

CHAPTER - II

**REVIEW OF THE
RELATED RESEARCH STUDIES**

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II.1) INTRODUCTION

The present study is concerned with the development of a Multi-media Instructional Package, for Std. IX in Botany. The researcher had decided to review the related literature for better planning, designing and developing of the Multi-media Instructional Package.

The present investigation touches various areas of education such as Educational Technology, Science Education, Multi-media Package etc. Hence the investigator had decided to review, in brief, the research studies from the related areas.

II.2 REVIEW OF THE RELATED STUDIES IN EDUCATIONAL TECHNOLOGY

The present study is concerned with the Development of Multimedia Instructional Package and the investigator had decided to review the related studies in Educational Technology. It includes the review related to studies in Multi-media and Audio-Visual Education.

II.2.1 (a) A brief review of related studies on Multimedia is undertaken for the development of the present study.



S.P.Mullick (1979) compared a multimedia programme with a book format programme for the same content. His study covered 204 students of class V and 240 students of class VI in the three English medium schools of Delhi.

In order to investigate the relative effectiveness of these programmes, six pairs of matched groups w.r.t. intelligence were formed. He administered pre-tests, post tests, and criterion test w.r.t. all the criterion measures. An analysis of variance of six cells (2 x 3) was used for analysing the gain achievement scores of the children. The major finding of the study was that the multimedia programme was superior to the book format programme.

A.Kumar (1981) conducted an experimental study of the relative effectiveness of three methods of instruction - exposition method, programmed learning method, and Multi-media method in science education. He used 3 x 2 factorial design which includes three methods of instruction and two levels of intelligence.

The sample consisted of 180 students of classes IX and X which were divided into three groups of 60 students each. All the three groups were administered the criterion test as pre-test. Then on the completion of respective treatments these three groups were again administered the criterion test. After 15 days, the same criterion test was re-administered.

The findings of the investigations were the multimedia method was more effective than either programmed learning or expository method, the retention in learning by the multi-media method was higher than by other two methods. There was no interaction between the three methods of instruction and the level of intelligence.

M.J.Ravindranath (1982) developed multimedia instructional strategy for teaching science (Biology) at secondary school level. The strategy developed by the investigator covered the prescribed content in biology for Std.VIII through different components, namely, introduction by the teacher, programmed learning material, lecture, team teaching. Inquiry technique, 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 experiment conducted on 90 students studying in Std. VIII of Baroda city. The students were divided into two matched groups and pre-test - post-test design was adopted for analysing the comparative effectiveness of the multimedia strategy and the traditional method of teaching. Effectiveness was assessed in terms of achievement on unit criterion tests and a comprehensive test. Students reactions were also obtained as a measure of effectiveness. Data regarding the intelligence of the 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-movement-coefficient. Achievement scores of the students w.r.t. three levels of intelligence were analysed with the help of analysis of variance. Relative effectiveness of two types of PLM - Inductive and deductive was studied in respect of few selected units.

The main findings of the investigation were - the instructional strategy was effective to the extent that 70% of students in experimental group obtained 60% and above on all unit tests and the comprehensive test; and also on the annual examination conducted by the school authority, about 70% students expressed favourable reactions to all components except team-teaching 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 were equally effective as instructional material.

V.P.Vardhini (1984) developed a multimedia instructional strategy for teaching science (Physics and Chemistry) but the abstract was not available to the investigator for the present study.

S.G.Shah (1979) developed and tried out multimedia package on effective questioning in the context of micro-teaching and found that the teachers who were exposed to the treatment of the self-instructional multimedia package course shows significant improvement.

Krishnan S.S. (1983) developed multimedia package for teaching a course on Audio-Visual Education.

The major objectives of the study were:

- 1) To develop a multi-media package for teaching a course on Audio-Visual training programme.
- 2) To find out the effectiveness of the multimedia package in terms of achievement of trainees and change in attitude of the instructor trainees towards multi-media package.
- 3) To study the feasibility of the multimedia package in terms of time and cost for the instructor training programme.

To attain the above objectives a single group design was evolved. As many as 127 instructor trainees enrolled during year 1981-1982 at the central training institute for instructor, Madras were treated as a sample of the study. The instructional strategy was prepared in modular form. There were five modules containing full course and component of modules were programmed. Slides, programmed Instructional material, non-projected visual aids, self instructional material with a manual for practical exercises, self evaluating unit-tests with answer keys discussions, feedback etc.

