CHAPTER VII

OBSERVATIONS, CONCLUSIONS AND SUGGESTIONS

CONTENTS

7.1 Resume of the Experiment
7.2 Observations
7.3 Statistical Observations
7.4 Findings and Discussion
7.5 Educational Implications
7.6 Suggestions for Further Research
CHAPTER - VII
OBSERVATIONS, CONCLUSIONS AND SUGGESTIONS

The present chapter deals with various steps taken by the investigator to complete the research, glaring observations made while the experiment was in progress and the conclusions made on the basis of the data obtained along with the suggestions for further work on the line.

7.1 Resume of the Experiment:

The present study as its title indicates, is concerned with the study of readability indices of the prescribed materials in social studies for standard IX. Therefore, it was the first and the foremost task to define readability and then to make a systematic assessment of the readability indices of all the twenty nine chapters of the text-book prescribed for standard IX. A systematic assessment needed the selection of a valid and reliable readability formula.

The use of term "readability" has been debated by many experts for its exact meaning - as it covers many aspects of written material, which collectively go to make their reading difficulty. Many of them have concluded that readability is synonymous to 'difficulty' in reading.
comprehension. The concern of the investigator in the present study has been, the style of writing and the way in which the matter has been presented in the text-book. In other words, it was a study of the factors that affect the style in which the language has been used.

A systematic assessment of the readability level of material demands the selection of an appropriate formula. In other countries a number of formulae has been developed to assess readability. For the present study the Aukerman's formula is selected, the reasons of selection are already stated in chapter IV.

The Aukerman's formula involves the count of average sentence length, long words, subordinate clauses and the impedilexae. Therefore, it was the first requirement to decide the impedilexae included in the language used in all twenty nine chapters of the text-book of social studies for standard - IX, before assessing it for its level of readability chapterwise. The investigator used a different but scientific method to locate the impedilexae already described in chapter IV. The total number of impedilexae located in all the twenty nine chapters is
The number of impedilexae having been fixed, all the twenty-nine chapters were analysed, keeping in view other components of the formula. For each chapter, the number of each component including impedilexae were thus determined. Applying Aukerman's formula to the data thus collected, raw readability scores were computed which were converted into standard scores. On the basis of these standard scores three hardest chapters were found out. These hardest chapters were 5, 9 and 18.

After deciding the hardest chapters, the investigators re-wrote them to a lower level of readability. The process of re-writing involved explanation, amplification, substitution and shortening of sentences. The content and the basic ideas which were contained in the original text were fully retained. No change was made in them. The re-written form of the chapters was re-assessed and it was seen that they had lower level of readability than what they had in the original text.

The second requisite was the comprehension test. So a reading comprehension test was prepared keeping in view the content of the above three chapters. For pilot work, 106 multiple choice items were prepared and tried on a population of pupils of standard VIII. Item analysis was
done using T.L. Kelley's 27% method. Finally 70 items were selected and arranged according to the difficulty. Thus the final form of the test was prepared and printed. The investigator also studied its reliability and validity.

This study also needed to measure other two different variables, that is the intelligence and the reading abilities of the students. To measure intelligence, the investigator selected non-verbal group test of intelligence prepared by M. M. Patel. Similarly to measure the reading abilities of the students, the reading ability test prepared and standardized by B.V. Patel was selected. These tests are reliable and valid too.

The second phase of the research is purely experimental in nature. Hence in order to study the effect of low readability material or reading comprehension, the investigator decided to follow the equivalent group technique. The total population under study was 576 pupils. Out of these 576 pupils only 160 pupils were selected under $2^4$ factorial design. Different treatments were given to both the groups. The experimental group was given to read the textual materials re-written to a lower level of readability and the control group was given the original textual material having high readability. The administration of comprehension
test followed by the reading of the individual chapters. Thus the comprehension scores of the subjects were obtained. These comprehension scores were subjected to statistical analysis to test the hypotheses of the study.

7.2 Observations:

During the process of Experimentation, the investigator made observations regarding the teachers as well as the students.

(a) About Teachers:

The investigator took the help of the subject teachers in supervising the reading of the material and the administration of the test. Most of them reacted very favourably and told the investigator that the language used to convey the ideas and content was quite readable and helped the students to comprehend the textual material better.

