

Chapter-4

*Analysis Result And
Interpretation*



CHAPTER -4

ANALYSIS RESULT AND INTERPRETATION

4.1 INTRODUCTION

Interpretation of data refers to that important part of the investigation, which is associated with the drawing of inference from the collected facts after an analytic study. It is extremely useful and important part of the study because it makes possible the use of collected data. Statistical facts by themselves have no utility. It is the interpretation that makes it possible for us to utilize collected data in various field of activity. It provides certain conclusion about the problem under study.

Keeping the objectives of the study in view the hypotheses have been tested for achieving the objective and drawing the conclusion further.

Science book prescribed for VI Class school children by M.P. Board has been analyzed. The book selected for evaluation is meant for Class VI. It has been written in Hindi medium and is published by the M.P. Textbook Corporation, Bhopal. In fact, it is on the guidelines of the science book prepared by the NCERT. The book was published in 2002 and due precautions have been taken to make it upto date as far as the factual information is concerned. The book costs Rs.13/- which is very much within the buying capacity of an ordinary student.

Identification Data About The Text Book.

Title of the Book	:	विज्ञान
Class	:	VI
Target Group	:	11 years
Subject	:	Science
Medium	:	Hindi



Publisher	:	M.P. Textbook Corporation
Price	:	13.00
Year of Publication	:	2002
No. of pages	:	126

4.2 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXTBOOK RATED BY PARENTS.

The 1st objective is to find out the percentage of parents who rated the physical aspects of the science textbook of Class VI as good, average and poor.

To achieve this objective and also objective 2 and 3 arithmetic mean and standard deviation and total score on physical aspects are computed. Then by using $M \pm \sigma$ three groups are made namely good, average and poor. The results are presented in the following table:

Table 4.1: Percentage of good, average and poor ratings of parents on the textbook.

Rating category	Frequency	Percent
Good	1	6.7
Average	11	73.3
Poor	3	20.0
Total	15	100.0

According to table no.4.1, 73.3 percent parents rated about the physical aspects of the textbook as average. Only few parents (6.7 percent) rated the text book as good and 20 percents parents rated the physical aspect of the textbook as of poor quality.



By going through the table 4.1 it is clear that the physical aspects of the textbook is of average quality according to parents.

4.3 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXTBOOK RATED BY TEACHERS

The 2nd objective is to find out the percentage of teachers who rated the physical aspect of VI Class textbook as good, average and poor.

To achieve this objective results are presented in the table 4.2.

Table 4.2: Percentage of good, average and poor ratings of teachers on the text book.

Rating category	Frequency	Percent
Good	3	14.3
Average	9	64.3
Poor	3	21.4
Total	15	100.0

Table 4.2 Shows that 64.3 percent teachers rated the physical aspect of the textbook as average, 14.3 percent as good and 21.4 percent as poor. In comparison to parents, teachers are more satisfied with the physical aspect of the textbook.

By going through the table 4.2 it is clear that physical aspects of the textbook is of average quality according to the teachers.



4.4 ANALYSIS OF THE PHYSICAL ASPECT OF TEXTBOOK RATED BY TEACHERS AND PARENTS

The 3rd objective is to find out the percentage of teachers and parents who rated the physical aspect of VI Class textbook as good, average and poor.

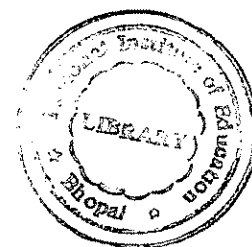
To achieve this objective results are presented in the following table:

Table 4.3: Percentage of good, average and poor ratings of teachers and parents on the textbook.

Rating category	Frequency	Percent
Good	3	10.0
Average	21	70.0
Poor	6	20.0
Total	30	100.0

Table 4.3 shows that most of the parents and teachers (70 percent) rated the physical aspect of the textbook as average, 10 percent as good and 20 percent as poor.

According to parents and teachers the physical aspect of the textbook is of average quality.



4.5 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXTBOOK ACCORDING TO THE PERCEPTION OF TEACHERS AND PARENTS.

The 4th objective is to find out the difference between teachers and parents with regard to their perception about the physical aspect of VI Class science textbook of M.P. State.

To achieve this objective the **first hypothesis** stating that there is no significant difference between teachers and parents with regard to their perception about the physical aspect of VI Class science textbook of M.P. State, is verified and presented in the Table 4.4.

Table 4.4: Significance of 't' between teachers and parents with regard to their opinion about the physical aspect of science textbook.

