Chapter V

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CHAPTER - V
SUMMARY AND CONCLUSION

5.1 INTRODUCTION

Our brains evolved to code and interpret complex stimuli such as images, colors, structures, sounds, smells, tastes, touch, positions, emotions and language. We use these to make sophisticated models of the world we live in. Our memories store all of these very effectively. Unfortunately, a lot of the information we have to remember in modern life is presented differently - as words printed on a page. While writing is a rich and sophisticated medium for conveying complex arguments, our brains do not easily encode written information, making it difficult to remember. The major assumption in antiquity was that there are two sorts of memory: the "natural" memory and the "artificial" memory. The former is inborn and is the one that everyone uses every day. The latter is trained through learning and practicing a variety of mnemonic techniques. It can also be used to perform feats of memory that are quite extraordinary or impossible to carry out using the natural memory alone.

5.2 STATEMENT OF PROBLEM

A Study on the Effectiveness of a Specially Designed Memory Training Package on Enhancement of Memory of Secondary School Students

5.3 OBJECTIVES OF THE STUDY

The main aims of the study were to Develop and Validate the Memory Training Package and ensure the effectiveness of Memory Training Package on Enhancement of Memory of Secondary School Students. The specific objectives are as follows...
1. To Study the Effectiveness of Memory Training Package among Secondary School Students.
2. To study the difference in the level of effectiveness of Memory Training Package among boys and girls of secondary school students.
3. To study the extent of retention of Secondary School Students taught by Memory Training Package.
4. To study the difference in the level of retention of boys and girls of Secondary School students taught by Memory Training Package.
5. To Study the relationship between Memory and Intelligence of secondary school students.

5.4. VARIABLES

Independent Variable – Memory Training Package.

Conventional Method

Dependent Variable - Enhancement of memory.

Secondary Independent Variable: Intelligence

Moderate Variables - Gender

5.5. HYPOTHESES

1. There exists no significant difference between the mean gain scores on enhancement of memory of experimental and control group before teaching Memory Training Package (MTP).
2. There exists significant difference between the mean gain scores on enhancement of memory of experimental and control group after teaching of Memory Training Package (MTP).
3. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of experimental group before teaching of Memory Training Package (MTP).
4. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of experimental group in their immediate post test after teaching Memory Training Package (MTP).

5. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of control group before teaching of Memory Training Package (MTP).

6. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of control group in their immediate post test after teaching of Memory Training Package (MTP).

7. There exists no significant difference between the mean gain scores on the enhancement of memory of boys of experimental and control group before teaching of Memory Training Package (MTP).

8. There exists no significant difference between the mean gain scores on the enhancement of memory of boys of experimental and control group in their immediate post test after teaching of Memory Training Package (MTP).

9. There exists no significant difference between the mean gain scores on the enhancement of memory of girls of experimental and control group before teaching of Memory Training Package (MTP).

10. There exists no significant difference between the mean gain scores on the enhancement of memory of girls of experimental and control group in their immediate post-test after teaching of Memory Training Package (MTP).

11. There exists no significant difference between the mean gain scores of experimental group in immediate post test and delayed post test after teaching of Memory Training Package (MTP).

12. There exists no significant difference between the mean gain scores of boys and girls of experimental group in their immediate post test.
13. There exists no significant difference between the mean gain scores of boys and girls of experimental group in their delayed post test.

14. There exists no significant difference between the mean gain scores of boys in their immediate post test and delayed post test.

15. There exists no significant difference between the mean gain scores of girls in their immediate post test and delayed post test.

16. There exists no significant relationship between memory and intelligence of secondary school students.

5.6. METHODOLOGY

For the present study Experimental Method was used. On the other hand Methodology of present study consists of design of the study, sampling, validation of achievement tool, development and validation of Memory Training Package, tools and techniques, procedure of data collection i.e., which clears the path of the study.

DESIGN OF THE STUDY

The present study is pre-test, post-test parallel group design. In this design the effects of the treatments are judged by the difference between the pre and post-test scores. This is compared with the control group.

The main steps included in the experimentation

i) Experimental and control group were pre tested on achievement tool

ii) Experimental group was taught by the Memory Training package and the control group was taught by the conventional method.

iii) Both the groups were immediately post tested on their achievement

iv) The Experimental group was delayadely post tested after the gap of one month on achievement test to test whether they sustain the improvements.
SAMPLING

The sample of 100 students were tested by simple memory test of recalling 20 words from given word list, students having similar average range of marks in simple memory test were divided equally and randomly in both experimental and control groups consisting of 60 sample. The Simple Random Stratified Sampling Technique was used for the study.

