table, (b) heavy workload for teachers, (c) lack of trained teachers in utilizing broadcasts, (d) lack of advance information by the AIR, and (e) non-supply of printed materials (handbooks) well in advance to help the teachers to prepare the students for radio listening; (4) Feedback on the AIR broadcasts was normally not given by many schools; (5) A majority of the teachers did not listen to school broadcasts. The main hurdle in using the radio was the school system itself. Without qualitative contribution the radio program had become an economic burden and the same could be diverted to more useful utilization for out of the school youth in rural areas.

Sudame and Goel (1988) evaluated school broadcasts in Baroda district with a view to assess its quality and relevance to school syllabus. The objectives of the study were: (1) to assess the production of school broadcast programs (SBPs); (2) to assess the utilization of SBPs in the secondary schools of Baroda districts; and (3) to study the quality and relevance of SBPs to the school syllabus. The sample comprised of 165 heads and teachers of all the high / higher secondary schools of Baroda districts, and the personnel of AIR, New Delhi and Ahmedabad, the State Institute of Education, Ahmedabad and the H.M. Patel Institute of English Training and Research. The tools used included questionnaires and interviews. The collected data were treated by frequency, percentage analysis and content analysis. The findings were: (1) It pointed out some bottlenecks. (2) One very
good feature was that 85% of the schools had radio sets but only 1/5 school provided for SBP in their timetable. (3) Radio lessons were largely textual curricular centered. They needed to move more towards enrichment type. (4) Scriptwriters didn’t receive any type of training.

**Educational Technology Cell (1989)** conducted a study whose objectives were: (1) to enable teachers to improve their teaching skills and to improve the classroom teaching-learning situations, and (2) to enrich the experience of both the teachers and the pupils by familiarizing with the latest information on educational innovations. The sample consisted of a panel of listeners of radio broadcasts and teachers drawn from schools located in Shillong. Two sets of questionnaires were prepared one each for use with the listening panel and the teachers. Percentages were used to treat the collected data. The finding was that the broadcast timing was the wrong one, and preference was more for the afternoon. Teachers were of the view that radio programs were helpful in their teaching and wanted more programs in service and languages.

**Mishra (1989)** critically analyzed the primary school radio programs in Puri, Bhubneswar and Cuttack districts. The objectives of the study were: (1) to study the effectiveness and impact of primary school radio programs; (2) to know the attitudes of children, parents, teachers and students towards the programs; (3) to assess the strengths and weaknesses of the programs; and (4) to assess the specific objectives of the programs. The investigator randomly selected 25 subjects from Puri, Bhubneswar and Cuttack. These 25 candidates represented different sections of the people, such as teachers, teacher-trainees, parents, and other government employees. A questionnaire was used as the tool. The collected data were qualitatively treated. The findings were: (1) the children liked radio programs in “Song” and “Story” format most. However, children did not like “Quiz” and “talk” program. (2) Child artists are not invited to narrate stories. (3) Children did not like long programs.
Choudhary (1990) assessed the impact of an audio intervention program aiming to sensitize Anganwadi workers. The objectives of the study were: (1) To promote cognitive skills in children such as sequential thinking, problem-solving, and concept-formation, (2) to inculcate among children an awareness of their immediate environment, (3) to develop in teachers/Anganwadi workers the skills to use the ‘play-way’ activity method in teaching young children, and (4) to develop in teachers/Anganwadi workers a positive attitude towards disadvantaged children and also help them in interact with children more actively. Out of the eight ICDS sectors of Kota, four sectors formed the experimental group and four formed the control group. One hundred Anganwadis each formed the experimental and control groups. Similarly, twenty-five morning-shift government primary schools were selected for the experimental groups and twenty-five afternoon-shift schools formed the control group. Audio programs were prepared keeping in view the developmental level and the abilities of children, and the needs of the community. A guidebook for each program was prepared containing details of each program. Radio sets were supplied to the 100 experimental Anganwadis and to classes I and II of the primary schools. It was found that Aganwadi children gained significantly more than their counterparts in the control group in capabilities, like, listening comprehension, verbal expression, vocabulary gain and sequential thinking. However, no significant difference was found between the experimental and control groups of primary schools.

Mohanty (1990) evaluated primary school radio programs. The objectives of the study were: (1) To identify the nature of the contents of primary school programs broadcast by All India Radio, Cuttack, and to ascertain pupils’ growth, and (2) to know about the suitability of language and format in respect of comprehension of the primary school programs. The sample consisted of 400 children studying in classes IV and V of rural and urban primary schools of Orissa. Out of the total primary schools of Orissa, 30 schools were drawn randomly. Boys and girls from
both urban and rural areas were taken in experimental and control groups. The tools used were Comprehension Test to test language development; Knowledge of Gain Test to measure cognitive growth; Aptitude Test of primary school teachers, and Interview Schedule. t-test and percentage were used to treat the collected data. The study revealed that the comprehension of radio programs by students was moderate and not satisfactory; programs that had feature/drama/story formats were comparatively better comprehended; and rural children as compared to urban children gained significantly less.

Sumitra (1991) conducted Case Study of the audio cassette project of Hoshangabad (M.P.) for teaching Hindi. The objectives of the study were: (1) to study the utilization and effectiveness of specially prepared audio cassettes in village primary schools for language development and listening comprehension; (2) to study the management strategies to achieve the objectives; (2) to study the problems involved in converting a broadcast mode into a cassette mode and to identify the steps to be taken; (3) to study the teachers’ acceptability of the media; and (4) to identify the types of programs understood, remembered and repeated more often than others and to identify their production characteristics. The sample comprised of 450 primary schools of Hoshangabad district of Madhya Pradesh. From these schools, there were 900 teachers and 34,345 students of classes I, II and II for three years. For collecting data 308 programs; 17 audio cassettes and 50 two-in-one tape recorders were used. The tools used included questionnaires, observations schedule and recording of children’s responses. The collected data were treated using percentage, averages and ranking. The salient outcomes of the study were: (1) the cost of two in one sets have limited life and they need proper budgetary provisions for running and maintaining them; (2) children when interviewed showed their happiness about the programs and wanted to listen to more of such programs; and (3) the best liked programs were those which had segments of songs, stories, questions and activities.
Harjal (1992) took up a case study of science broadcasts. This study dealt with the science programs broadcast by All India Radio (AIR) from its various science cells. The objective of the study was to survey and understand the procedure of preparing the science programs broadcast by AIR. The programs prepared by the Science Cells set up in the state capitals and broadcast by the AIR were selected. A sample was the audience responses to science programs from Delhi and a structure schedule was developed with some open-ended questions. The Audience Research Unit collected data on listening, contents and conceptions about the science programs. The data were analyzed by computing percentages. The finding was that around 20% to 30% students listened to the program. Out of this lot, 64% rated programs as “satisfactory” and found the language “easy to follow”. The respondent also saw links between science programs and economic development.

