Chapter - II

Review of Related Literature

-The competent physician must keep abreast of the latest discoveries in the field of Medicine. Obviously, the careful student of education, the research worker and Investigator should become familiar with the location and use of sources of educational information.

-Good, Bar, Scates
CHAPTER-II

REVIEW OF RELATED LITERATURE

2.0.0 INTRODUCTION

Research in any field implies a step ahead in the exploration of the unknown. Unknown which is darkness. Any researcher to be able to take this step, should be adequately prepared for it. One such preparation is the gathering of knowledge of what has already been done in the given field. A step towards unknown can only be taken after the review of literature and researches done in that area. Any research without such a review is likely to be a building without any foundation.

Borg (1978) suggested, "The literature in any field forms the foundation upon which all future will be built. If we fail to build the foundation of knowledge provided by the review of literature, our work is likely to be shallow and naive and will often duplicate the work that has already been done by some one else."

The review of literature gives clear picture of the problem to be solved as being a prerequisite to actual planning and conducting the study. The review of past investigations serves as a guide to the researcher as it avoids duplication in his field. The knowledge of what has already been done in the area of investigation regarding the methods used for data collection and the results of their analysis, keeps a researcher systematic in his own endeavour. Thus the review of related literature is an indispensable step in any research.

In the present study, the investigator examined the effect of three communication technology on the achievement of secondary school students while teaching Information Technology. There are various researches conducted to evaluate the comparative effectiveness of different approaches of instructions for science, social studies, mathematics, music, languages, home-science etc. but not such researches in the field of information technology subject.

This chapter is concerned with review of literature related to the research problem. In this section, the research studies concerning in Audio-Video instructional system and Multimedia instructional system have been reviewed and the research problem identified.
Audio-Video Concept:

The conventional audio-visual aids seem to attract very limited attention from researchers. Except for blackboards, maps and some charts, aids have not been easily available to a large number of teachers. They have been encouraged and trained to prepare their own aids but this has its limitations in facilities, funds and time available to the teachers. Project's aids needed financial and, more than that, maintenance support. Moreover, availability of software did not keep pace with the movement. The area seems to have lost the interest of educationists/researchers.

As there has been a debate in the late seventies and early eighties regarding the use of modern electronic media to support school education, its feasibility and cost, a very timely study has been carried out by Singh (1984) in 'A Comparative Cost-Effectiveness Study of "Low-Cost" Audio-Visual Teaching Aids and "High Cost" audio-visual Teaching Aids.' On comparing cost and feasibility to using low-cost aids such as charts, pictures, etc., with that of films, video and satellite television, he reported that the 'low-cost' media, when used in all schools, would cost four times as much as video-teaching and seven times as much as satellite television when latter two are used in all the schools. 'Films' are the most expensive and difficult to manage, the distribution system is also quite expensive in this case. Film in any case, is losing ground to video/television. The researcher recommends a nationwide coverage by educational television.

Shah (1973): examined the scope, utility and limitations of Educational Television (ETV) in India regarding planning, production and prospects of its programmes.

The assumptions made for the study were - (i) ETV is helpful in promoting mass education keeping in view the population explosion in India; (ii) The services of experts in the subjects like mathematics, English and science to the rural school children can be provided which otherwise were not easily available; (iii) ETV is useful for teacher education; and (iv) the problem of illiteracy among adults can be solved with the help of ETV. The study was completed in two phases - pilot study and actual survey. For pilot survey, seventeen schools, four education colleges and four coordinating agencies were selected.
For actual survey, four nursery schools, thirty primary and middle schools, 113 higher secondary schools, four colleges of education and eleven AIR and TV personnel were taken. The data were collected with the help of observation, interview schedule and questionnaires. Interview were taken of TV producers, programme executives, audience research officer, and school administrative setup. The questionnaire were administered to school principals, subject teachers, students and parents. Main findings showed that the TV lessons were not planned well in advance. There was no change in the quality and quantity of programmes for a long period. The selection of TV teachers and the lesson supervisors and the work assigned to them was unsatisfactory. TV programmes were not duly evaluated. The service and maintenance of TV set was not quick and efficient. It was also noted that educational personnel were not involved in the planning, production and utilisation of school telecasts. There was no provision for TV courses in education colleges.

**Sonar (1975): analysed the use of film strips in teaching of science.**

The investigator analytically studied the design, contents, utility and correlation of film strips and film strip projectors with primary science syllabus and text books. Twenty film strips on general science were prepared on the basis of prescribed textbooks. Evaluation forms were used for evaluating these film strips. These film strips were shown to students of classes V, VI and VII. Different film strip projectors were also examined. The researcher developed and improvised film strip projector operating on solar energy. The study film strip projector researcher developed and improvised film strip projector operating on solar energy. The study revealed that very few film strips produced and available correlate with the prescribed syllabus and text books. Nearly all the topics in general science can be effectively taught through film strips. If produced in large quantities, their cost of production is low. The methods of teaching sciences can be improved with the help of film strips resulting in better standard of science education at primary school level.

**Jayachandran (1980): studied the efficacy of programmed film strips as a method of teaching history in the secondary schools.**

The performance of the students was noted in terms of immediate recall and delayed retention in the case of four objectives viz - knowledge, understanding, application and
skill. The sample for the study comprised of 450 boys and 315 girls from nine schools of Madras city. The population was divided into three groups. These groups were taught through three different methods viz teacher with programmed film strip, programmed film strip without teacher and the conventional method. Four lessons were developed on the topics 'Buddhism' and 'Jainism'. Data were collected by administering the achievement test at pre-test and post-test stage. Major findings of the study indicated that learning was better through PLM in terms of retention. Programmed film strip with teacher method was more effective than programmed film strip without teacher method. The achievement of different objectives viz. knowledge, understanding, application and skill was maximum with the programmed film strip with teacher method followed by programmed film strip without teacher in decreasing order and least with the conventional method.

