Chapter - 2
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2.1 Introduction

“Every research project should be based on all of the relevant thinking and research that has preceded it, when completed, it becomes as part of the some accumulated knowledge in the field and so it contributes to the thinking and research that follows. For any specific project to occupy this place in the development of a discipline, the researchers must be thoroughly familiar with both previous theory and Research.” –Fox (1969).1

In the process of investigation of any field of knowledge the place of past studies or survey of related literature has very important bearing on total framework of the investigation. It gives the basic idea and clues for constructing the frame of references about present problem. Thus, survey of related literature provides with the base for generation of new knowledge. Any planning which is made for future on the basis of past will surely be successful. For any kind of study, in the field of knowledge, the researcher needs an adequate familiarity with the library and many other sources of information. A very effective research for specialized knowledge will be possible only with the help of related literature. Therefore, an investigator must know, what are available in his field of enquiry and be acquainted with up to date information about what has been thought and done in the particular area from which he intends to take up a problem of research.

The review of literature aims to describe the ‘state of play’ in the area selected for study. It should describe the point reached by the discipline of which the particular research study will form a part. An effective literature review is not merely a summary of research studies and their findings. Rather, it represents a ‘distillation’ of the essential issues and inter-relationships associated with the knowledge, arguments, and themes that have been explored in the area. Such literature reviews describe what has been written about the area, how this material has been received by other scholars,

and the major research findings across studies, and the major debates in terms of substantive and methodological issues.²

2.2 Review of Related Literature

Research to determine the effects of teaching with various educational media has gone on for more than fifty years, as each technological innovation has emerged, educators have to seek to determine its utility and to compare the effects of its use with those of existing modes of instruction.

This chapter provides conceptual framework for the present study, as the research studies taken up in the area of effective of media in education are reviewed here. This chapter throws light on the environment Education, media and concept of media characteristics of media, types of media, use of media, effectiveness of media in environment education (formal), and non formal.

Extensive research has been done at school level in the area of effectiveness of media and its use in education. However, few researches have been conducted at higher education level, which have been reported in this chapter.

2.2.1 What is Environment Education?

Environment education is not an easy task, unlike other curriculum areas. It is universally accepted that environmental education should be interdisciplinary, drawing from biological, sociological, anthropological, economic, and political and human resources. [Sharma (1981)]³.

The international union for conservation of Nature and Natural Resources (1970) called the need for Environmental Education as: “Environmental education is the process of recognizing values and clarifying concept in order to develop skills and


attitudes necessary to and appropriate the inter relatedness among men, his culture and his biophysical surrounding.”

Environmental educators have consistently recognized the importance of both cognitive and affective dimensions of people – environment interactions, as well as the interactions between learners and environmental learning. Another area of research deals with how formal educational programmes influence researcher and/or student attitude and values with regard to the environment and environmental concerns. One research review concludes those student’s attitudes towards learning are positively related to learning itself, and that changes in cognitive knowledge levels can influence student attitudes towards environmental concerns.

The Belgrade charter was developed in 1975 at United Nations Educational, Scientific, and Cultural Organization Conference in Yugoslavia, and provides a widely accepted goal statement for environmental educations. The goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and collectively toward solutions of current problems and prevention of new ones.

Following Belgrade, the world’s First Intergovernmental Conference on Environmental Education was held in Tbilisi, Georgia. Building on the Belgrade charter, representatives at the Tbilisi conference adopted the Tbilisi Declaration, which challenged environmental education to create awareness and values amongst humankind in order to improve the qualities of life and the environment. A major outcome of Tbilisi was detailed descriptions of the objectives of environmental education. Most environmental educators have since universally adopted these objectives.

- Awareness – to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems.

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5 ‘ibid’. p. 22-23.
• Knowledge – to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.

• Attitudes – to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.

• Skills – to help social groups and individuals acquire the skills for identifying and solving environmental problems.

• Participation – to provide social groups and individuals with an opportunity to be actively involved at all levels in working towards resolution of environmental problems.  

2.2.2 Guiding Principles

The guiding principles of environmental education should be:

1. The environment has to be considered in its totally natural as well as built, technological and social, economic, political, moral, cultural, historical and aesthetic aspects.

2. Environmental education should a continuous life process which is beginning at the preschool level and continue through all formal and non-formal stage.

3. Environmental education should be on interdisciplinary in its approach. The specific role in making possible a holistic and balanced perspectives.

4. Environmental education should emphasize active participation in preventing and solving environmental problems.

5. Environmental education should examine major environmental issues from local, national, regional and international point of view so that learners get insights into environmental conditions in other geographical areas.

6. Environmental education should focus on current and potential environmental situations while taking into consideration the historical perspective.

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6 ‘ibid’
7. Environmental education should explicitly regard environmental aspects in plans for development and growth.

8. Environmental education should emphasize the complexity of environmental problems and thereby the need to develop critical thinking and problem-solving skills.

9. Environmental education should be able to promote the values and necessity of local, national and international co-operation in the prevention and solution of environmental problems.

10. Environmental education should help learners to find out the symptoms and the real causes of environmental problems.

11. Environmental education should be able to relate environmental sensitivity knowledge, problem solving and values clarification of every grade lying, but leg in special emphasis on environmental sensitivity to the learner’s own community in early years.

12. Environmental education should make learners to have a role in planning their learning experience and give an opportunity for making decisions and accepting their consequence.\(^7\)

2.2.3 Concept of Environment

The word “ENVIRONMENT” in English is derived from the word “ENVION”. Any environment that surrounds the living or non-living is known as an environment because it covers the whole existence from all four directions (Sharma 1994). Air, water and land surround the living organism, therefore these constitute the environment. The living beings of the same environment are not independent but interdependent. The science of these mutual inter-relations is known as ecologic\(^8\).


Environment refers to the sum total of condition, which surround man at a given point in space and time.

The National Environment board has given the definition of the environment as it generally refers to everything surrounding us either living, or non-living either naturally biologic or created by men in concrete and in abstract. These objects have influence among them and have to support each other. The effect from one factor can support or destroy another factor in related cyclic system.

However the efforts are put to understand the interdependent relations between these existences and the problem. The thin layers surroundings the earth and the atmosphere that covers it form up a unique environment. This environment nurtures biological growth and development. It is this environment that a shape the being maintains and destroys it is obvious that small changes that take in nature affect the life. Air, water, land and other living beings are included in the environment. This, in turn, includes all insects, animals, vegetations, atmosphere, land and all the chemical and physical elements which surround the man. The geographical circumstances are responsible for the variations in the human life; “geographical circumstances” are known as “geographical environments” also there is a close relation between these geographical environments and the living beings.

2.2.4 What is Media?

1. Communication channels through which news, entertainment, education, data or promotional messages are disseminated. Media includes every broadcasting and narrow casting medium such as newspapers, magazines, T.V., radio, billboards, direct mail, telephone, fax, and internet.

Media is the plural of medium and can take a plural or singular verb, depending on the sense intended.

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2. Data storage material divided into three broad categories according to the recording method: (1) Magnetic, such as diskettes, disks, tapes, (2) Optical, such as microfiche, and (3) Magneto-Optical, such as CDs and DVDs.\(^{10}\)

The word media comes from the Latin plural of medium. The traditional view is that it should therefore be treated as a plural noun in all its senses in English and be used with a plural rather than a singular verb: the media have not followed the reports (rather than has) in practice, in the sense television, radio, and the press collectively, it behaves as a collective noun which means that it is now acceptable in standards English for it to take either a singular or a plural verb. The word is also increasingly used in the plural form medias, as if it had a conventional singular form media especially when referring to different forms of new media, and in the sense the material or form used by an artist: there were great efforts made by the media of the involved countries about 600 works in all genres and medias were submitted for review.\(^{11}\)

### 2.2.5 Importance of Media Education

According to Tella et. al. (1998) following points of view:

- Media education is grounded in the theoretical basis of the systemic study of education and didactics. Therefore, those who work with media education should also know and be interested in knowing what teaching; studying and learning are Media education is expected to study the global flows of education and to ponder upon their relevance influence on the finish educational system.

- Media education is directly linked to initial and in-service teacher education. It should also try to promote the ideals of continuing education and lifelong learning. Media education is concerned with teacher’s changing roles, status, and professional image, especially in an information and communication society.

- Media education represents educational sciences as well as new cultural sciences. Educational technology but not technological determinism plays a major role in the implementation of media education.

\(^{10}\) Retrieved from http://www.businessdictionary.com/definition/media.html.

\(^{11}\) Retrieved from Oxforddictionaries.com/definition/media.
Media education has latterly been conceptually reoriented towards modern technology. A fair command of digital tools and software is needed to incorporate media education adequately into curricula at different levels.

Media education is concerned with wide variety of discipline and domains of knowledge; therefore its character is, from the very outset, multidiscipline and media education. A concrete task for media education is thus to decrease fragmentation in science and to create more harmony between different disciplines.

The emergence of knowledge of media education is related to the synergy between science, culture, art and technology.

Media education has every possibility to combine media and education, communication mediation. To achieve this goal, media education needs elements that help bridge these different areas of human action.

Media education is likely to greatly benefit from the principles of dialogism and dialogic communication culture, if they can be applied to all its activities in the spirit of true communalism.\textsuperscript{12}

2.2.6 Concept of ‘Audio-Visual’ media

Audio-Visual aids are those aids other than the printed or written word which help us form a clear concept of a thing. The best way, of course, to form a clear concept of thing is to experience it directly. We understand a mango best by seeing, touching, and tasting, smelling, and tasting a real mango. Not everything, however, in this vast and complex world can be learnt through direct experience in this manner. We must take the help of substitutes. Audio-Visual aids provide these substitutes and they are called audio-visual, because they become effective mainly through the two senses hearing and sight.\textsuperscript{13}


2.2.7 Background Concept of Media

Technologies, as channels through which modes (symbols acting as stimuli) pass, differ in the responses they evoke in users. For example, text is a mode of presentation. Print-on-paper is one possible medium (channel) for text, but there are others, a computer monitor, an overhead projection, a television screen, film (moving or still) etc. wherever it is used, text remains text and must be read to be comprehended.

Despite their different characteristics, useful online training technologies have in common the effect of somehow bringing students into contact with their tutors, the content, and their peers. In this way media may help to reduce “transactional distance in learning the communication gap or psychological distance between participants which may open in a teaching learning situation. Although similar in producing these outcomes, the differences in how various technologies accomplish their effects are important to their potential usefulness.

2.2.8 Characteristics of Media

It may seem obvious to say that each medium is constructed differently, nothing for example the difference in constructing the messages in a film. At its most basic level, a book requires the creator to work together in creating a product that includes sound and live or animated motion.

Consider the language used in photography to describe the process of creation. Photographers use terms such as “wide shot”, “close up”, “deep focus”, and “f-stops”. Someone writing a book would probably be more, concerned with “chapter”, “logical flow”, “character development”, and “story”. Each medium uses its own language or process of creation, and this process makes each medium unique. As an example, compare the construction of a television commercial and a reality show. Both are created using the same language, but they are created for different purposes and so must be constructed differently.

2.2.9 Use and purpose of Media

The sole purpose of media’s existence is to improve communication. The sender encodes a messages and uses different channels of communication. The

receiver decodes the message. Often, the message is distorted due to a barrier in communication. Media can help overcome the psychological, background, language and perception barriers.

The process of communication can be improved and made more realistic by using pictures and motion, contrivances with controls of light and sound and other types of learning experiences. The phenomenon of learning has been a subject of much research. It is now understood that learning and the rate of learning depend upon time of day, environment, teaching strategy and time of progress during learning. The learning created by media can be retained longer and it can be applied to problem solving. The retention rate can be considerably improved by using media and by employing interactive modes of learning.\(^\text{15}\)

### 2.2.10 Types of Educational Media

The education media are classified in a variety of ways such as audio, visual and as combined audio-visual aids. A classification preferred by media in terms of non-projected, projected and electronic media. The audio component may be added to any of media, e.g. to workbook, to overhead projection and to computers.

![Figure 2.1 Classifications of Educational Media](image)

The use of media now a day is deeply impressed and has an enormous influence on every single one of us who are living on this planet.

The module of communication and media studies is crucial to everybody on this earth. For instance technology is growing amazingly fast these days. People may only consider studying aspects related to technology. However, as suggested “The internet has gone commercial too. More Websites, more channels, more choices, more media. And hence media is as well worth-studying for us. Media has purpose of getting people more up-to-date. Not only does it have the above academic functions, but also its main role is to entertain people on earth. Without it, this world would be back to the uncivilized stage. Communication and media studies get us to understand more about the all rounded life of human media and communication provide the common factors for human being.

2.2.11 Use of Media in Education

One of the most important changes that have occurred in this century is the increasing importance given to the study of the child in place of the knowledge he/she should be acquiring. Even a subject was considered from the point of view of the adult not by whether it was appealing to the student or not. Learning was then a difficult business. But what a change has taken place in educational practice! How much attention is now being paid to the learning activity of the student! We now know that effective learning depends to a great extent upon the student’s having a strong motive for learning as well as upon his experience being made meaningful and purposeful for him / her by the use of any audio-visual aids. Media motivate the student’s learning by arousing his/her interest in a number of ways.

In the first place, the media are something new for student. They provide a change from the usual activities of school or college such as reading, writing, listening. The novelty of the media makes them attractive to students.

Secondly, the aids provide a change in the atmosphere of the classroom e.g. when a film or filmstrip is screened, student talk, question and comment upon freely as they do outside the classroom. This pleasant and natural atmosphere contributes greatly to learning.

Thirdly audio-visual aids are comparatively easy to understand and so they interest students more than the description of anything through a talk.
In the fourth place, many of these aids give students opportunities to do something.

Fifth place audio-visual aids makes the student’s experience meaningful. Because audio-visual material supplies a concrete basis for conceptual thinking they give rise to meaningful concepts.

Sixth point, media help us not only to see things that are removed by space but also those that are removed by time. We can, of course, read about things of past as we can read about things of the present.

Properly selected and used audio-visual aids/media help decrease the amount of forgetting and increase the permanence of what is learnt.16

In this age of information revolution, new technologies are revolutionizing the field of education. The devices such as computers, internet and video which seemed far-flung a few years back are now at the doorstep in community. As the technology reaches the villages, more and more people likely to get the benefit of education at their doorsteps. Earlier studies have shown that mass media of communication have tremendous persuasive impact on rural masses and it has been found to be positively related with adoption of improved farm practices.

Varma, S. and all (2009), Rana (1992) revealed that video has high impact and its advantages need to be given due consideration as it holds potentially of replacing the trainer once the message has been captured on the video. It is a most effective media.17

Akhileshwari (1990) Opined that video is yet another new medium. It has challenged the supremacy of TV both as a teacher and us a medium of education. Some industrial houses like Voltas and Glaxo have been dispensed with their in-


house magazine and switched over to video magazines since they make great impact.\(^{18}\)

Narayan’s (1987) studied revealed that one of the functions of TV as identified by adolescence was fulfilling the need for information as well as education. TV promotes various programmes which provide recreation and education, and serves the purpose of welfare as well as development.

The demand for higher education increased with increasing population in our country. TV serves the purpose of imparting education and information, which supplements educational as well as vocational needs.