The strategy was implemented for one academic year. The tool used for data-collection were criterion-test comprehensive tests and attitude scale prepared by investigator and an English language ability test designed at the matriculation level.

The major findings of the study were:

- 1) Ninetyeight percent of the trainees obtained more than 80% of marks on the final post-test.
- 2) The mean percentage of 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 level.
- 4) The mean gain scores of knowledge, comprehension and higher mental abilities were found to be significant at 0.01 level.
- 5) The mean attitude changes was found to be significant at 0.01 level.
- 6) The achievement of trainees and their language ability were found to be positively related at 0.01 level of significance.

- 7) The feasibility of the multimedia package was established in terms of cost involved in reproduction of the various resource materials and time scheduling is an actual institutional set up.

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

MENON M:B. (1984)

Evolving a multimedia approach to teaching at Post-graduate level.

The major objectives of the study were;

- (i) To develop a multimedia strategy in organizing a course in Educational Technology for post-graduate and research students.
- (ii) To validate the strategy in terms of students performances in criterion tests and discussion sessions and their attitude towards strategy.
- (iii) To study the relationship between achievement and English reading, comprehension.
- (iv) To study the feasibility of the strategy.

A single group design was worked out for carrying out the investigation over a long period of time. The sample for the validation study consisted of 21 M.Ed. students, 15 M.Sc. Home science students, and eight research students of Education during the 1977-78 session. The instructional input of the strategy were P.L.M. structured lecture, team teaching, seminar, slide-tape commentary, work-book presentation, discussion, library work, assignment, feedback session, practical work and summary. The tools used for the study were criterion test, an observation schedule, an attitude scale prepared by investigator, Govindas English Reading Comprehension and Raven's Standard Progressive Matrices, Discriptive Statistics, test, partial co-relation and product - moment co-relation techniques were used for analysis of data.

The findings of the study were:

- 1) In the initial year 90% of Ph.D. students and M.Sc. students scored 60% and above marks on comprehensive criterion Test and more than 50% M.Ed. students scored 60% and above.
- 2) In the subsequent year around 90 per cent scored 75 per cent and more marks.
- 3) An improvement trend was witnessed with regard to discussion sessions.

- 4) At different stages of implementation of strategy, the students attitude towards multimedia approach went on increasing in favourable direction.
- 5) During the period of try out of the strategy of two years the relationship between intelligence and academic achievement was found not significant.

The relationship between English comprehension and academic achievement was found significant at 0.01 level.

- 6) The unit cost varied from Rs.47 to Rs.37 for range of 25 to 50 students. If software suitable to be presented through hardware was to be incorporated, the strategy worked within prescribed periods of time.

The educational implication of the study is that validated 'Multimedia strategy' with the suitable software material can be used to provide instruction in 'Educational Technology' of one semester duration to post-graduate students in education and related disciplines.

Criticism

The multimedia was used in above studies and it was found to be effective in all the above studies.

**11.2.1.b) Review of the Studies Related
to Audio-visual Education :**

There are 20 studies in audio-visual materials, teaching aids, instructional materials; out of which none is related to mathematics education. As the investigator has to use variety of audio-visual materials in her study, a brief review is undertaken in the following paragraphs :

Usha Subba Roa (1972) made a survey of growth and development of audio-visual education in Maharashtra State and found that certain progressive schools of big cities were definitely advanced in the use of audio-visual materials than the schools in slum areas and villages, there is shortage of fund in purchasing aids, there were variety of aids and the percentage varies from aid to aid in geography aids, The treatment given to the experimental group showed a success of more than seventyfive percent over the control group.

S.L.Ahluwalia and Y.P. Aggrawal (1970) did a survey of the extent of the use of films, filmstrips in 260 secondary schools of Madras state and found that on an average, a school possessed 13 classrooms filmstrips and 13 general filmstrips, about 13.4% of the schools had separate projection rooms, more than half of the schools had technicians, the general feeling of the schools was positive towards the advantages of films, most of the schools preferred to have instructional films in regional language.



A.George (1966) made an Enquiry into the scope and Effectiveness of A.V. Instruction in English teaching and found it effective.