Category	AM	SD	N	df	t	sig
Teachers	16.36	4.75	15	27	0.07	0.946
Parents	16.47	3.81	15			

The value of 't' is countable not significant, then the hypothesis is accepted. This shows that teachers and parents do not differ significantly from each other in their perception about the physical aspects of the VI Class science textbook.

Besides testing the hypothesis, the researcher is interested to find out the differences among teachers and parents in respect of their perception about the various physical aspects of the textbook. The results are presented in the table no.4.5.



Table 4.5: Values of 't' between teachers and parents on different physical aspects of the text book.

S.No.	Aspect	Category	AM	SD	N	df	t	sig
1.	Design	Teacher	4.57	2.14	15	27	.367	.716
		Parent	4.80	1.08	15			
2.	Printing	Teacher	4.14	1.99	15	27	2.854	.008
		Parent	2.47	1.06	15			
3.	Get-up	Teacher	.14	.53	15	27	5.510	.000
		Parent	1.93	1.10	15			
4.	Price	Teacher	7.50	1.22	15	27	.573	.571
		Parent	7.27	.96	15			

Except design and price the value of 't' comes to be significant for all the aspects (Printing and Get-up). This indicates that teachers and parents differ in their perceptions about printing and get-up of the textbook. Otherwise it is observed that teachers (AM = 4.14) are more satisfied with the printing of the textbook when compared to parents (AM = 2.47). As regards Get-up of the textbook parents (AM= 1.96) seem to have more satisfaction than teachers. (AM = 0.14). However, teachers and parents do not differ with each other in respect of design and price of the textbook.

4.6 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXTBOOK ACCORDING TO THE PERCEPTION OF MALE AND FEMALE (WHOLE SAMPLE)

The 5th objective is to find out the difference between male and female with regard to their perception about the physical aspect of VI Class science textbook of M.P. State.



To achieve this objective the **second hypothesis** stating that there is no significant difference between male and female with regard to their perception about the physical aspect of VI Class science textbook of M.P. state, is verified and presented in the table 4.6.

Table 4.6: Significance of 't' between male and female (whole sample) with regards to their opinion about the physical aspect of science textbook.

Sex	AM	SD	N	df	t	sig
Male teachers and parents	16.40	4.27	15	28	.129	0.899
Female teachers and parents	16.20	4.25	15			

The value of 't' is countable not significant, then the hypothesis is accepted. This shows that male and female teachers and parents do not differ significantly from each other in their perception about the physical aspect of the VI Class science textbook.

4.7 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXT BOOK ACCORDING TO THE PERCEPTION OF TEACHERS (SEX-WISE)

The 6th objective is to find out the perception of teachers (sex-wise) about the physical aspect of VI Class science textbook of M.P. State.

To achieve this objective the **third hypothesis** stating that sex of teachers would not influence significantly their perception about the



physical aspect of VI Class science textbook of M.P. State, is verified and presented in the Table 4.7:

Table 4.7: Significance of 't' between male and female teachers with regard to their opinion about the physical aspect of science textbook.

Sex	AM	SD	N	df	t	sig
Male teachers	16.22	4.79	9	12	-.137	.893
Female teachers	16.60	5.22	6			

The value of 't' is countable not significant, then the hypothesis is accepted. This shows that male and female teachers do not differ significantly from each other in their perception about the physical aspects of the VI Class science textbook.

4.8 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXTBOOK ACCORDING TO TEACHERS (QUALIFICATION WISE)

The 7th objective is to find out the perception of teachers (qualification wise) about the physical aspect of VI Class science textbook of M.P. State.

To achieve this objective the **fourth hypothesis** stating that qualification of teachers would not influence significantly their perception



about the physical aspect of VI Class science textbook of M.P. State, is verified and presented in the table 4.8.

Table 4.8: Significance of 't' between post graduate and under graduate teachers with regard to their opinion about the physical aspect of science textbook.

Qualification	AM	SD	N	df	t	sig
PG.	14.67	4.27	7	12	-1.170	.265
UG	17.63	4.96	8			

The value of 't' is countable **not significant**, then the hypothesis is **accepted**. This shows that postgraduate teachers and undergraduate teachers do not differ significantly from each other in their perception about the physical aspects of the VI Class science textbook.

4.9 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXT BOOK ACCORDING TO TEACHERS (EXPERIENCE WISE)

The 8th objective is to find out the perception of teachers (experience wise) about the physical aspect of VI Class science textbook of M.P. State.