Pal (2001) conducted an experimental study with off timing of AIR, namely, Audio-conferencing for Primary School Teachers. The focus of the study was to assess the feasibility, workability and effectiveness of audio-conferencing in the area of teacher education by using off timings of AIR. The two way audio communication method was adopted to conduct the experiment in which teachers were given telephone facility at one end and at the other end the live broadcast from the All India Radio was available. Teachers were also linked with AIR station through FAX facility available nearby. The experiment was conducted for three days. Also each day was divided into three sessions, namely, the problem session, the solution session and the discussion session. The sample included two hundred teachers on eleven teachers’ centers selected from four Tehsils of Indore district. Besides this, 22 facilitators including 11 from the DIET Faculty and 11 Head Teachers / Principals of the schools where the teacher centers were fixed. The study revealed that the off timings of local AIR station could be utilized for local educational purpose especially in teacher education. Local resources, both, human and material can be utilized in education through proper co-ordination.
Jain (2002) studied IGNOU Teleconferencing for Distance Learners with objectives, such as, (1) to analyze the teleconferencing programs of IGNOU subjects in terms of contents, methods, media and modes; (2) to study the effectiveness of teaching the distance learners through teleconferencing in terms of mean achievement scores; (3) to study the reactions of distance learners regarding preparation, presentation, duration, talkback, technical and non-technical problems and utility aspects of IGNOU Teleconferencing with respect to selected variables; (4) to study the views of IGNOU Personnel involved in planning, production, co-ordination and implementation stages of IGNOU teleconferencing programs; and (5) to study the feedback on IGNOU teleconferencing programs with respect to views of Coordinators regarding attendance, technical and non-technical problems, motivation, participation, utility and benefits of IGNOU Teleconferencing programs. Very few participants were found attending the teleconferencing programs. Usually the participants were found attending the programs attentively. Participants wanting to ask questions seemed more interested in the programs. The time allotted for the talkback session usually was not enough. Some learners having vernacular background expressed apprehension about the comprehensibility of the programs. They felt inhibitions in discussing and asking questions. There were mixed responses regarding the effectiveness of the teleconferencing programs. Some found these programs very exciting and wonderful, whereas others could not utilize these programs properly. Proper coordination was required among all the personnel involved in IGNOU Teleconferencing.

2.4.0 AUDIO - VISUAL MEDIA AND ACHIEVEMENT

Roy (1974) studied the cognitive effects of the ETV programs telecasted by the Delhi TV center. The objectives of the study were: (1) To find out the present situation through observations of the teachers and students on an observation schedule about the cognitive effects of ETV programs through four bases of cognition. (2) To study any probable effect of two variables (TV teaching and discussion). The hypotheses were: (1) There would be a significant difference between TV teaching followed by discussion and TV teaching followed by no discussion (A1B1-A2B2). (2) There would be a significant difference between TV teaching followed by discussion and non-TV teaching followed by discussion (A1B1-A2B1). (3) There would be a significant difference between TV teaching followed by discussion and non-TV teaching followed by discussion (A1B1-A2B2). (4) There would be a significant difference between TV teaching followed by no discussion and non-TV teaching followed by no discussion (A1B2-A2B1). (5) There would be a significant difference between TV teaching followed by no discussion and non-TV teaching followed by no discussion (A1B2-A2B2). (6) There would be a significant difference between non-TV teaching followed by discussion and non-TV teaching followed by no discussion (A2B1-A2B2). The sample comprised of students of class X of science stream of two classes, each of which was divided into two matched groups as class I-A1B1, A1B2 and class II-A2B1, A2B2. Both the classes were taken from the same school where ETV was being used for classroom purposes. The instruments prepared and administered
were an opinionnaire having thirty-eight items meant for both the TV teachers and the students; and a test based upon the lesson which the TV teacher gave. The findings of the study were: (1) The opinionnaire revealed that nearly half of the students were not having the overall and cognitive effects out of the TV lessons. (2) The most affected were the assimilation and utilization bases out of the four bases.

Paiganokar (1978) conducted a study on the use of mass media for second language teaching in India with special reference to radio and television. The objectives of the study were: (1) To take a survey of the availability of English and Hindi teaching programs through the mass media in India. (2) To see how far the principles of linguistics, the principles of psychology of learning and considerations about the socio-cultural conditions of the learners were used in preparing English and Hindi lessons for the mass media. (3) To see if there was an attempt to use the potentials of each mass media while preparing English and Hindi lessons and to what extent they were utilized. (4) To find out facts about the conditions in which planning, preparation, and evaluation of English and Hindi lessons for the mass media took place. (5) To see how English and Hindi programs over the mass media were being utilized by teachers and pupils. The programs studied were Hindi teaching on the Pune radio through Marathi, English teaching on radio for schools in Maharashtra, English teaching on Bombay-Pune and Delhi televisions under the School Television Program and English teaching through the Marathi newspaper ‘Kesari’ from Pune. The design of the study was based on survey methodology, using observation, interviewing and questionnaire as tools for data collection. Content analysis of official documents was also carried out. All those connected with policy formation, program production, program execution and program participation were studied using suitable methods. The findings of the study were: (1) Script-writers and subject experts of radio and TV lessons for schools had the knowledge about the principles of linguistics and pedagogy but
did not have the training needed to use the media potentials. This was reflected in
the actual lessons produced. English lessons through the newspaper and Hindi on
radio for general public did not reflect such knowledge and training of their
producers. (2) Teachers in the schools of Pune, Bombay and Delhi lacked
awareness of the principles of linguistics and their application to second language
learning. No training was available to them from any source. A few Bombay and
Delhi teachers were exposed to some orientation because of user-teacher courses
and on-the-spot evaluation meetings. This, however, covered very few teachers.
(3) Teachers were generally aware of the second language teaching programs over
the mass media with the exception of linguaphone records. (4) Rural teachers were
more aware of the radio as an available medium of teaching second languages than
their urban counterparts, but the situation was reversed in the case of the rest of the
mass media. (5) It was hypothesized that the use of English and Hindi lessons put
across by the radio and the TV would progressively decrease as one moved from
the urban upper class schools to rural schools. This was not supported in the case
of the radio programs and there were very few TV sets in the rural schools, a
meaningful comparison could not be made.