**Phutela (1980): studied the utilisation and comprehensibility of school television (STV) programmes in Delhi.**

The investigation aimed at studying the factors responsible for under utilisation of programmes, to study the teachers, attitude towards the school telecasts, to find out the preferences of teachers regarding the subjects for teaching through television and to study the level of comprehension of the STV programmes on the part of the students of different classes. The sample for the study was selected from the middle, high and higher secondary schools of Delhi. A questionnaire was prepared based on content factors, motivation factors, presentation factors and viewing conditions. To assess the attitude of teachers towards STV programmes, a 4-point attitude scale was also employed. Comprehension tests were administered to the students at pre-test stage (before the telecast) and at the post-test stage (after the telecast). The outcomes of the study revealed that STV programmes were not found useful by many teachers because they did not differ from classroom teaching and these programmes failed to sustain pupil's motivation. About 38 percent schools in the sample possessing TV sets were utilising STV programmes. Most of the teachers agreed that teachers also learn from the programmes.

The objectives of the study were (i) to create awareness among teachers and headmasters of secondary school's about the importance of audio-visual aids, (ii) to help in raising the academic standard in secondary schools of Thane district, (iii) to know the existing situation regarding audio-visual materials in the secondary school of Thane district, (iv) to elicit the opinion of the headmaster and concerned teachers about the measures for providing better and improvised materials on audio visual education, and (v) to present the above measures in the form of concrete proposals and their implications for secondary schools as well as for the professional courses in training of teachers and preparing materials for audio-visual aids in education.

The tools of investigation were questionnaires to schools, headmasters and teachers to assess the availability and use of audio-visual aids in schools, interviews to supplement the information available through questionnaires, and visits and observations.

Some of the important findings of the study were: 1. Schools that were situated in urban areas and the ones which were conducted by rich societies possessed audio-visual aids. 2. Only a few teachers used audio-visual aids in teaching. 3. Teachers who were trained in the use of audio-visual aids were inadequate in number. 4. At many places the audio-visual aids were in a broken-down condition and awaited repairs. 5. At many places the hardware was purchased. However, it was not used as proper software was not available. 6. Audio-visual aids were useful in teaching. 7. Audio-visual aids were not used due to lack of properly trained personnel and lack of accommodation in the schools. 8. There were no incentives to teachers who used audio-visual aids. 9. The state institute for audio-visual education could not provide training to personnel and could not supply proper learning materials.


The main objective of the inquiry was to study the effectiveness of two broadcast media: radio and television, in terms of the extent to which a climate for development was
created through measurement of gain in knowledge and attitude, and the extent to which the instructional communication was utilized by the target viewers and listeners through tests of comprehension and retention.

The study made use of a quasi-experimental design of investigation. Four groups of subjects, two experimental and two control, were selected separately for radio and television, from the village communities of two districts of Orrissa. In each group there were 40 subjects who were found to have been exposed to the media programmes in the case of the experimental groups, and not exposed to such programmes in the case of the control groups. Observations were made on three different occasions with a gap of ten weeks between occasions. Closed-form questionnaires were developed and used by the investigator for measurement of knowledge (impact) and attitude. One test was prepared and used for study of comprehension and retention. Statistical measures like mean, SD, correlations, t-test and ANOVA were used for analysis of data. The major findings of the study were: 1, The differences between different treatment groups were not systematic so far as the nature of gains were concerned. 2. Such type of unsystematic variations were highlighted by the tests of statistical significance of the mean gain scores. 3. ANOVA revealed that the changes over various lengths of exposure were not only unsystematic but also small in magnitude. 4. Results of ANOVA showed that the 6-space (generated by occasion-impact-attitude dimensions) centroids were widely different but the differences between groups were nonsignificant. However, the difference between radio experimental and control groups was significant. 5. Difference between occasions were very small in magnitude and the trend of gain from one occasion to another was more or less negative. 6. The results of the comprehension and retention of the programme contents indicated that media programmes were only moderately comprehended, but retained well, and there was no effect, of any remarkable merit, of the duration of exposure on the target audience.


The objectives of the study were (i) to find out the present position of the audio-visual equipment and materials in the secondary schools of East and West Godavari districts of
Andhra Pradesh, (ii) to determine the factors hindering the effective use of audio-visual equipment and materials in classroom teaching, and (iii) to ascertain the attitude of the respondents towards the factors influencing the effective use of audio-visual equipment and materials in classroom teaching.

The study was conducted on a sample of eight schools by mailing four types of questionnaires for the availability of audio-visual equipment and materials and their effective use in classroom teaching. The following tools were developed by the investigator for the purpose of data collection: (1) questionnaire on the availability of audio-visual equipment, (2) questionnaire on the availability of audio-visual materials, (3) questionnaire on the effective use of audio-visual equipment in classroom teaching, (4) questionnaire on the effective use of audio-visual materials in classroom teaching.

The major findings were: 1. The position of the audio-visual equipment in the schools was poor. 2. There was a significant relationship between the availability of the equipment and the type of the management of the school. 3. There was association between the availability of the equipment in the schools and their locality. 4. There was a relationship between the availability of the audio-visual equipment and the age of the schools. 5. There was a relationship between the availability of the audio-visual equipment and the type of school. 6. There was no positive association between the availability of audio-visual equipment and the strength of the school. 7. There was no positive association between the effective or ineffective use of audio-visual equipment in classroom teaching and the type of management. 8. There was no significant relationship between the effective use of audio-visual equipment in classroom teaching and the locality of the schools. 9. There was no relationship between the effective use of audio-visual equipment in classroom teaching and the strength of the schools. 10. Most of the respondents checked the factor, 'Absence of sufficient equipment and materials' as the first and foremost hindering factor for the effective use of audio-visual equipment and materials. The other factors hindering the effective use of audio-visual equipment and materials, given in order of importance, were: 'Heavy work load on the part of the teacher,' Lack of accommodation', 'Lack of funds', Lack of trained personnel', 'Lack of time for the teacher' and 'Very expensive.'

The main objectives of the inquiry were (i) to study the effectiveness of educational television in terms of educational utility to students and teachers, (ii) to study the attitude and views of parents about educational programmes on radio and television as far as their growing children were concerned, (iii) to study the attitude, views and opinion of high-school teachers towards the educational programmes given by radio and television and to ascertain their wants from these media, (iv) to study the merits and demerits of radio and television as communication media with respect to education, and (v) to study the attitude of students towards these programmes. The hypothesis of study was that radio and television had made a considerable impact on education.