### 2.3 Review of Related Study

In relation to review of past studies L. P. Mehootra says “One of the essential aspects of a research is to review of the related literature. The investigator should know that his problem is not absolutely new but a lot of work has already been done on the problem, which he proposes to study, and therefore his effort should be acquaint himself with all the connected literature contributed previously by other investigators as far as possible. Such a systematic, thorough and relevant review of material promotes a greater understanding of the problem and resumes the avoidance of unnecessary duplication. It also helps him to make a comparative study of his findings with those of others and thus evaluate and interpret their significance.”\(^{19}\)

G.J. Moole says that “The review of the literature promotes a greater understanding of the problem and its crucial aspects and resumes the avoidance of unnecessary duplication. It also provides comparative data on the basis of which to evaluate and interpret the significance of one's findings.”\(^{20}\)


In short, surveys of related literature throws light on conceptual framework, help to justify the relevance of the problem, reveals the gap which is to be filled in successive researches. It also helps in process of defining and selecting variables, in selection of sample, in selection of tool, in analysis and side by side in the interpretation of the result also.

For convenience, study of past researches is divided in three parts as (i) researches done in university of Gujarat state, (ii) researches done in Indian university apart from Gujarat state and (iii) researches done out of India. The studies are arranged in ascending sequence of year in which it take place.

2.3.1 Agarkar, A. J., 1947

**Title** Folk Dance and Physical Education (With Special reference to Maharashtra).

**Objectives** The study aimed at finding out folk dances of Maharashtra that could be introduced in the school curriculum as a means of physical education.

**Methodology** A detailed study of the various aspects of folk dance of Maharashtra was made. The various aspects were the occasion of dancing, movements and formations, dress and accompaniment, music, songs and notations dancing in early societies, dance and culture.

**Findings** The observations made were,

(i) Group dance suits both the boys and girls and hence overcomes the trouble of training in physical education in co-educational institutions.
(ii) This can give rise to better social intercourse.
(iii) The wide range of movements of folk dances can be utilized as an aesthetically satisfying and interesting form of physical exercise.
(iv) The folk dance combination should be preferred from the point of view of such neuron muscular movements being old and fitted with man’s expressive life.
(v) Folk dance is psychologically sound as it is recreational and joyful activity.

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2.3.2 Dewan, S. S., 1966

**Title** Programmed Learning through Television.

**Objectives** The objective of the study was to find out ways of applying principles of programmed learning to make televised instruction more effective.

**Methodology** The study investigated the effect of two different modes of presenting the learning material, viz.,

(i) With the knowledge of immediate results.
(ii) In the question-answer format implying active responding in the context of televised instruction.

Students from grade X from three Delhi schools were selected for the purpose. In each school, all students in grade X were listed and then randomly assigned to the three treatment groups. Under treatment I, which may be called conventional television lesson, the teacher lectured or demonstrated an experiment and then went on describing the concepts involved therein like the usual lecture method of teaching. Under treatment II, which may be called experimental treatment A, the topic was divided into subunits and after the completion of every subunit the teacher asked a question and allowed sufficient time to the students to respond to his question. The television screen showed only a question mark during this period. After this small pause, the teacher again appeared on the screen and gave the correct answer the students who checked their answers with the teacher-given answer. In the treatment III, which may be called experimental treatment B, an auto-elucidation test was added further. A sample chemo-card was used to enable the students to know whether they were correct or incorrect immediately after they had responded to the question. The questions in the post-test, developed in consultation with the TV teacher and the educational consultants of the TV centre were different from questions which were asked during the TV lesion. A delayed post test was also administered. Mean, SD, and significance of differences between groups were computed to analyze data.

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**Findings** The findings of the study revealed that

(i) The experimental group A was clearly superior to the conventional TV lesion group.
(ii) Scores obtained on the delayed post-test could not be attributed to learning through the TV lesson.

2.3.3 George, A., 1966

**Title** An Enquiry into the Scope and Effectiveness of Audio-Visual Instruction in Improving English Teaching in Kerala State in the first three years of School Course.

**Objectives** The study was undertaken to find out,

- The availability of audio-visual aids in schools
- The aptitude of teachers towards the use of audio-visual aids
- Whether the teaching of English with audio-visual aids in more effective than the usual way of teaching.

**Methodology** Data were collected by observing thirty lessons, by administering a questionnaire to 200 teachers from 200 different schools selected at random and by conducting an experiment in actual classroom situation. Information on the following points was obtained through the questionnaire,

(i) The availability of the aids in schools.
(ii) The frequency of use of aids by teachers.
(iii) Facilities to use these aids in the schools.
(iv) The reasons for not using aids.
(v) Teachers’ opinion regarding the use of these aids.

The experiment was conducted on children selected from two government schools and two private schools. They were grouped on the basis of their achievement

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in English. The parallel group technique was followed. At the end of the term, a test (consisting of essay type and new type of questions) was administered.

**Findings** The important findings were,

(i) The teachers teaching English in grades fifth, sixth and seventh generally used the translation method.

(ii) The oral work was neglected in all the three grades.

(iii) The teacher’s pronunciation was incorrect and they did not pay much heed to the pupils’ pronunciation.

(iv) Due to overcrowding in the classroom, the children did not get individual attention.

(v) The type of seating arrangement was neither healthy nor conducive to language learning.

(vi) Majority of schools did not possess aids like projectors, tape recorders and flannel boards; and aids available in schools were not properly used.

(vii) Teachers did not use audio-visual aids because of heavy cost, heavy syllabus, insufficient number of material aids, and lack of skill and special training.

(viii) The percentage of specially trained teachers in audio-visual instruction was 6.06 only.

(ix) The achievement of pupils taught by using audio-visual aids was greater than those taught by the usual method and the use of audio-visual aids did not require more time than what was required for ordinary teaching.

2.3.4 Sharma, M. M., 1966

**Title** A Comparative Study of outcomes of Teaching of Algebra by Conventional Classroom Method and Method of Programmed Instruction.

**Objectives** The present study aimed at comparing the programmed method of teaching algebra with the conventional classroom lecture method, with a delayed posttest, to study the relative retention under the two methods.

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Methodology The sample of the study consisted of eighty students of class IX who were first divided into upper, middle and lower groups on the basis of marks in the terminal examinations and then they were randomly assigned to an experimental and a control group. Besides the usual pretest and post-test, a delayed post-test was also administered to study the effectiveness of the two methods in terms of retention.

Findings The findings of the study revealed that

(i) The mean achievement of the experimental group taught through the programmed method was found to be 2.5 points higher than that of the control group taught by the teacher through the lecture method.
(ii) The obtained mean gain was significant at .01 levels.
(iii) Sixty percent of the experimental group secured cent percent on the test, whereas only twenty percent of the controlled group could reach that high standard.
(iv) The experimental group had a minimum score of four, whereas the control group showed a minimum of zero.
(v) The delayed post-tests also showed better retention by the experimental group.

2.3.5 Nagar, P. S., 1971

Title Utilization of Learning by different Teaching Methods at Various Levels of Intelligence.

Objectives The purpose of the study was to compare three different measures of learning, viz., recall, retention and utilization, obtained separately under two instructional treatments, viz., Herbartian method and programmed learning of linear type. Specifically, the objectives were to find out,

(i) Which of the two instructional methods yield better recall, retention and utilization scores, when the content, learning time and educational level of the subjects are kept constant?
(ii) The method of teaching in which the two sexes show differential scores?
(iii) Which method is more effective in the case of superior, average and below average students?

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(iv) Whether instructional treatment, sex, intelligence and measures of learning interact and if so, which of these factors have significant interactions?

Methodology  A stratified random sample of 207 boys and 143 girls from six higher secondary schools (three boys and three girl’s schools) in Gorakhpur was selected on the basis of the geographical location and socio-economic status. The students of class IX from each school were divided into two groups each containing not more than thirty pupils for the two instructional treatments. Each group was further divided into three on the basis of intelligence. The investigator taught one group and the subject teacher taught the same topic which was given to him one week earlier, to the other group by the usual method. After the completion of the initial learning the subjects were tested on the recall test. After seven days, the retention test was administered. The Joshi’s Humanities Group Test of General Mental Ability, the Hindi version of the programme on “Flower” prepared by the NCERT, and three tests of learning were used. The data were set in a factorial design, with a four way analysis of variance. A factorial design with the two methods t₁ and t₂, sex, three levels of intelligence I₁, I₂, and I₃, and three learning tests L₁, L₂, and L₃ was laid out with varying number of observations for each cell. In all, 660 observations were taken. The three and four factor interactions were assumed to be absent and taken as errors.

Findings  The findings were that.

(i) The effects of treatments were highly significant at .01 levels.
(ii) The effects of intelligence, learning and the two methods of teaching were highly significant, but no evidence of the significant effect of sex existed.
(iii) Two factor interactions of intelligence and sex, learning and methods of teaching, were highly significant, but the two factor interactions between intelligence and learning, learning and sex, intelligence and methods of teaching, and methods and sex were not significant.
(iv) Interaction between instructional treatments and measures of learning was significant.

2.3.6 Kapadia, G. G., 1972

Title  Develop Programmed Learning material and study pupils’ Achievement on

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Programmed Learning Material in relation to some Personality Variables.

**Objectives** The investigation was undertaken to study the relationship between the immediate achievement and the retention scores on linear and branching programmes and some selected personality variables, viz., intelligence, anxiety, self-sufficiency and introversion-extraversion. Development and validation of the linear programmed learning material (programme) also formed the part of the investigation.

**Methodology** A linear programme on ‘Heart and Blood Circulation’, which was used as one of the tools for the investigation, was developed by specifying the entering and terminal behaviors and analyzing the tasks. It was validated on the basis of the individual tryout and field tryout of the programmed learning material. Other tools used for the investigation were Branching Programme on ‘Factors Affecting Air Pressure’, Bernreuter’s Personality Inventory Desai-Bhatt’s Group Test of Intelligence and IPAT Anxiety Scale by R.B. Cattell. All the tools were administered to the pupils of standard VIII from eleven schools in the city of Baroda. The sample of the investigation was 525 pupils including 299 girls and 226 boys. The criterion tests of the linear and the branching programmes were given immediately after an individual pupil completed the programmes. The same criterion tests for both the programmes administered earlier were given to the same pupils after an interval of two months. The retention scores were obtained from the re administration of criterion tests (linear programme), retention scores on the criterion test (branching programme) and retention score on the criterion test (branching programme). Partial correlations of the third order were computed between each of the personality variables and each of the achievement variables when rests of the personality variables were partially out.

**Findings** The results indicated that intelligence was positively related to achievement (based on immediate and retention scores) on both types of programmes. The relationship between Intelligence and achievement on both the types was significant at 0.05 levels. Anxiety was negatively related to achievement on the linear programme. There was no significant relationship between anxiety and achievement on branching programme. There was no significant relationship between self-sufficiency and achievement on both the types of programmes. There was no significant relationship between introversion-extraversion and achievement on both the types of programmes. It can be inferred from the findings of the investigation that
with the time lapse intelligence appears to have less influence over achievement on both the types of programmes. The lower correlation between intelligence and achievement on the branching programme as compared to that between intelligence and achievement on linear programme indicates the possibility of minimizing the individual differences on intellectual ability by using branching programmes. It appears from the result of the present investigation that anxious children tend to achieve less on programmed learning material. As anxiety is not related to achievement on the branching programme significantly, the effect of anxiety can be ironed out by giving branching programmes. Being more or less self-sufficient, introversion or extraversion does not come in the way of pupils’ achievement on either linear or branching programmes. It can be concluded that generally, the personality variables have little effect on learning in a programmed way.

2.3.7 Shitole, C. B., 1976

Title To Develop Programmed Learning Material for Agricultural Subjects in Marathi Medium Secondary Schools and to Study its Utility for Different Categories of Students.

Objectives The following were the main objectives of the study;

(i) To develop programmed learning material regarding a few difficult concepts from the agriculture syllabus for standard VIII of Marathi medium schools.
(ii) To evaluate these programmes.
(iii) To compare achievements through this programme and through the traditional methods.
(iv) To find out how effective one has been over the other.

Methodology The study adopted an experimental approach. It was conducted in Sholapur district and involved four secondary schools teaching agriculture. As many as 48 girls and 352 boys formed the sample. The experiment involved three phases, viz., and 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.

**Findings** Results showed the superiority of programmed learning method over the traditional one, irrespective of the category and sex of the students. The study also showed that programmed learning method required less time than the traditional one.

**2.3.8 Patel, A. D., 1977**

**Title** Development and Tryout of Auto-Instructional Programmes in Some Units of Geometry for Class VIII and to Study its Effectiveness in the Context of Different Variables.

**Objectives** The major objectives of the study were,

(i) To develop programmed learning material (PLM) in some units of Geometry for class VIII.

(ii) To compare the achievement in mathematics of students having different reading abilities, and learning through PLM and traditional way of teaching.

(iii) To compare the achievement in mathematics of the students having different study habits, and learning through PLM and traditional way of teaching.

(iv) To compare the achievement in mathematics of students with respect to anxiety and n-Ach. when taught through PLM and traditional way of teaching.

**Methodology** 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 criteria:

(i) The strength of the school,

(ii) The area whether urban or rural,

(iii) Type of school and

(iv) SSCE results.

The achievement of the students was measured through teacher made tests.

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The differences between different groups were studied by calculating mean, SD and t values.

**Findings** It was found that,

(i) The auto-instructional material does not work well with pupils having low n Ach.
(ii) In case of highly motivated students the material was found to be working well.
(iii) The PLM was found to be effective for the pupils who had good study habits as well as those who had poor study habits, when compared to traditional way to teaching.
(iv) Learning through auto-instructional programme in case of students having poor reading ability was not more effective than the conventional method but it was superior in case of students who had good reading ability.
(v) The more anxious students could learn better through PLM than their counterparts.

**2.3.9 Antonysamy, L. 1980.**

**Title** Teaching environmental concepts to school drop-outs through video and charts.

**Objectives** The study is undertaken to investigate whether working children in the non-formal education centers achieved more when taught environmental concepts by the video method than by using charts.

(i) To prepare a video programme on environmental concepts.
(ii) Find out experimentally whether the video method is more effective than using charts in teaching the environmental concepts.

**Methodology** The sample of the study constituted 60 working children at the school for working children in Dindigul. The pre-test-post-test-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 programme on ‘Environmental Concepts’ lasting for 40 minutes was produced for this study. The ‘t’ test was applied for statistical analysis.

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Findings  Major Findings,

1. The school drop-outs taught by the video method learned more concepts on environment than those who were taught by using charts.
2. The working children improved their achievement on ‘Environmental Concepts’ after the video programme. [MKU 1058]

2.3.10 Jeyachandran, J., 1980

Title  An Experimental Study of the Efficiency of Programmed Filmstrips as a Method of teaching History in the Secondary Schools.

Objectives  The objectives of the study were,

(i) To develop software materials for the media, and
(ii) To validate the developed materials against the conventional teaching in terms of immediate recall and delayed retention in the case of the four objectives, viz., knowledge, understanding, application and skill.

Methodology  The sample was chosen from nine schools in the city of Madras. All were Tamil-medium schools out of which five were boy’s and four girls’ schools. The total sample consisted of 450 boys and 315 girls. The subjects were divided into three groups which were taught through three different methods, namely, teacher with programmed filmstrip, programmed filmstrip without teacher, and the conventional method. Four lessons were prepared on the unit ‘Buddhism and Jainism’. Data were collected with the 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 employing the statistical techniques like Bartlett’s F test.

Findings  The major findings of the study were,

(i) It was possible to develop programmed learning materials in history.
(ii) Group pacing was possible in programmed learning.