Jeyachandran (1980) studied programmed filmstrip as a method of teaching
history in secondary schools. The objectives of the study were: (1) To develop
software materials for the media. (2) To validate the developed materials against
the conventional teaching in terms of immediate recall and delayed retention in the
case of the objectives, viz., knowledge, understanding, application and skill. The
sample was chosen from nine schools in the city of Madras. All were Tamil
medium schools and out of which five were boys’ and four girls’ schools. The
total sample consisted of 450 boys and 315 girls. The subjects were divided in
three groups which were taught through three different methods, namely, teacher
with program filmstrip, program filmstrip without teacher, and the conventional
method. Four lessons were prepared on unit ‘Buddhism and Jainism’. Data were
collected with help of achievement tests prepared by the investigator. These tests were administered before the lesson, after the lesson and four weeks later to get the pretest, posttest and retention scores. The data were analyzed by employing the statistical techniques like, Bartlett’s F-test. The findings of the study were: (1) It was possible to develop programmed learning materials in history. (2) Group pacing was possible in programmed learning. (3) Programmed Learning Material (PLM) could be integrated with audio-visual materials. (4) PLM could be used through media like filmstrips. (5) Teacher had an important role when self-learning techniques were employed. (6) Learning through PLM resulted in better retention. (7) Between programmed filmstrip with teacher and programmed filmstrip alone, the former was more effective. (8) Retention of learning was more in the case of programmed filmstrips with teacher and programmed filmstrip without teacher in comparison with the conventional method. (9) So far as the achievement of different objectives, viz., knowledge, understanding, application and skill was concerned, it was the maximum in the case of teacher with programmed filmstrip followed by programmed filmstrip and the conventional method in that order.

Phutela (1980) evaluated school television programs in Delhi. The objectives of the investigation were: (1) To determine the extent of utilization of school television (STV) programs by the schools. (2) To study the factors responsible for under utilization of the programs. (3) To study the process and liaison between the various agencies involved in the production and utilization of the programs. (4) To study teachers’ attitudes towards the school telecasts. (5) To find out the preferences of teachers regarding the subjects for teaching through television. (6) To study the level of comprehension of the STV programs on the part of the students of different classes. The sample was drawn from the higher secondary, high schools and middle schools of Delhi. Every third school was included in the sample study. The schools were visited by researchers without prior intimation at
the time of the telecast. Comprehension tests were administered to the students both before the telecast (pretest) and after the telecast (posttest). A questionnaire was constructed based on content factors, motivation factors, presentation factors and viewing conditions. A four-point attitude scale for assessing the attitudes of the teachers towards STV programs was also included. The data obtained were analyzed using percentages and t-test. The findings of the investigation were: (1) Many teachers did not find school television (STV) programs useful as they were not different from classroom teaching or were not presented in such a manner as to sustain student’s motivation. The quality of the program was not high. The number of programs per class was not adequate. (2) About 38 percent schools in the sample possessing TV sets utilized STV programs. The reasons for not viewing were: TV sets being out of order, functions in the schools, examinations, etc. (3) Most of the teachers from these schools accepted TV as a welcome help and agreed to the positive statements, like, teachers too learn about better methods of teaching. (4) The results of four out of five comprehension tests showed real difference in the learning of the subject matter, indicating that these lessons were well understood.

Kumar (1981) compared the effectiveness of methods of instruction and multi media method. The objectives of the investigation were: (1) To find out the relative effectiveness of the three methods of instruction - expository method, programmed learning method and multi-media method. (2) To study the relative retention in learning through these three methods. (3) To develop a program in branching style on the selected unit of content in biology. (4) To develop multi media text on the programmed content. In order to experimentally study the relative effectiveness and the interaction between the three methods and two levels of intelligence, a 3X2 factorial design was employed. The Biology students of Classes IX and X of two Inter Colleges formed the sample of study. In all, 180 students were divided into three groups of sixty students each. One group was
given instructions through programmed learning method, the other through expository method and the third group through the multi-media method. All the students of three groups were administered the criterion test as pretest, then on the completion of the respective treatments these three groups were again administered the criterion test. After fifteen days, the same criterion test was re-administered. It was found that (1) The multimedia method was more effective than either the programmed learning method or the expository method. (2) The programmed learning method was more effective than the expository method. (3) Retention in learning by the multi-media method was higher than by the other two methods. (4) Retention in learning by the programmed learning group and the expository group was equal. (5) There was no interaction between the three methods of instruction and the levels of intelligence.

Oberai (1981) evaluated radio vision as an instructional system. The objectives of the investigation were: (1) To compare the effectiveness of the radio vision method of instruction with the traditional method of instruction in terms of academic gains on the part of the subjects. (2) To study how far the instructional objectives set for each lesson were fulfilled by instruction through radio vision with the help of teachers’ ratings. (3) To compare the effectiveness of radio vision as a medium of instruction with certain methods of classroom instruction with or without radio vision in terms of academic gains on the part of the students. (4) To study how far the instructional objectives set for each lesson were achieved by instruction through radio vision with black-and-white slides and radio vision with colour slides with the help of teachers’ ratings. The pilot study was conducted on the students of classes VIII and IX of the Government Boys’ Secondary and Girls’ Secondary School in Dausa, Rajasthan. In all, 125 students were selected randomly from both the schools. The final experiment was conducted on the students of class IX of the same school. Pretest-posttest control group design was used for the experiment. Data were collected by using Jalota’s Group Test of
Mental Ability, Srivastava’s Socio-Economic Status Scale, criterion test, interview schedule for students, a questionnaire for teachers, observers’ class profile and attention measures. The data were analyzed with the help of t-test and F-test. The findings of the study were: (1) The radio vision groups obtained significantly higher mean scores on the recognition test than the group receiving instruction through the traditional method. (2) All the radio vision groups, except the black-and-white radio vision group, obtained significantly higher mean gain scores than the group receiving instruction through the traditional method in the final-experiment. (3) With respect to the recall test, the group receiving instruction through color radio vision plus workbook obtained significantly higher mean scores on the criterion test than the remaining six groups. (4) The majority of the teachers opined that most of the students found the radio vision method interesting. (5) The attention profiles of different radio vision groups indicated that radio vision could attract the attention of very high percentage of students and sustain their attention throughout the length of the presentation.