To achieve this objective the **fifth hypothesis** stating that experience of teachers would not influence significantly their perception about the physical aspect of VI Class science textbook of M.P. State, is verified and presented in the table 4.9.

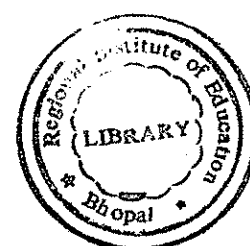


Table 4.9: Significance of 'F' among teachers having different years of experience with regard to their opinion about the physical aspect of science textbook.

Source of variance	Sum of squares	df	Mean square	F	sig
Between Groups	15.648	2	7.824	.310	.740
Within Groups	277.567	11	25.233		

The value of 'F' is countable **not significant**, then the hypothesis is **accepted**. This shows that teachers having above 5 years, below 5 years and more than 10 years experience do not differ significantly from each other in their perception about the physical aspects of the VI Class science textbook.

4.10 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXTBOOK ACCORDING TO PARENTS (SEX-WISE)

The 9th objective is to find out the perception of parents (sex-wise) about the physical aspect of VI Class science textbook of M.P. State

To achieve this objective the **sixth hypothesis** stating that sex of parents would not influence significantly their perception about the



physical aspect of VI Class science textbook of M.P. State, is verified and presented in the Table 4.10.

Table 4.10: Significance of 't' between male and female parents with regard to their opinion about the physical aspect of science textbook.

Sex	AM	SD	N	df	t	sig
Male parents	16.67	3.78	6	13	.160	.875
Female parents	16.33	4.06	9			

The value of 't' is countable **not significant**, then the hypothesis is **accepted**. This shows that male parents and female parents do not differ significantly from each other in their perception about the physical aspect of the VI Class science textbook.

4.11 ANALYSIS OF THE PHYSICAL ASPECT OF THE TEXTBOOK ACCORDING TO PARENTS (QUALIFICATION WISE)

The 10th objective is to find out the perception of parents (qualification wise) about the physical aspect of VI Class science textbook of M.P. State.

To achieve this objective the **seventh hypothesis** stating that qualification of teachers would not influence significantly their perception

about the physical aspect of VI Class science textbook of M.P. State, is verified and presented in the table 4.11.

Table 4.11: Significance of 'F' among parents having post-graduation, under graduation and intermediate qualification with regard to their opinion about the physical aspect of science textbook.

Source of variance	Sum of squares	Df	Mean square	F	sig
Between Groups	6.978	2	3.489	.213	.811
Within Groups	196.756	12	16.396		

The value of 'F' is countable **not significant**, then the hypothesis is **accepted**. This shows that parents having post graduation, under graduation and intermediate qualification do not differ significantly from each other in their perception about the physical aspect of the VI Class science textbook.

4.12 TEXT ANALYSIS

Objective 11: The 11th objective of the study is to assess the efficacy of text presented in the VI Class science textbook of M.P. State.

To achieve this objective the text matter is categorized and the overall involvement index for text is calculated. The data are presented in the table 4.12



Table 4.12: Text analysis on the basis of randomly selected ten pages from the textbook.

Category of the text lines		No. of pages										Total
		1	2	3	4	5	6	7	8	9	10	
a.	Statements of facts	16	7	8	13	15	19	16	9	14	20	135
b.	Conclusions or Generalizations	1	3	2	1	1	0	6	8	6	0	28
c.	Definition	0	0	5	5	2	2	1	2	2	4	23
d.	Questions asked but answered immediately by the text.	4	4	1	0	0	2	0	0	0	1	12
e.	Questions requiring the student to analyze data	0	1	1	0	0	0	0	0	0	0	2
f.	Statements requiring the students to formulate his own conclusion	1	3	0	0	2	0	0	5	1	0	12
g.	Directions telling the student to perform and analyze some activity	2	5	7	3	2	1	2	0	1	0	23
h.	Questions that are asked to arouse student interest	1	2	1	3	3	1	0	1	1	0	13

$$\text{Index of student involvement for the text} = \frac{e+f+g+h}{a+b+c+d}$$

$$\frac{2+12+23+13}{135+28+23+12} = \frac{50}{198} = 0.252$$



The index in this section is revealed to be 0.252, which is below 1.0 as suggested by William D. Romey. 1.0 represents material with an equal number of statements requiring no student participation and statements requiring some student thought. The components with indices much below about 0.4 will be primarily authoritarian. The index for present section interprets it to be authoritarian in nature providing mainly facts and definitions to the students to memorize. This does not pose enough challenge for the students intellect to develop analytical capacity. It means the book is authoritarian and non-investigative because it contains more sentences in categories 'a', 'b', 'c' and 'd' which do not require student involvement or use of scientific skills.

