CHAPTER-III

REVIEW OF THE PAST WORK

3.1 Introduction

3.2 Researches Conducted in other countries

3.3 Researches conducted in India
3.1 Introduction:

The review work of the past researches is one of important steps in the entire process of a research since it helps the investigator preparing ones own research design. It also gives the idea of the limitations of tools and procedure used by the past investigators. In short the activity of reviewing the past studies is indeed a very important activity from the point of view to equipping the researcher to evaluate the past researches critically. In fact this activity helps the researcher to be critical and more accurate and particular in attacking ones problem squarely.
It is only in the light of above discussion the researcher has reviewed a few relevant studies conducted in India and abroad.

3.2 Researches Conducted in Other Countries:

Study-1

"A study of supervised and non-supervised programmed instruction in the university setting."

The present study was published in the Journal of Educational Research. It aimed at comparing the efficacy of supervised and non-supervised programmed instruction. The experiment was conducted to find out which of the two is more effective. The same type of programme was administered to the two experimental identical groups. One group read the programmed Text in the absence of any supervised atmosphere. Whereas, the other experimental group read the same programmed Text under the supervision of the teacher. The

hypotheses of the study were tested using the significant tests. It was found out that the group which studied the programmed text under the proper supervision was significantly found superior to the group studied the same text in a non-supervised atmosphere.

The methodology of the study was found properly focussed. The discussion of the findings were noted in the light of the statistical inferences.

Study-2

"Comparative Research on methods and medium for presenting programmed course in mathematics and English."^{2}

In the present research, the investigator tried to compare the relative efficacy in Teaching of (1) Teaching Machines (2) Programmed Text (self paced) (3) Film strips (externally paced) and (4) Conventional Teaching. Through the proper use of analysis of variance technique the data was analysed to test the null hypotheses of the study. Behaviour entrance and

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criterion attainment testing work was carried out, prior and after the implementation of the Teaching Techniques. Special care was taken to keep the sample groups separate to avoid any possible contiguous effect. It was found out that except the programmed treatment others were on par in their relative efficacy. The programmed group's attainment was significantly higher than that of all the other groups and also found quite narrow in variance. The methodology of Conduction of research, analysis of the data and inferences drawn were quite proper. However it needs to be mentioned that the experimental groups lacked to be properly matched on some control variables.

Study-3

"Comparative Study of Programmed and Conventional Instruction."  

Two experimental groups were matched on reasoning ability. One group was assigned the programmed material and the other was assigned the conventionally printed material on the same content. At the initial stage both

the groups on entering behaviour test were found equal. The criterion test was administered to both the groups at the end of the experiment.

The sorted out data was grouped to study the objectives and test the hypotheses of the present project. With the help of proper statistical techniques the difference between the means of two groups was studied. It was found that the statistical difference in the achievement of two groups was significantly in the favour of the group which studied the programmed material. Hence it was concluded that programme learning teaching technology was more effective than the conventional reading material.

Study-4

"A Comparison of the achievement of high school pupils using an overt answering method vs a covert answering method when studying programmed materials involving the Graphical addition and substraction of factors."  

The present study has broken the new ground in the research area of the programmed learning material. Three groups were matched on the pre-learning testing. Two groups were selected for experimental work and one group as a control group randomly. The experimental groups were again randomly assigned the covert vs overt response modes.

At the end of the experiment it was found that both the experimental groups were equally more effective than the control groups. It was also noted down that covert answering mode required less time to complete the programme than the overt mode of answering.

From the point of view of design, conduction of research and analysis of the data it was found quite upto the mark. It is indeed a contributive research.

Study-5

"An Evaluation of the use of Programmed Instruction, Conventional classroom Approach and Integrated Programmed Instruction in the Teaching of Probability to high school studies in Kenya."

The major purpose of the investigator was to determine the comparative effectiveness of programmed instruction, conventional classroom approach and integrated programmed instruction in the teaching of probability to form II Kenyan students. Effectiveness was measured in terms of the effects of the three methods of instruction on achievement and retention of form II Kenyan students studying a unit in probability. The difference in the time taken to complete the unit in probability when the three methods of instruction used was also examined.

A secondary purpose of the investigator was to identify some predictors that might be used in predicting the performance of Kenyan students studying a unit in probability. The predictors used were as follows:
- Computational ability.
- Attitude towards mathematics.
- Mathematical reasoning.
- Comprehension of mathematics and science terms.