(iii) Programmed learning material (PLM) could be integrated with audio-visual materials.
(iv) PLM could be used through media like filmstrips.
(v) Teacher had an important role when self-learning techniques were employed.
(vi) Higher cognitive abilities could be developed through PLM.
(vii) Learning through PLM resulted in better retention.
(viii) Between programmed filmstrip with teacher and programmed filmstrip alone, the former was more effective.
(ix) Retention of learning was more in the case of programmed filmstrips with teacher and programmed filmstrip without teacher in comparison with the conventional method.
(x) 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.

2.3.11 Basu, M. K., 1981

Title Effectiveness of Multimedia Programmed Materials in the Teaching of Physics.

Objectives 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 conjunction with audio-visual media

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(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.

(v) To study the interaction effects of instructional strategies, abilities and occasions (immediate learning retention and delayed retention).

**Methodology**  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 on referenced Tests I,II and III. Five treatment groups were T-1 having programmed lessons, teachers’ resource book and guide, students’ study guide for class room demonstration; T-2 having a semi-programmed text, tape-slide work-book, tape-transparency, auto education test, tape-filmstrip, tape-film, physics-kit, manual for performing experiments; T-3 with a linear programmed text, tape-slide work-book, tape-transparency, auto-education test, tape-filmstrip, tape-film, physics-kit, manual; T-4 having a branching programmed text, tape-slide work-book, tape-transparency, auto-elucidation test, tape-filmstrip, tape-film, physics-kit, manual; T-5 having a hybrid programmed text, tape-slide work-book, tape-transparency, auto-elucidation test, tape-filmstrip, 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 for 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 analyzed by analysis of covariance and by 5 x 3 x 3 factorial experiment with nesting and crossing.

**Findings**  The following were the findings of the study,

1. There was a significant difference among 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 was better than the multimedia semi-programmed instruction; the multimedia branching programmed instruction was
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 a significant difference existed in the achievement through the different strategies in ability.

2.3.12 Kumar, A., 1981\(^{32}\)

**Title** An Experimental Study of the Relative Effectiveness of Three Methods of Instruction—Exposition Method, Programmed Learning Method, and Multi-media Method in Science Education.

**Objectives** The objectives of the investigation were:

(i) To find out the relative effectiveness of the Three methods of instruction—expository method, programmed learning method and multi-media method.
(ii) To study the relative retention in learning through these three methods.
(iii) To develop a programme in branching style on the selected unit of content in biology.
(iv) To develop multi-media text on the programmed content.

**Methodology** In order to experimentally study the relative effectiveness and the interaction between the three methods and the two levels of intelligence, a \(3 \times 2\) factorial design was employed. The biology student of Classes IX and X of two inter-colleges formed the sample of the study. In all, 180 students were divided into three groups of sixty students each. One group was given instructions through the programmed learning method, the other through the expository method and the third group through the multi-media method. All the students of the three groups were administered the criterion test as pretest, then on the completion of the respective

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treatments these three groups were again administered the criterion test. After fifteen days, the same criterion test was re-administered.

**Findings** The findings of the investigation were,

(i) The multi-media method was more effective than either the programmed learning method or the expository method.
(ii) The programmed learning method was more effective than the expository method.
(iii) Retention in learning by the multi-media method was higher than by the other two methods.
(iv) Retention in learning by the programmed learning group and the expository group was equal.
(v) There was no interaction between the three methods of instruction and the levels of intelligence.

2.3.13 Golani, T. P., 1982

**Title** The Use of Audio-visual Aids in the Secondary Schools of District Thane.

**Objectives** The objectives of the study were;

(i) To create awareness among teachers and headmasters of secondary schools 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 schools of Thane district.
(iv) To elicit the opinions of headmasters and concerned teachers about the measures for providing better and improvised materials on audio-visual education.
(v) To present these measures in the form of concrete proposals and their implications for secondary schools as well as for the professional courses in training teachers and preparing materials for audio-visual aids in educations.

**Methodology** The methodology consisted of library study, empirical survey through questionnaire, interview, visits and observation and field experiment. A survey was conducted in 217 secondary schools in Thane district. Experiments were conducted in

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20 schools to demonstrate the advantage of using audio-visual aids in teaching subjects like social studies, mathematics, sciences and languages.

**Findings** The findings of the study were:

(i) According to the opinions of the secondary schools under survey, the teaching aids were essential and useful in developing clear concepts and in stimulating learning.

(ii) The audio-visual aids being expensive, the schools could not afford to purchase them. Sophisticated aids, like tape recorder, radio, television set and projectors, were out of the question in many of the schools as they were exorbitantly costly.

(iii) Audio-visual aids were not easily made available whenever required.

(iv) Due to difficulty of transport facilities in rural areas, the audio-visual aids were not available even on loan.

(iv) The use of audio-visual materials could be increased if teachers were allowed some free time for the location and preparation of requisite materials; because they had to perform many other duties in addition to teaching, they did not usually find time.

(vi) Because of non-availability of trained personnel in audio-visual education, there was lack of guidance and assistance to the teachers; not a single school had employed a specially trained teacher for this purpose.

(vii) Some schools had projectors, but few films and due to non-availability of technicians, the projectors were lying unused.

(viii) Accommodation was a problem of every school in the district; laboratory and teachers’ common rooms were used for storing the materials.

(ix) For want of accommodation, some schools used laboratory and classrooms for showing films and filmstrips on the projector.

(x) Very few schools were having an auditorium of their own, but it was hardly used for showing films; on the contrary, some class arrangements were made in the hall, due to shortage of classrooms.

(xi) There was no incentive of any kind to the teacher for using teaching aids.

(xii) Schools promised to use modern teaching aids in the near future, if they got monetary support from the Government.

(xiii) The fullest value of the teaching aid could be realized only when the teacher was thoroughly trained to use it to the best possible advantage.
(xiv) Better results in the field of audio-visual aids could be achieved only if the Audio-visual Education Institute took up this problem with the Government, through the State Institute of Education, Pune, and provided a good service to the secondary schools as early as possible.

(xv) The students learned better when audio-visual aids were used and they also sustained more interest in the learning activity with audio-visual aids than without them.

2.3.14 Ravindranath, M. J., 1982

Title Development of Multi-media Instructional Strategy for Teaching Science (Biology) at Secondary School Level.

Objectives The main objectives of the investigation were,

(i) To develop a duly validated multi-media instructional strategy for teaching the course in biology at Standard VIII.
(ii) To study the relationship between students’ achievement and intelligence.
(iii) To study the feasibility of the strategy in terms of time and cost.
(iv) To develop alternative instructional components for teaching a few concepts and study their relative effectiveness.

Methodology The strategy developed by the investigator covered the prescribed content in biology for Standard VIII through different units. The multi-media strategy arrived at comprised twelve instructional components, namely, introduction by the teacher, programmed learning material (PLM), lecture, team teaching, inquiry technique, and 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

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comprehensive test. Students 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.

**Findings** The main findings of the investigation were,

1. The instructional strategy was effective to the extent that 70 per cent of the experimental group students obtained 60% 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 per cent 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.
7. Both types of PLM, namely, inductive and deductive, were equally effective as instructional material.

**2.3.15 Krishnan, S.S., 1983**

**Title** Development of Multimedia Package for Teaching a Course on Audio-Visual Education.

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Objectives  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.

(iii) To study the feasibility of the multimedia package in terms of time and cost for the instructor training programme.

Methodology  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 five modules containing the full course units. The component of the modules were programmed slides, programmed instructional material, non-projected visual aids, self-instructional materials with a manual for practical exercises, self-evaluating unit tests 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 attitude scale prepared by the investigator, and an English language ability test designed at the matriculation level.

Findings  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-tests.

2. The mean percentages of the post-test scores varied from 81.41 to 90.46.

3. The mean gain in the total scores for all the modules was found to be significant at 0.01 levels.

4. The mean gain scores of knowledge, comprehension and higher mental abilities were found to be significant at 0.01 levels.

5. The mean attitude change was found to be significant at 0.01 levels.

6. The achievement of trainees and their language ability were found to be positively retained at 0.01 level of significance.

7. The feasibility of the multimedia package was 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.

2.3.16 Neera, Chetanal., 1983\textsuperscript{36}

**Title** Relative Effectiveness of Graphic Aids and Projected Aids Enriched with Museum Experiences, in teaching food And Digestion to VIII standard Studies of Navrachna Higher Secondary School Baroda.

**Objectives** The main objectives of the study were as follows,

(i) To find out the gain in knowledge regarding food and digestion as a result of teaching

(ii) To find the significant differences in the gain in knowledge, regarding food and digestion, in control group (C), Experimental group I (E\textsubscript{1}) and Experimental group II (E\textsubscript{2}).

(iii) To find out the significant differences in the gain in knowledge, regarding food and digestion in C, E\textsubscript{1} and E\textsubscript{2} in relation to:

   - Sex
   - Academic achievement
   - Socio-economic status.

(iv) To find out the change in opinions regarding food and digestion as a result of teaching.

(v) To find out the significant difference in the change in opinions regarding food and digestion in C, E\textsubscript{1} and E\textsubscript{2}.

(vi) To find out the significant differences in the change in opinions, regarding food and digestion in C, E\textsubscript{1} and E\textsubscript{2} in relation to:

   - Sex
   - Academic achievement
   - Socio-economic status.

(vii) To find out the change in practices regarding food and digestion, as a result of teaching.

(viii) To find out the significant differences in the change in practices regarding food and digestion in C, E1 and E2 in relation to: Sex, Academic achievement and Socio-economic status.

**Methodology** The present design of the investigation was “Quasi experimental design”, that is the “pretest-post test control group design” was used. The investigator followed the following steps, while conducting the experiment.

(I) Selected the sample from an English medium school of Baroda. (II) The sample was divided into three groups, a control group and two experimental groups, according to sex, academic achievement and socio-economic status (III) Pretest was administered to find out the previous knowledge opinions and practices of the students regarding “food and digestion”. (IV) Keeping all the conditions same for the experimental group and control group – except for the teaching aids – the experimental treatment was given for a stipulated time. (V) Post test was administered to find out the gain in knowledge, change in opinions and change in practices of the students regarding “food and digestion” (VI) Statistical analysis was done to find out the relative effectiveness of teaching aids and significant differences between the three groups and in relation to selected variables.

**Sampling** The section A and B and standard VIII, were selected as a control group and an experimental group, respectively having thirty eight students in each section. The section B was subdivided into two groups, experimental group I (E1) and experimental group II (E2), which were taught with graphic aids and projected aids enriched with museum experiences respectively. The distribution of the respondents was according to almost equal distribution in various categories of following variables.

(i) Sex, (ii) Academic achievement, (iii) Socio-economic status.

A questionnaire cum checklist in the area of food and digestion, was used for pre test and post test. It had following three sections:

Section ‘A’ was an objective type test, to measure the knowledge of the students regarding “food and digestion”.

Section ‘B’ was a checklist to find out the opinions of the students regarding “food and digestion”.

48
Section ‘C’ was a checklist to find out the practices of the students regarding “food and digestion”.

**Statistical method used** Analysis of variance was used to find out the overall gain in knowledge, change in opinions, and change in practices regarding food and digestion. Paired-’t’ test was used to find out the significant differences in C, E₁, and E₂ regarding food and digestion in terms of gain in knowledge, change in practices in relation to: Sex, academic achievement and socio-economic status.

**Findings**

1. It was found that the students learned more with graphic aids and projected aids enriched with museum experience, as compared to when taught with no teaching aids.

2. The gain in knowledge was equal for the two groups – groups taught with graphic aids and the groups taught with projected aids enriched with museum experience significant differences were found regarding food and digestion in the gain in knowledge in relation to sex, academic achievement and socio-economic status.

3. There were no significant differences regarding change in opinions and practices as a result of teaching – and also the differences were not significant in relation to sex, academic achievement and socio-economic status.

2.3.17 Samant, C.R., 1983

**Title** Role Efficacy of Communication Media: A Comparative Evaluation.

**Objectives** The main objective of the inquiry was 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 test of comprehension and retention.

**Methodology** The study made use of quasi-experimental design of investigation. Four groups of subjects, two experimental and two controls, were selected separately for radio and television, from the village communities of two districts of Orissa. In

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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.

**Findings** 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 was 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 non-significant. However, the difference between radio experimental and control groups was significant.
5. Difference between occasions was 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 durations of exposure on the target audience.

**2.3.18 Singh, U., 1983**

**Title** Effectiveness of Media with reference to Classroom Ethos.

**Objectives** The major objectives of study were,

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(i) To know the effect of programmed learning material (PLM) in book format, PLM in tape-slide format, PLM in audio-tape format, and teaching in the traditional way, as media of instruction, on classroom ethos.

(ii) To compare the ‘actual’ classroom ethos of four groups in terms of authenticity, legitimacy and productivity (ALP) after receiving instruction through, different media.

(iii) To compare ‘ideal’ with ‘actual’ classroom ethos of a group after receiving instruction through each of the four media.

(iv) To compare effectiveness of different media used in teaching general science in the tenth standard in terms of mean gain scores achieved by the students based on pre- and post-criterion tests. In the light of these objectives, null hypotheses formulated were,

1. There will be no differences between the perceived ‘actual’ pre- and post-ALP ethos of a classroom receiving instruction through PLM in book-format, PLM in tape-slide format, PLM in audio-tape format, and teaching in the traditional way.

2. There will be no difference between ‘actual’ ALP scores of four groups after receiving instruction through different media.

3. There will be no difference between perceived ‘ideal’ ALP ethos of a classroom after receiving instruction (treatment).

4. There will be no difference between mean gain scores of different groups of students receiving instruction through different media.

Methodology  The present study was developmental-cum-experimental in nature and consisted of two parts. The first part consisted of development and tryout of programmed learning material in three formats on ‘reproduction’, based on the syllabus of the tenth standard. Each PLM consisted of three sub-units. The second part of the study was concerned with the comparison of their effectiveness in terms of ALP scores of classroom ethos and achieved gain scores. In this study the different instructional media were the independent variables (treatments) and students achievement on the post-test and ALP scores of classroom ethos were the dependent variables. A pre-test post-test single group design was used to test the null hypotheses. In all, 240 students selected from four secondary schools of Sardar Shaher formed the sample. Four pairs of groups were formed by matching their age, science attitude scores and intelligence scores. Each school had two groups and each group consisted
of 30 students. Out of eight groups, four were formed for replication of the experiment. In order to collect data, a number of research tools were developed or acquired. These tools included Thelen’s ALP Classroom ethos Instrument, 1972, Jalota’s Group Test of Mental Ability, Grewal’s Science Attitude Scale, criterion tests and PLM on ‘reproduction’ in three formats in Hindi for the tenth standard. The classroom ethos and its patterns were computed with the help of prototype profiles developed by Thelen (1972). Analysis of variance was used to test the significance of difference among the mean achievement scores of the four groups and their replicates.

**Findings** The major findings were,

1. The underlying basic pattern of congenial group educative life for ‘actual’ classroom before and after the treatment of PLM in book-format, tape-slide format and traditional treatment by teacher revealed the obvious differences between by teacher revealed the obvious differences between the top and bottom clusters of their pre and post situations.

2. The different groups perceived differently the ‘actual’ post-classroom situations after getting treatment. The group during instruction through PLM in book-format gave more emphasis to the authenticity aspect of the ethos. The group felt highly authentic during treatment, in comparison to other groups. Other groups gave top priority to the productivity aspect of the ethos. The experimental group II which underwent tape-slide treatment gave second preference to the legitimacy aspect whereas the experimental group III, which had audio-tape treatment, gave second preference to the authenticity and then the legitimacy aspect of ALP ethos.