The study employed the descriptive survey method, using documentary analysis and library research. In order to collect the relevant data, the investigator critically referred to various encyclopaedias, directories, theses, research studies, reports, periodicals, and journals and analysed them in view of the specified objectives. The other tools employed in this study were questionnaires, interviews, visits, observations and correspondence. The questionnaires, which were developed by the author, were duly filled in by 900 teachers, 500 students and 400 parents selected from different schools in Maharashtra State. The researcher interviewed headmasters of schools, parents of children of school-going age and eminent educationists to gain information about the scope and impact of radio and television on education of school-going children. The data were analysed, using descriptive statistics.

The main conclusions of the study were: 1. The school TV programmes were liked by children for their variety, their authenticity and as a change in the learning process. 2. Children were more influenced by the entertainment TV programmes than the school TV programmes. 3. School broadcasts gave programmes which were excellent in their content and standard. They were useful in increasing the span of attention of school-going children. 4. School broadcast programmes, even though useful, interesting and rich in content, were used rarely in the teaching-learning process in the urban areas of Maharashtra and
less than 50 per cent of the total programmes were used in the learning process in rural areas, 5 school telecast programmes were fair in their content-wise standard as far as the English language programmes for standard V and VI were concerned. The content-wise standard of science programmes for standard VIII given in the school telecasts was good. 6. The percentage of good science programmes considerably increased due to the production of biology programmes. 7. For teaching English, school telecast programmes brought presenters whose pronunciation was too sophisticated for the village students and they found it difficult to follow the language used in the programmes. 8. TV lessons for standards V and VI in English as a second language and that of science for standard VIII were just insufficient as far as the needs of the students were concerned. 9. There was a need of school TV programmes specially prepared to give guidance to students who appeared for scholarship examinations. This was very necessary for the students who were deprived of many facilities just because they stayed in rural areas. 10. The need of communication media in the teaching-learning process had been felt by the teachers and parents also, but yet the radio and TV programmes had not attained a 'must value' in the learning process. 11. The teachers teaching in the rural areas were more keen on using radio and TV programmes in the learning process. 12. The communication media remained a complementary aid of classroom teachers and they were keen on using these media in the learning process if the syllabus to be completed was not heavy. 13. School radio was doing valuable work for SSC students but not school TV. 14. It was found from the headmasters' opinion that the scope of these media was restricted because of lack of adequate participation of students, teachers and parents in these programmes.

DESAI (1985) An Investigation into Efficacy of Different Instructional Media in the Teaching of Science to the Pupils of Class VIII in Relation to Certain Variables.

The objectives of the study were (i) to compare the achievement of pupils in science learning through different instructional media and the traditional way of teaching, (ii) to compare the achievement of pupils in science learning through the programmed learning approach and the traditional way of teaching, (iii) to compare the achievement of pupils in science learning through slides with discussion approach and the traditional way of
teaching, (iv) to compare the achievement of pupils in science learning through the experimental approach and the traditional way of teaching, (v) to compare the achievement of pupils in science learning through the programmed learning approach and slides with discussion approach, (vi) to compare the achievement of pupils in science learning through the programmed learning approach and the experimental approach, and (vii) to compare the achievement of pupils in science learning through slides with discussion approach and the experimental approach.

The density, specific density of a solid, and the cell and its structure were selected for the preparation of the material for instructional media. The programmed learning material, slides and laboratory experiments were designed. The criterion test was prepared on the units selected for experimentation. The Junior Index of Motivation Scale and the Reasoning Ability Test were used for measuring motivation towards schools and reasoning ability of pupils. The experiment was carried out in two schools of Anand city. Four equivalent groups with respect to motivation towards schools and reasoning ability were prepared. In each group there were 25 learning, the second group was taught through slides with discussion approach, the third group was taught through the experimental approach and the fourth group was taught through the traditional approach. The analysis of co-variance was used to test the various hypotheses.

The major findings of the study were: 1. The programmed learning approach was more effective than the traditional way of teaching science. 2. The slide with discussion approach was more effective than the traditional way of teaching science. 3. The experimental approach was more effective than the traditional way of teaching science. 4. In the teaching of science, the experimental approach was the most effective of all approaches. 5. The programmed learning approach and slides with discussion approach were equally effective. 6. The use of instructional media indicated the possibility of improvement in the methodology of science teaching, raising the standard of science education in secondary schools and development of taste and interest in the younger generation for the subject of science.

The major educational implication of the study is that there is not one method of
teaching science. The teacher should be experimental-minded and should use different approaches in the light of different objectives. Media are effective in science education. Dhamija (1985) : Studied - "A Comparative Study of the Effectiveness of Three Approaches of Instructions - Conventional, Radio-Vision and Modular Approach on Achievement of Students in Social Studies.

3x3x3 factorial (Nesting-cum-crossing) design was followed. For the study, sample students of three schools formed three parallel groups for the three approaches. The design was factorial because the achievement and retention of concepts were investigated through two more factors i.e. intelligence and test occasions. Thus three factors were involved, namely-approaches of teaching (conventional, radio vision and modular), intelligence (high, middle and low), and test occasion (pretest, post test I and post test II). Geography, History and Civics subjects were taught. The study revealed that the students achieved the highest knowledge achievement scores in geography when taught through radio vision approach, the achievement of the students was the highest in knowledge achievement scores in civics when taught through modular approach, and the students achieved the highest achievement scores in history when taught through conventional approach.

KOTHARI (1985) An Investigation into Efficacy of Different Instructional Media in the Teaching of Mathematics to the Pupils of Class IX in Relation to Certain Variables.

The objectives of the study were (i) to investigate the efficacy of instructional media I (visual projection) over a structural media II (activities and experiment) in terms of achievement, (ii) to investigate the efficacy of visual projection over programmed learning material, (iii) to investigate the efficacy of activities and experiments over programmed learning material, (iv) to investigate the efficacy of visual projection over the traditional method of teaching, (v) to investigate the efficacy of activities and experiments over the traditional method of teaching, and (vi) to investigate the efficacy of programmed learning material over the traditional method of teaching in terms of achievement.

Factorization of the type $a^2-b^2$ and expansion of $(a\pm b)^2$ were selected for preparing transparencies for projection through the overhead projector. The same topic was selected
for the preparation of materials for activities and experiments as well as for preparing programmed learning material. The criterion tests on both units were prepared. The pretest post-test on both units were prepared. The pretest post-test control group design was adopted for the purpose of studying the efficacy of different media. The experiment was carried out in two schools. Four groups of class IX pupils having 30 pupils in each group were selected for implementing the instructional media while the other four groups were treated as control groups. The Junior Index of Motivation (JIM Scale) and Test of Reasoning Ability were used for collecting necessary information about the variables under study. The pupils were matched on these two variables. The analysis of co-variance was used to draw conclusions.