By going through the above table, it is clear that the text is full of facts and definitions which is appropriate for those pupils who have sharp memory and more cramming power, but not fit for the creative children. This type of text is not suitable for skill development.

The researcher analyzed the Table 4.13 in this way also. First page was randomly selected from the introductory unit of the text. So, in the first page, there is no need of definition. Second page is the starting of an unit so there is need of definitions and questions that are asked to arouse student interest. In most of the pages there is lack of those types of questions by which students analytical power will develop and they formulate his own conclusions.



4.13 FIGURES AND DIAGRAMS ANALYSIS

Objective 12: The 12th objective of the study is to assess the effectiveness of figures and diagrams presented in VI Class science text book of M.P. State.

To achieve this objective figures and diagrams are categorized and presented in Table 4.13. Then overall index for figures are calculated.

Table 4.13: Rating of randomly selected ten figures or diagrams from the text.

Categories of figures or diagrams		No. of pages										Total
		1	2	3	4	5	6	7	8	9	10	
a.	Used strictly for illustrative purposes	1	1	0	1	0	1	0	1	1	0	6
b.	Requires students to perform some activity or to use data.	0	0	1	0	1	0	1	0	0	1	4
c.	Illustrates how to set up the apparatus for an activity	0	0	0	0	0	0	0	0	0	0	0
d.	Fits none of the above categories	0	0	0	0	0	0	0	0	0	0	0

$$\text{Index of student involvement for the figures and diagrams} = \frac{b}{a} = \frac{4}{6} = 0.666$$

By going through the table it is clear that most of the figures and diagrams come under the category 'a'. The index of student involvement



comes out 0.66 which shows that the diagrams or figures do not appreciate the student involvement.

4.14 ANALYSIS OF EXERCISE

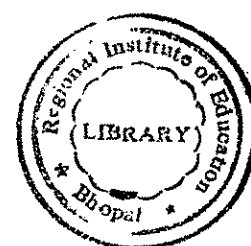
Objective 13: The 13th objective is to assess the nature of exercise given in the VI Class science textbook of M.P. State.

To achieve this objective questions are divided into different categories and overall index for questions is calculated which is presented in the Table 4.14

Table 4.14 Rating of randomly selected ten questions at the ends of ten different chapters.

Categories of question		No. of pages										Total	
		1	2	3	4	5	6	7	8	9	10		
a.	Answer can be obtained directly from the text	1	0	1	0	0	0	0	0	0	0	1	3
b.	Definition	0	0	0	1	0	0	1	0	1	0	0	3
c.	Questions requires student to apply learning from new situations	0	1	0	0	1	0	0	0	0	0	0	2
d.	Question requires student to solve a problem	0	0	0	0	0	1	0	1	0	0	0	2

$$\text{Index of student involvement for the questions} = \frac{c+d}{a+b} = \frac{2+2}{3+3} = \frac{4}{6} = 0.666$$



The index of student involvement for the question comes out 0.66 by which it is concluded that most of the questions come under the category 'a' and 'b'. By going through the table it is clear that questions of the textbook do not enhance the learning ability of students because questions are based on facts and definitions.

4.15 ANALYSIS OF ACTIVITIES GIVEN IN THE TEXT

Objective 14: The 14th objective of the study is to know the student participation in activities presented in the VI Class science textbook of M.P. State. To achieve this objective activities are categorized and given in the Table 4.15.

Table 4.15: Rating of activities on the basis of randomly selected ten pages from the textbook.

	No. of pages										Total
	1	2	3	4	5	6	7	8	9	10	
No. of activities per page	1	2	2	1	1	2	1	1	2	2	15

$$\text{Index Number} = \frac{\text{Number of activities found}}{\text{Number of pages examined}} = \frac{15}{10} = 1.5$$

The index in this section is revealed to be 1.5, which is much above to 1.0 (1.0 represents material with an equal number of statements requiring no student participation and statements requiring some thought according to William D. Romey). This higher index number represents that much student participation and requirement of analysis of some kind is encouraged here. The index comes out 1.5 by which it can be concluded



that activities contains few challenges to students other than memorization of facts and definitions.

4.16 ANALYSIS OF CHAPTER SUMMARIES

Objective 15: The 15th objective is to analyze the chapter summary given in the VI Class science textbook of M.P. State.