Present investigation comprises following sampling Phases

Phase-1: To give ‘Meaningful Connected Words Recall Test’ on 100 9th Standard students. (As Prescribed in Manual of Experiments in Psychology). The term described in 3.5.)

Phase-2: Categorizing 60 average memory level students out of 100 sample

Procedure in Framing the Equivalent Groups

60 students of 9th graders were selected from two government high school of Shimoga city and sample was divided into two groups namely experimental (Government High School, Durgigudi) and control group (Government High School, B.H Road). The experimental group consisted 30 sample of 15 male and 15 female students who were taught “Memory Training Package” by investigator and the control group comprising 30 of 15 male and 15 female students were taught by the conventional method of teaching by subject teacher. To find out whether there was any significant difference between the two groups; mean, SD and t test was calculated to scores of ‘Meaningful Connected Words Recall Test’. The obtained t-value was 1.68 which found insignificant at 0.05 level of significance. The mean of the both the groups were 12.83 and 12.56 than SD was 1.74 and 1.67 respectively. Hence the mean were almost same. Consequently it was assured that both the groups were equivalent to each other before beginning of the experiment.
Construction of Achievement Tool

In the present study, it was supposed to construct valid, reliable and comprehensive achievement tests to measure the achievement of the students in prescribed lessons included in the study. Those lessons were 'Delhi Sultans' and 'Mahmud Ghazni and Mohammad Ghori', from Social Science, 'The Little Martyr', and 'The Black Tuesday' from English of 9th standard state syllabus. The achievement test contained 79 items. While constructing the tests the following aspects were considered.

1. The test should adequately cover all the contents selected.

2. The test should be objective type.

3. Language of the items and instruction to respond to the items should be clear and appropriate to the level of students.

4. Items should be specific and unambiguous.

With the above consideration in mind adequate number of objective test items like 'Multiple Choice', 'fill in the blanks', 'Matching', 'answer in one sentence', 'true or false' were constructed on all the sub contents.

The draft items were scrutinized by the investigator in consideration with a few subject experts, teacher educators, and experienced teachers at the primary level and guide to see that curricular validity is ensured, all the basic competencies are being tested and items good and appropriate for the purpose. They were modified according to the suggestions and comments.

Scoring

Simple scoring method was followed for giving weightage to responses of the students. One mark each was awarded for right answer and zero mark awarded for wrong answer.
PILOT STUDY

To test the validity and reliability of the test, the preliminary form of the achievement test consisting of about 79 items was administered personally by the investigator to a group of 36 students of 10th standard on 9th standard achievement tool who were not included in the sample of the study. The 10th standard students were chosen for the pilot study because when investigator started the pilot study the students of 9th standard were new to the subjects because of new academic year. Hence 10th standard students were considered for the pilot study because they were just output from 9th standard. As the students had no difficulty in following instructions given in the test paper for each type of questions, oral instructions were not necessary. However the students were given clarifications wherever they expressed doubts and such points were noted, to be made use of modify the instructions and test items for the final form of the test. The test was administered in one session for the 1 hour.

Item Analysis

One of the important steps in the standardization of any tool is item analysis. For this purpose, the investigator selected 36 samples as mentioned above and they were arranged from the highest to the lowest score to analyse the items for find out the difficulty level and discriminative index for each item. Investigator took top 27% of the sample –the high scores and the bottom 27% of the sample –low scores and 46% of the sample -average scores were grouped.

• Selection of Items

Any item whose discriminating power is above 0.30 should be considered as a reasonably good item. Keeping this in mind the present investigation, only such of those items whose difficulty index ranged from 0.33 to 0.76 and whose discriminating power falls between 0.30 and 0.68 were selected.
Item Validity

Than Item validity was computed to the 50 items selected based on difficulty index and discriminatory power. Phi-Coefficient technique was employed to find out the correlation between item to item.

Reliability of the Test

• Split Half Reliability

The reliability co-efficient was found to be 0.90, which depicted the high reliability of the tool. The final form of the scale containing 50 items was used as an achievement test in 45 minutes for pre-test. The same test was used in post test.

• Test- Retest Reliability

The test-retest reliability co-efficient was found to be 0.86, which depicted the high reliability of the tool.

TOOLS USED FOR STUDY

The present study involved following tools

1. Meaningful Connected Words Recall Test: Learning does not take place without memory. In the sense the organism has to start from the scrtatch in each trail. It is because of retention the organism shows progressive change as training proceeds, and responds with less energy in each successive trail. This is possible because of memory traces which are technically known as neurogram of engrams. Of course anatomical and physiological details of these traces are not yet known. Recalling is also known as reproduction. The amount of material reproduced correctly of what has been learned is known as recalling or recall memory. There are several ways of recalling like method of retained members, memory span,
method of anticipation and method of paired associations...etc., here the subject has to identify or recognize the items shown to him.