Some of the major findings of the study were: 1. Visual projection and activities and experiment were equally effective for Unit I while visual projection was superior to the activities and experiment approach for Unit II. 2. Visual projection was superior to programmed learning material for Unit I, while they were equally effective for Unit II. 3. The approach of media activities and experiment as superior to programmed learning materials for Unit I but they were equally effective for Unit II. 4. Visual projection was superior to the traditional method of teaching for Units I and II. 5. The activities and experiment, approach and the traditional method were equally effective for both units. 6. Programmed learning material and the traditional method of teaching were equally effective for Units I and II. The results clearly indicated that the instructional media I, namely visual projection, was comparatively more effective than any other media like activities and experiment or even programmed learning material. The low achievers were comparatively more benefited by programmed learning material than the high and average achievers.

Shah and Kaushal (1988): Studied the Impact of Television on Students in Terms of Gain in Knowledge; Change in Opinions Regarding Family Relationships and Household Management; etc.

Change in the amount spent by them on household and outside activities. The sample of the study constituted 75 third year students (seen 1985) of the Institute of Home Economics, Delhi. Tools used were - a check list about film oriented/
educational programmes, serials, documentaries, advertisements and other entertainment programmes like youth forum, play etc. On the basis of these programmes, a final questionnaire having two sections was constructed. The first section of final questionnaire collected information about socioeconomic status, personality dimension, academic performance and adaptation to modernity through the use of kuppuswamy's revised SES scale (1981), V.S. Shantamani and A. Hafeez's revised personality scale; previous year's final result for academic performance and Alex Inkles (1974) short form adapted to Indian conditions for modernity scale. The second section of items was about social and legal problems (cause and ill effects), personality development and household management, change in opinions regarding family relationships and household management, and change in the amount of time spent on household and outside activities. The results of the study revealed that majority of the respondents were modern, high achievers and from high socioeconomic status. The students gained the knowledge about personality development than social and legal problems and household management. The impact of television viewing on the respondents in terms of change in their opinions was not so significant. It was, however, observed that television viewing had more impact on introverts, average achievers and conservative students than extroverts, high achievers and modern students in terms of change in opinion and gain in knowledge. The study concluded that the television programmes should be prepared in such a way that they may suit to all categories of people like children, youth, adults, old men and women and at the same time people should explore the potentialities of television as a versatile medium giving educational programmes and mass entertainment programmes.


A survey of the needs of rural women regarding home and family life was made. About 500 adult rural women in the age group of 15-35 years were selected from ten villages of Ludhiana district, Punjab. The sample for the study included almost equal percentage of married and unmarried women, 94 percent married women were housewives, about 80 percent were in 15 to 25 age group, most of the women were
having education between primary and high school stage, some were completely illiterate and the range of family income varied from Rs. 300-1000 per month. On the basis of pooled judgement of home and family life, two topics were finally selected which were of great need and interest to women. The topics were removal of stains from clothes (87 percent responses) and decoration of house (86 percent responses). The video films on these two topics were prepared after consultation with subject experts of the concerned disciplines in Home Science. Two villages out of ten (which were included in need survey) were selected at random. Pre-test Post-test group design was employed. An objective type test consisting of 50 items for each film was administered immediately before and after the video films show. The results of the study indicated that the achievement of respondents was greater for film I (use of colour for home decoration) than for film II (removal of stains) for post-test II. A great variation of scores was also observed for scores of film I than film II but the values of paired 't' (P 0.01) indicated that both the films were significantly effective for gaining knowledge. The study suggested that video film can be an effective medium of teaching, particularly useful for adult rural women.

Beishuizen and Putten (1989) : carried out an evaluative study into a long TV series on mental arithmetic for the upper grades of the primary school.

For study I, eight schools were selected for data collections. The patterns of usage for TV series in 1986/87 in the classroom were observed. The programmes on video were used in an active way by half of the teachers with interactive stops and discussions (ACTIVE), while other half of the teachers used the programmes in a passive way (PASSIVE). Eight comparable schools were selected. Out of which, four schools made a combined use of video with interactive teaching and other four schools used video recording only. But for reasons like delays of lessons, less interactive use because of shortage of time etc., six schools were kept for statistical analysis. The programme duration was twenty five minutes but in ACTIVE condition-the time was about twice (on the average 45 minutes). This was because of intermitted interactions as there were about 10-15 video stops per lesson. Criterion tests developed by the investigators themselves were applied to the subjects. The criterion tests were taken (in parallel forms) three times, during
the evaluation period-before (T1), halfway (T2) and after (T3) the twelve weekly TV quizzer. The results of the study revealed an increase in mental computations and a decrease in written calculations as compared to control schools. When the conditions of using video tape were compared, in the ACTIVE-condition learning gains increased more strongly from the very start of the TV quizzes. The investigators made a follow up study II in 1987/88 with the improved TV series "Rekenwerk". Two former ACTIVE schools were ready to participate again and one new control school was selected. The number of subjects was 80. The TV series was reduced to 8 programmes-this time the criterion test was applied only two times-one before (T1) and second 3 months later (T2) after the TV quizzes. In this study II, the lessons were not observed. A short record of the number and types of interactions and total time of each lesson was kept by teachers. The results of study II again indicated that the TV series has resulted in substantial learning effects and learning is higher than at the control No-TV schools.

Saadat and Afifi (1990): evaluated the effectiveness of closed-circuit television instruction (CVTVI) and simultaneous instruction (SI) for teaching of English.