S.K.Mitra and P.N.Khanna, (1963) used CCTV in observing surgical operation and found that it was more effective than direct observation in the operation theatre.

M.S. Sonar (1975) used filmstrips in teaching of science. The study was mainly analytical. Filmstrips and filmstrip projectors were analytically studied. Twenty filmstrips in Marathi on General Science were prepared. Evaluation forms were developed for evaluating the produced filmstrips. The produced filmstrips were tried out on students in Stds. V to VII. The main findings of the study were - filmstrips correlated with text and in regional languages help to increase the knowledge of students, systematic planning is essential in using filmstrips and their projectors, use of such instructional aids increase the interest and develop the taste in the younger generation.

M:C: Shah (1973) surveyed the scope, utility and limitations of ETV in India. The major findings were - the planning for TV lessons is not proper, the pamphlets and the guidance notes were not available to the subject teachers in due time, due importance was not given to the evaluation of TV lessons, educational personnel were not involved in the planning, production and utilization of school telecast etc.

N.Oberai, (1981) developed and evaluated radio-vision as an instructional system. He compared the effectiveness of radio-vision method of instruction with the traditional in terms of academic gains on the parts of subjects and also with the help of teachers' ratings.

In all, 125 students of class IX were selected from two schools in Dausa, Pretest - posttest control group design was used for the experiment. Data were collected by using Jalota's Group Tests of Mental ability, Srivastava's Socio-Economic Scale, Criterion Tests, students interviews, a questionnaire to teachers, observers' class profile and attention measures. In order to test the significance of the difference between means, t-test and f-test were used.

The major findings of the investigation were - the radio-vision groups obtained significantly higher mean scores on the recognition test than the group receiving instruction through the traditional method; w.r.t. recall test, the group receiving instruction through colour radio-vision plus work book obtained significantly higher mean score on the criterion test than the remaining six groups; the majority of the teachers opinioned that most of the students found the radio-vision method interesting; the attention profiles of the different radio-vision groups indicated that radio-vision could attract the attention of very high percentage of students and sustain their attention throughout the length of presentation.

M.Seth (1974) studies the learning process with special reference to audio-visual aids in language education. He used flannel board accompanying with recorded voice. The audio-visual aids were found to be more beneficial.

S.Gupta, (1978) investigated the role of organizing strategies and methods of presentation on short term retention. The study reveals that the visual mode presentation is significantly better than auditory mode in effective retention.

L.M. Shivaneekar, (1979) studied the effect of pictures and contextual conditions on learning responses to printed words. The study was restricted to children of classes I and II and limited to the recognition of a few words.

The method consisted of the use of a 4 x 3 x 2 factorial design - four treatments, three scripts and two classes. The four treatments were word - no picture (T1), word - picture (T2), sentence - no picture (T3), and sentence - picture (T4). The three scripts were English, Devnagari and Malyalam. The sample for the experiment comprised 300 children of class I and 300 children of class II. Analysis of variance was used for the analysis of data.

The major findings were - association of pictures with new words to be learnt had an adverse effect on learning them;

while teaching reading to beginners, whether individually or in group, the word method alone, was found to be more efficient than the word picture method in fixing new words and this held good for boys as well as for girls, etc.

L.P. Bhardwaj, (1981) in his project work attempted to find out the position of audio-visual teaching aids in Kaval towns. A sample of 200 private schools was selected. Data were collected through questionnaire, and interviews of teachers, students, principles, suppliers of teaching aids. The findings were that the position of audio-visual aids w.r.t. availability and use of teaching aids along with difficulties encountered in the availability of appropriate aids; their use in respect of existing facilities of trained persons as well as the administrative difficulties encountered in procuring them.

G.S. Jarial, (1981) attempted to study the effectiveness of verbal and non-verbal instructional materials in the development of creativity of students. The findings revealed that creativity mean scores of the experimental group were significantly higher than those of control group.

T.P. Golani (1982) attempted to study the use of audio-visual aids in the secondary schools of district Thane. 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. The findings of the study were - teaching aids were essential and useful in developing clear concepts and in stimulating learning; 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 fullest value of the teaching aid could be realized only when the teacher was thoroughly trained to use it to the best possible advantage; the students learn better when audio-visual aids were used and they also sustained more interest in the learning activity with audio-visual aids than without them.