Finding of this study were as follows:

1) No significant difference was found between the means of the treatment population on the first achievement test for girls; but a significant
difference was found at the 0.05 level between the treatment populations on the second achievement test for girls and on both achievement tests for girls.

2) The results of the study showed a definite superiority in time taken to complete the probability unit for the programmed learning materials. Compared to conventional classroom approach, programmed instruction resulted into a saving of nearly fifty percent of instruction time. While the integrated programmed instruction resulted into a saving of 20% of instruction time.

3) No significant difference in retention was detected between the treatment groups in the boys school (P > 0.05) while significant difference were found between the treatment groups (P < 0.05) for girls with regard to the retention test.

4) The pre-tests that were used in this study accounted for 24.96% of achievement for boys and 25.96% of achievement for girls. Mathematical ability (five dot test) and mathematical reasoning ability (Arithmetic reasoning) were found to be
statistically significant predictors of achievement for boys (P < 0.05), while comprehension of mathematical terms and mathematical reasoning ability were found to be statistically significant predictors of achievement for girls (P < 0.05).

Statistical techniques used in analysis of the quantified data were quite appropriate.

Study-6

"An investigation to determine if two methods of teaching at college level course in introductory business management, programmed learning vs Business simulation can be matched to student personality characteristics."

This study was undertaken to determine if one of the two learning methods; Programmed learning vs Business simulation can be matched to student personality characteristics. The study also tried to determine if

students could identify instructional method by which they would attain maximum achievement.

The study utilized two predictor instruments and one criterion instrument. The predictor instruments used to determine personality characteristics was the California Personality Inventory (CPI). The other predictor variable was questionnaire which described the two teaching methods and asked the students to indicate the method which would be the best for them. The criterion instrument was the introductory business management examination developed by the Educational Testing Services of Princeton, New Jersey.

The results were statistically analyzed and tested for significant at 95% confidence level. The null hypotheses were as follows:

\[ H_{01} \quad \text{After teaching a course by two different methods, programmed instruction vs. Business simulation, there would be no significant difference in the learning as measured by the identical examination used in the pre-test.} \]

\[ H_{02} \quad \text{After teaching the course, there would be no significant differences in the learning as} \]
of the introductory business management students (these students that are part of the two treatments) and the introduction to business and industry students (the control group) as measured by the identical examination used in the pre-test.

\(H_0^3\) There will be no significant differences between the respective correlation co-efficients when comparing personality characteristics and the scores obtained in the two teaching methods.

\(H_0^4\) There would be no relationship between the achievement of students whose treatment matched their performance and those whose treatment did not match their performance.

The null hypotheses were accepted for hypotheses two and four. The results of the study for hypothesis one is that the gain scores (the post test scores minus the pre-test score) showed no significant difference. However, the difference was significant on the basis of the post test scores. This was accounted for the fact that the programmed learning group had the highest gain scores and also had the highest pre-test scores. Neither difference was significant in itself, but after being combined in a post test scores, results were significant.
It was concluded that the two groups started out with identical pre-test scores, the post-test scores would not have been found significant. Therefore the null hypothesis was accepted.

The result of the study for hypothesis three found seven personality scales on the CPI as having significant correlation with the programmed learning teaching methods. They were dominance, responsibility, tolerance, communality achievement via conformance, achievement via independence and intellectual efficiency.

Only two scales had significant correlation with the business simulation method of teaching. They were tolerance and communality.

3.3 Researches Conducted in India:

Study-1

"An Investigation into the Relative Effectiveness of Different forms of Programmed Learning Material."^6

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In this study researcher used seven forms of a programme on 'Thermometers' were prepared. All the seven forms had a common entering behaviour and terminal behaviour and hence a common criterion test was prepared to measure the achievement of the programme forms.

The seven forms prepared were as follows:

1. Linear overt form,
2. Linear covert form,
3. Response prompt writing form,
4. Response prompt reading form,
5. Skip programme form,
6. Branching form, and
7. Hybrid form (Branching and Linear form).

