

CHAPTER - IV

DATA PROCESSING, ANALYSIS, TESTING OF HYPOTHESIS AND INTERPRETATION

Research process cannot proceed further if the collected data has not been properly processed, analysed and, interpreted.

In this chapter of analysis and interpretation the data collected from the sample of secondary school pupils of Aurangabad district. Analysis of data means tabulating the raw scores studying the tabulated material in order to determine the inherent facts or meanings. It involves breaking down existing complex factors into simple parts and putting the parts together in new arrangements for the purpose of interpretation.

The purpose of analysis was to survey the extent or socio-economic condition of the parents and compare their attitudes among the secondary school students towards education. The data has been gathered through survey method, by administration of the scale to selected sample.

When the data was collected, the researcher found herself in the possession of large quantities of information. The sorting, classifying, analyzing and, interpreting of this data was done. This activity is commonly been called as Data Processing.

Data:

“Things known or assumed, facts or figures from which conclusion can be inferred, is known as information”

Researcher collected data or information from the students of X standard of various media schools. Researcher while collecting data strictly adhered to the instructions given in the test manual. Researcher took utmost care while collecting data. Her approach towards data collection was very cautious. She took full care not to leave any kind of loopholes while collecting the data. She utilized maximum time in the collection of the data. She never collected any data in haste because careful collection of data leads to maximum accuracy during the interpretation of data.

Data processing:

Data Processing has been described as a particular method of doing something, generally involving a number of steps of operations. Researcher after collecting the data classified and consolidated the information, which she collected, in such a way that, it provided a blueprint and a framework for analysis. It helped the researcher to detect omissions if any and deviations or abnormalities in the research.

The information collected in this research could give an indication of the attitude of the respondents, but more important it helped in the systematic application of research techniques to interpret the collected data.

Data processing arranged the collected data and categorized it into specific groups and represented them into a tabulated form. It also helped to indicate the analytical techniques, which was applied, and the statistical treatment was done.

Data processing was extremely useful and necessary to the researcher because the data obtained was bulky and complex. Data processing helped in making the process of classification and analysis more manageable. It was sophisticated and time saving. It avoided repetition and weeded out the irrelevant data.

MAIN STAGES OF DATA PROCESSING:

The main stages of data processing were Editing, Coding and, Tabulation.

Editing:

Editing of data is a process of examining the collected raw data in surveys to detect errors and omissions and to correct these when possible, It is for completeness and accuracy. As a matter of fact, editing involves a careful scrutiny of the completed questionnaire. Editing was done by the researcher to assure that the data is accurate, consistent with other facts gathered, uniformly entered, as complete as possible and have been well arranged to facilitate coding and tabulation.

Accordingly in this research also the researcher collected data from 1325 students. All the tests given by the students and parents were scrutinized carefully. Many responses were

found incomplete because the researcher used two different standardized test of attitude and socio-economic status test.

Data collected from student's 'Attitude test' in different media schools of Aurangabad District is 1267 i.e., 58 responses were found incomplete therefore they were not included in the process of the analysis.

In these collection of data many test on socio-economic status were found to be incomplete, because these tests were given to the parents and in the rural area most of the parents are illiterate therefore the researcher could not get their responses. Therefore they were not included in the process of analysis.

In the Socio-economic Status test the data collected from different media schools of Aurangabad is 1200 i.e., 125 responses were found incomplete because the Socio-economic test were given to the parents. In urban area researcher collected the data of socio-economic status and scrutinized carefully, she noted that 38 responses were found incomplete. And in the rural area most of the parents are illiterate, therefore researcher observed that 2 from English medium, 39 from Urdu medium, and 46 from Marathi medium i.e., total 87 responses were found incomplete. Therefore, they were not included in the process of analysis.

However, the researcher got responses from 120 secondary school students from different media schools of Aurangabad district i.e., 60 urban area schools and 60 rural area schools.

Out of 120 secondary school students –

- ★ 29 (0.24%) were from English medium
- ★ 50 (0.41%) were from Marathi medium
- ★ 41 (0.34%) were from Urdu medium schools.

The target students from each school were 12 to 15 students. The researcher selected fewer students because in rural area there were very few schools of English medium as compared to Marathi and Urdu medium schools.