A 3-version questionnaire was administered to both male and female students to elicit feedback. The questionnaire covered the following six areas concerning the use CVTVI as a tool of instructions: lesson presentations and method(s) of teaching, student-instructor interaction, student achievement, evaluation of students work, the role of female teaching assistants (TAs) in supervising CCTV classes, and instructors and students attitudes towards CCTVI and SI. There were 35 questions for instructors version. 14 for male students version and 24 for females'. The questions were of two types. Type A included those questions in which the subjects were asked to respond on 3 point rating scale of 'agree', 'disagree' or 'uncertain'. Type B included those questions where the subjects were to choose one or more responses from 3 or 4 possibilities. Each version consisted of an open-ended attitude question as final question. Further two main areas of foreign language education i.e. English 252 (introduction to literature) and English 204 (English Grammar 1) were analysed. These courses were offered to male and female students in two different semesters. In one semester the course instructions were given through SI i.e. course taught
by male instructors to male students in an origination studio and simultaneously to female students in a class studio via CCTV. Then in other semester the courses were taught through DI i.e. directly by male instructors to male students and female instructor to female students in conventional classrooms. The achievement of male students in DI courses were compared with their achievements in SI courses and achievement of female students in DI courses were compared with their achievements in CCTV courses. The calculations gave the differences between the means of grades that male students and female students achieved in each course. On the basis of questionnaire results and course grades analysis, the study suggested that DI is the best alternative to overcome the limitations of CCTV and SI, particularly in language courses. This was also supported by Mckeachie (1978) that TV instruction in composition courses proved to be significantly inferior to conventional instruction.

After having reviewed the related literature, it was substantially found that there have been various studies on effectiveness of lecture mode, demonstration mode, programmed learning approach, inductive and deductive modes, expository method, problem solving method, auto-instructional programmes, laboratory method, analytico synthetic approach, narration-explanation approach, tell-and-do method, guided discovery method and interactive video mode etc. but no effort has been made in the direction of studying the comparative effect of demonstration mode, video mode and students learning through self-experimentation on the achievement of secondary students in science. Hence the present study is an attempt in this direction.

Ilangoavan (1998). Effectiveness of audio video intervention in developing listening comprehension in English at higher secondary stage.

Problem: It attempts to study the effectiveness of audio-video intervention in developing listening comprehension in English at higher secondary stage.

Objective: (i) To establish the relative effectiveness among the different instructional strategies viz. Conventional Teaching Method (CTM). Media-based Non interactive Group Instruction (MNGI) and AV Presentation as a Support System (SS) in developing listening comprehension in English at higher secondary stage. (ii) To find out whether there is
significant difference among the different instructional strategies, viz CTM, MNGI and AV 
as support system (SS) in terms of their effectiveness in modifying the micro-skills which 
are required for local listening comprehension and global listening comprehension among 
the higher secondary students. (iii) To develop syllabus based audio-video materials in 
developing listening comprehension in English among the students at the higher secondary 
stage. (iv) To develop audio-video material for testing and assessing the performance of 
the higher secondary students in listening comprehension in English before and after 
experimentation (v) To evaluate the developed audio-video materials form technical and 
pedagogical points of view by experts, educationists and practising teacher of English 
(vi) To find out whether there is any significant difference among different instructional 
strategies, viz. conventional teaching method (CTM), Media-based Non-interactive Group 
Instruction and AV presentation as support system in their effectiveness in terms of their 
retention of micro skills required for local listening comprehension and global listening 
comprehension, and (vii) To find out whether there is significant difference with regard to 
student's academic achievement in English before and after experimentation owing to 
the intervention of AV presentation in developing listening comprehension skills of the 
higher secondary students.

Methodology: The sample of the study comprised 105 students of Standard XI. These 
students were divided into three groups, one of the groups was identified as control 
groups and the other two groups were treated as experimental groups. The tools used to 
collect data were audio/video cassettes and three objective-based paper-pencil tests. 
The collected data were treated with mean, SD, t-test, ANOVA, ANCOVA and Product 
moment correlation.

Major Findings: (1) It was found that the three instructional strategies viz. CTM, MNGI 
and AVPSS were effective in modifying and developing the skills of local and global 
listening comprehension in English at the higher secondary stage. (2) The CTM, MNGI 
and AVPSS were more effective in developing all the micro-skill in respect of listening 
comprehension in English at the higher secondary stage. (3) It was found that the CTM, 
MNGI and AVPSS were found different in their effectiveness while modifying the skills of
local and global listening comprehension in English among student's. AVPSS was the most effective instructional strategy as compared to others. (4) It was found that the CTM, MNGI and AVPSS were more effective as compared to CTM in modifying the different micro-skill of the local and global listening comprehension in English among higher secondary students. But these were equally effective in modifying the micro-skills such as listening to contextual speech via picture cues and local listening comprehension via audio model. (5) It was found that the MNGI were more effective in comparison to CTM in modifying the micro-skills i.e listening to lecture and news items both, in audio-mode but they were equally effective in listening to modifying the listening to news item and listening to talk, both in video mode (6) It was found that the MNGI were more effective when comparing AVPSS in modifying the micro-skills i.e. listening to lecture via audio mode but AVPSS was more effective as compared to MNGI while listening to news item via video mode. (7) AVPSS was found found more effective as compared to MNGI and CTM in enhancing the retention of the skill of listening comprehension, whereas MNGI was more effective as compared to CTM and AVPSS in enhancing retention of the skill of global listening comprehension among higher secondary students. (8) The MNGI was more effective as compared to CTM in enhancing retention of the skill of local listening and comprehension namely the ability to discriminate among the distinctive vowels and consonants, to guess the meaning the words listened to, to make use of the real world knowledge and experience in understanding ideas and the ability to detect the key words in English. While CTM was more effective as compared to MNGI on the skill of the ability to fix the related words in their proper contexts. (9) It was found that AVPSS was more effective as compared to MNGI and CTM in enhancing retention of the micro-skills namely the ability to detect attitude of speaker towards subject matter to identify relationship among units within discourse and the ability to make use of facial, paralinguistic and other clues to arrive at meaning. (10) It was ascertained that the effectiveness of different instructional strategies differed from each other in realizing the instructional objectives in developing the listening skill and enhancing the retention of listening skill in English among higher secondary students.
2.2.0 MULTIMEDIA CONCEPT & VARIOUS RESEARCH STUDIES IN THIS FIELD

Multimedia concept:

Education has always acknowledged versatility and efficiency of multi-media communications. Mixing face-to-face teaching, self-learning, use of audio-visual aids and do-it-yourself activities has been part of this understanding. The NCERT included media like television and radio in a well-knit package for training of primary teachers in teaching science and extended it to a large number of teachers in 1975-76. Multimedia communication was found useful in explaining and demonstrating the process part of teaching.