A small number of teachers expressed a sense of fear that the absence of challenge element in the low readability materials might hamper, in bright students, the development of a sense of meeting the difficulties. They also feared that this type of material might hamper the development of reading skills. The doubts raised by the
teachers are quite reasonable. But they can be 'shaken off by introducing reading material having graded readability.

(b) About the pupils:

It was observed that some of the pupils of the control group gave an impression of being tired while reading the textual material and left reading at times in between. This did not happen in the case of pupils of the experimental group. They read a chapter at a stretch.

In addition to this, it was also observed that the students of experimental group finished reading of the chapters in the stipulated period while some of the pupils of the control group could not do so.

When the test was over, the investigator casually, asked some questions to the students about the material. It was found that the pupils of experimental group enjoyed reading the new material and easily comprehended content. This spark of joy and satisfaction of reading was found to be missing in the pupils of the control group.

7.3 Statistical Observations:

On the basis of data analysis made in chapter VI, the following observations and conclusions were made, study-wise. They are briefly described below:
Study - 1: Treatment Vs Reading Comprehension:

$H_1$: There is a significant difference between the mean scores, on reading comprehension test in social studies of the Experimental Group and Control Group.

The null form of hypothesis was tested.

Data:
\[ F_{\text{obs.}} = 58.08 \quad F_{\text{tab.}} = 6.81^{**} \]
\[ M_{A1} = 34.62 \quad M_{A2} = 28.72 \]

Observation:

The null hypothesis was rejected.

Conclusions:

(1) The built up alternative hypothesis was accepted.

(2) The means show that the comprehension of Experimental Group was better than the control group.

(3) The low readability material had improved comprehension of the students in social studies.

Study - 2: Sex Vs Reading Comprehension:

$H_2$: There is no significant difference between the reading comprehension of boys and girls.

Data:
\[ F_{\text{obs.}} = 41.29 \quad F_{\text{tab.}} = 6.81^{**} \]
\[ M_{B1} = 34.1 \quad M_{B2} = 29.18 \]
Observation: The built up null hypothesis was rejected.

Conclusions:
(1) The alternative hypothesis was accepted.
(2) The difference is significant.
(3) The comprehension of the boys is comparatively better than the comprehension of the girls.

Study - 3: Intelligence Vs Reading Comprehension:

$H_3^-$: There is no significant difference between the mean scores, on reading comprehension of low I.Q. group and high I.Q. group.

Data: $F_{\text{obs.}} = 11.279 \quad F_{\text{tab.}} = 6.81^{**}$

$M_{C1} = 32.41 \quad M_{C2} = 30.37$

Observation:
The built up null hypothesis was rejected.

Conclusion:
(1) The alternative hypothesis was accepted.
(2) The difference is significant.
(3) The comprehension of the students possessing high I.Q. is comparatively better than the comprehensions of the students possessing low I.Q.
Study - 4: Reading Ability V/s Reading Comprehension:

$H_4$: There is no significant difference between the mean scores, on reading comprehension test of Good and Poor readers:

**Data:**  
$F_{\text{Obs.}} = 13.533$  
$F_{\text{tab.}} = 6.81^{**}$  
$M_{D1} = 33.01$  
$M_{D2} = 30.27$

**Observation:**  
The built up null hypothesis was rejected.

**Conclusion:**  
(1) The alternative hypothesis was accepted.  
(2) The difference is significant.  
(3) The comprehension of the Good readers is better than the poor readers.

Study - 5: Treatment x Sex Vs Reading Comprehension:

$H_5$: There is no significant effect of the interaction of treatment and sex on the reading comprehension.

**Data:**  
$F_{\text{Obs.}} = 0.001$  
$F_{\text{tab.}} = 6.81^{**}$  
$F_{\text{tab.}} = 3.91^{*}$

**Observation:**  
The null hypothesis is not rejected.

**Conclusion:** There is no significant interaction effect of treatment and sex on reading comprehension.
Study - 6: **Treatment x Intelligence Vs Reading Comprehension**

**H₆**: There is no significant effect of the interaction of treatment and Intelligence on the reading comprehension.

**Data:**  
\[
F_{\text{obs.}} = 0.9385 \quad \quad F_{\text{tab.}} = 6.81^{**} \\
F_{\text{tab.}} = 3.91^{*}
\]

**Observation**: The null hypothesis is not rejected.

**Conclusion**:  
There is no significant interaction effect of treatment and I.Q. on reading comprehension.

Study - 7: **Treatment x Reading Ability Vs Reading Comprehension**

**H₇**: There is no significant effect of the interaction of treatment and reading ability on reading comprehension.

**Data:**  
\[
F_{\text{obs.}} = 0.0166 \quad \quad F_{\text{tab.}} = 6.81^{**} \\
F_{\text{tab.}} = 3.91^{*}
\]

**Observation**:  
The null hypothesis is not rejected.
Conclusion:
The interaction effect of treatment and reading ability on reading comprehension is not significant.