Dhamija (1985) compared the achievement of class VII students in Geography when taught through different approaches viz, radio-vision, modular and conventional. The objectives of the study were: (1) To compare the achievement of students of class VII in social studies when taught through three different approaches, viz. radio-vision, modular and conventional. (2) To compare the achievement of students in Geography when taught through these three approaches. (3) To compare the achievement of students in Civics when taught through these three approaches. (4) To compare the achievement of students in History when taught through these three approaches. (5) To compare the retention of these three approaches. (6) To compare the retention of students in Civics when taught through these three approaches. (7) To compare the retention of students in History when taught through these three approaches. (8) To compare the students’ involvement in Geography when taught through three approaches. (9) To compare
the students’ involvement in Civics when taught through three approaches. (10) To compare the students’ involvement in History when taught through three approaches. (11) To compare the self-confidence of students in Geography when taught through these three approaches. (12) To compare the self-confidence of students in Civics when taught through these three approaches. (13) To compare the self-confidence of students in History when taught through these three approaches. The sample of the final study comprised of 30 students in each of three different schools. The students were selected on the basis of their intelligence scores. In total there were 90 students. The sample of the confirmatory study comprised 90 students belonging to one school. These students were also selected on the basis of their intelligence scores. In the final study stage three schools formed three parallel groups for three approaches of teaching, viz. radio-vision, modular and conventional. So a three-way factorial design (3 x 3 x 3) was followed where three factors were involved, namely approaches of teaching (radio-vision, modular and conventional), intelligence (high, middle and low) and testing occasions (pretest, post-test, and retention test). In the confirmatory study, students in one school were divided into three parallel groups. These groups of students were taught by three approaches of teaching radio-vision, modular and conventional and later on the teaching methods were rotated in a Latin square design. In both the stages, Social Studies comprised three different disciplines, namely, Geography, Civics and History. These three subjects were taught one by one with the help of three different approaches of teaching. The students were administered the achievement test, retention test, Students’ Self Confidence Scale, and Students’ Involvement Scale. The achievement and retention test comprised a criterion test. The test-retest reliability coefficient of Students’ Self Confidence Scale was 0.86 and validity coefficient 0.75. The test-retest reliability coefficient of Students’ Involvement Scale was 0.89 and validity 0.72 against the criterion of students’ achievement scores. The findings were: (1) Achievement of students was
highest when taught through radio-vision approach. (2) The retention of knowledge, comprehension and total achievement scores were the highest in that group of students who were taught Geography through radio-vision approach.

Goel (1985) studied organization and utilization of Educational Television (ETV) programs. The organization of ETV was studied in Delhi, Maharashtra, Srinagar, Jaipur, Raipur and Muzaffarpur. The utilization of ETV was studied in Maharashtra State. The data were collected from the producers of ETV programs and academic staff of the Educational Technology (ET) Cells, Directorate of Education, through questionnaires and interviews. Information was also collected from official documents. The findings of the study were: (1) In 1983-84 Door Darshan Kendra Delhi used to telecast 16 programs per week for secondary students, two for elementary pupils and one for teachers. In Maharashtra, there were three school TV (STV) programs, one each for students of class V, class VI and class VII. In Srinagar there were two programs per week for the age group 6 to 13 years. Delhi was producing six programs per week for class V to IX for the school of Jaipur, Raipur and Muzaffarpur. (2) In Delhi, TV handbooks were distributed to all TV viewing schools. In Maharashtra TV handbook and other support material were distributed to all schools but they did not reach the schools in time. In Srinagar, Jaipur, Raipur and Muzaffarpur support material was not supplied to teachers. (3) In Delhi and Maharashtra script writers and teachers were oriented whereas in other centres there was no similar program. (4) In Delhi and Maharashtra STV programs and / or support material were produced by the ET Cell of Education Directorate. There was no program of preparing these in Jaipur, Raipur and Muzaffarpur. In Srinagar the Door Darshan Kendra produced the software.

Joshi (1987) studied the effectiveness of School Television (STV) programs in science at the secondary school level. The objectives of the investigation were: (1) To study the STV programs in science in terms of instructional objectives,
of programs, content coverage, its suitability and resources required. (2) To study the impact of STV programs on the scholastic achievement and scientific attitude of students. (3) To study the effect of intervention activities on the achievement and attitudes of students. The sample included all the personnel from the production of STV programs to the utilization covering 50 school Principals, 180 school teachers and 200 students. The tools used were: questionnaire, check-list, unstructured interview schedule, Raven’s Progressive Matrices and Vardhini and Ravinderanath’s Scientific Attitude Scale. The collected data were treated by content analysis, percentages and ANCOVA. The findings were: (1) School TV programs were running for long and have not changed over the years. (2) The programs were of poor quality. (3) No significant difference was found in scholastic achievement and scientific attitudes of students exposed to STV programs.

**Educational Technology Cell, Meghalaya (1988)** conducted a survey of the ETV programs in the state. The organization interviewed 289 headmasters, 538 teachers, 774 parents and 1240 students. The survey revealed that students wanted longer duration TV programs and with the frequency of one program a day. Power supply and problems relating to maintenance and repair were blocks to popularizing ETV programs.

**Mohanty (1988)** critically analyzed the Educational Television (ETV) programs for the primary school children in the state of Orissa. The objectives of the study were: (1) To study the impact of ETV programs on the scholastic achievement of primary school children in general science, social studies and language development. (2) To study the operational credibility of the medium of TV, particularly that of ETV programs. (3) To collect and analyze the opinion of the school inspecting officers towards ETV programs. A sample of 30 control schools from all the three cluster districts (Sambalpur, Dhenkanal and Bolangir) was drawn randomly (10 schools from each district). From the selected schools a
sample of 300 subjects was further drawn randomly for treatment conditions. The total number of teachers interviewed from TV and non-TV schools was 300 (150 from each set-up). The total number of inspecting officers interviewed for the purpose was 75. The tools used were three Achievement Tests that were developed to assess the impact of ETV programs. Questionnaires, check-list and an interview schedule were developed to get the feedback from teachers, headmasters and inspecting officers of both TV and non-TV schools. Using mean, SD, CR and ANOVA, treated the collected data. The findings were: (1) Children exposed to ETV programs had superior scholastic attainment as compared to children of the non-exposed group. (2) The greatest achievement was in respect of ‘language’. 

Antonysamy (1989) compared the Teaching of Environment Concepts to school dropouts through video and charts. The objectives of the investigation were: (1) To prepare a Video program on Environmental concepts, and (ii) to find out experimentally whether the video method is more effective than using charts in teaching the Environmental concepts. The sample of the study constituted 60 working children at the school in Dindigul. The pretest posttest equivalent groups design was employed. The experimental group was taught through Video lessons on ‘Environmental Concepts’, and the same lessons were taught to the control group using charts. A video program on ‘Environmental Concepts’ lasting for 40 minutes was produced for this study. The t-test was applied for statistical analysis. It was found that learning through viewing of the video films was more effective than learning through charts.

Arularam (1990) evaluated UGC’s countrywide educational television programs. The objective of the study were: (1) To verify the extent to which the UGC country-wide ETV enriched knowledge, and promoted development. (2) Utilized the potentiality of the TV medium. (3) To cater to the needs of target population. The sample comprised rural undergraduate students who were drawn using cluster
sampling method. An observation schedule was used as a tool to collect the relevant data. The findings were: (1) The needs of the rural students still remain unfulfilled. (2) The programs in humanities were poor in offering knowledge enrichment.