3. All the groups and their replicates, except the PLM in book-format group, gave top priority to the productivity aspect of the ethos for ‘actual’ classroom situations. All the groups, except the PLM in audio-tape format group, had perceived an ‘actual’ post-ALP ethos nearer to their perceptions of an ‘ideal’ classroom. The audio-tape as an instructional medium was not found effective in creating an ‘ideal’ classroom ethos with special reference to the legitimacy and authenticity aspects.

4. Both traditional and tape-slide treatments were found to be significantly better in achieving mean gain scores than the PLM book or the audio-tape treatments.

5. If use of any media treatment in the teaching learning process is capable of creating ideal classroom situations, it would be also helpful in achieving high scores.

6. The study indicated some relationship between media and classroom ethos.
2.3.19 Wad, V., 1984

Title  A study of the Scope of the Communication Media Such as Radio, Television in Education at High School Level in Maharashtra State.

Objectives  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 opinions 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.

Methodology  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 encyclopedias, directories, theses, research studies, reports, periodicals, and journals and analyzed 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 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 analyzed, using descriptive statistics.

Findings  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 rural areas.

5. School telecast programmes were fair in their content-wise standard as far as the English language programmes for standard V to 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 lesions for standard V to VI in English as 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 keener on using radio and TV programmes in the learning process.

12. The communication media remained a complementary aid of classroom teachers and they were keep 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.

2.3.20 Desai, K. V., 1985

Title An Investigation into Efficiency of Different Instructional Media in the Teaching of Science to the Pupils of class VIII in Relation to Certain Variables.

Objectives The objectives of the study were,

(i) To compare the achievement of pupils of science learning through different instructional media and the traditional way of teaching.
(ii) To compare the achievement of pupils in science 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.

Methodology 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 the experimentation. The Junior Index of Motivation Scale and the Reasoning Ability Test were used for measuring motivations towards schools and reasoning ability of pupils. The experiment was carried out in two schools of Anand city. Four equivalent groups respect to motivation towards schools and reasoning ability were prepared. In each group there were 25

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students. One group was taught through programmed 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 covariance was used to test the various hypotheses.

**Findings** 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 was more effective than the traditional way of teaching science.
4. In the teaching 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.

**2.3.21 Dhamija, N., 1985**

**Title** A Comparative Study of the Effectiveness of Three Approaches of Instructions Conventional, Radio-vision and Modular Approach on Achievement of Students in Social Studies.

**Objectives** The objectives of the study were,

(i) To compare the achievement of students of class VII in social studies when

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taught through three different approaches, viz. radio-vision, modular and conventional.

(ii) To compare the achievement of students in geography when taught through these three approaches.

(iii) To compare the achievement of students in civics when taught through these three approaches.

(iv) To compare the achievement of students in history when taught through these three approaches.

(v) To compare the retention of students in geography when taught these three approaches.

(vi) To compare the retention of students in civics when taught through these three approaches.

(vii) To compare the retention of students in history when taught through these three approaches.

(viii) To compare the students’ involvement in geography when taught through these three approaches.

(ix) To compare the students’ involvement in civics when taught through these three approaches.

(x) To compare the students’ involvement in history when taught through these three approaches.

(xi) To compare the self-confidence of students in geography when taught through these three approaches.

(xii) To compare the self-confidence of students in civics when taught through these three approaches.

(xiii) To compare the self-confidence of students in history when taught through these three approaches.

**Methodology**  The study was conducted at the final study stage and at the confirmatory stage. The sample of the final study comprised 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 \((3 \times 3 \times 3)\) 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, posttest 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 by 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 tests comprised a criterion test. The Students’ Self Confidence Scale and test-retest reliability 0.86 and validity coefficient 0.75. The students’ Involvement Scale and test-retest reliability coefficient 0.89 and validity 0.72 against the criterion of students’ achievement scores.

**Findings** The findings of the study were,

1. The students achieved highest knowledge achievement scores in geography when taught through radio-vision.

2. High intelligent students scored highest knowledge achievement scores in geography when taught through radio-vision.

3. The achievement of students was the highest in comprehension scores in geography when taught through radio-vision approach.

4. The High intelligent students got the highest comprehension achievement scores in geography when taught through radio-vision approach.

5. The students achieved highest total achievement scores in geography when taught through radio-vision approach.

6. Students, having high intelligence, attained the highest achievement scores in civics when taught through radio-vision approach.

7. The achievement of students was the highest in knowledge achievement scores in civics when taught through modular approach.
8. Students, having high intelligence got the highest knowledge achievement scores in civics when taught through modular approach.

9. The achievement of students was the highest in comprehension achievement scores in civics when taught through modular approach.

10. Students, having high intelligence got the highest comprehension achievement scores in civics when taught through modular approach.

11. The students achieved highest total achievement scores in civics when taught through modular approach.

12. The students having high intelligence scored the highest total achievement scores in civics when taught through modular approach.

13. The students achieved the highest knowledge achievement scores in history when taught through the conventional approach.

14. Students of high intelligence got the highest knowledge achievement scores in history when taught through the conventional approach.

15. The students’ achievement was the highest in comprehension achievement scores when taught through the conventional approach.

16. The High intelligent students attained the highest comprehension achievement scores in history when taught through conventional approach.

17. The achievement of students on total achievement scores was the highest in history when taught through conventional approach.

18. The students having high intelligence got the highest total achievement scores when taught history through conventional approach.

19. The retention on knowledge, comprehension and total achievement scores was the highest in that group of students who were taught geography through radio-vision approach.

20. The retention on knowledge, comprehension and total achievement scores was the highest in that group of students who were taught civics through the modular approach.
21. The retention on knowledge, comprehension and total achievement scores was highest in that group of students who were taught history through the conventional approach.

2.3.22 Joshi, U. 1987.  

Title Effectiveness of teaching a course introduction to Home Science education and Extension through multimedia strategies to the first year home science students of the faculty of Home Science, Baroda, in relation to the selected student characteristics.

Objectives

General objectives of the study were,

(i) To evolve two multimedia strategies to teach a course “Introduction to home science education and extension” to the first year home science students of faculty of Home science, Baroda in relation to the selected student characteristics.

(ii) To study the effectiveness of multimedia strategies to teach a course “Introduction to Home science education and extension” to the first year home science students of faculty of Home science, Baroda in relation to the selected student characteristics.

Specific objectives of the study were:

a) To develop hardware and software oriented two multimedia strategies for teaching selected unit.

b) To study the effectiveness of the multimedia strategies for teaching a selected unit.

c) To study the difference in the effectiveness of the two multimedia strategies in terms of students achievement.

d) To study the difference in the effectiveness of the two multimedia strategies in terms of students achievement according to the level of intelligence.

e) To study the difference in the effectiveness of the multimedia strategies in terms of student’s achievement according to their level of competence in English.

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f) To study the difference in the effectiveness of the two multimedia strategies in terms of student achievement according to their stream of study at higher secondary school level.

g) To study the difference in the effectiveness of the two multimedia strategies in terms of student’s achievement according to their attitude towards learning through multimedia strategies.

h) To study the difference in the effectiveness of the two multimedia strategies in terms of student’s achievement according to the multiple effect of the selected variables.

i) To study the difference in the students’ attitude towards multimedia strategy according to their level of intelligence, competence in English and stream of study at higher secondary school level.

**Methodology** The course “Introduction to Home science Education and Extension” was selected for the study. The need was felt to teach this course through an effective instructional strategy to create and sustain students’ interest in the course and help students to have optimum gain of knowledge.

The first unit of the course was selected for developing multimedia strategies as this unit comprised the major content of the course.

Following media could be applicable to the listed objectives of the selected unit.

a. Graphic aids or slides  
b. Audio Instruction  
c. Printed material in the form of lesson content or programme learning.

Finally two multimedia strategies evolved.

**Strategy I (st1)**

a. Programme learning material (PLM)  
b. Visual (charts and diagrams)  
c. Printed material on lesson content

**Strategy II (st2)**

d. Programme learning material (PLM)  
e. Slides (with taped commentary)  
f. Tapped Lectures.
Sampling The test was administered to a group of 11 randomly selected first year students of the faculty of Home Science, M.S. University of Baroda, in the year 1983-84. The test was administered twice at an interval of one month. The test re-test reliability was found to be 0.95.

Statistical Method Used Ravan standard progressive matrices were used in Intelligence Test. There is no time limit for this test.

Split-half and test-retest relationships as well as the concurrent validity have been established. Reliability coefficients vary from 0.70 to 0.90 for various groups.

The Post-test was conducted after seven days of the completion of the leading through multimedia strategy. The post test was conducted for all the groups together.

Frequency Distribution of the sample according to the stream of study and strategy applied.

<table>
<thead>
<tr>
<th>Group</th>
<th>Stream of Study</th>
<th>Strategy Applied</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Science</td>
<td>St₁</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Science</td>
<td>St₂</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>General</td>
<td>St₁</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>General</td>
<td>St₂</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>120</td>
</tr>
</tbody>
</table>

Findings

1. Majority of the students had average and below level of intelligence, high competence in English and favorable attitude towards multimedia strategy.
2. Both the strategies were effective as there was considerable increase in the mean scores of the student’s achievement on post-test for both the strategies.
3. Overall, there was no significant difference in the effectiveness of the two multimedia strategies.
4. There was no significant difference in the effectiveness of the two multimedia strategies in relation to the student’s intelligence as well as the multiple effect of intelligence and other variables.
5. There was no significant difference in the effectiveness of the two multimedia strategies in relation to the student’s competence in English as well as the multiple effect of competence in English and other variables.
6. There was no significant difference in the effectiveness of the two multimedia strategies, in relation to the student’s stream of study as well as the multiple effect of stream of study and other variables.

7. There was no significant difference in the effectiveness of the two multimedia strategies, in relation to the student’s stream of study as well as the multiple effect of stream of study and other variables.

8. There was no significant difference in the effectiveness of the two multimedia strategies in relation to the student’s attitude towards multimedia strategy as well as the multiple effect of attitude and other variables.

9. There was no significant effect of the other variables on the student’s attitude towards multimedia strategy.

10. The main effects of the variables, namely, intelligence competence in English and stream of study were significant.

**2.3.23 Manoharan, M. 1988.**

**Title** Relative effectiveness of print media.

**Objectives** It attempts to study the relative effectiveness of print media using experimental method.

(i) To find out experimentally the print media in terms of knowledge gain and retention of knowledge.

(ii) To measure the retention of knowledge on the Fifteenth day of exposure.

(iii) To assess the extent of adoption, if any through reading print media.

(iv) To study the contribution of selected characteristics of farmers towards knowledge gain, retention and adoption.

**Methodology** The experiment included seven treatments and these treatments were randomly assigned to seven villages selected at random from Kodaikanal Taluka. From each village, 36 subjects were selected, matched on age and educational status for the particular treatment assigned to that village. The seven treatments were: Newspaper, Magazine, Folder, Newspaper and Magazine, Newspaper and Folder, Magazine and Folder. The knowledge gain was assessed by using a knowledge list

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meeting the criteria of difficulty index and discrimination index. A symbolic adoption quotient was used to measure adoption. The collected data were treated by using percentage analysis, ‘t’ test, F-test, Z-test, McNemar $x^2$ test, Rank Order Correlations Keadll’s Coefficient of Concordance, ANOVA, simple and multiple correlation and path analysis.

Findings Major Findings:

1. The main knowledge gain score was 2.72 for Newspaper treatment; 1.39 for Magazine; 1.12 for Folder; and 3.28 for the three media together. The knowledge retention after 15 days was 62.13% for Newspaper, 61.87 per cent Magazine, 70.42% for Folder; and 72.71% for all the three together. The mean symbolic adoption score was 7.22 for Newspaper, 4.97 for Magazine, 5.14 for Folder and 10.83 for all the three together.

2. The respondents’ socio-economic status, media participation, contact with extension agency, progressiveness, interest in possession of print media, attitude towards print media, practicability of the message and its understandability and simplicity had a significant and positive relationship with knowledge gain, knowledge retention and symbolic adoption.

3. The young respondents (up to 30 years) had gained significantly more knowledge and had retained more knowledge and had higher symbolic adoption as compared to the middle-aged (30 to 45 years) respondents.

2.3.24 Usha, P. 1990. 44

Title Preparing and evaluating self-instructional film-strips on nutrition education for B.Ed. students.

Objectives The study attempts to assess the effectiveness of film-strips as programme material on nutrition education for B.Ed. students.

(i) To develop software material for the chosen (film-strip) medium on the topic ‘Nutrients’.

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(ii) To evaluate the developed material against the conventional teaching method in terms of immediate recall and delayed retention on the following behavioral objectives: knowledge, understanding, application, and skill under three instructional approaches –

(a) teacher and the film-strips,

(b) film-strips only, and

(c) teacher only.

Methodology The final sample consisted of 771 student-teachers (B.Ed.) from nine colleges of education in Tamil Nadu. Of these, 450 were men and 321 women. Software for the unit ‘Nutrients’ consisting of frames, which are verbal in content, and pictures prepared by the investigator. All the subjects had been administered the preliminary test before being randomly assigned into three groups. The tools used included software for the unit ‘Nutrients’, a preliminary test developed by the investigator, an achievement test developed by the investigator, an achievement test and a Retention Test. The collected data were treated by using ‘t’ test and ANOVA.

Findings Major Findings,

1. On ‘Knowledge’,

(a) The gain in the score in the Recall Test’ for all the three treatments was significant,

(b) The difference between treatment 2 and treatment 3 and between treatment 1 and treatment 3 were significant. Treatment 2 made the highest gain.

2. On ‘Understanding’, the gain score in the ‘Retention and Recall Test’ was significant for all the three treatments (conditions).

3. On ‘Skill’, the gain score in the ‘Retention and Recall Test’ was significant for all the three treatments.


Instruction (CAI).

**Objectives** To study the effectiveness of the simulation model in teaching physics to Standard XI students through Computer Assisted Instruction (CAI).

(i) To find out the effectiveness of the simulation model of teaching as compared to the traditional model of teaching as compared to the traditional method.

(ii) To utilize the growing use of computers in education.

**Methodology** The sample for this investigation consisted of students of Standard XI of two schools selected. The pre-test-post-test method was used. Mean, SD and ‘t’ test were used to treat the data.

**Findings** Major Findings:

1. The experimental group obtained a higher mean than the control group.
2. The sex-wise comparison proved to be insignificant.
3. There was no significant difference in learning level between Tamil-medium and English-medium students.
4. On the basis of the research findings, it was concluded that the experimental group performed significantly better than the control group.


**Title** Developing a Video programme on environmental pollution in biology for higher secondary students.

**Objectives** This study is undertaken to investigate whether students in higher secondary schools who are taught certain concepts in biology by the video method achieve more than those who are taught by traditional method.

(i) To prepare a video programme on environmental pollution for instructional use for higher secondary students.

(ii) To find out whether the video method is more effective than the traditional lecture method in teaching the concepts on environmental pollution.

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Methodology  The sample of the study constituted 60 students (30 males and 30 females) of Standard XI at K.R. Government Higher Secondary School, Chatrapatty.

The pre-test-post-test equivalent-groups design was employed in the study. The experimental group was taught through video lessons on environmental pollution and the same topic was taught to the control group by the lecture method. A video lesson on environmental pollution, lasting for 36 minutes, was prepared for this study. Mean, SD, and ‘t’ test were applied for statistical analysis.