To obtain accurate results the number of students were rounded by random sampling method during the processing and the responses of students from each school were finally fixed, so, in all data of 1200 students were collected from different media schools.

Coding:

The next important activity in the data processing after editing was 'coding'. The qualitative data in the questionnaire was converted into numerical form and presented in the coding matrix.

This process reduced the huge quantity of data to manageable proportion and made it possible for researcher, to process the data more systematically and rapidly.

Coding was necessary for efficient analysis and through it the several replies were reduced to a small number of classes, which contained the critical information required for analysis.

Tabulation:

The researcher put the data once it was edited and coded, together in carefully designed tables for statistical analysis.

Tabulation is the process of summarizing raw data and displaying the same in compact form for further arrangement of data in columns and rows. Later on, the researcher carried out editing, coding, classification and lastly, tabulation was done with the help of a computer.

After administrating standard test of socio-economic status prepared by **Rajiv Bhardwaj** and Attitude test of **S.L. Chopra** among secondary school students of standard X, the information was collected and quantified as per the norms given in the standard test.

In all, twelve tables were prepared regarding English, Urdu and, Marathi medium schools that too situated in Urban and Rural areas respectively. A table regarding the scores of students of English Medium schools, situated in urban area is given in the next page as a sample; all the tables are given in Appendix B.

TABLE NO. 1
ENGLISH MEDIUM SCHOOLS IN URBAN AREA

Table showing the scores of 200 students of tenth standard of English medium schools situated in urban area.

ANALYSIS OF DATA:

Of all the stages of this research work, the analysis of data was the most skilled task. It was the task for the researcher's own judgement and skill. Therefore, the researcher herself under the guidance of the research guide completed the analytical work.

Statistics used in the analysis:

Statistical results can be useful only to the extent that they are correctly interpreted. With full and proper interpretations extracted from the data, statistical results are the most powerful source of meaning and significance. In the hands of skilled operators, statistics make data "talk". It was therefore very important for the researcher that the implications of statistical results were to be realized and its proper meaning made to manifest.

The researcher therefore used statistics to get appropriate results. The primary objective of statistical inference is to enable us to generalize from a sample to some larger population of which a sample is a part.

We do not know, of course, the parameters of a given population. But we can, under-specified conditions-forecast the parameters from our sample statistics with known degree of accuracy.

The degree to which a sample, means to represent its parameter, is an index of the significance or trustworthiness of the computed mean. When any sample is taken randomly it is bound to cause some degree of error. Therefore it is necessary to calculate the standard error of the "mean".

After going through the various statistics and taking into consideration the data collected in this research, the researcher came to the conclusion to use “**t**” test to see the significance level of difference of mean to interpret the data.

As a first step the researcher calculated “**mean**” of the scores of 100 students regarding their ‘Attitude’ towards Education with reference to the Socio-economic conditions of their parents. It was done with the help of a computer and noted in all the twelve tables.

The calculation of “**Standard Deviation**” was the next step of the researcher. Standard Deviation of all the scores given in the twelve tables were also calculated with the help of a computer and noted below the “Mean” column in all the tables.

The researcher first found out whether there is any correlation between the two variables – Socio-economic status and Attitude. The coefficient of correlation were tested as, coefficient of correlation are indices ranging over a scale which extends from -1.00 through 0.00 to 1.00. A **positive** correlation indicates that large amount of one variable tends to accompany large amount of the other. A **negative** correlation indicates that small amount of one variable tends to accompany large amount of the other. A zero correlation indicates no consistent relationship.

The coefficient of correlation such as ‘*r*’ to be interpreted as ‘**high**’ or ‘**low**’ depending in general upon how close they are to +1.00 and -1.00.

When a sample was large the “t” critical value is expressed as ‘z’ (sigma score). If the “t” value equals or exceeds 1.96 it may be concluded that the difference between means is significant at the 0.05 level.

If the Critical Ratio value equals or exceeds 2.58 it may be concluded that the difference between means is significant at the 0.01 levels. Therefore, the researcher for each hypothesis calculated the C.R. with the help of a computer to test each hypothesis.

Testing of Hypothesis:

On the basis of the significance level of mean difference of Attitude of students towards education, hypothesis of this research was tested at 0.05 levels.