**Behera (1990)** investigated the impact of ETV programs on the competency of teachers of elementary schools. The objectives of the study were: (1) to study the impact of ETV on the competency of teachers of elementary schools in terms of knowledge, understanding and application in content areas, (2) to study the classroom interaction between teachers and students, (3) to study the attitude of the teachers towards ETV programs, and (4) to study the problems of the teachers with respect to the utilization of the ETV programs. The sample of the study constituted twenty-five TV schools as experimental schools with 50 teachers and 25 non-TV schools as control schools with 50 teachers were taken as sample schools. In addition, 25 of the Inspecting Officers concerned were also selected to provide data about the problems of TV utilization. Tools used were Competency Based Achievement Test (CBAT), Flanders’ Interaction Analysis Categories System (FIACS), Opinionnaire, and Feedback Schedules. The collected data were treated by using ANOVA, and percentage. The findings were: (1) Teachers exposed to ETV programs achieved significantly more on their knowledge, understanding and in actual classroom interaction. (2) ETV teachers significantly differed from non-ETV teachers on teacher response ratio, teaching question ratio, and pupil initiation ratio. (3) Teachers also pointed out poor failures, mechanical disorders and unsuitable time slot as some of the vulnerable problems.

**Choudhary (1990)** conducted a study on teachers’ attitude towards school TV and its relationship to mass media behavior and job satisfaction. The objectives of the study were: (1) To study the attitude of teachers toward school television as an educational subsystem. (2) To study the relationship between the teachers’ attitude toward school television and his mass-media behaviour. (3) To study the
relationship between the teachers’ attitude and his job satisfaction. (4) To study the influence of the personal and academic characteristics of teachers in relation to their attitude towards school television. The sample comprised primary school teachers of 104 villages having television, falling under the Jaipur Kendra. The tools consisted of a Teachers’ Attitude Towards School Television Scale and Interview Schedule. Using t-test, ANOVA and chi-square treated the collected data. The findings were: (1) Job satisfaction was associated with the authority responsible. (2) For work allocation, the study revealed that the majority of teachers did no operate STV regularly and the majority of TV sets were out of order. (3) Teachers perceived STV as a good tool for teaching and were fairly satisfied with their job. (4) Teachers teaching classes IV and V showed a more positive attitude towards STV.

**Pillay and Anandan (1990)** made an analysis of the educational video programs produced in India at the higher educational level. The objectives of the study were: (1) To find out the distribution of educational video produced by different centers and in different years. (2) To analyze the content of the educational videos produced in different subjects. (3) To make suitable suggestions for improvement. The educational video telecasts in India from 1983-88 were content analyzed. Using the census approach, all the video telecasts were analyzed using counting of frequencies and percentages. The findings were: (1) Very few video programs were produced in subjects, like, law, anthropology and veterinary sciences. (2) In general, educational subjects, like, economics, sociology, management, and education received greater attention but not geography or political science. (3) There was no coordination between various production agencies.

**Abrol (1991)** conducted a study on TV viewing among children of Delhi school. The objectives of the investigation were: (1) To study the TV-viewing behaviours of children in terms of duration of viewing and program preference. (2) To delineate the factors influencing TV-viewing among children. (3) To determine
the relative importance of the factors influencing TV-viewing among children. (4) To study the impact of TV on the daily life of children. (5) To study the perception of parents regarding the TV-viewing of their children. The study was confined to 754 children studying in primary and secondary level schools of Delhi. A two-stage sampling procedure was followed. A total of 44 schools constituted the sample. In the second stage, 254 children covering 135 boys and 119 girls from the primary level, and 500 children covering 250 boys and 250 girls from the secondary level were selected through sample comprised of 754 subjects. Two separate interview schedules were constructed for interviewing the children and the mothers. For measuring the duration of viewing the program, recall list method was used. Collected data were treated with mean, SD and ANOVA. The finding revealed that the majority of the mothers were restrictive to their children’s TV viewing, and significant difference was found in the amount of TV viewing by male and female children. Viewing was independent of IQ of viewers and it was heavy on Saturdays and Sundays.

Anuradha (1991) studied children’s television viewing behavior and its effect on personal and educational development. The objectives of the investigation were: (1) To develop tools to measure television-viewing behaviour (TVB) and attitude towards television-viewing (ATTV). (2) To compare parents’ and children’s viewpoints with regard to TV-viewing. (3) To explore the potential influence of TV-viewing on the educational development of children. The sample of the study comprised of 180 children, who had TV in their homes (96 boys and 84 girls), selected by a systematic random sampling method from two English medium schools of Tirupati urban area. The children belonged to the 5-10 years age group. Schedules for parents and children and Intellectual Achievement Responsibility Scale (IAR) were used to collect data. The TV-viewing index (TVI) was calculated for the sample. Mean and percentage and chi-square were used of
analyze the data. The finding was that children liked watching advertisement and programs on sports.

Idayani (1991) undertook a study whose objectives were: (1) To prepare a video program on ‘Weathering’ and ‘Work of the Rivers’ for instructional use for higher secondary students. (2) To find out whether the video method is more effective than the traditional lecture method in teaching the concepts on ‘Weathering’ and ‘Work of the Rivers’. (3) To find out whether the higher secondary students improve their achievement after viewing the video program. The sample of the study constituted of 60 students (30 males and 30 females) of standard XII of the O.C.P.M. Girls Higher Secondary School, Madurai. The pretest-posttest equivalent groups design was employed. Video-lesson and lecture method were used. Mean, SD and ‘t’ test were used to treat the data. It was found that students who were exposed to the video programs performed better than students taught by the traditional lecture method.

Kaimuthu (1991) undertook a study whose objectives were: (1) To prepare a video program on environmental pollution for instructional use for higher secondary students. (2) To find out whether the video method is more effective than the traditional lecture method in teaching the concepts on environmental pollution. The sample of the study constituted of 60 students (30 males and 30 females) of standard XI at K.R. Government Higher Secondary Schools, Ottachatram and S. M. Girls’ Higher Secondary School, Chatrapatty. An achievement test was used to collect the data. The data were analyzed with the help of t-test. The experimental group receiving instruction through the video program gained more and learnt more concepts as compared to students of the control group.

Mishra (1991) studied the role of television in diffusion of home-making practices among urban housewives. The objectives of the study were: (1) To determine the extent of exposure of urban housewives to different mass media for
obtaining information on home-management practices. (2) To explore the relationship between the socio-economic profile of television viewers and their information seeking behaviour. (3) To analyze the reaction of television audience programs on house-management practices in terms of duration, time, presentation, use of visual aids and other relevant factors. (4) To find out about the adoption of home-management practices by the television audience as a result of watching television. (5) To suggest suitable modifications in women’s programs on television to make them need based and meaningful. The sample comprised of 190 housewives and 18 program designers. The study was conducted in the state capital of Orissa, Bhubneswar covering different wards and units of the city. The selection of the sample was based on three criteria, namely, education up to matriculation, possession of TV, adoption of any one of the HMPs. The major areas of HMPs consisted of eight items, namely, food and nutrition, child care, home management, budgeting, kitchen, and textile and clothing. The tool used to collect data was mass media sources of information. Using Z-value, percentage and content analysis treated the collected data. It was revealed that the TV programs made little contribution to housewives in their efforts to adopt home making practices.