Findings  Major Findings,
1. The higher secondary students taught through the video programme learnt more of
   the concepts on environmental pollution than those who were taught by the lecture
   method.
2. The higher secondary students improved their achievement on environmental
   pollution after viewing the video programme.

2.3.27 Phutela, R.L. 1991. 47

Title  A study on the effects of comics and comic television serials on children.
Independent study.

Objectives  The study attempts to assess the effects of comics and comic television
serials on children.
(i) To survey various types of available comic books and comic television serials.
(ii) To find out the extent of reading/viewing on the part of children,
(iii) To know the perception children, teachers and parents as regards their useful
     effects on their growth and development.

Methodology  Data were collected from a cross-section of 198 children, 19 teachers
and 17 parents, taking 25 children each from Classes III to VI from six schools in
Delhi representing various strata. Tools comprised a questionnaire, check-list and
rating scales. Cumulative frequencies, percentages and median were used to treat the
data.

47 R. L. Phutela, A study on the effects of comics and comic television serials
and Training. Abstracted in M. B. Buch (Ed.), Fifth Survey of Research in
Findings  Major Findings:

1. Class III students liked stories on magic the most, followed by those of horror, animals, fools and silly dolts, etc. for Class VI or older children, the linking was in the order: stories on magic, fools and silly dolts, horror and animals.

2. Among the various types of comics, the younger children preferred detective comics the most, followed classics (mythological, folk tales, etc.), the supernatural, ‘character’ comics, crime and horror comics. The order of preference for the older children was: classics, detective, “character”, supernatural, crime and horror (64%, 52%, 33% and 20% respectively).

3. Most teachers (58%) felt that comics were useful in many ways, whereas 16% considered these passive materials as fostering undesirable values.

4. The highest reservations were about horror and crime comics (47.4%). Parents largely concurred with the observations of the teachers.

5. Among the six cartoon television serials, the percentages of preferences for Classes III and VI, respectively, were Mickey Mouse and Donald Duck (65.7% and 75.8%), ‘He-man” (56.6% and 62.6%), and “Glow Friends” (36.4% and 33.3%).

6. Teachers and parents liked these serials as these provided a healthy entertainment, adventure, recreation and a messages of cooperativeness. They agreed that children learnt new things and got entertained. They, however, felt that excessive reading of comics affects their studies, development of language and aesthetic sense.

2.3.28 Pillai, G.S., Dhanasekaran, S. 1991.48

Title  Relevance of the course on audio-visual education in the B. Ed. Programme to the present-day educational technology requirements.

Objectives  The study focuses on the relevance of the course on audio-visual education in the B.Ed. to present-day educational technology requirements.

(i) To analyze the B.Ed. course content of the Universities of Tamil Nadu in order to Identify the elements of audio-visual education introduced and their achievement.

(ii) To study the practical aspects of the audio-visual education elements in the B.Ed course of different universities of Tamil Nadu.

(iii) To study the practices in audio-visual education in the B.Ed. course of different universities of Tamil Nadu.

(iv) To find out the modern educational technology required of a classroom teacher.

(v) To identify gaps, if any, in the present audio-visual education programme of the B.Ed. course, with reference to the educational technology requirements.

(vi) To suggest a course on modern educational technology suitable for filling up the gaps identified.

Methodology In the study, four types of samples were selected. The syllabi of all the six universities of Tamil Nadu where B.Ed. programmes were going on were selected. Five different sets/groups of students-teachers were selected from eight colleges of education and one university department of education, to study the practices in audio-visual education, to study the practices in audio-visual education and the training procedures followed and to assess modern educational technology requirements. Teacher-educators from eight colleges of education and one university department of education and 34 heads of schools of the Madurai Educational District comprised the sample.

The tools used included Practices in Audio-Visual Education questionnaires, Training in Audio-Visual Education Questionnaire and Educational Technology Requirements Scale. Mean, SD, correlation, percentage, ‘t’ test, F-test, and ‘Z’-test were computed while treating the data.

Findings Major Findings:

1. Under the different optional and elective subjects of the B.Ed. programme, the objectives of introducing the elements of audio-visual education were not totally achieved. These were achieved only among 32% of subjects.

2. All the universities in Tamil Nadu did not give equal emphasis to audio-visual education in the B.Ed. programme.

3. Out of 52 audio-visual aids identified the preparation and use of ‘Improved Aids’ has been recommended in all the universities and in one autonomous college of education.
4. The students did not receive sufficient practice in the preparation, production, operation, and use of educational technology hardware and software.
5. The practical training given to the student-teachers, in general, was not up to the level required under the B.Ed. programme.
6. Though sufficient hardware and software were available in the colleges of education, they were not utilized properly to the optimum level.
7. Though teachers, teacher-educators, and heads of schools differed in their assessment of educational technology requirements, they invariably expected higher educational technology requirements.
8. While students, teachers and teacher-educators opted for the component ‘skills’ under educational technology requirements.
9. There were gaps found in the audio-visual education of the B.Ed. programme mainly
   (a) In achieving the objectives of audio-visual education,
   (b) In giving practical training to the student-teachers in audio-visual education.
   (c) In achieving modern educational technology requirements.


Title  Teaching of mathematics: Effectiveness of Computer-Assisted Instruction (CAI) and conventional method of instruction.

Objectives  The study centers 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.

(i) To study the difference in mathematics achievement which occurs as a result of the difference in instructional strategy among boys and girls separately and as a group.

(ii) To study the direction of change in attitudes of male and female students separately and as group 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 Steel Plant, Bhilai (M.P.)

**Findings**  Major Findings,

1. The students who used the computer scored significantly higher than those taught mathematics through the conventional method.
2. The students who used computer showed significantly highly favorable attitude towards mathematics than those who did not use computer.
3. Achievement in mathematics and change in attitude towards mathematics were found to be independent of the sex factor.

2.3.30 Sinnathambi, V. 1991.\(^50\)

**Title**  Developing a video programme on energetic in chemistry for higher secondary students.

**Objectives**  The attempt is to study whether students in higher secondary schools who are taught certain concepts in chemistry by video methods achieve more than those who are taught by the traditional method.

(i) To prepare a video programme on ‘exegetics’ for instructional use for higher secondary students.

(ii) To find out experimentally whether the video method is more effective than the traditional lecture method in teaching the concepts on ‘energetic’.

(iii) To find out whether the higher secondary students improve their achievement after viewing the video programme on ‘energetic’.

**Methodology**  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 pre-test-post-test 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. The ‘t’ test was applied or statistical analysis.

Findings Major Findings,
1. The students who were taught by the video method learned more concepts on ‘energetic’ than those who were taught by the lecture method.
2. The students improved their achievement on ‘energetic’ after viewing the video programme.

2.3.31 Sumitra, L.G. 1991.  

Title The audio cassette project of Hoshangabad district, M.P. in collaboration with the Government of M.P. and UNICEF: A case study, Independent study.

Objectives It attempts to study the utilization and effectiveness of specially prepared audio cassettes in village primary schools for language development and listening comprehension.
(i) To study the management strategies to achieve the objectives.
(ii) To study the problems involved in converting a broadcast mode into a cassette mode and to identify the steps to be taken.
(iii) To study the teachers’ acceptability of the media.
(iv) To identify the types of programmes understood, remembered and repeated more than others and to identify their production characteristics.

Methodology The sample comprised 450 primary schools of Hoshangabad District of Madhya Pradesh. 900 teachers, and 34,345 students of Classes I,II and III for three years. The tools used included 308 programmes, 17 audio cassettes and 500 two-in-one tape recorders. The tools used included questionnaires, observations and

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recording of children’s responses. The collected data were treated using percentage, averages and ranking.

**Findings** Major Findings,

1. The children were able to tell the stories and sing the songs they had heard as a part of the project, where the songs had simple tunes and the stories were narrated in direct, uncomplicated formats.
2. Children wanted to listen to more such programmes. The programmes were enjoyed as being entertaining in spite of having been produced with definite learning objectives for language learning.
3. The content analysis indicated that the best liked programmes had segments of songs and stories, question-and-answer which was ‘activity oriented’.
4. The learning points were repeated in the different segments of programme; the production followed the scripts with care.

2.3.32 Shah, A, and Mandal S., 1992.52

**Title** A Comparative study of the Effectiveness of three Instructional strategies in teaching selected aspects of puppetry to Home Science students of the M. S. University, Baroda.

**Objectives**

1. To study the effectiveness of the three instructional strategies (lecture-cum-live demonstration, video film and booklet) in teaching selected aspects of puppetry to Home Science students in terms of gain in knowledge.
2. To find out the effectiveness of the three instructional strategies in helping Home Science students to develop an ability in making a glove puppet.
3. To find out the significant differences in the effectiveness of the three instructional strategies in teaching selected aspect of puppetry to Home Science students in terms of gain in knowledge.

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4. To find out the significant differences in the effectiveness of the three instructional strategies in terms of developing an ability in preparing a glove puppet.

5. To find out the significant differences in the effectiveness of the three instructional strategies in teaching selected aspects of puppetry to Home Science students in terms of gain in knowledge in relation to the students:
   a. English language competence
   b. Academic achievement
   c. Attitude towards instructional strategy.

6. To find out the significant differences in the effectiveness of the three instructional strategies in terms of developing an ability in preparing glove puppets in relation to the students.
   a. English language competence
   b. Academic achievement
   c. Attitude towards instructional strategy.

**Methodology** The first step of the investigation was to select the subject matter on puppetry, which was common for all the three strategies. It included:

a. Types of puppets.

b. Types of puppets stages.

c. Preparation of puppets, especially rod and glove puppets.

d. Manipulation of puppets, especially rod and glove puppets.

e. Accessories used for puppet play for measuring gain in knowledge all the above topics were considered; but for the development of ability only the glove puppet was to be prepared by the students.

A battery of tool was used by the researchers to collect information as given below:

**Sampling** The sample of the study consisted of 177 1st year B.Sc. (Home Science) female students from the faculty of Home Science, M.S. university, Baroda, India in the year 1991-92, selected out those, 13 students could not be included because of either very high pre-test stage of the experiment. The students were allotted to three experimental groups as follows:

E1    Experimental group exposed to lecture-cum-live demonstration. (N=57)
E2    Experimental group exposed video film. (N=55)
E3 Experimental group exposed to booklet. (N=65)

**Statistical Method Used**

Each experimental group (E1, E2, E3) was divided for statistical analysis according to English competence (ELC) (good and poor), attitude (favorable and unfavorable) and academic achievement (high and low). Statistical analysis used was percentage, t-test, F-test and paired t-test.

**Findings**

There was significant gain in knowledge as well as development of ability through all the three instructional strategies lecture-cum-live demonstration, video film and booklet, on puppetry in the respondents of the three experimental groups.

This shows that all the three strategies were effective in imparting knowledge regarding puppetry and in developing the ability to prepare a glove puppet. The findings regarding the effectiveness of the instructional strategies were also supported by the researchers.

The possible reasons for the above finding could be many. The instructional strategies, which involve use of teaching aids, create interest among the students and motivate them to learn. Illustration in booklet clarifies the concepts. Demonstration and video film shows the actual process in motion. Thus, all the three instructional strategies can hold the attention of the learners and may have helped to score high in the knowledge and ability test.

**2.3.33 Joshi, U., and Sovani, K., 1998**

**Title** Effectiveness of a communication strategy on Environmental Pollution and its Effect on Health for the Low Socio-economic groups of females in the selected Communities of Baroda City.

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Objectives

(i) To develop a communication strategy on environmental Pollution and its effect on health for the low socio-economic groups of females in the selected communities of Baroda city.

(ii) To study the effectiveness of the communication strategy on environmental Pollution and its effect on health for the low socio-economic groups of females in terms of gain in knowledge.

(iii) To study the differences in the effectiveness of the communication strategy on environmental Pollution and its effect on health for the low socio-economic groups of females in terms of gain in knowledge according to their,

a) Age
b) Educational level
c) Income level
d) Concern for health.

Methodology

The population of the study comprised females belonging to low socio-economic status groups in Baroda city. To get the information regarding females of low socio-economic status groups in Baroda city, the Urban Basic Services Office (WBS) and Vikas Jyot Trust a non-government organization were contacted as they were catering to low socio-economic status females groups. Following communities were selected:

a) Patel Community and Harijanvas from Pensionpura area.
b) Inrapuri Community at waghodia Road.

The content related to environmental pollution and its effect on health were developed based on the suggestions and views given by the subject matter specialist and from reference books and the material provided by the earlier mentioned agencies. The content was developed keeping in mind the following objectives:

a) To create an awareness regarding environment and the need to protect it.

b) To create awareness regarding various causes of and steps to control:


The content developed for the strategy carried the following messages:
a) What is environment?
b) Why should we protect it?
c) Causes of and steps to control.

The strategy included the following components:

a) Slides.
b) flashcards.
c) posters.

Lecture-cum-discussion method was also used

Sampling Purposive sampling method was used for the experiment. The sample represented the females belonging to the low socio-economic status from different parts of Baroda city. Knowledge test was prepared to measure the level of knowledge before teaching the respondents regarding above mentioned points.

After conducting food demonstration as motivational activity, the pretest was given.

Statistical Method Used The post-test was administered on the test day after the use of strategy which included knowledge test.

Different statistical measures for various purposes were used as follows:

<table>
<thead>
<tr>
<th>Purposes</th>
<th>Statistical Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background information</td>
<td>frequency and percentage</td>
</tr>
<tr>
<td>Overall in knowledge of the respondents</td>
<td>paired-t-test</td>
</tr>
<tr>
<td>Variable wise gain in knowledge of the respondents</td>
<td>Paired-t-test</td>
</tr>
<tr>
<td>Variable wise differences in mean post-test scores of the respondents</td>
<td>One-way analysis of variance.</td>
</tr>
</tbody>
</table>

Findings

1. Equal percentage (50 percent) of the respondents was distributed in the younger and older age group.

2. Little less than half (48 percent) of the respondent had low educational level and one-third of the respondents had middle educational level, whereas only one-sixth
3. Little less than 50 percent of the respondents’ mother were illiterate Twenty-three percent of the respondents’ smother were educated up to the primary level whereas only 17 percent and 11 percent of the respondents mothers were educated up to the secondary level and could read and write respectively.

4. More than 30 percent of the respondent fathers were educated up to the primary level whereas only one fourth of them had secondary education. Thirteen percent of the respondent’s fathers were illiterate and only six percent of them could read and write. Equal percentage (10 percent) of them was educated up to higher secondary level and was graduates.

5. Two-third (64 percent) of the respondents had high level of family income whereas only one-third of the respondents had a low level of family income.

6. Little more than 50 percent of the responds were concerned regarding their health, whereas 47 percent of the respondents were less concerned about their health.

7. Overall and variable wise there was significant gain in knowledge for the messages related to environmental pollution and its effect on health.

8. Respondents with a high educational level and the respondents with less concern for health had more gain in knowledge. The gain was almost equal.

9. No significant difference was found in the mean post-test scores of the respondents in relation to the following categories:
   a. Younger and older age groups
   b. Low educational level, middle educational level and high educational level.
   c. Low income level and high income level.
   d. More concerned and less concerned.

10. The cluster of the above findings reveals that a combination of various channels, when planned systematically, can achieve the purpose of the study and can be effective in teaching and learning.
2.3.34 Bhatt, K. 2001.54

Title Effectiveness of strategy consisting of Video Bhavai, Flashcards and Discussion for teaching selected topics of social studies course to the fifth standard students of the two selected school’s of Baroda.