Plan: Present orally the list thrice. Have the number of words reproduced from list.

Procedure: Seat the S comfortably and instruct them thus: I will read out a list of words, listen carefully so that you may have to reproduce the list sometime later. With this instruction say ready, start the stop watch, and read out the list at the rate of two seconds a word and an even tone. Thus the present the list three times with an interval of 5 seconds in between each presentation of the list. Then make them to reproduce the list.

Precautions: The rate of presentation and the tone must be constant, throughout.

Analysis of the Results: Find out how many words are correctly reproduced from list. Calculate mean, SD and t for the group results.

The list of meaningful connected words given in Appendix.

2. Raven's Progressive Matrices: Standard Progressive Matrices is a test of person's capacity at the time of test, to apprehend meaningless figures presented for observation. The test consists of 60 problems divided into 5 sets of 12 each. The problems become progressively more difficult. In order to sustain interest and to be free from fatigue the figures are boldly presented accurately drawn and pleasing to look at. The scale is intended to cover the whole range of intellectual development from childhood to early old age the total scores of a person provide
an index of intellectual capacity whatever his nationality of education. In the sense it is culture fair test to a great extent. Individuals’ intelligence can be assessed and compared irrespective of caste, creed, culture, nationality, education and sex. Time taken is considered for the purposes of comparison it is mainly a work limit test. 1) Though the deviation in the consistency score is more than 2 and it not considered as consistency in the strict sense, for general purposes the total score can be taken as valid. 2) It is said that the people who obtain low scores have a proportionately greater number of success by pure chance. To this extent low total scores are always less consistent and reliable than high scores, 3) if the test is administered individually it appears to introduce emotional factors which are less operative. When he is allowed to work quietly at his own speed. Group test provides more reliable sample of a person’s output of intellectual activity during the test. 4) (a) one in 20 may be expected to obtain a score at or above 95\textsuperscript{th} percentile point. Similarly one in 20 can be expected to obtain a score at or below 5\textsuperscript{th} percentile point. (b) one in 10 may be expected to obtain a score at or above 90\textsuperscript{th} pp. and one in 10 may obtain score at or below 10\textsuperscript{th} pp. (c) one in 4 may obtain a score at or above 75\textsuperscript{th} pp and one in 4 may obtain score at or below 25\textsuperscript{th} pp. (d) one in every two may be expected to fall between 25\textsuperscript{th} and 75\textsuperscript{th} pp. 5) RPM does not very clearly differentiate between young children or between adults of superior intellectual capacity 6) Test normally takes 45 minutes to complete.

Materials: 1) RPM 2) Key to check up the answers 3) norms 4) Data Sheet to write answers 5) stop-watch 6) writing materials.

Procedure: Seat Subjects in well ventilated room. Place the RPM book let before them. And give instructions. Give set A first than after completion of A give B set then C then D and Then E. note down the total time taken by individuals to answer the all the problems
Precautions: 1. Before allowing the Subjects to start answering the problems, make sure that they understood what exactly they have to do. 2. Check up the answers of Subjects, only after all the problems solved. 3. No problem should be left unanswered. 4. Though there is no time limit, the Subjects have to answer the problems as fast as possible.

Analysis of the Result: 1. Check up the answers with reference to the key. 2. While checking the answers, it the subjects have written more than one answer to a problem. Take the last answer into account, whether it is right or wrong.

RPM can use individually and for group, for the present study it was used on group of 9th standard students who were included in the experiment to see the relationship of their Intelligence with their Memory.

DEVELOPMENT OF MEMORY TRAINING PACKAGE:

The four lessons were taken from the 9th standard Social Science and English (State Syllabus). The lessons were ‘Delhi Sultans’, ‘Mahmud Ghazni and Mohammad Ghori’ from Social Science, ‘The Little Martyr’, and ‘The Black Tuesday’ from English. The package developed by dividing the whole lesson into different tasks.

Development of the Memory Training Package considered following factors.

1. Flexibility for teachers to recognize the content and activities wherever necessary to suit the situation.
2. Sustenance of motivation and interest among students throughout the programme.
3. Provision to continuous and inbuilt evaluation throughout the programme.
4. Students would be able to perform the activities on their own according to the instructions by the investigator.