Narayanasamy (1991) investigated whether students in standard VI who are taught by the video method develop more vocabulary in Tamil than those who are taught by the traditional classroom method. The objectives of the study were: (1) To prepare video lessons for standard VI students on certain common topics such as “Weekly market”, “Village and Town”, and “Animals”. (2) To find out the effectiveness of video lessons in language teaching and learning. (3) To find out whether standard VI students improve their vocabulary in Tamil after viewing the video program. The sample of the study constituted of 120 students (60 boys and 60 girls) of standard VI from the K.R. Government Higher Secondary School, Oddanchatram and the S.M. Girls’ Higher Secondary School, Chatrapatty in Anna
District. The researcher used the pretest-posttest equivalent groups design. Video lessons of 60 minutes’ duration were prepared. The experimental group was taught the topics by the video method. The same topics were taught to the control group by the traditional classroom method. The t-test and ANOVA were employed for statistical analysis. It was found that the experimental group learnt more Tamil words using the program than the control group.

**Phutela (1991)** studied the effect of comic and comic TV serials on children. The main objectives of the study were: (1) To survey various types of available comic books and comic television serials. (2) To find out the extent of reading/viewing on the part of children. (3) To study their likes and dislikes as regards comic books/serials. (4) To know the perceptions of children, teachers and parents as regard their useful effect on their growth and development. Data were collected from a cross-section of 198 children taking 25 children each from classes III and VI from the six schools in Delhi representing various strata; 19 teachers and 17 parents. Tools comprised a questionnaire, checklist and rating scales. Cumulative frequencies, percentages and median were used to treat the data. The findings were: (1) The younger children liked stories related to horror, animals and silly dolls. (2) Children preferred detective, comics / serials followed by mythological and folk tales. (3) Most teachers felt that comics help in language and aesthetic development. (4) It is interesting to note that none of the teachers or parents supported the view that comics develop criminal tendencies.

**Sinnathambai (1991)** conducted an experimental study whose objectives were: (1) To prepare a video program on ‘Energetic’ for instructional use for higher secondary students. (2) To find out experimentally whether the video method is more effective than the traditional lecture method in teaching the concepts on ‘Energetic’. (3) To find out whether the higher secondary students improve their achievement after viewing the video program on ‘Energetic’. The sample of the study comprised 60 students (30 males and 30 females) from standard XII at K.R.
Government Higher Secondary School, Oddanchatram, and at S.M. Girls’ Higher Secondary School, Chatrapatty in Anna District. The pretest-posttest equivalent groups design was employed. The experimental group was taught through the video lessons on ‘Energetic’ and the same topic was taught to the control group by the lecture method. A video lesson on ‘Energetic’ lasting for 46 minutes was prepared. Achievement was assessed with the help of achievement test developed by the investigator. The t-test was applied for statistical analysis. It was found that the experimental group learnt more concepts and gained more on the achievement test in ‘Energetic’ in comparison to control group.

Kapadia (1992) studied the impact of television on students’ learning. The objectives of the study were: (1) To find out the impact of television on students’ learning. (2) To find out the comparative effectiveness of the tele-films and the tape-chart programs. (3) To get the opinion of students and teachers regarding the two media used. For survey of the opinions, the stratified random sampling method was used. In all, 24 Gujarati-medium secondary schools, and 84,000 students belonging to classes VIII to X of Surat district were selected as the sample. For the experiment, 180 students of class IX from two schools of Surat district were selected purposively. Four matched groups, two from each school, each group having 45 students were formed. Tools used were Bhatt and Desai Intelligence Test, Desai’s SES scale, Opinionnaires, criterion test and interview schedule. Using t-test, and chi-square treated the collected data. The findings were: (1) The TV group gained significantly more than the control group. (2) The retention scores of the experimental group were better. (3) 70% of the students opined that TV programs helped them in self-learning.

Chitale (1993) developed instructional material for adaptive mode of teaching applied art and study their effect. The sample comprised 66 girl students studying in pre-specialization year of home Science degree program of S.N.D.T. college of Home Science, Pune. CIPP (context, input, process and product) model of
evaluation is followed for studying the effects of using the developed instructional material in adaptive mode of teaching. The major findings were: (1) Interactive mode of teaching visual art was found feasible in existing formal educational setup. (2) Adaptive mode was found to be supportive to teaching visual art to promote visual perceptual sensitivity. (3) Adaptive mode of teaching was found to be time effective. (4) Holistic approach of presenting the content of visual art seemed to have positive effects on all the three dimensions of development, viz. cognitive, connative and affective. (5) Development of visual perceptual sensitivity was trainable skill; girl students at the age of 17+ could be trained. (6) Development of visual perceptual sensitivity could be assessed by using the casual perceptual sensitivity test and the scheme of evaluation designed in this program. (7) The instructional material prepared was directly usable educational product. (8) This study added to knowledge of teaching visual art in visual interactive mode and holistic teaching based on the theories of latent learning.

Lal (1996) developed Video Teaching Learning Material (VTLM) in Home Science for senior secondary students of Delhi. The sample of the study comprised 102 students from three schools. The tools used consisted of Criterion Referenced Test, Retention of Concept Test, and Attitude Scale based on Likert’s method and were developed by the investigator. The data collected were treated using chi-square, ANOVA, Sum of Ranks test and t-test. The findings were: (1) On pre-test scores the F-ratios for the three groups belonging to three levels of intelligence and interaction effects were not found to be significant. (2) Students exposed to VTLM and VAI achieved higher as compared to CT. (3) There was no significant difference between two treatments of VTLM and VAI. (4) The low intelligence students achieved higher when exposed to VTLM as compared to VAI. (5) On retention scores, significant differences were observed in three different treatments. Students exposed to VTLM and VAI retained more concepts in home science as compared to students in CT. (6) Students exposed to VTLM achieved
higher as compared to VAI. (7) The majority of the students had favorable attitude towards video teaching - learning material.