Objectives

(i) To evolve a strategy consisting of videoed Bhavai, flashcards and discussion for teaching selected topics of Social studies course to the fifth standard students.

(ii) To study the overall effectiveness of a strategy consisting of videoed Bhavai, flashcards and discussion for teaching selected topics of social studies course to the fifth standard students of the following two selected schools of Baroda in terms of gain in knowledge.
   a) Privately Managed school-Alembic Vidyalaya.
   b) Municipal Corporation Managed school-No. 7 Fatechgunj.

(iii) To find out the difference in the effectiveness of a strategy consisting of videoed Bhavai, flashcards and discussion for teaching selected topics of social studies course to the fifth standard students of the selected privately managed school in relation to the sex, father’s and mother’s education, Academic Achievement, Exposure to folk media-variables.

(iv) To study the reaction of the fifth standard students of the two selected schools regarding learning through a strategy consisting of videoed Bhavai, flashcards and discussion.

Methodology The investigator reviewed the theories on variety of methods and materials like lecture, discussion, workshop, drama, role-play, flashcards, and flip charts-etc. It was found that each individual method or material had some or the other limitation when used for teaching. Therefore the investigator decided to use a combination of the three methods i.e. Bhavai, flashcards and discussion.

The investigator selected videoed Bhavai as a major component and flashcards

54 Kinjal Bhatt, Effectiveness of strategy consisting of Video Bhavai, Flashcards and Discussion for teaching selected topics of social studies course to the fifth standard students of the two selected school’s of Baroda. Unpublished master’s dissertation, P.G. Department of Extension Education.
and discussion as supplementary components of the strategy.

**Sampling**  The fifth standard students were selected for the experimentation of the designed strategy because the content treated in the strategy was a part of their syllabus. The total sample consisted of 100 fifth standard students, 50 from each of the two selected schools.

**Statistical Method Used**

To check the consistency of the responses given by the students, the knowledge test was re-administered by the investigator. Reliability of the knowledge test was found to be 0.94. Different statistical measures for various purposes were used as follows:

<table>
<thead>
<tr>
<th>Purposes</th>
<th>Statistical measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Background information</td>
<td>- Percentile</td>
</tr>
<tr>
<td>2. Overall gain of respondents</td>
<td>- Mean scores, Paired t - test</td>
</tr>
<tr>
<td>3. Differences in effectiveness</td>
<td>- Two sample t - test</td>
</tr>
<tr>
<td>of the strategy in relation to the selected variables</td>
<td>ANOVA</td>
</tr>
<tr>
<td>4. Item wise exposure to folk media of respondents</td>
<td>- Intensity Indices</td>
</tr>
</tbody>
</table>

**Findings**

1. The study indicated that there was a significant gain in knowledge of the respondents of fifth standards, from both the selected schools, on learning through a strategy consisting of videoed Bhavai, flashcards and discussion. The effectiveness of the strategy can be attributed to the well planned tailor made strategy itself.

2. The effectiveness of the strategy is also revealed by the positive reactions of majority of the students from both the selected schools, towards learning through videoed Bhavai, flashcards and discussion.

3. The students from the privately managed schools gained higher in knowledge as compared to the students from the Municipal Corporation managed schools.

4. It can be concluded that an instructional strategy can be more effective if the school is well equipped and well managed, teachers more qualified and if the
students are more exposed to variety of learning experiences. This implies that innovative well planned strategies should be developed in the schools.

5. The findings of the study also indicated that well planned strategy could nullify the effect of variety of factors like sex, father’s education, mother’s education, and academic achievement. Thus, it can be concluded that such novel instructional strategies can be helpful to all students irrespective of their individual differences.

2.3.35 Gandhi, H., 2003

Title Study of the Effectiveness of intervention programme on Environmental Awareness among selected rural women.

Objectives General objectives of the study were:

(i) To test and enhance environmental awareness of selected rural women.
(ii) To study existing level of environmental awareness among the selected rural female in Anand District.
(iii) To develop and implement a programme to enhance the environmental awareness among selected females.
(iv) To study the effect of environmental awareness programme in relation to selected variables. (age, education, income)

Methodology The investigator intended to study the knowledge, practices and attitudes of the women (Rural area, Jhol) regarding environmental awareness and enhancement through intervention programme. It was decided to use interview cum questionnaire method. It is a method in which investigator structures the questions and Answers that the questions are so worded that is no confusion and that one and the same question does not convey two different meaning. This method is more convenient and reduces personal bias. The first hand information obtained by the investigator herself is bound to be more reliable and accurate since the investigator can extract the correct information by removing the draughts, if any, in the minds of the respondents. When the audience is approached personally by the investigator, the response is likely to be more encouraging.

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Sampling  Jhol village was selected it is away from Anand by 8 Kms. The fulltime home makers only were selected as sample total 60 homemakers were taken. Purposive techniques was used for sampling “Home Maker” ready to attend the intervention programme was selected sample.

Statistical Method Used  The number of item collected for constructing the knowledge test will be framed in the objective from with different alternative answers. Before collecting the actual data pilot test with 10 women from the same village area was carried out. Who were not included in the study as final sample on the basis of responses obtained, necessary changes were carried out to finalize the interview schedule. Pre-test was carried out to know the present status of awareness regarding environmental aspects among selected women. After pre-test and post-test responses the investigator planned 15 days intervention programme.

To test the enhancement in environmental awareness among selected group after exposure to the intervention programme post test was carried out which was planned after one week of the last day of the programme. The paired ‘t’ test was carried out to find out the significance of difference between the pre-test and post-test results regarding the environment awareness to study the effect of intervention programme planned.

Findings  Paired ‘t’ test was administered that showed highly significant difference for both age group below 30 years and 31 to 40 years, insignificant difference in the attitude regarding environment aspect. Highly significant difference was found in paired ‘t’ test among the respondents as an effect of intervention programme on environmental awareness.

2.4. Research review

2.4.1 Research review according to objectives

In field of Educational Technology and Educational Assessment and Evaluation various materials prepared using different means of education technology to develop materials and to study effectiveness of different media in education at different level of standards. Researches done since from 1947 by researchers were:
The study aimed at finding out folk dances of Maharashtra that could be introduced in the school curriculum as a means of physical education (Agarkar, A. J., 1947). In programmed learning through television, objective of the study was to find out ways of applying principles of programmed learning to make televised instruction more effective (Dewan, S. S., 1966). An enquiry into the scope and effectiveness of audio-visual instruction in improving English teaching was undertaken to find out, the availability and aptitude of teachers towards the use of audio-visual aids in schools. Whether the teaching of English with audio-visual aids in more effective than the usual way of teaching (George, A., 1966). A comparative study of outcomes of teaching of Algebra by conventional classroom method and method of programmed instruction aimed at comparing the programmed method of teaching algebra with the conventional classroom lecture method, with a delayed post-test, to study the relative retention under the two methods (Sharma, M. M., 1966). Utilization of learning by different teaching methods at various levels of intelligence was purposed to compare three different measures of learning, viz., recall, retention and utilization, obtained separately under two instructional treatments, viz., Herbartian method and programmed learning of linear type (Nagar, P. S., 1971). The investigation was undertaken to study the relationship between the immediate achievement and the retention scores on linear and branching programmes and some selected personality variables. Development and validation of the linear programmed learning material (programme) also formed the part of the investigation (Kapadia, G. G., 1972). To Develop programmed learning material for Agricultural subjects in Marathi medium secondary schools and to study its utility for different categories of students was objected to compare achievements through this programme and through the traditional methods to find out how effective one has been over the other (Shitole, C. B., 1976). Development and tryout of auto-instructional programmes in some units of Geometry for class VIII and to study its effectiveness in the context of different variables was objected to develop programmed learning material (PLM) and to compare the achievement in mathematics of students having different reading abilities, study habits, anxiety and learning through PLM and traditional way of teaching (Patel, A. D., 1977). The study, teaching environmental concepts to school drop-outs through video and charts, was undertaken to investigate whether working children in the non-formal education centers achieved more when taught environmental concepts by the video method than by using charts and to prepare a video programme on
environmental concepts (Antonymsamy, L., 1980). An experimental study of the efficiency of programmed filmstrips as a method of teaching History in the secondary schools was objected to develop software materials for the media, and to validate the developed materials against the conventional teaching in terms of immediate recall and delayed retention (Jeyachandran, J., 1980). Effectiveness of multimedia programmed materials in the teaching of Physics was purposed 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. To develop instructional materials, the programmed learning materials, a multimedia programme package using each style of programme in conjunction with audio-visual media 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 (Basu, M. K., 1981). An experimental study of the relative effectiveness of three methods of instruction-exposition method, programmed learning method, and multimedia method in Science education was objected to find out the relative effectiveness of the three methods of instruction-expository method, programmed learning method and multi-media method. To develop multi-media text on the programmed content (Kumar, A., 1981). The use of audio-visual aids in the secondary schools of district Thane was objected to know the existing situation regarding audio-visual materials in the secondary schools of Thane district and preparing materials for audio-visual aids in educations (Golani, T. P., 1982). Development of multi-media instructional strategy for teaching science (Biology) at secondary school level was objected to develop a duly validated multi-media instructional strategy for teaching the course in biology at Standard VIII. To study the feasibility of the strategy in terms of time and cost (Ravindranath, M. J., 1982). Development of multimedia package for teaching a course on audio-visual education was objected to develop a multimedia package for teaching a course on audio-visual education for the instructor training programme to find the effectiveness of the multimedia package and feasibility of the multimedia package (Krishnan, S.S., 1983). Relative effectiveness of graphic aids and projected aids enriched with museum experiences, in teaching food and digestion to find out the significant differences in the gain in knowledge, change in opinions and practices, regarding food and digestion in C, E1 and E2 in relation to: sex, academic achievement and socio-economic status (Neera, Chetanal., 1983). Role efficacy of
communication media: A comparative evaluation was to study the effectiveness of two broadcast media: radio and television (Samant, C.R., 1983). Effectiveness of media with reference to classroom ethos was objected to know the effect of programmed learning material (PLM) in book format, PLM in tape-slide format, PLM in audio-tape format, and teaching in the traditional way, as media of instruction, on classroom ethos. To compare the ‘actual’ classroom ethos of four groups in terms of authenticity, legitimacy and productivity (ALP) after receiving instruction through, different media (Singh, U., 1983). A study of the scope of the communication media such as Radio, Television in education at high school level in Maharashtra state was objected to study the effectiveness of educational television in terms of educational utility to students and teachers, to study the merits and demerits of radio and television as communication media with respect to education. The hypothesis of study was that radio and television had made a considerable impact on education (Wad, V., 1984). An investigation into efficacy of different instructional media in the teaching of Science to the pupils of class VIII in relation to certain variables to compare the achievement of pupils of science learning through different instructional media and the traditional way of teaching (Desai, K. V., 1985). A comparative study of the effectiveness of three approaches of instructions conventional, radio-vision and modular approach on achievement of students in social studies. To compare the retention of students, students’ involvement and to compare the self-confidence of students in Social Studies when taught through these three approaches (Dhamija, N., 1985). Effectiveness of teaching a course introduction to Home Science education and extension through multimedia strategies to the first year home science students of the faculty of Home Science, Baroda, in relation to the selected student characteristics was objected to develop hardware and software oriented two multimedia strategies for teaching selected unit and to study the effectiveness of multimedia strategies to teach a course (Joshi, U., 1987). Relative effectiveness of print media attempts to study the relative effectiveness of print media using experimental method to find out experimentally the print media in terms of knowledge gain and retention of knowledge (Manoharan, M., 1988). Preparing and evaluating self-instructional film-strips on nutrition education for B.Ed. students was objected to develop software material for the film-strip medium on the topic ‘Nutrients’ and to evaluate the developed material against the conventional teaching method (Usha, P., 1990). Effectiveness of the simulation model of teaching through Computer Assisted
Instruction (CAI) was objected to study the effectiveness of the simulation model in teaching physics to Standard XI students through Computer Assisted Instruction (CAI) as compared to the traditional method (Jeyamani, P., 1991). Developing a video programme on environmental pollution in biology for higher secondary students was undertaken to investigate whether students in higher secondary schools who are taught certain concepts in biology by the video method achieve more than those who are taught by traditional method. To prepare a video programme on environmental pollution for instructional use for higher secondary students (Kalimuthu, T., 1991). A study on the effects of comics and comic television serials on children attempts to assess the effects of comics and comic television serials on children (Phutela, R.L., 1991). Relevance of the course on audio-visual education in the B. Ed. programme to the present-day educational technology requirements, was focuses on to analyze the B.Ed. course content of the universities of Tamil Nadu in order to identify the elements of audio-visual education introduced and their achievement. To find out the modern educational technology required of a classroom teacher, to suggest a course on modern educational technology suitable for filling up the gaps identified (Pillai , G.S., Dhanasekaran , S., 1991). Teaching of mathematics: Effectiveness of Computer-Assisted Instruction (CAI) and conventional method of instruction was objected to study the difference in mathematics achievement which occurs as a result of the difference in instructional strategy among boys and girls separately and as a group (Singh, R.D.; Ahluwalia, S.P. and Verma, S.K., 1991). Developing a video programme on energetic in chemistry for higher secondary students, was objected to prepare a video programme on ‘exegetics’ for instructional use for higher secondary students and to find out experimentally whether the video method is more effective than the traditional lecture method in teaching the concepts on ‘energetic’ (Sinnathambi, V., 1991). The audio cassette project of Hoshangabad district, M.P. in collaboration with the Government of M.P. and UNICEF: Independent case study attempts to study the utilization and effectiveness of specially prepared audio cassettes in village primary schools for language development and listening comprehension (Sumitra, L.G., 1991).

A Comparative study of the effectiveness of three Instructional strategies in teaching selected aspects of puppetry to Home Science students of the M. S. University, Baroda. was objected to study the effectiveness of the three instructional strategies lecture-cum-live demonstration, video film and booklet in teaching selected aspects of puppetry to Home Science students in terms of gain in knowledge and to develop an
ability in making a glove puppet (Shah, A, and Mandal S., 1992). Effectiveness of a communication strategy on Environmental Pollution and its effect on health for the low socio-economic groups of females in the selected communities of Baroda city was objected to develop a communication strategy on environmental pollution. To study the effectiveness of the communication strategy and to study the differences in the effectiveness of the communication strategy according to age, educational level, income level, concern for health (Joshi, U., and Sovani, K., 1998). Effectiveness of strategy consisting of videoed Bhavai, flashcards and discussion for teaching selected topics of social studies course to the fifth standard students of the two selected school’s of Baroda was aimed to evolve a strategy consisting of videoed Bhavai, flashcards and discussion for teaching selected topics of Social studies course to the fifth standard students and to study the overall effectiveness of a strategy consisting of videoed Bhavai, flashcards and discussion for teaching to find out the difference in the effectiveness of a strategy (Bhatt, K., 2001). Study of the effectiveness of intervention programme on environmental awareness among selected rural women objected to test and enhance environmental awareness of selected rural women. To develop and implement a programme to enhance the environmental awareness among selected females to study the effect of environmental awareness programme in relation to selected variables like age, education, income (Gandhi, H., 2003).