5. Materials required would be readily available within the local environment, preferably low cost materials.

6. Active use of process skills of observation, classification and inference was facilitated.


8. The clarity should be maintained to use the package by any other teachers also.

Validating the Memory Training Package

Prepared package validated by the eight eminent experts from the field of education by evaluation of a questionnaire which provided in 5-point Scale;

1. Superior - Score 5
2. Excellent - Score 4
3. Very good - Score 3
4. Average - score 2
5. Poor - score 1

It was found that Eighty percentage of positive report of judges, so it made to use the package with full confidence. Then it was taken for consideration for final Study.

The Memory Training Package implemented over a span of 5 months in about 120 periods of 45 minutes each from Monday to Friday of the week.

Methods of Teaching used During Memory Training Programme

The methods of Lecturing, Discussion, Activity, Role play, group study method was used during Memory Training Programme.
Materials used during Memory Training Programme

Activity Sheet, Flash cards, chits, charts, books, photographs, observation sheets, pencils, erasers.

DATA COLLECTION

The data were collected by controlling the extraneous variables and internal and external threats of the experiment. The objectivity was ensured during the data collection. The experiment was conducted for the period of 120 working days. The investigator conducted the experiment and collected the data in person by visiting two Government Secondary Schools in Shimoga city by dividing 45 minutes of time for each class for experimental and control group. There was heed given for simultaneous class by investigator to experimental group and by subject teacher to control group.

The students of experimental group of 9th standards were subjected to experimental treatment i.e., they were taught with the specially designed Memory Training Package, whereas the students of control group were taught the prescribed units with the conventional method by subject teacher. The package was implemented by the investigatory herself carefully following all the relevant principles, guidelines over a span of 5 months, from June 2010 to October 2010 in about 120 periods of 45 minutes each from Monday to Friday of the week. While implementing the package the following factors were duly considered.

1. Even though the package was developed by the investigator herself, a thorough mastery over each topic of the planned syllabus in respect of objectives specified, and insight into the subject itself, the method of introduction of each topic, interaction with the students during the activity and finally, evaluation of each student’s performance in each class were
considered essential for its implementation. These factors were satisfied by the investigator.

2. As the intellectual and motivational appeal of the activity based package might vary from child to child, as also their reception and reaction capabilities and forms, the principle of flexibility was adopted to make adaptations within the classroom sessions: usage of varied language forms to enable every student to understand the presentation and questions involved, elongation or reduction of session length in keeping with motivational level of the group in a particular class, above rule followed throughout the implementation stage was to make each classs and enjoyable learning experience for each student.

The following observations made during the course of teaching package;

1. All learners showed a keen interest in all the activities by investigator.

2. Students who were not good at speaking English also showed a great interest in preparing themselves for the activities. Their verbal ability is eliminated as the attention is paid on the spot to the performance in the activity.

3. For some classes, the investigator had to literally pull the bright achievers out of their hideouts for activity class.

4. The students seemed to be not exposed to any sort of academic freedom in the classroom, So, the activity classes became a bit chaotic.

The collected data were subjected to statistical analysis.
STATISTICAL TECHNIQUES USED

3. **t-test**: t-test is the test of the significance of the difference between two means. It involves the computation of the ratio between observed difference between two sample means and the sampling error factor.

2. **Carl Pearson's Product Moment Correlation**: this type of Correlation used to find the relationship of two variables, for the present study Carl Pearson's Product Moment Correlation was used to see the relationship to two variables namely Memory and Intelligence.

5.7. FINDINGS OF THE STUDY

1. The present study made known that the experimental and the control group differ significantly in the post-test when compare to pre test. Experimental group were scored high in post test than control group. Study exposed that there was immense enhance in total marks of experimental group during post test compare to control group. Conclusions cleared that the students who were taught by Memory Training Package memorized events more and show higher achievement than those who were taught with conventional method of teaching. Therefore Memory Training Package found effectiveness in memorizing and in teaching.

2. Boys and girls of experimental group were scored high compare to boys and girls of control group after teaching of Memory Training Package, that to girls were scored little well again compare to boys thus it can be concluded that Memory Training Package have significant impact on gender.

3. The study inculcates mnemonics for memorization and helps for longer retention, Hence the delayed post test was given after one month of
immediate post test. The result revealed that the Memory Training Package helped students in longer retention.

4. Interesting finding was that the girls were retained unerringly same in immediate and delayed post test.

5. To distinguish the relationship between memory and intelligence the r was calculated. Study revealed that there was a slight and negligible relationship between memory and intelligence. So it can be said that memory has slight relationship with intelligence but it can be said insignificant to take into consideration.