**Goel, Das and Joshi (2000)** conducted a study related to ETV. A Standard from the University Experimental School for a particular program was selected depending upon their suitability to the content telecast on that specific day. All the students of that class were selected for the intervention of that day. 10 students of that class were selected randomly for unstructured interviews and discussion. The tools used for the study were observation schedules, unstructured interviews and discussion. Data obtained through watching the videocassettes, observations and discussions with students were analyzed through content analysis technique. The findings were: (1) The students enjoyed watching the ETV programs. (2) Learning took place by viewing the ETV programs. (3) Students learnt seriously from the content based programs, whereas, they enjoyed poems and dramas from recreation point of view. (4) Students felt that they would like to have ETV programs in their timetable. (5) There was a lack of infrastructural facility for viewing the ETV programs in the school. (6) The quality of the ETV programs needs to be enhanced. (7) The ETV programs should not be abruptly cut off to accommodate other programs at the end.

**Kewalramani (2000)** studied the Instructional and feedback use of television. Teaching by teacher, teaching through television, teaching through television after traditional teaching was considered as independent variables. Scholastic achievement in school subjects (Home Science, Biology and Music) was considered as dependent variable. Intelligence, school subjects, and instructional climate were considered as moderator variables, whereas, age, grade, sex, SES, previous academic achievement, extra coaching, and television programs viewing were considered as control variables. Sample comprised of 450 female students studying in XI class. The findings were: (1) A significant effect of instruction through television was observed on the various school subjects in comparison to
the traditional method of teaching. (2) For different educational stream courses (Science, Art, and Fine Art), there was a different effect of instructions through television. (3) The feedback effect of instructions through television was found highly significant for all the courses. (4) Intelligence was found to play a significant role in relation to the instructional use of television.

**Sarangi (2000)** conducted a study with objectives: (1) To study the effect of TV Language proficiency, viewing strategy, and their interactions on the components (concept, proposition and schema) of cognitive map in terms of corresponding map scores taking intelligence as a covariate. (2) To study the effect of television language proficiency (TLP), viewing strategy and their interaction on cognitive map (total score) by taking intelligence as a covariate. (3) To analyze the cognitive maps of the different television language groups in relation to different production variables, namely, message track, message presentation form and message type. (4) To analyze the cognitive maps of learners of the treatment (VS) groups in relation to different production variables, namely, message track, message presentation form and message type. (5) To analyze the learning distortions in the cognitive maps of the students in relation to viewing strategy, television proficiency and production variables, namely, message track, message presentation form and message type. Six ETV programs for class VIII produced and telecast by the SIET, Orissa, Bhubneswar were selected. These programs were The Living Fossils, Composition of Water, The Environment, Properties of Water, the Dust Particles, and Thermal expansion of matter. Intact classroom groups were used as the sample groups. The composition of sample students from rural and urban background was deliberately manipulated to ensure a fine dispersal of TLPT. The number of students for difference ETV was different and ranged from 155 - 170. Intelligence was measured with the help of Raven’s Standard Progressive Matrices and Television Language Proficiency with a standardized Television Language proficiency Test (TLPT). Cognitive map data were collected
through cognitive map inventories and subsequent ratings were done with rating scale. The findings were: (1) Children’s learning through ETV programs was found to be positively influenced by their Television Language Proficiency. (2) The Television viewing strategies, namely, Direct Viewing, Viewing with Note taking, and Advance Organizer followed by viewing produced similar influences on cognitive map formation among the learners. (3) The ideal cognitive map of the sample ETV was transacted more at the concept level than at the Proposition Level. In most cases distorted transaction of the message items was more than the meaningful transaction. (4) Learners cognitive maps contained large amount of feeble and blurred concepts and proposition, chiefly inadequate Learning, idiosyncrasies, confusion, some amount of over-learning and marginal overgeneralization. (5) Meaningful and distorted transaction of the concepts and propositions exhibited distractive relations with message type, message form and message track. These basic relations could be instrumental for improving educational tele-production and to make TV a more potential instructional medium. (6) The tele-visual instructional designs in general and the process of message mediation in particular need reexamination for effective education of children.

**Reddy (2001)** studied the impact of ETV programs on scholastic achievement of the primary school children in AP on 21 Experimental (TV schools) and Control Schools (Non-TV Schools) representing three regions, namely, Telangana, Coastal Andhra and Rayalaseema, representing one district from each, namely, Nalgonda, Krishna and Kurnool. It was found that regular and continuous exposure to the ETV programs has a positive influence on the scholastic achievement of the primary school students.

**Reddy & Ramar (2001)** measured the relative effectiveness of video instruction in teaching science and social science to slow learners. The sample comprised of 50 slow learners of Class VIII from S.S.H.N. Higher Secondary School, Muhavur.
The tools used for the study were Raven’s Standard Progressive Matrices and Achievement Test developed and validated by the investigator. The data were analyzed with the help of mean, SD and t-test. The finding of the study was that the video instruction was more effective than the traditional lecture method in teaching science and social science.

Vekaria (2002) studied the effect of video instruction programs in teaching science to standard VIII on achievement. The researcher developed video instructional program and constructed a test, an opinionnaire for the students and an opinionnaire for the teachers. The findings were: (1) The video instructional program developed by the researcher was found to be effective in the urban as well as rural areas of Saurashtra, Central Gujarat and South Gujarat. (2) The video instructional program was found equally effective on rural and urban areas of entire Gujarat. (3) The effectiveness of video instructional program was found directly proportional to the level of achievement in all the three areas. (4) The students and teachers were found to have positive reactions towards the video instruction program.

2.5.0. SUMUP

From the review presented in this chapter, it can be said that Programmed Learning Material alone as well as in combination with other methods for teaching different subjects was found to be effective in terms of achievement of students (Bhushan, 1973; Dewal, 1974; Pandya, 1974; Shitole, 1976; Kuruvilla, 1977; Patel, 1977; Sodhi, 1977; Verma, 1977; Sansanwal, 1978; Mullick, 1979; Parlikar, 1979; Shah, 1979; Pandey, 1980; Seshadri, 1980; Shah, 1980; Trivedi, 1980; Inamdar, 1981; Man, 1981; Mavi, 1981; Suthar, 1981; Davies, 1982; Ravindranath, 1982; Menon, 1984; Choudhary, 1985; Gautam, 1986; Joshi, 1988; Thaker, 1993; Agashe, 1995; Shah, 2002; Pandit, 2003; Dubey, 2004 & Kaur, 2005). PLM was found to be as effective as Structured Lecture Method in terms of
achievement of students (Chandrakala, 1976; Govinda, 1976). Lecture Method was found more effective than Demonstration Method and Programmed Learning Method (Ghetiya, 1999). Also students expressed favourable opinion towards PLM (Govinda, 1976; Chauhan, 1976; Kuruvilla, 1977; Sansanwal, 1978; Mavi, 1981; Davies, 1982; Menon, 1984; Agashe, 1995; Shah, 2002; and Kaur, 2005). In addition to it, the developed Instructional Material was found to be significantly effective in enhancing creativity (Sharma, 1995), in developing better understanding about environment (Sharma, 2005) and in enhancing Reading Skills amongst students (Danikhel, 1998).