From above discussion we may conclude that in various study means of presenting educational information were; folk dances, auto-instructional programmes, programmed instruction, programmed learning, linear and branching programmes, programmed learning material, charts, book format, print media, comics, flashcards, discussion, graphic aids, projected aids, multimedia, Herbartian method, exposition method, multi-media instructional strategy, tape-slide format, audio-tape format, self-instructional film-strips, television, serials, audio-visual instruction, audio cassette, live demonstration and Computer Assisted Instruction (CAI). Subjects of information were; Physical education, English, Algebra, Agriculture, Geometry, Environment, Physics, Science, Biology, Social studies. Home Science, Nutrition, Environmental pollution, Mathematics and Puppetry.
In present study researcher used traditional lecture method, Power Point Presentation and Film demonstration to provide information on selected topics of Environment.

2.4.2 Research review according to methodology

In researches various methodologies was followed to develop educational programme using different media and to evaluate its effectiveness. Various methods of sampling and statistical analysis were used to analyze the collected data.

A detailed study of the various occasion of dancing, movements and formations, dress and accompaniment, music, songs and notations dancing, in early societies dance and culture of folk dance of Maharashtra was made (Agarkar, A. J., 1947). The study investigated the effect of two different modes of presenting the learning material, viz., with the knowledge of immediate results and in the question-answer format implying active responding in the context of televised instruction. Students from grade X from three Delhi schools were selected, listed and then randomly assigned to the three treatment groups. Under treatment called conventional television lesson, the teacher lectured or demonstrated an experiment and then went on describing the concepts involved there in like the usual lecture method of teaching. Under treatment called experimental treatment A, the topic was divided into subunits and after the completion of every subunit the teacher asked a question and allowed sufficient time to the students to respond to his question. In the treatment III, called experimental treatment B, an auto-elucidation test was added further. A sample chemo-card was used to enable the students to know whether they were correct or incorrect immediately after they had responded to the question. The questions in the post-test, developed in consultation with the TV teacher and the educational consultants of the TV centre. A delayed post test was also administered. Mean, SD, and significance of differences between groups were computed to analyze data (Dewan, S. S., 1966). Data were collected by observing thirty lessons, by administering a questionnaire to 200 teachers from 200 different schools selected at random and by conducting an experiment in actual classroom situation. The experiment was conducted on children selected from two government schools and two private schools, grouped on the basis of their achievement in English. The parallel group technique was followed. At the end of the term, a test was administered (George, A., 1966). The sample of the study consisted of eighty students of class IX who were first divided
into upper, middle and lower groups on the basis of marks in the terminal examinations and then they were randomly assigned to an experimental and a control group. Besides the usual pre-test and post-test, a delayed post-test was also administered to study the effectiveness of the two methods in terms of retention (Sharma, M. M., 1966). A stratified random sample of 207 boys and 143 girls from six higher secondary schools in Gorakhpur was selected on the basis of the geographical location and socio-economic status. The students were divided into two groups each containing not more than thirty pupils for the two instructional treatments. Each group was further divided into three on the basis of intelligence. The investigator taught one group and the subject teacher taught the same topic which was given to him one week earlier, to the other group by the usual method. After the completion of the initial learning the subjects were tested on the recall test and retention test was administered. The Joshi’s Humanities Group Test of General Mental Ability, the Hindi version of the programme on “Flower” prepared by the NCERT, and three tests of learning, were used. The data were set in a factorial design, with a four way analysis of variance. A factorial design with the two methods $t_1$ and $t_2$, sex, three levels of intelligence $I_1$, $I_2$, and $I_3$, and three learning tests $L_1$, $L_2$, and $L_3$ was laid out with varying number of observations for each cell. The three and four factor interactions were assumed to be absent and taken as errors (Nagar, P. S., 1971). A linear programme on ‘Heart and Blood Circulation’ was used as tools for the investigation. It was validated on the basis of the individual tryout and field tryout of the programmed learning material. Other tools used for the investigation were branching programme on ‘Factors Affecting Air Pressure’, Bernreuter’s Personality Inventory, Desai-Bhatt’s Group Test of Intelligence and IPAT Anxiety Scale by R.B. Cattell. All the tools were administered to the pupils of standard VIII from eleven schools in the city of Baroda. The sample of the investigation was 525 pupils including 299 girls and 226 boys. The criterion tests of the linear and the branching programmes were given immediately after an individual pupil completed the programmes. The same criterion tests for both the programmes administered earlier were given to the same pupils after an interval of two months. Partial correlations of the third order were computed between each of the personality variables and each of the achievement variables when rest of the personality variables was partially out (Kapadia, G. G., 1972). The study adopted an experimental approach was conducted in Sholapur district and involved four secondary schools teaching agriculture. As many as 48 girls and 352 boys formed the
The experiment involved three phases, viz., and 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 (Shitole, C. B., 1976). The sample consisted of 810 students of class VIII studying in fourteen schools of Kaira District was selected. The achievement of the students was measured through teacher made tests. The differences between different groups were studies by calculating mean, SD and t values (Patel, A. D., 1977). The sample of the study constituted 60 working children at the school for working children in Dindigul. The pre-test-post-test-equivalent-groups design was employed. The lessons on ‘Environmental Concepts’ lasting for 40 minutes was taught through video to the experimental group and to the control group using charts. The ‘t’ test was applied for statistical analysis (Antonyssamy, L., 1980). The sample was chosen from nine schools in the city of Madras. The total sample consisted of 450 boys and 315 girls. The subjects were divided into three groups which were taught through three different methods, namely, teacher with programmed filmstrip, programmed filmstrip without teacher and the conventional method. Data were collected with the 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 employing the statistical techniques like Bartlett’s F test (Jeyachandran, J., 1980). 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 on referenced tests I, II and III. The experiment was performed on five treatment groups in schools for a pretty long time in three phases, from March 1979 to December 1979. 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 analyzed by analysis of covariance and by 5 x 3 x 3 factorial experiment with nesting and crossing (Basu, M. K., 1981). In order to experimentally study the relative effectiveness and the interaction between the three methods and the two levels of intelligence, a 3 x 2 factorial design was employed. The biology student of Classes IX and X of two inter-colleges formed the sample of the study. In all, 180 students were divided into three groups of sixty students each. One group was given instructions
through the programmed learning method, the other through the expository method and the third group through the multi-media method. All the students of the three groups were administered the criterion test as pre-test, 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 (Kumar, A., 1981). The methodology consisted of library study, empirical survey through questionnaire, interview, visits and observation and field experiment. A survey was conducted in 217 secondary schools in Thane district. Experiments were conducted in 20 schools to demonstrate the advantage of using audio-visual aids in teaching subjects like social studies, mathematics, sciences and languages (Golani, T. P., 1982). The strategy developed by the investigator covered the prescribed content in biology for Standard VIII through different units. The multi-media strategy arrived at comprised twelve instructional components. 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. 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 inductive PLM and deductive PLM was studied in respect of a few selected units (Ravindranath, M. J., 1982). A single group design was evolved and 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 five modules. The strategy was implemented for one academic session. The tools used for data collection were criterion tests, comprehensive course tests and attitude scale prepared by the investigator, and an English language ability test designed at the matriculation level (Krishnan, S.S., 1983). The present design of the investigation was “Quasi experimental design”, that is the “pre test-post test control group design” was used. Sample selected from standard VIII of an English medium school of Baroda was divided into three groups, a control group and two experimental groups, according to sex, academic achievement and socio-economic
status. Pretest was administered to find out the previous knowledge opinions and practices. The experimental treatment was given for a stipulated time. Post test was administered to find out the gain in knowledge, change in opinions and change in practices. Statistical analysis of variance was used to find out the relative effectiveness of teaching aids and significant differences between the three groups and in relation to selected variables. Paired ‘t’ test was used (Neera, Chetanal., 1983). The study made use of quasi-experimental design of investigation. Four groups of subjects, two experimental and two controls were selected separately for radio and television, from the village communities of two districts of Orissa. 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 by the investigator for measurement of knowledge (impact) and attitude and for study of comprehension and retention. Statistical measures like mean, SD, correlations, t-test and ANOVA were used for analysis of data. (Samant, C.R., 1983). The study developmental-cum-experimental in nature and consisted of two parts. The first part consisted of development and tryout of programmed learning material in three formats on ‘reproduction’, based on the syllabus of the tenth standard. Each PLM consisted of three sub-units. The second part of the study was concerned with the comparison of their effectiveness in terms of ALP scores of classroom ethos and achieved gain scores. A pre-test post-test single group design was used to test the null hypotheses. In all, 240 students selected from four secondary schools of Sardar Shaher as the sample. Four pairs of groups were formed, each school had two groups and each group consisted of 30 students. Out of eight groups, four were formed for replication of the experiment. In order to collect data, a number of research tools were developed or acquired. Analysis of variance was used to test the significance of difference among the mean achievement scores of the four groups and their replicates (Singh, U., 1983). The study employed the descriptive survey method using documentary analysis and library research. To collect the relevant data, the investigator critically referred to various encyclopedias, directories, theses, research studies, reports, periodicals, and journals and analyzed 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 author, were duly filled in by 900 teachers, 500 students and 400 parents selected from different schools in Maharashtra state. The data were analyzed, using descriptive statistics (Wad, V., 1984). The programmed learning material, slides and laboratory experiments were designed. The criterion test was prepared. The Junior Index of Motivation Scale and the Reasoning Ability Test were used for measuring motivations towards schools and reasoning ability of pupils. The experiment was carried out in two schools of Anand city. Four equivalent groups respect to motivation towards schools and reasoning ability were prepared. In each group there were 25 students. One group was taught through programmed 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 covariance was used to test the various hypotheses (Desai, K. V., 1985). The study was conducted at the final study stage and at the confirmatory stage. The sample of the final study comprised 30 students in each of three different schools, 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, 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 \((3 \times 3 \times 3)\) was followed where three factors were involved, namely; approaches of teaching, intelligence and testing occasions. 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 and later on the teaching methods were rotated in a Latin square design. Three subjects geography, civics and history were taught one by one by 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 tests comprised a criterion test (Dhamija, N., 1985). The course “Introduction to Home science Education and Extension” was selected for the study. The need was felt to teach this course through an effective instructional strategy to create and sustain students’ interest in the course and help students to have optimum gain of knowledge. The units of the course were selected for developing multimedia strategies. To establish the reliability of the test, a test re-test was applied. The test was administered to a group of 11 randomly selected
first year students of the faculty of Home Science, M.S. University of Baroda, in the year 1983-84. The test was administered twice at an interval of one month. Ravan standard progressive matrices were used in Intelligence Test. Split-half and test-retest relationships as well as the concurrent validity have been established. The Post-test was conducted after seven days of the completion of the leading through multimedia strategy. The post test was conducted for all the groups together (Joshi, U., 1987). The experiment included seven treatments and these treatments were randomly assigned to seven villages selected at random from Kodaikanal Taluka. From each village, 36 subjects were selected, matched on age and educational status for the particular treatment assigned to that village. The knowledge gain was assessed by using a knowledge list. A symbolic adoption quotient was used to measure adoption. The collected data were treated by using percentage analysis, ‘t’ test, F-test, Z-test, McNemar $\chi^2$ test, Rank Order Correlations Kendall’s Coefficient of Concordance, ANOVA, simple and multiple correlation and path analysis (Manoharan, M., 1988). The study consisted final sample of 771 student-teachers (B.Ed.) from nine colleges of education in Tamil Nadu. Of these, 450 were men and 321 women. Software for the unit ‘Nutrients’ consisting of frames, which were verbal in content, and pictures prepared by the investigator. All the subjects after the preliminary test (developed by the investigator) randomly assigned into three groups. The collected data were treated by using ‘t’ test and ANOVA (Usha, P., 1990). The sample for this investigation consisted of students of Standard XI of two schools selected. The pre-test-post-test method was used. Mean, SD and ‘t’ test were used to treat the data (Jeyamani, P., 1991). The sample of the study constituted 60 students (30 males and 30 females) of Standard XI at K.R. Government Higher Secondary School, Chatrapatty. The pre-test-post-test equivalent-groups design was employed in the study. The experimental group was taught through prepared video lessons on environmental pollution lasting for 36 minutes, and the same topic was taught to the control group by the lecture method. Mean, SD, and ‘t’ test were applied for statistical analysis (Kalimuthu, T., 1991). Data were collected from a cross-section of 198 children, 19 teachers and 17 parents, taking 25 children each from Classes III to VI from six schools in Delhi representing various strata. Tools comprised a questionnaire, check-list and rating scales. Cumulative frequencies, percentages and median were used to treat the data (Phutela, R.L., 1991). In the study, four types of samples were selected. The syllabi of all the six universities of Tamil Nadu where B.Ed. programmes were going on were
selected. Five different sets/groups of students-teachers were selected from eight colleges of education and one university department of education. Teacher-educators from eight colleges of education and one university department of education and 34 heads of schools of the Madurai Educational District comprised the sample. The tools used included practices in audio-visual education questionnaires, training in audio-visual education questionnaire and educational technology requirements scale. Mean, SD, correlation, percentage, ‘t’ test, F-test, and ‘Z’-test were computed while treating the data (Pillai, G.S., Dhanasekaran, S., 1991). 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 Steel Plant, Bhilai (M.P.) (Singh, R.D.; Ahluwalia, S.P.; and Verma, S.K., 1991). 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 pre-test-post-test 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. The ‘t’ test was applied for statistical analysis (Sinnathambi, V., 1991). The sample comprised 450 primary schools of Hoshangabad District of Madhya Pradesh. 900 teachers, and 34,345 students of Classes I, II and III for three years. The tools used included 308 programmes, 17 audio cassettes and 500 two-in-one tape recorders. The tools used included questionnaires, observations and recording of children’s responses. The collected data were treated using percentage, averages and ranking (Sumitra, L.G., 1991). Researcher selected the subject matter on puppetry, which was common for all the three strategies. A battery of tool was used by the researchers to collect information. The sample of the study consisted of 177 1st year B.Sc. (Home Science) female students from the faculty of Home Science, M.S. university, Baroda, India in the year 1991-92, The students were allotted to three experimental groups as E₁- Experimental group exposed to lecture-cum- live demonstration (N=57), E₂-Experimental group exposed video film (N=55) and E₃-Experimental group exposed to booklet (N=65). Statistical analysis used was percentage, t-test, F-test and paired t-test. (Shah, A, and Mandal S., 1992). The population of the study comprised females belonging to low socio-economic status groups in Baroda city. To get the information regarding females the Urban Basic Services Office (WBS) and Vikas Jyot Trust a non-government organization were
contacted as they were catering to low socio-economic status females groups. The content related to environmental pollution and its effect on health were developed based on the suggestions and views given by the subject matter specialist and from reference books and the material provided by the earlier mentioned agencies. The strategy included Slides, flashcards and posters as components. Lecture-cum-discussion method was also used. Purposive sampling method was used for the experiment. The sample represented the females belonging to the low socio-economic status from different parts of Baroda city. Different statistical measures for various purposes were frequency and percentage, Paired-t-test and One-way analysis of variance (Joshi, U., and Sovani, K., 1998). The investigator reviewed the theories on variety of methods and materials and decided to use a combination of the three methods i.e. Bhavai, flashcards and discussion. The investigator selected videoed Bhavai as a major component and flashcards and discussion as supplementary components of the strategy. The total sample consisted of 100 fifth standard students, 50 from each of the two selected schools. To check the consistency of the responses given by the students, the knowledge test was re-administered by the investigator. Different statistical measures for various purposes used were as percentile, mean scores, paired t – test, two sample t – test, ANOVA and Intensity Indices (Bhatt, K., 2001). Only fulltime homemakers of Jhol village were selected as sample total 60 homemakers were taken. Purposive techniques were used for sampling. The investigator used interview cum questionnaire method. investigator structures the questions The first hand information obtained by the investigator herself is bound to be more reliable and accurate since the investigator can extract the correct information by removing the draughts, if any, in the minds of the respondents. When the audience is approached personally by the investigator, the response is likely to be more encouraging. Pilot test with 10 women from the same village area was carried out. necessary changes were carried out to finalize the interview schedule. Pre-test was carried out to. After pre-test and the intervention programme post test was carried out which was planned after one week of the last day of the programme. The paired ‘t’ test was carried out to find out the significance of difference between the pre-test and post-test results regarding the environment awareness to study the effect of intervention programme planned (Gandhi, H., 2003).
From above discussion we may conclude that universe of various studies ranged from Classes I to XII, working children, village communities, B.Ed. F.Y.B.Sc. and fulltime homemakers. Research methodology followed was; pre-test post-test, delayed post-test, pre-test-post-test-equivalent-groups design, achievement tests, and retention scores. $3 \times 2$ factorial design, criterion test, design criterion tests, “Quasi experimental design”, “pre test-post test control group design” Closed-form questionnaires, descriptive survey method, documentary analysis, A pre-test post-test single group design, material, three-way factorial design ($3 \times 3 \times 3$) Latin square design, multimedia strategies. Software, subject matter, Slides, flashcards and posters, Bhavai, flashcards and discussion and interview cum questionnaire method.