Study - 8: Sex x Intelligence Vs Reading Comprehension:

H₈: There is no significant effect of the interaction of sex and I.Q. on the reading comprehension.

Data:

\[ F_{\text{obs.}} = 0.4549 \quad F_{\text{tab.}} = 6.81^{**} \]

Conclusion:
The interaction effect of sex and I.Q. on reading comprehension is not significant.

Study - 9: Sex x Reading Ability Vs Reading Comprehension:

H₉: There is no significant effect of sex and Reading ability on the reading comprehension.

Data:

\[ F_{\text{obs.}} = 0.3764 \quad F_{\text{tab.}} = 6.81^{**} \]

Conclusion: The interaction effect of sex and reading ability on reading comprehension is not significant.
Study - 10: Intelligence x Reading Ability Vs Reading Comprehension:

$H_{10}$: There is no significant effect of the interaction of I.Q. and reading ability on the reading comprehension.

Data: $F_{\text{Obs.}} = 5.1 \quad F_{\text{tab.}} = 3.91^*$

Observation:

The null hypothesis was rejected.

Conclusion:

The interaction effect of I.Q. and reading ability on the reading comprehension is significant.

Study - 11: Treatment x Sex x I.Q. Vs Reading Comprehension:

$H_{11}$: There is no significant effect of the interaction of treatment, sex and I.Q. on the reading comprehension.

Data: $F_{\text{Obs.}} = 6.51 \quad F_{\text{tab.}} = 3.91^*$

Observation:

The null hypothesis was rejected.

Conclusion:

The interaction effect of treatment, sex and I.Q. on reading comprehension is significant.
Study - 12: Treatment x Sex x Reading Ability V/s Reading Comprehension:

\[ H_{12} : \text{There is no significant effect of the interaction of treatment, sex and reading ability on the reading comprehension.} \]

\[ \text{Data: } F_{\text{Obs.}} = 0.051 \quad F_{\text{tab.}} = 3.91^* \]

\[ \text{Observation: } \]

The null hypothesis is not rejected.

\[ \text{Conclusion: } \]

The interaction effect of treatment, sex and reading ability Vs reading comprehension is not significant.

Study - 13: Treatment x I.Q. x Reading Ability V/s Reading Comprehension:

\[ H_{13} : \text{There is no significant effect of the interaction of treatment, I.Q. and reading ability on the reading comprehension.} \]

\[ \text{Data: } F_{\text{Obs.}} = 1.36 \quad F_{\text{tab.}} = 3.91^* \]

\[ \text{Observation: } \]

The null hypothesis is not rejected.

\[ \text{Conclusion: } \]

The interaction effect of sex, I.Q. and reading ability on the reading comprehension is not significant.
Study - 14: **Sex x I.Q. x Reading Ability V/s Reading Comprehension:**

\[ H_{14} : \text{There is no significant effect of the interaction of sex, I.Q. and reading ability on the reading comprehension.} \]

**Data:**

\[ F_{obs.} = 0.028 \quad F_{tab.} = 3.91^* \]

**Observation:**

The null hypothesis is not rejected.

**Conclusion:** The interaction effect of sex, I.Q. and reading ability on the reading comprehension is not significant.

Study - 15: **Treatment x Sex x I.Q. x Reading Ability: V/s Reading Comprehension:**

\[ H_{15} : \text{There is no significant effect of the interaction of treatment, sex, I.Q. and reading ability on the reading comprehension.} \]

**Data:**

\[ F_{obs.} = 0.65 \quad F_{tab.} = 3.91^* \]

**Observation:**

The null hypothesis is not rejected.