To achieve this objective summaries are categorized. By calculating index data is interpreted and presented in table 4.16.

Table 4.16: Rating the chapter summaries from randomly selected three different chapters.

Category of sentences		No. of chapters			Total
		1	2	3	
a.	Repeats the conclusion of the chapter	21	28	7	56
b.	Raises new questions, the answers to which are not available in the text	0	2	1	3

$$\text{Index of involvement for the summaries} = \frac{3}{56} = 0.053$$

The index in this section comes out 0.05 which is much below to 1.0. This lower index no. represents that summaries of different chapters are based on facts of the text and don't arouse new questions, the answers to which are not available in the text.



4.17 ANALYSIS OF THE NATURE OF THE TEXTBOOK

Objective 16: The 16th objective is to study the nature of the textbook in terms of authoritarian type or democratic type.

To achieve this objective interpretation is done on the basis of above mentioned all the tables (4.12-4.16).

Overall it is concluded that book is authoritarian in nature providing mainly facts and definitions to the students to memorize. The book does not pose enough challenge for the students intellect to develop analytical capacity. The book is of non-investigative type which do not require student involvement and use of scientific skills. The book is full of facts and definitions which is suitable for those students who have sharp memory and more cramming power but, not fit for creative children and below average children. The book is not helpful for skill development or psychomotor development of the children. The textbook do not enhance the learning ability of students because of factual matters.

4.18 STRONG POINTS OF THE TEXTBOOK

Objective 17: The 17th objective is to know the strength of the VI Class science textbook of M.P. State.

To achieve this objective the overall analysis of the book has been done and strong points of the book are taken out which are as follows:-

- (i) Since it is an adoption of the NCERT book there appears no deficiency in the content area, factual information is accurate, adequate and uptodate.
- (ii) Headings and sub-headings are properly used in the chapters.
- (iii) The readability aspect is quite sufficient.



- (iv) Mostly, illustrations produced in the textbook are very relevant and match with the content.
- (v) The evaluation reveals that the book contains sufficient number of illustrations of different nature and size.
- (vi) There are no difficult words which are beyond the comprehension of a sixth class reader.
- (vii) The back page of the book has also been properly utilized. The National Anthem is given in the inner part.

4.19 WEAK POINTS OF THE TEXTBOOK

Objective 18: The 18th objective is to know the shortcomings of the VI Class science textbook of M.P. State.

To achieve this objective weak points of the book has been taken out on the basis of whole analysis of the book, which are as follows:

- (i) There appears to be some anomaly in the sequencing of chapters.
- (ii) Paragraphing is not normal. There are paragraphs of very lengthy nature and also of very short size.
- (iii) Only black and white colours are used. They are not sufficient to explain a concept. Attractive, colourful and catchy illustrations are more suitable for junior classes.
- (iv) Different objectives not properly tested.
- (v) The paper and the title cover used are not very handy.
- (vi) There are some printing error too which are given separately in Appendix III.
- (vii) The usability aspect or the binding of the book is not up to the mark.



- (viii) Test items belong to two different categories – (a) objective type, and (b) short answer type. But the essay type of test items did not find any place in the book anywhere.
- (ix) Under objective type, three sub-categories have been used – (a) Fill in the blanks, (b) Matching type, and (c) multiple choice type. But in multiple choice type, the distracting or the alternative choices are not properly balanced.

4.20 FINDINGS

1. The text is full of facts and definition which is appropriate for those pupils who have sharp memory and more cramming power, but not fit for creative children. This type of text is not suitable for skill development.
2. The diagrams and figures presented in the book do not appreciate the student involvement.
3. The questions of the textbook do not enhance the learning ability of students because questions are based on facts and definitions.
4. Activities presented in the book contain few challenges to the students other than memorization of facts and definitions.
5. Chapter summaries are based on facts of the text and do not arouse new questions.
6. Overall it is concluded that book is authoritarian in nature providing mainly facts and definitions to the students to memorize. The book does not pose enough challenge for the students intellect to develop analytical capacity. The book is non-investigative type which do not require student involvement and use of scientific skill. The book is



full of facts and definitions which is suitable for those students who have sharp memory and more cramming power. The book is not fit for creative children and below average children. The book is not helpful for skill development or psychomotor development of the children. The textbook do not enhance the learning ability of students because of factual matters.

7. According to the opinion of parents and teachers the physical aspect of the textbook is of average quality.