One may say that the movement of educational technology is today multi-media based. The work reported in this survey is comparatively little because of lack of facilities for individual students and also, till lately, in most of the institutions also, for production of their own learning materials. More research is likely to be undertaken when multi-media packages are available.

Till recently, computers were used in India mainly for storage and processing of data. Computer Aided Instruction had not attracted any large group of learners or teachers. In 1984, the Computer Literary And Studies in Schools (CLASS) Project was initiated for senior secondary students. It has been mainly perceived as an awareness programme. Starting with 250 schools, computers have been installed in 1,200 schools up to 1988. It is projected that, by 1995, 50,000 secondary schools and 600,000 primary schools will have computers. Software is being developed both in the public as well as the private sector.

Most of the effort, as at present, is invested in providing computers, training teachers and producing software. Few research studies have been conceived to investigate its actual use or effect on teaching-learning. Considering the money that is being or planned to be invested in computers, research needs to be undertaken regarding the use being made of this costly technology. Recently the chief minister of Haryana, also ordered to start computer training to be given to the students in govt. schools of Haryana.
BASU (1981) Studied the Effectiveness of Multimedia Programmed Materials in the Teaching of Physics. The main purpose of the study was to make an appraisal of the relative effectiveness of multimedia programmed instruction and programmed class-teaching on the criteria of immediate achievement and retention of a group of subjects at three levels of ability. The specific objectives of the study were (i) to develop instructional materials for the strategy of programmed class-teaching and to study its effectiveness, (ii) to develop the programmed learning materials on light in school physics in four different styles—semi-programme, linear programme, branching programme, and hybrid programme, (iii) to develop a multimedia programme package using each style of programme in conduction with audio-visual media, (iv) to compare the relative effectiveness of different strategies of instruction employing multimedia programmed material and programmed class-teaching on the criteria of immediate achievement, retention and delayed retention, and (v) to study the interaction effects of instructional strategies, abilities and occasions (immediate learning, retention and delayed retention).

The sample consisted of 400 learners of standard IX which comprised an equal number of boys and girls. The tools used were A Group Test of Intelligence B.E.P.R.T. in Bengali, the Entry Level Tests, and criterion referenced Tests, I, II and III. Five treatment groups were T-1 having programmed lessons, teacher's resource book and guide, students' study guide for class-text, tape-slide work-book, tape-transparency, auto-elucidation test, tape-film strip, tape-film, physics-kit, manual for performing experiments; T-3 with a linear programmed text, tape-slide work-book, tape transparency, auto-elucidation test, tape-film strip, tape-film, physics-kit, manual; T-4 having a branching programmed text, tape-slide work-book, tape-transparency, auto-elucidation test, tape-film strip, tape-film, physics-kit, manual. The experiment was performed in schools for a pretty long time in three phases, from March 1979 to December 1979. Some concepts and principles were first developed in the subjects through the respective programmed texts, which were then concretized and strengthened through the tape slide work-book or tape-transparency or tape-film presentation. Concepts and principles illustrated through these written and A-V media were then evaluated on a short auto-elucidation test. Feed-
back was then provided by involving the subjects in experimental work with the help of the
physics-kit and manual. The experimental data were analysed by analysis of co-variance
and by 5x3x3 factorial experiment with nesting and crossing.

The following were the findings of the study: 1. There was a significant difference the
different strategy means on the criterion on overall achievement. It was found that on the
criterion of overall achievement the multimedia semi-programmed instruction was better
than the strategy of programmed teaching the multimedia linear programmed instruction
as better than the multimedia semi-programmed instruction; the multimedia branching
programmed instruction as better than the multimedia linear programmed instruction; and the
multimedia hybrid programmed instruction was better than the multimedia branching
programmed instruction. 2. The strategies of multimedia programmed instruction enabled
learners to reach the level of mastery learning (mean score varied between 80.00 and 86.00
out of 100). 3. It was found that significant difference existed in the achievement through the
different strategies due to differences in ability.

Kumar (1981): made an experimental study of the relative effectiveness of three
methods of instruction exposition method, programmed learning method and
multimedia method in science education. 3x2 factorial design was employed as there
were three methods of teaching and two levels of intelligence. The sample for the study
comprised of 180 students of classes IX and X of two inter colleges, divided into three
groups of sixty students each. One group was taught through expository method, another
group through programmed learning method and the third group was taught through
multimedia method. Criterion test was administered both at pre-test stage and post-test
stage. The results of the study revealed that multimedia method was found to be more
effective than the expository method. Retention in learning was higher when taught through
multimedia method as compared to other two methods and retention in learning by the
programmed learning group and expository group was equal.

Ravindranath (1982): undertook a study to develop a duly validated multimedia
instructional strategy for teaching biology at standard VIII. The multimedia strategy
had twelve instructional components viz. introduction by the teacher, programmed learning
material, lecture, team teaching, inquiry technique, pupil activities with teacher demonstrations, audio-visual presentations, narration of biographical sketches of scientists, summary, criterion test and feedback, exercises and assignments. An experiment was conducted on ninety students of standard VIII for final validation of multimedia strategy. Two matched groups were formed from the sample. Pre-test and post-test design was employed. Effectiveness of multimedia strategy and traditional method of teaching was assessed in terms of achievement. Also relative effectiveness of two types of programmed learning material (PLM) i.e. inductive PLM and deductive PLM was also assessed on few selected units on biology. The results indicated that multimedia instructional strategy was found to be effective in terms of achievement. The performance of the students of experimental group was better as compared to control group on comprehensive test and also on annual examination conducted by the school authorities. The students of experimental group showed better development of scientific attitude.

Krishan (1983) Development of Multimedia Package for Teaching a Course on Audio-Visual Education. The major objectives of the study were (i) to develop a multimedia package for teaching a course on audio-visual education for the instructor training programme, (ii) to find the effectiveness of the multimedia package in terms of achievement of trainees and change in attitude of the instructor trainees towards the multimedia package, and (iii) to study the feasibility of the multimedia package in terms of time and cost for the instructor training programme.