**Conclusion:** The interaction effect of treatment, sex, I.Q. and Reading Ability on the reading comprehension is not significant.
7.4 Findings and Discussion:

On the basis of the conclusions drawn for the 15 studies, a brief summary of the findings is given below:

(1) The low readability material had significant effect on the reading comprehension ability of the students in social studies. The reading comprehension of the experimental group showed considerable improvement.

(2) Boys and girls differed in reading comprehension. Boys showed comparatively better improvement in comprehension than the girls.

(3) The more intelligent students showed more improvement in comprehension than pupils with the low intelligence. The improvement in the reading comprehension of the students of low I.Q. of both the groups is also observed. (32.95 - 27.75).

(4) Good readers can comprehend better than the poor readers.

(5) The students possessing high I.Q. and good reading ability can comprehend better. The interaction effect of I.Q. and reading ability has significant effect on the reading comprehension.
There is no significant interaction effect of sex and I.Q. on the reading comprehension but the second order interaction of sex, I.Q. and treatment has significant interaction on the reading comprehension. Thus the treatment plays important role on the reading comprehension.

It is heartening to state that the pupils of the experimental group scored higher on reading comprehension test than the pupils of the control group. In this study the natural conclusion, therefore could be that lower the level of readability of material the more is the comprehension. It is in agreement with the often quoted findings of David Williams, who observes:

Sixth grade pupils... read with greater speed and better comprehension when they read Science text book materials which had been re-written to a lower level of readability.¹

It is clearly found that the more intelligent pupils can comprehend better than those of low I.Q. but the low readability materials are also found effective on the reading comprehension of low I.Q. students. Therefore, the low readability material at this stage is found to be more useful for the students having low I.Q.

It is notable that reading ability and I.Q. were found to have a significant effect on the reading comprehension of the materials at different levels of readability.

7.5 Educational Implications:

There is very little research in education pertaining to classroom teaching. The reasons are many. Lack of communication is one. The reluctance of teachers to change their modes of teaching is another. Since the system of education in India is highly centralised, there is a little scope for teacher's initiative. The materials, like low readability material could be profitably used by teachers with a little additional effort.

(1) The teacher can re-write the high readability material into low readability material.
(2) The re-writing of low readability materials would be helpful in building the basic ideas while teaching his subjects in the classroom.

(3) The low readability material would motivate the students of different capacities to learn and digest the subjects.

(4) It can bring a change in outlook of a teacher and makes him an excellent one.

(5) Since motivation is an internal condition of the learner, such material will benefit the highly motivated group.

(6) It would be to great advantage of the students if the list of impedilexae and technical words is given at the end of each chapter with their meanings.

7.6 Suggestions for Further Research:

India being a developing country, is lagging far behind as compared to the advanced countries like U.S.A., U.K. and Russia in almost all the scientific and technical fields. It is equally true in the field of educational research and more so in the field of reading and readability.
Indian educational researches have just made a scratching here and there in this field. They have studied only linguistic ability, vocabulary, preparation of a reading ability test and a comparative study of reading formulae. The present study has also focussed its energy on a limited area, though of great importance to accelerate the wheels of research.

Following few problems are indicated for further research:

(i) A study of readability levels of text-books of pupils in relation to their age.
(ii) A study of the effect of written redundancy on the readability of reading materials.
(iii) A study of oral language patterns of the pupils in the context of language patterns used in the reading materials.
(iv) A study of readability levels of text-books in context of explanatory pictures and sketches.
(v) A study of readability levels of reading materials in context of socio-economic status of families of the pupils.
(vi) A comparative study of the effectiveness of low readability materials and programmed instructional materials on the reading comprehension of the pupils.
To develop a formula to measure ideational load of readability in the reading materials.

A comparative study of readability indices of the new text-books and old text-books used in schools before the formation of text-book bureau.

A comparative study of readability indices of reading materials used in different school subjects and their effect on reading comprehension.

A study of readability levels of text-books in the context of children's attitudes towards reading materials.

In this age of mass education it is becoming increasingly difficult to individualise instruction. Therefore, it is most necessary for the good of the nation to think in terms of improving reading materials and developing reading skills to increase the pupils reading ability and decreasing their dependence on the teacher for reading. Therefore, research needs in these fields have become manifold and more urgent. A regular and systematic instruction in reading skills is highly essential in the lower classes of secondary education and a consciousness of the importance of reading on the part of all teachers, irrespective of the subject they teach, is indispensible.