5.8. DISCUSSION

Robert Kail and Christine Vereb Marshall conducted the study on reading skill and memory scanning. In this study they found the scanning memory of less skilled and skilled readers and found that skilled readers were answered quickly to be learnt material. But the present study entirely different, tried to enhance the memory of average level students.

Richard. J. Patterson, James W. Hall, Kim, Willson.P. conducted a study on mnemotechnic of keyword method for the study of foreign language vocabulary and found effectiveness of key word method on the study of foreign language vocabulary. In Present study key word method is one of mnemotechniques and applied to learn the vocabulary of the English lesson of ‘The Little Martyr’ and found effectual in learning vocabulary.

Charles Bowen, Tony Gelabart, and Joseph Torgesen in 1979 investigated memory process involved in performance on the Visual-Sequential Memory Subtest of the Illinois test of psycholinguistic abilities. This study just investigated the memory process involved in visual-sequential memory in psycholinguistic
abilities. Present study employed all the memory process on remembering the contents of their subjects and found effective.

M. Carr Payne of Gerogia State University in 1980 found the normal and poor readers auditory short term memory and span of digit. Present study considered average memory level students and implemented the all the memory techniques to enhance their memory.

Vanderburgh, Robert in 2005 tried on contributions of working memory in creative writing samples of high school students. Present study tried to give techniques for long-term memory retention.

Mojardin-Heraldex, Amrocio in 1998 searched the memory processes cause adults in order to prevent their negative consequences or false memory. Present study helped the students who learning in secondary schools to apply the mnemotechnics in learning their subject contents.

5.9. EDUCATIONAL IMPLICATIONS
1. Present study reveals the effectiveness of the memory techniques in enhancement of memory among students. It can be practiced in the schools.
2. Teachers’ should aware of the memory techniques and they implement mnemonics in their teaching.
3. Teachers should make the students to follow the techniques to remember the concepts.
4. The board of the editors of textbooks should give heed on memory techniques. In the end of the lessons they should give tip-off of activities based on memory techniques.
5. Teachers can give group activities and group discussion to practice the memory techniques for remembering the concepts.
6. Teacher’s role is of paramount importance in teaching-learning process. Thus teacher should give creative learning environment for better learning. So it can be suggested that by inculcating mnemonics in teaching help the students’ to get done more in their studies.

7. Seminars, Workshops and refresher courses should be organized to train the teachers regarding mnemonics.

Based on the findings of the Present study, it showed that the practicing memory techniques can enhance the achievement of students. Teacher teaches the lessons but won’t help the students to memorize the events. We have number of memory techniques, teacher should make the students to use memory techniques in their study and memorize the events. Present study made new effort and evident that the Memory Training Package is helpful for the memorizing events when needed. The Study suggest that the Memory Techniques can use in all the subjects and at all the levels of education effectively.

Today it is commonplace to compare the human brain to a computer, and the human mind to a program running on that computer. Once seen as just a poetic metaphor, this viewpoint is now supported by most philosophers of human consciousness and most researchers in artificial intelligence. The brain is highly redundant; memory capacity suggests that the capabilities of the human brain are more approachable than we had thought. While this might come as a blow to our egos, it suggests that we could build a device with the skills and abilities of a human being with little more hardware than we now have—if only we knew the correct way to organize that hardware. A research study published in the June 2006 issue of the American Journal of Geriatric Psychiatry found that people can improve cognitive function and brain efficiency through simple lifestyle changes such as incorporating memory exercises, healthy eating, physical fitness and stress reduction into their daily lives. There are a loosely associated group of mnemonic
principles and techniques that can be used to vastly improve memory known as the Art of memory. Some of the recommendations are to stay intellectually active through learning, training or reading, to keep physically active so to promote blood circulation to the brain, to socialize, to reduce stress, to keep sleep time regular, to avoid depression or emotional instability and to observe good nutrition.

5.10. DIRECTIONS FOR FURTHER INVESTIGATION

1. This type of study can be conducted on all the levels of education and all the levels of students and also in all the subjects.

2. Memory training programme can conduct on using images, pictures, animations,

3. Computer assisted memory training package can prepare and administer on all the levels of students.

4. Comical associations also done with mnemonics and train the students to remember the learnt materials.

5. Each technique can be studied separately by more examples and can establish the effectiveness of each technique.

5.11. LIMITATIONS OF THE STUDY

1. This study confined to two Government secondary schools.

2. This study restricted to Shimoga city only.

3. This study limited to 9th Standard Students.

4. Package included only English and Social Science lessons of English Medium

5. The Memory Training Package includes only 7 mnemonics.