To attain the above objectives, a single group design was evolved. As many as 127 instructor trainees enrolled during the year 1981-82 at the Central Training Institute for Instructors, Madras were treated as the sample of the study. The instructional strategy was prepared in modular form. There were five modules containing the full course units. The components of the modules were programmed slides, programmed instructional material with a manual for practical exercises, self-evaluating unit test with answer keys, discussions, feedback, etc. The strategy was implemented for one academic session. The tools used for data collection were criterion tests, comprehensive course tests and an attitude scale prepared by the investigator, and an English language ability test designed
The major findings of the study were: 1. Ninety-eight percent of the trainees obtained more than 80 percent of the marks on the final post-test. 2. The mean percentages of the post-test scores varied from 81.41 to 90.46. 3. The main gain in the total scores for all the modules was found to be significant at 0.01 level. 4. The mean gain scores of knowledge, comprehension and higher mental abilities were found to be significant at 0.01 level. 5. The mean attitude change was found to be significant at 0.01 level. 6. The achievement of trainees and their language ability were found to be positively related at 0.01 level of significance. 7. The feasibility of the multimedia package as established in terms of cost involved in reproduction of the various resource materials and the time scheduling in an actual institutional set-up.

The implication of the study was that multimedia packages in modular form could be used for training programmes in vocational institutions.

**MENON (1985) Evolved a Multimedia Approach to Teaching at Postgraduate Level.**

The major objectives of the study were (i) to develop a multimedia strategy in organizing a course in educational technology for postgraduate and research students, (ii) to validate the strategy in terms of students performance in criterion tests and discussion sessions, and their attitude towards the strategy, (iii) to study the relationship between achievement and intelligence, and achievement and English reading comprehension, and (iv) to study the feasibility of the strategy.

As 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 combined group of 22 students from M.Ed. and M.Sc. (Home) students of the 1978-79 session. The instructional, team teaching, seminar, slide-tape commentary, work-book presentation, discussion, library work, as-significant, feedback session, practical work and summary. The tools used for the study were the criterion test an 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 per cent Ph.D. students and M.Sc. students scored 60 percent and above marks on the Comprehensive Criterion Test, and more than 50 per cent M.Ed. students scored 60 percent and above marks. 2. In the subsequent year around 90 per cent students scored 75 per cent and more marks. 3. An improvement trend was witnessed with regard to discussion sessions. 4. At different stages of implementation of the strategy, the students' attitude towards the multimedia approach went on increasing in a favourable 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 found significant at 0.01 level. 6. The unit cost varied from Rs. 47/- to Rs. 32/- for a range of 25 to 50 students if software suitable to be presented through hardware was to be incorporated. The strategy worked within prescribed periods of time.

The educational implication of the study is that the validated multimedia strategy, with suitable software material can be used to provide instruction in 'educational technology' of one semester duration to postgraduate students in education and related disciplines.


Problem: The study centres upon the problem of the effectiveness of computer-assisted instruction and of the conventional method of instruction in teaching mathematics, in terms of achievement in mathematics and direction of change in attitude towards mathematics of male and female students.

Objective: (i) To study the difference in mathematic achievement which occurs as a result of the difference in instructional strategy among boys and girls separately and as a group, and (ii) to study the direction of change in attitudes of male and female students separately and as a groups towards mathematics as a result of two different instructional strategies.

Methodology: The sample of the study consisted of 220 students from four selected higher secondary schools, covering the good, average and poor schools of the Bhilai
Major Finding: (1) The students who used the computer scored significantly higher than those taught mathematics through the conventional method. (2) The students who used the computer showed significantly highly favourable attitude towards mathematics than those who did not use the computer. (3) Achievement in mathematics and change in attitude towards mathematics were found to be independent of the sex factor.


Objectives: (i) To develop CAI software (ii) To find out the effectiveness of CAI with TSS and CAI without TSS with reference to the learner variables, viz, sex, locale, IQ, and achievement level, and (iii) To find out the interaction of the learner variables and the treatment on the achievement score.

Methodology: The randomized block design was followed in the selection of the sample, with IQ as the blocking variable. The sample consisted of three groups of size 32 each composed of students of Standard IX selected from three Tamil Nadu State Board Schools covering one rural and two urban. The underachievers in the sample were identified by using the regression analysis. The tools used included CAI software on "the language of sets", Achievement Test, Culture Fair Intelligence Test by Cattell and Cattell, Study Habits Inventory by Patel, and mathematics Study Attitude SCALE BY Sundarajan. Mean, SD, 't' test, chi-square, one-way and two-way ANOVA were used to treat the collected data.

Major findings: (1) Both the CAI strategies were superior to the traditional method of instruction, and CAI with TSS was more effective than CAI without TSS for underachievers (UA). (2) Except achievement level, all the other learner variable combined with the treatment had no interaction effect on the achievement score. (3) There was no relationship between the post treatment score and the variables 'sex' 'locale' and 'achievement level' of the experimental group. In the case of variables and achievement at the pre-
treatment level was found to be cancelled at the post-test. Similar results were obtained for UA.

Shah, Beena and Agarwal, Rashmi. (1994) Teachers attitude towards computer assisted instruction and computer education in relation to sex, organization and experience. Problem: This study focuses upon the attitude of secondary school teachers towards computer-assisted instruction and computer education.

Objective: (i) To know relationship between gender and attitude towards computer education and computer assisted instruction. (ii) To assess the relationship between type of school and attitude towards computer education and computer-assisted instruction, and (iii) To study the relationship between teaching experience and attitude towards computer education and computer assisted instruction.

Methodology: A sample of 150 teachers in the age group of 20 to 40 year were selected from four public schools and four central school of Lucknow City using multistage random sampling technique. Data were collected using a five-point Attitude Scale by Shah and Pandey. They collected data were treated with mean. SD and 't' test.

Major Findings: (1) Teacher had great linking as a subjects as well as using these computer as a medium/aid for instruction. (2) The female teachers has more positive attitude toward computer education in comparison to the male teachers. (3) The central school teachers had more positive attitude towards computer-assisted instruction in comparison to the public school teacher. (2) The length of teaching experience did not have much effect on the attitude of the teachers towards computer education and computer assisted instruction.

Kaswekar (1996) : Construction and effectiveness of multimedia Package to develop population awareness in the trainees of primary teacher training instruction. Problem : It attempts to study the effectiveness of multimedia package developed to enhance population awareness among the teacher-trainees of primary teacher training instruction.