The achievement of students through Programmed Learning Material alone as well as in combination with other methods was also studied. Average achievers were found to learn better than high and low achievers through PLM (Bhushan, 1973; Chandrakala, 1976). High achievers benefited more through PLM (Parlikar, 1979). PLM was suited to both average as well as low achievers (Shrivastava, 1990). Intelligence of students was found to be significantly and positively related with Achievement through PLM alone as well as in combination with other Methods of Teaching (Bhushan, 1973; Singh, 1973; Patel, 1977; Sodhi, 1977; Sansanwal, 1978; Mullick, 1979; Parlikar, 1979; Seshadri, 1980; Shah, 980; Inamdar, 1981; Ravindranath, 1982; menon, 1984; & Shah, 2002). PLM alone as well as in combination with other Methods of Teaching was found to benefit students with different levels of Intelligence (Pandya, 1974; Govinda, 1976)

Gender was not significantly related to Achievement through PLM alone as well as in combination with other Methods of Teaching (Bhusan, 1973; Shitole, 1976; Trivedi, 1980)

Academic Motivation was not significantly related to Achievement through PLM alone as well as in combination with other Methods of Teaching (Kuruvilla, 1977; Sansanwal, 1978; Inamdar, 1981).
High as well as average SES students were found to benefit equally through PLM alone as well as in combination with other Methods of Teaching (Parlikar, 1979). High creative students benefited from PLM more than low creative (Gautam, 1986). Students with low anxiety benefited more from PLM than with high anxiety (Joshi, 1988).

The appropriate forms for presentation, such as, dramatization, plays, dialogue, conversation, discussion with students, narration and question-answer were appreciated by teachers, educators, and students. These were useful in motivating students, creating interest in them and holding their attention (Shrivastava, 1974; Mohanty, 1990; Sumitra, 1991).

School broadcasts were useful in enriching and extending the work of teachers but could not replace the classroom teaching (Shrivastava, 1974; Biswal, 1980; Educational Technology Cell, 1989; Choudhary, 1990). Subject-wise topics for broadcasts suggested by teachers were: Hindi-grammar, stories, poems, pronunciation, and Kabir Ka Rahasyavad, English-grammar, and pronunciation. The teachers liked to listen to broadcasts related to the ways of motivating and creating interest among students for teaching language and science, maintaining discipline in classrooms as well as in school, administering and engaging students in purposeful learning in single-teacher primary schools, psychology, specially socialization of the child, motivation, problem-solving, etc., the new methods of teaching science such as discovery method, and method of teaching English through structural approach (Passi, katiyar, Sansanwal & Syag, 1980; Mishra, 1989). Majority of the radio programs were not related to the syllabus (Singh and Shukla, 1980; Goel, 1982; Sudame and Goel, 1988). Non-availability of program schedule and lack of awareness of radio programs were some of the difficulties in the utilization of school programs. The students gained very little on word knowledge and concept formation. Most gain was on acquisition of the factual information (Singh and Shukla, 1980; Nagaraju and Ramkumar, 1982).
The off timings of local AIR station could be utilized for local educational purpose especially in teacher education. Local resources, both, human and material can be utilized in education through proper co-ordination (Pal, 2001).

Kaur (1981) reported that the self-instructional audiocassettes were effective for developing different teaching skills. Immediate, pinpointed and self-feedback through audiocassettes was an effective way of improving the performance of student teachers in the use of different teaching skills.

There were mixed responses regarding the effectiveness of the teleconferencing programs. Some found these programs very exciting and wonderful, whereas others could not utilize these programs properly. Proper coordination was required among all the personnel involved in IGNOU Teleconferencing (Jain, 2002).

TV programs were not effective in terms of learning by students (Roy, 1974; Arularam, 1990; Choudhary, 1990, Kapadia, 1992). Many teachers did not find school television (STV) programs useful as they were not different from classroom teaching or were not presented in such a manner as to sustain student’s motivation. The quality of the program was not high. The number of programs per class was not adequate (Phutela, 1980). School TV programs were running for long and have not changed over the years. The programs were of poor quality. No significant difference was found in scholastic achievement and scientific attitudes of students exposed to STV programs (Joshi, 1987). The survey revealed that students wanted longer duration TV programs and with the frequency of one program a day (Educational Technology Cell, Meghalaya, 1988). Children exposed to ETV programs had superior scholastic attainment as compared to children of the non-exposed group (Mohanty, 1988; Kewalramani, 2000; Sarangi, 2000; Reddy; 2001). Students enjoyed watching the ETV programs (Goel, Das & Joshi, 2000). Teachers exposed to ETV programs achieved significantly more on their knowledge, understanding and in actual classroom interaction (Behra, 1990).
Children liked watching advertisement and programs on sports on TV (Anuradha, 1991).

Learning through viewing of the video films was more effective than learning through charts (Antonysamy, 1989). Students who were exposed to the video programs performed better than students taught by the traditional lecture method (Idayani, 1991; Kaimuthu, 1991; Narayanasamy, 1991; Sinnathambai, 1991; Lal, 1996; Reddy & Ramar, 2001; Vekaria, 2002).

Very few video programs were produced in subjects, like, law, anthropology and veterinary sciences. In general, educational subjects, like, economics, sociology, management, and education received greater attention but not geography or political science. (Pillay & Anandan, 1990).

Between programmed filmstrip with teacher and programmed filmstrip alone, the former was more effective. Retention of learning was more in the case of programmed filmstrips with teacher and programmed filmstrip without teacher in comparison with the conventional method. So far as the achievement of different objectives, viz., knowledge, understanding, application and skill was concerned, it was the maximum in the case of teacher with programmed filmstrip followed by programmed filmstrip and the conventional method in that order (Jeyachandran, 1980). Kumar (1980) found that the multimedia method was more effective than either the programmed learning method or the expository method. The programmed learning method was more effective than the expository method. Retention in learning by the multi-media method was higher than by the other two methods. Retention in learning by the programmed learning group and the expository group was equal.

Oberai (1981) found that the radio vision groups obtained significantly higher mean scores on the recognition test than the group receiving instruction through the traditional method. All the radio vision groups, except the black-and-white radio vision group, obtained significantly higher mean gain scores than the group
receiving instruction through the traditional method in the final-experiment. With respect to the recall test, the group receiving instruction through color radio vision plus workbook obtained significantly higher mean scores on the criterion test than the remaining six groups. The majority of the teachers opined that most of the students found the radio vision method interesting. The attention profiles of different radio vision groups indicated that radio vision could attract the attention of very high percentage of students and sustain their attention throughout the length of the presentation. Dhamija (1985) also found that achievement of students was highest when taught through radio-vision approach. The retention of knowledge, comprehension and total achievement scores were the highest in that group of students who were taught Geography through radio-vision approach.