These seven forms of the programme were the independent variables of the investigation. The sample consisted of 322 pupils drawn from eleven sections of std. VIII of nine English medium secondary schools in the city of Baroda. There were forty six students in each treatment group. The experiment was conducted separately in each class. The pupils of a class were randomly divided into seven groups in order to assign one treatment to each group. The criterion test of the programme was given immediately after the pupils completed the programme.
The data were analysed using the analysis of covariance comparing the different treatments with respect to immediate test scores and retention scores.

Findings:

The results of the study revealed that form (4) response-prompt covert reading was better than all the others, both on the immediate post test and the retention test form (6) i.e. branching form was the least efficient in terms of both immediate post test and the retention test. The percentage of the retention as another measure of comparison indicated that the groups with the covert forms—viz. form 'b' (linear covert form thinking) and form (d) (response promot covert form reading) were the groups with highest loss. The overt response forms such as form 'a' (linear overt form), form 'f' (Branching form) and form 'g' (hybrid form) facilitated better retention. The results implied that 'd' form can be said to be the most efficient form if one considers both the criteria of immediate post-test and percentage of retention. It was suggested that the retention test should be a part and parcel of the development of programmed material.
Study-2

"A Comparative Study of Teaching by Different Methods of Programming of Different Levels of Pupils."

This study attempted to know which method of programming could have better impact on instruction for the development of an ability for a given group of students.

Branching, linear and simple programmes (i.e. without providing immediate knowledge of results) were tried out on below average, average and above average students to study the relative effects of different types of programmes on the development of knowledge, comprehension and application objectives for 'solving simple equations'.

The sample consisted of class VI students of an English medium school in Delhi. Three matched groups were formed on the basis of marks obtained by students in mathematics in their last examination. These groups

were then administered the different styles of programmes on 'Solving Equations'. The treatment lasted for a week. To analyse results 'treatment X levels' design of analysis was followed and F value were computed.

The main findings were -

(i) F value for the treatments were 3.15 and 5.14 respectively, which obviously showed that the treatment effects did not seem to be significantly different,

(ii) With so many missing cases with school marks not very much dependable as criterion variable and the sample size being also quite small, no sound conclusions could be drawn;

(iii) To arrive at certain conclusions replications with better control were needed.

Study-3

"An Experimental Study of Interaction Effects of Styles of Programming, Response mode and Taxonomic categories in Geography."  

The major objective of the study was to ascertain the interaction effects and main effects of styles of programming, response mode and taxonomic categories.

The study was conducted on a sample of 240 students of class VIII in two cycles. The two styles of programming linear and branching- were developed on the topic 'Earth as a Planet' in Physical Geography. A mixed 2x2x2 factorial design with three variables- styles of programming (A), response mode (B) and taxonomic categories (C) was used.

The major findings of the study were as follows:

(i) Branching programme was more effective to linear programme. But linear programme was more effective at knowledge level, whereas branching programme was more effective at comprehension level.

(ii) The Branching programme with covert response mode at comprehension level was more effective to linear programme, whereas linear programme with overt response mode at knowledge level was superior to branching programme.
Study-4

"The use of Linear and Branching Programmes under Supervised and Non-supervised situations."  

In this study researcher used the two types of programmes. One is Linear and Second one is Branching. Researcher programmed learning material which can be given to the learner under two situations, namely supervised and non-supervised.

The objectives of the study were as follows:

(i) To develop the programme learning material on one unit of geography in two different styles namely Linear and Branching.

(ii) To compare the relative effectiveness of:
(a) Linear and Branching programmes.
(b) Linear programmes under supervised and non-supervised situation.
(c) Branching programmes under supervised and non-supervised situation.
(g) Linear supervised and Branching supervised situation.

(e) Linear non-supervised and Branching non-supervised situation.

The subjects of the experiment were 194 pupils—boys and girls of std. IX studying in five schools, out of which three were rural schools and two were urban schools of Baroda city. The students were randomly assigned to four treatment groups. The age of the subjects ranged from 14 to 18 years.

The investigator used the statistical technique of analysis of covariance on the basis of the analysis of covariance. The following observations were made.

(a) The Linear supervised was found to be superior to linear non-supervised in both rural and urban samples.

(b) The branching non-supervised was found to be significantly better than linear non-supervised.

(c) The Branching supervised was found to be significantly better than Linear non-supervised.

(d) The Branching supervised and the Branching non-supervised were not found to differ significantly.