Sample of study varies from 60 to 765 students per one experiment. Place of research carried out were; Delhi, Gorakhpur, Baroda, Kaira District, Anand city, Sholapur, Dindigul, Madras, Thane district, Orissa, Sardar Shaheer, Maharashtra, Tamil Nadu. Chatrapatty, Bhilai, Oddanchatram, Hoshangabad and Madurai. Standardized tests used during experiments were; Joshi’s Humanities Group Test of General Mental Ability, Hindi version of the programme on “Flower”, Bernreuter’s Personality Inventory, Desai-Bhatt’s Group Test of Intelligence, IPAT Anxiety Scale by R.B. Cattell, Test of Intelligence B.E.P.R.T. in Bengali.

Entry level tests, Referenced tests I, II and III., Madhukar Patel’s Intelligence Test, Junior Index of Motivation Scale and Reasoning Ability Test. Different statistical formulas used were; Mean, SD, significance of differences, four way analysis of variance, three and four factor interactions, correlations of the third order, t test, Bartlett’s F test, analysis of covariance, $5 \times 3 \times 3$ factorial experiment with nesting and crossing, comparative effectiveness, product moment coefficient, relative effectiveness, Paired ‘$t$’ test, correlations, ANOVA, descriptive statistics, Split-half, test-retest, concurrent validity, percentage analysis, F-test, Z-test, McNemar $x^2$, Rank Order Correlations, Kendall’s Coefficient of Concordance, path analysis, cumulative frequencies, percentages, frequency, One-way analysis of variance, two sample $t$-test, Intensity Indices and ranking.

In present study researcher used three group pre test - post test method having sample of 1080 college students selected from the colleges of Saurashtra region of Gujarat state. Researcher used statistical calculation like item analysis, t-test, f-
ANOVA, f-ANCOVA, factor analysis, Gain score, multiple correlation and correlation study using statistical programme SPSS-17 and Micro soft excel 2007.

2.4.3 Research review according to findings

Group dance suits both the boys and girls and better social intercourse. Movements of folk dances can be utilized as physical exercise. The folk dance combination should be preferred from the point of view of such neuro-muscular movements being and is psychologically sound as it is recreational and joyful activity (Agarkar, A. J., 1947). The teachers teaching English in grades fifth, sixth and seventh generally used the translation method while oral work was neglected in all the three grades. Majority of schools did not possess aids like projectors, tape recorders and flannel boards; and teachers did not use audio-visual aids because of heavy cost, heavy syllabus. The achievement of pupils taught by using audio-visual aids was greater than those taught by the usual method and the use of audio-visual aids did not require more time than what was required for ordinary teaching (George, A., 1966). The mean achievement of the experimental group taught through the programmed method was found to be 2.5 points higher than that of the control group taught by the teacher through the lecture method. The obtained mean gain was significant at 0.01 level. Sixty percent of the experimental group secured cent percent on the test, whereas only twenty percent of the controlled group could reach that high standard. The delayed post-tests also showed better retention by the experimental group (Sharma, M. M., 1966). The findings of the study revealed that the experimental group A was clearly superior to the conventional TV lesson group. Scores obtained on the delayed post-test could not be attributed to learning through the TV lesson (Dewan, S. S., 1966). The effects of treatments were highly significant at 0.01 levels. The effects of intelligence, learning and the two methods of teaching were highly significant. Two factor interactions of intelligence and sex, learning and methods of teaching, were highly significant, Interaction between instructional treatments and measures of learning was significant (Nagar, P. S., 1971). Intelligence was positively related to achievement on both types of programmes. The relationship between Intelligence and achievement on both the types was significant at 0.05 levels. Anxiety was negatively related to achievement on the linear programme. There was no significant relationship between anxiety and achievement on branching programme, also between self-sufficiency and achievement on both the types of programmes. There was no significant relationship
between introversion-extraversion and achievement on both the types of programmes. With the time lapse intelligence appears to have less influence over achievement on both the types of programmes. Generally, the personality variables have little effect on learning in a programmed way (Kapadia, G. G., 1972). Results showed the superiority of programmed learning method over the traditional one, irrespective of the category and sex of the students. The study also showed that programmed learning method required less time than the traditional one (Shitole, C. B., 1976). The PLM was found to be effective for the pupils who had good study habits as well as those who had poor study habits, when compared to traditional way to teaching. Learning through auto-instructional programme was superior in case of students who had good reading ability than the conventional method (Patel, A. D., 1977). It was possible to develop programmed learning materials in history. PLM could be used through media like filmstrips. Higher cognitive abilities could be developed through PLM. Learning through PLM resulted in better retention. Between programmed filmstrip with teacher and programmed filmstrip alone, the former was more effective. 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, J., 1980). The school drop-outs taught by the video method learned more concepts on environment than those who were taught by using charts. The working children improved their achievement on ‘Environmental Concepts’ after the video programme (Antonysamy, L., 1980). The multi-media method was more effective than either the programmed learning method or the expository method. Retention in learning by the multi-media method was higher than by the other two methods. There was no interaction between the three methods of instruction and the levels of intelligence (Kumar, A., 1981). On the criterion of overall achievement the multimedia semi-programmed instruction was better than the strategy of programmed teaching, the multimedia branching programmed instruction was better than the multimedia linear programmed instruction and the multimedia hybrid programmed instruction was better than the multimedia branching programmed instruction. It was found that a significant difference existed in the achievement through the different strategies in ability (Basu, M. K., 1981). The instructional strategy was effective to the extent that 70 per cent of the experimental group students obtained 60 per cent and above on all the unit tests and the comprehensive test. The experimental group
students performed better than the control group on the comprehensive test. There was positive and significant correlation between intelligence and achievement through the strategy. 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 PLM, namely, inductive and deductive, were equally effective as instructional material (Ravindranath, M. J., 1982). The use of audio-visual materials could be increased if teachers were allowed some free time for the location and preparation of requisite materials. The students learned better when audio-visual aids were used and they also sustained more interest in the learning activity with audio-visual aids than without them (Golani, T. P., 1982). The students learned more with graphic aids and projected aids enriched with museum experience, as compared to when taught with no teaching aids. There were no significant differences regarding change in opinions and practices as a result of teaching – and also the differences were not significant in relation to sex, academic achievement and socio-economic status (Neera, Chetanal., 1983). Ninety-eight percent of the trainees obtained more than 80 percent of the marks on the final post-tests and mean percentages of the post-test scores varied from 81.41 to 90.46. The mean gain in the total scores for all the modules was found to be significant at 0.01 level. The feasibility of the multimedia package was 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 (Krishnan, S.S., 1983). The differences between different treatment groups were not systematic so far as the nature of gains were concerned. Results of ANOVA showed that the 6-space (generated by occasion-impact-attitude dimensions) centroids were widely different but the differences between groups were non-significant. However, the difference between radio experimental and control groups was significant. 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 durations of exposure on the target audience (Samant, C.R., 1983). The underlying basic pattern of congenial group educative life for ‘actual’ classroom before and after the treatment of PLM in book-format, tape-slide format and traditional treatment by teacher revealed the obvious differences between by teacher revealed the obvious differences between the top and bottom clusters of their pre and post situations. All
the groups and their replicates, except the PLM in book-format group, gave top priority to the productivity aspect of the ethos for ‘actual’ classroom situations. Both traditional and tape-slide treatments were found to be significantly better in achieving mean gain scores than the PLM book or the audio-tape treatments. The study indicated some relationship between media and classroom ethos (Singh, U., 1983). The school TV programmes were liked by children for their variety, their authenticity and as a change in the learning process were more influenced by the entertainment TV programmes than the school TV programmes. 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 rural areas. The need of communication media in the teaching-learning process had been felt by the teachers and parents also. The communication media remained a complementary aid of classroom teachers and school radio was doing valuable work for SSC students but not school TV (Wad, V., 1984). The programmed learning approach, slide with discussion approach and experimental approach was more effective than the traditional way of teaching science. In the teaching science, the experimental approach was the most effective of all approaches. The use of instructional media indicated the possibilities of improvement in the methodology of science teaching Media are effective in science education (Desai, K. V., 1985). The students achieved highest scores in geography when taught through radio-vision approach, in civics when taught through modular approach and in history when taught through the conventional approach. The retention on knowledge, comprehension and total achievement scores was highest in that group of students who were taught geography through radio-vision approach, taught civics through the modular approach and taught history through the conventional approach. The involvement of students in the classroom was maximum when they were taught through the radio-vision approach. Self-confidence among the students increased the most when they were taught through the modular approach (Dhamija, N., 1985). Reliability coefficients vary from 0.70 to 0.90 for various groups. The test re-test reliability was found to be 0.95. Both the strategies were effective as there was considerable increase in the mean scores of the student’s achievement on post-test for both the strategies, there was no significant difference in the effectiveness of the two multimedia strategies in relation to the students intelligence, student’s stream of study, student’s attitude as well as the multiple effect of variables (Joshi, U., 1987). The main knowledge gain score was
2.72 for Newspaper treatment; 1.39 for Magazine; 1.12 for Folder; and 3.28 for the three media together. The knowledge retention after 15 days was 62.13% for Newspaper, 61.87 per cent Magazine, 70.42% for Folder; and 72.71% for all the three together. The mean symbolic adoption score was 7.22 for Newspaper, 4.97 for Magazine, 5.14 for Folder and 10.83 for all the three together. Media participation, contact with extension agency, interest in possession of print media, attitude towards print media, had a significant and positive relationship with knowledge gain, knowledge retention and symbolic adoption. The young respondents (up to 30 years) compared to the middle-aged (30 to 45 years) gained significantly more knowledge and had retained more knowledge and had higher symbolic adoption (Manoharan, M., 1988). Gain in the score in the ‘Retention and Recall Test’ for all the three treatments were significant, The difference between treatment 2 and treatment 3, and between treatment 1 and treatment 3 were significant. Treatment 2 made the highest gain (Usha, P., 1990). There was no significant difference in learning level between medium and sex of students. On the basis of the research findings, it was concluded that the experimental group performed significantly better than the control group (Jeyamani, P., 1991). The higher secondary students taught through the video programme learnt more of the concepts on environmental pollution than those who were taught by the lecture method, and improved their achievement after viewing the video programme (Kalimuthu, T., 1991). Among the various types of comics, the younger children preferred detective comics the most, followed classics (mythological, folk tales, etc.), the supernatural, ‘character’ comics, and crime and horror comics. The order of preference for the older children was: classics, detective, “character”, supernatural, crime and horror (64%, 52%, 33% and 20% respectively). Among the six cartoon television serials, the percentages of preferences for Classes III and VI, respectively, were Mickey Mouse and Donald Duck (65.7% and 75.8%), ‘He-man” (56.6% and 62.6%), and “Glow Friends” (36.4% and 33.3%).None of the teachers/parents endorsed the statement that comics led to development of criminal tendencies in children (Phutela, R. L., 1991). Under the different optional and elective subjects of the B.Ed. programme, the objectives of introducing the elements of audio-visual education were not totally achieved. These were achieved only among 32% of subjects. Though teachers, teacher-educators, and heads of schools differed in their assessment of educational technology requirements. They invariably expected higher
educational technology requirements. There were gaps found in the audio-visual education of the B.Ed. programme mainly

(a) In achieving the objectives of audio-visual education,
(b) In giving practical training to the student-teachers in audio-visual education.
(c) In achieving modern educational technology requirements (Pillai, G.S., Dhanasekaran, S., 1991). The students who used the computer scored significantly higher and having highly favorable attitude than those taught mathematics through the conventional method. Achievement in mathematics and change in attitude towards mathematics were found to be independent of the sex factor (Singh, R.D.; Ahluwalia, S.P.; and Verma, S.K., 1991). The students who were taught by the video method learned more concepts on ‘energetic’ than those who were taught by the lecture method. The students improved their achievement on ‘energetic’ after viewing the video programme (Sinnathambi, V., 1991). The children were able to tell the stories and sing the songs they had heard as a part of the project, where the songs had simple tunes and the stories were narrated in direct, uncomplicated formats. The content analysis indicated that the best liked programmes had segments of songs and stories, question-and-answer which were ‘activity oriented’ (Sumitra, L.G., 1991). There was significant gain in knowledge as well as development of ability through all the three instructional strategies lecture-cum-live demonstration, video film and booklet, on puppetry in the respondents of the three experimental groups. This shows that all the three strategies were effective in imparting knowledge regarding puppetry and in developing the ability to prepare a glove puppet. The findings regarding the effectiveness of the instructional strategies were also supported by the researchers (Shah, A, and Mandal S., 1992). Overall and variable wise there was significant gain in knowledge for the messages related to environmental pollution and its effect on health. No significant difference was found in the mean post-test scores of the respondents in relation to variables. The cluster of the above findings reveals that a combination of various channels, when planned systematically, can achieve the purpose of the study and can be effective in teaching and learning (Joshi, U., and Sovani, K., 1998). An instructional strategy can be more effective if the school is well equipped and well managed, teachers more qualified and if the students are more exposed to variety of learning experiences. This implies that innovative well planned
strategies should be developed in the schools. The findings of the study also indicated that well planned strategy could nullify the effect of variety of factors like sex, father’s education, mother’s education, and academic achievement. Thus, concluded that such novel instructional strategies can be helpful to all students irrespective of their individual differences (Bhatt, K., 2001). Paired ‘t’ test was administered that showed highly significant difference for both age group below 30 years and 31 to 40 years, insignificant difference in the attitude regarding environment aspect. Highly significant difference was found in paired ‘t’ test among the respondents as an effect of intervention programme on environmental awareness (Gandhi, H., 2003).

From above discussion we may conclude that most of study experimental method used were found effective than that of traditional lecture method. Some studies concluded that multimedia and media with instruction have better impact than that of programmed instruction method and only graphic aid methods.

Results of present study indicate power point presentation method is effective in more cases; Documentary film method was next to power point presentation method while lecture method was at third place. Lecture method provides only audio sensation while power point presentation method and film method provides audio-video sensation to students. Thus audio-video sensation is proved better then only audio sensation. In power point presentation method audio-video sensation was taken place in presence of lecturer while in film method it was by back ground voice, so effectiveness of power point presentation method indicates that mode of interaction is also prime factor for achievement.