B.Biswal (1980) searched for a strategy for effective utilization of school broadcast programmes in his study conducted in Orissa. The major findings were that the objectives of the broadcast lessons were vague, the coverage rather erratic and the scripts written by untrained writers unsatisfactory; most of the programmes were monotonous; most schools were non-users and others had neither any arrangement nor guidance for the students.

R.Shrivastava (1974) found more or less the same tendency in his study covering western region, i.e. Maharashtra, Gujarat and Madhya Pradesh as in Orissa state and the country.

D.R. Goel (1982) studied the school broadcast in the country, covering all the 35 AIR stations engaged in producing school broadcast programmes, eight of which were chosen for indepth

analysis. He contacted a sample of script writers, school authorities, teachers and students. It was revealed that there was no coordination between the broadcast division and state departments of education; the objectives were vague and the coverage low. The script writers were without any training; the schools had no provision for listening time. Lack of preparedness and co-ordination and a tendency of continuing the rituals broadcasting with or without utilization are evident from the study.

R.L. Phutela (1980) found that many teachers of Delhi did not find TV lessons useful and in any way different from ordinary classroom teaching. The lessons were partial in coverage and unable to sustain the motivation of students.

A. Paigaonkar (1978) studies the use of radio and television for second language teaching. He found that the knowledge and skills for utilizing linguistic, psychological and pedagogical methods for second language instruction were lacking in the makers of the programme although theoretical awareness existed.

K.V. Desai (1985) made an investigation of different instructional media in teaching of science to the pupils of class VIII in relation to certain variables. But the abstract was not available for the present study.

M.Labhante (1987) did his study on development of instructional material for teachers teaching science to class VIth in rural areas of M.P. But the abstract was not available for the present study.

Criticism : From the review of the studies in audio-visual education it is clear that audio-visual aids are effective in instruction. There is not a single study of using A.V. Aids in mathematics education.

It was found that certain progressive schools of big cities were definitely advanced in the use of audio-visual materials than the schools in slum areas and villages.

Most of the schools preferred to have instructional films in regional language.

C.C.T.V. used in observing surgical operation was more effective than direct observation.

Use of instructional aids increase the interest and develop the taste in the younger generation.

Radio vision groups obtained significantly higher mean scores, than the group receiving instruction through the traditional method. Radio-vision could attract the attention of high percentage of students and sustain throughout the length of presentation.

From the above studies in audio-visual education, it is clear that audio-visual aids are effective in instruction.

II.3 Review of Related Studies in Methods of Teaching

Ten studies are related to science education, 5 to general teaching methodology. A review of the studies related to science and general teaching methodology is taken below;

N.K.Patole (1967) explored the existing weaknesses of teaching science in rural primary schools and then tried out activity based method which was found superior to traditional one.

M.S. Sonar (1975) used filmstrips in teaching of science which was found effective.

N.D. Sharma (1978) found that guided activity was more effective in respect of concept formation in natural science.

I. Jha, (1979) compared the different methods of teaching high-school biology and reported superior performance in case of activity based approach.

K.R. Shivdasan (1981) attempted to compare the effectiveness of different classroom situations on the attainment of objectives of science education.

K. Abhinarayan (1979) developed learning packages for average children to conduct simple scientific investigations in a laboratory

situation and found that the students performed better than the students taught by the conventional method.

M.M. Shahajahan (1980) designed and developed modules for teaching science in Stds. VI and VII and found the modular way of learning more effective than the conventional method.

W.A.F. Hopper (1982) designed and developed modules for teaching certain units in biology in Std. XII and found that all the three structured modular approaches of teaching viz. self learning, peer group learning and peer group learning with teacher intervention, were effective in terms of the mean gain score in cognitive achievement.

G. Swarnamma, (1978) conducted an enquiry into the teaching of biology in the upper primary schools of Kerala and found that most teachers resorted to the lecture-demonstration method in teaching of the subject.

V. Muddu (1978) studied the prevalent status of instructional procedures in biology and reported that most teachers preferred only the lecture-demonstration method.

II.4 Concluding Remarks

The Multimedia approach is used in above studies and it was found to be effective in all the studies. There are 20

studies in audio-visual materials, teaching aids, instructional materials, from the review of the studies it is clear that audio-visual aids are effective in instruction.

There are 10 studies related to science education. It was found that students performed better with developed learning packages than conventional method.