Objectives: (i) To develop a multimedia package for developing population awareness in primary teacher-trainee (ii) To examine effectiveness of the multimedia
package constructed for developing population awareness (iii) To examine effectiveness of multi-media package (iv) To examine effectiveness of multi-media package in rural, urban teacher trainees

Methodology: The sample comprised 570 first year's teacher-trainees studying in the primary teacher training colleges belonging to six colleges, four from Ahmedabad and one each from Kheda and Mahesana. Multi-media package was constructed keeping in view the trainees' age level and the topics of the subject content. Various other tools used included Desai Verbal and Non-Verbal Intelligence Test, Socio-Economic Status Scale of K.G Desai and Population Awareness Memory Test. The collected data were treated using mean, SD, 't' test and ANCOVA.

Major Findings: (1) Teaching through multi-media package for developing population awareness was found to be significantly effective in comparison to the lecture method. (2) The use of multi-media package to develop population awareness among boys and girls, rural and urban students did not differ. (3) Multi-media package was more effective in changing the attitude of teacher-trainees towards population education, as compared to lecture method. (4) The test constructed to measure population awareness had proved to be very useful.

Rangaraj (1997): Effectiveness of computer assisted instruction in teaching physics at higher secondary stage. Problem: He studied the effectiveness of computer assisted instruction in teaching physics at higher secondary stage.

Objective: (i) To establish the relative effectiveness among different instructional strategies viz conventional lecture method, CAI as individualised instructional strategy and CAI as support system to teachers' classroom instruction in teaching-learning physics at higher secondary level, (ii) to find out whether there was significant difference among different instructional strategies viz. Conventional lecture method, CAI as individualised instructional strategy and CAI as support system(s) to teachers' classroom instruction in terms of their effectiveness in modifying the cognition among the higher secondary students in physics at different levels viz knowledge, Understanding and Application, (iii) to develop syllabus based computer software packages in teaching physics at higher secondary
testing level. (iv) to develop a computer managed testing software for assessing the academic achievement of the pupils in physics through computer before and after experimentation (v) to evaluate the developed computer software packages from technical and pedagogical point of view by experts, educationists and practising teachers (vi) to find out whether there was any significant difference among different instructional strategy and viz conventional lecture method, CAI as individualised strategy and CAI as support system to teachers' classroom instruction in their effectiveness in term of their retention power as revealed by the learners' performance in the retention test and (vii) to develop criterion test in the contentit areas taught through different instructional strategy in the present study.

Methodology: The sample of the study comprised 120 students of class XII. The tools used to collect data included six syllabus based computer software packages developed by the investigator, six objective based criterion test developed by the investigator, achievement value and Anxiety Inventory standardised by Prayag Metha, Probabilistic Orientation standardised by Narayanan and Internal-External Locus of Control Inventory standardised by Venkatapathy, Cattell's Culture Fair Intelligence Scale and Scientific Attitude Test by Nelliappan. The collected data were treated with mean SD and 't' test.

Major Findings: (1) There were significant difference between the means of pre and post test in physics among one control and two experimental at all the levels of cognition in favour of post test (ii) there was significant difference between the means of CAI-SS and PAI as individualised instruction and conventional lecture method by post method. The mean of CAI-SS was found to be greater than as individualised instruction and conventional lecture method. (iii) There was significant difference between the means of the scores of the pupils at all levels of cognition as measured by retention test between lecture method and CAI as individualised instructional and CAI as SS (iv) There was no significant difference between the means of high and low range scores classified based on different psychological variables with regards to their academic achievement in physics for groups of CAI as individualized instruction and CAI as SS. (v) There was no significant
difference between the means of the groups of CAI as individualised instruction and CAI as support system on the scores of the pupils on the psychological variables as measured by the post test.

Naryanasamy and Tangasamy (2001): A study of computer uses among teacher educators in teacher training institutions in Tamilnadu. Objective: The present study was undertaken to find out the extent of the use of computer by teacher in District Institutes of Education and Training (DIETs) and Teachers Training Institutes (TTIs).

Methodology: The sample consisted of 453 teachers (326 in DIETs and 127 in TTIs managed by private management/agencies) from Tamil Nadu. Questionnaire was used to collect data. Frequencies, percentage Krusykal-wall’s analysis were used for data analysis.

Major Findings: (i) Nearly 35% of the teachers' in DIETs reported that computer has been used all the six tasks whereas in TTIs it was only 20% (ii) In both types of institutions nearly 65 to 80% of teacher admitted that they were not able to perform a variety of computer tasks. (iii) About 52% of DIETs teachers agreed that computer could be used in pre-service training in their institutions and 53.7% teachers reported that computers could be used in in-services training. (vi) In TTIs 45.7% of teachers favoured the use of computer in pre-services, whereas only 5.5% teacher reported that computer could be used in in-service training. (v) Nearly 50% of teachers in DIETs reported utilization of computer for resource support and action research purposes but only 7.7% of teachers of TTIs reported the use of computer in action research. (vii) Over 80% of teachers of DIETs considered lack of adequate training, lack of external incentives, lack of equipment and software as the most important barrier in learning more about computer. Only small percentage of teachers reported lack of time and lack of interest of computers as barrier and the same was the case with teachers of TTIs (viii) In DIETs only 27.9% teachers were using computer frequently. 52.2% occasionally and 46.9% were rarely using computer. (ix) In TTIs about 17% teachers were using computer frequently, 21.3% occasionally and 61.4% never used computer. The study has 14 references.

Objective: Meta analysis of studies on effectiveness of tele-course in distance education.

Methodology: 53 studies served as sample for the study. These were collected through Journal and Internet and coded in order to examine the contextual characteristics of the studies. Cohen approach was used for meta-analysis.

Major Findings: (i) A considerable heterogeneity in achievement was observed in all the studies (ii) It was found that the instructional features influencing learners achievement were: type of interaction available during the broadcast, type of courses, types of delivery equipment used, type of remote size, presenter's experience with delivery method etc. Two way interaction was found to be the best method of interaction between the presenter and learner (iii) Improvement in technology, transactional strategies had a major impact on students achievement in distance education tele-course. (iv) The effect size difference between male and female authors seemed to reflect improvement in the quality of technology over the decades rather than a direct relation to the gender of the author because all the female authors published in the late 1980s to the 2000s. (v) There was no relationship found between learner's achievement, types of research design or type of text used to measure achievement. The study has 43 references.