(e) The Branching supervised and the linear supervised were not found to differ significantly.
Study-5

"Programmed Learning vs. Traditional approach in the teaching of Gujarati in Std. IX."¹⁰

In this study, the investigator attempted the technique of programming in the teaching of language and also analysing the reactions of the students to the programmed learning approach.

Following were the findings of this study:

(i) The difference between the two means of the experimental and the controlled groups was found to be significant at .01 level.

(ii) The programmed learning approach was more effective than the conventional teaching approach for the students having high I.Qs. as well as low I.Qs.

Study-6

"To develop Auto-instructional programmes in Algebra for Std. VIII and to find out their Effectiveness in relation to different variables."¹¹


In this study investigator developed the auto-instructional programmes covering the whole syllabus of Algebra (old course) of Std. VIII. In this experimental type of study, the control group was taught by conventional method and the experimental group was allowed to learn by auto-instructional method. The self-test, which could give the idea of achievement to the students as well as the teacher was prepared and given to both the groups at the end of each unit. The total mean score as well as the test-wise mean scores of both the groups were computed to find out the effectiveness of auto-instructional programmes. The investigator also studied the relationship between the achievement scores on auto-instructional programmes and variables.

The results of the study were:

(i) The total mean score achieved by the experimental group was higher than the total mean score achieved by the control group.

(ii) The average time taken by the experimental group was less than the average time allotted to the control group.

(iii) The order of difference between mean achievement
(iv) With some explanation of a few technical terms the standard V students could learn through the programme easily and could answer the 'Self-tests' given at the end of each unit quite satisfactorily, but taking atmost double the time to go through the same content learnt by the students of standard VIII.

Study-7

"To Develop Programmed Learning Material and Study Pupil's Achievement on Programmed Learning Material in Relation to some Personality variables."¹²

This study was undertaken to investigate how effective the Programmed learning material is with pupils having different personality characteristics. A sample of 525 pupils of Std. VIII was taken from eleven Gujarati medium schools of the city of Baroda.

One linear programme in science and branching programme in Geography were prepared by the investigator. These programmes were given to the pupils along with psychological tests such as Bermeuter's Personality Inventory, IPAT anxiety scale and intelligence test. The achievement on programmed learning material was judged in terms of the scores obtained by the pupils on the criterion tests given immediately after completing the programmes and after an interval of two months. Partial correlations between programme types and selected personality variables were computed.

The following were the findings of the study:

(i) Relationships between both types of programmes and intelligence was found to be significant.

(ii) Anxiety correlated negatively with the achievement on the linear programme.

(iii) Self-sufficiency and introversion-extroversion did not influence the achievement on any of the two types of programmes.

The findings of the investigation supported the general assumption that the achievement on programmed learning material is least affected by the personality characteristics of the learners.
Study-8

"A study of the Effectiveness of Programmed Learning Strategy in Learning of Physics in X class of Secondary School."

In this study Miss Pandya developed Programmes on 'light' which were tried out in class X of different schools. The criterion tests were developed. A sample of class X students of six schools in the rural area of the four districts of Gujarat state was selected. Out of these three classes were treated as experimental group which was taught through the programmed learning material and three classes of the other three schools as the control group which was taught through the conventional teaching method. Data about achievement motivation, S.E.S. and I.Q. were also collected. Analysis of variance and convenience technique were employed to compare the achievement of the experimental and control groups.

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The major findings of the study were as follows:

(i) The experimental group achieved more in all the four tests.

(ii) The gain of the students of the experimental group at the past test scores was significantly greater than the pre-test scores.

(iii) Learning through programmed learning material benefited the students with high, middle and low I.Q.

(iv) When the effect of the variable of motivation was partialled out, the adjusted mean scores showed that the experimental group achieved higher than the control group.

(v) The developed programme gave enough challenge to lowly motivated pupils than to highly motivated pupils.

In all, the researcher reported the review of fourteen studies in this chapter. Besides the reported studies number of other small studies were studied by him. From these studies the researcher got a comprehensive view of the studies, their techniques of
attacking the problem, statistical analysis of the data and findings supported by the evidences. The researcher got an opportunity to modify his design to study his objectives and hypotheses of the research. He could select the appropriate statistical techniques to analyse the data in the light of the hypotheses of the study. In short, the review work provides important guidelines for threshing out the problem, selection of the objectives, preparation of design to collect the data, and the use of appropriate statistical techniques to analyse the data in the context of the hypotheses of the study.