HYPOTHESIS

1. There is negligible correlation between the attitude and socio-economic status of male students towards education.
2. There is negligible correlation between the attitude and socio-economic status of female students towards education.
3. There is negligible correlation between the attitude and socio-economic status of urban area students towards education.
4. There is negligible correlation between the attitude and socio-economic status of rural area students towards education.
5. There is negligible correlation between the attitude and socio-economic status of the students of English medium schools towards education.
6. There is negligible correlation between the attitude and socio-economic status of the students of Marathi medium schools towards education.
7. There is negligible correlation between the attitude and socio-economic status of the students of Urdu medium schools towards education.
8. There is no significant difference between the attitude of urban and rural area students towards education.
9. There is no significant difference between the attitude of male and female students towards education.

HYPOTHESIS No.1

There is negligible correlation between the attitude and socio-economic status of male students towards education.

Table showing –

- The square of the scores of socio-economic status (Σx^2) and attitude (Σy^2).
- Summation of the product of scores of socio-economic status and attitude (Σxy).
- Mean of socio-economic status scores and attitude scores (M_x), (M_y) respectively.

Table no. 1 for male students

Area	Σx^2	Σy^2	Σxy	Mean (M_x)	Mean (M_y)	Total (N)
Male students	589995	5201.69	60976.6	82.87	7.09	600

Calculation of Coefficient of Correlation:

$$r = \frac{\Sigma xy - N.M_x.M_y}{\sqrt{(\Sigma x^2 - N.M_x^2)(\Sigma y^2 - N.M_y^2)}}$$

$$= \frac{60976.6 - 600 \times 82.87 \times 7.09}{\sqrt{(589995 - 600(82.87)^2) \times (5201.69 - 600(7.09)^2)}}$$

$$r_1 = -0.35$$

-ve

Interpretation:

Since the co-efficient of correlation is (-0.35) which is negative, it means that the socio-economic status and the attitude of male students of high school is negatively correlated, but it is less in degree (i.e., negligible) and we clearly infer that as the socio-economic status increases, the attitude of male students of high school is not increased. Therefore hypothesis no. 1 is accepted.

HYPOTHESIS No. 2

There is negligible correlation between the attitude and socio-economic status of female students towards education.

- The square of the scores of socio-economic status (Σx^2) and attitude (Σy^2).
- Summation of the product of scores of socio-economic status and attitude (Σxy).
- Mean of socio-economic status scores and attitude scores (M_x), (M_y) respectively.

Table no.2 for female students

Area	Σx^2	Σy^2	Σxy	Mean (M_x)	Mean (M_y)	Total (N)
Female students	716072.83	4626.42	963242.6	75.46	6.69	600

Calculation of Coefficient of Correlation:

$$r = \frac{\Sigma xy - N.M_x M_y}{\sqrt{(\Sigma x^2 - N.M_x^2)(\Sigma y^2 - N.M_y^2)}}$$

$$= \frac{963242.6 - 600 \times 75.46 \times 6.69}{\sqrt{(716072.83 - 600(75.46)^2) \times (4626.42 - 600(6.69)^2)}}$$

$$r_2 = +0.56$$

+ve

Interpretation:

Since the coefficient of correlation is (+0.56) which is positive. It means that socio-economic is moderately correlated to the attitude of female students of high schools. Therefore hypothesis no. 2 is rejected.

HYPOTHESIS No. 3

There is negligible correlation between the attitude and socio-economic status of urban area students towards education.

- The square of the scores of socio-economic status (Σx^2) and attitude (Σy^2).
- Summation of the product of scores of socio-economic status and attitude (Σxy).
- Mean of socio-economic status scores and attitude scores (M_x), (M_y) respectively.

Table no.3 for urban students

Area	Σx^2	Σy^2	Σxy	Mean (M_x)	Mean (M_y)	Total (N)
Urban students	692262	5395.18	660597.4	88.78	7.24	600

Calculation of Coefficient of Correlation:

$$r = \frac{\Sigma xy - N.M_x.M_y}{\sqrt{(\Sigma x^2 - N.M_x^2)(\Sigma y^2 - N.M_y^2)}}$$

$$= \frac{660597.4 - 600 \times 88.78 \times 7.24}{\sqrt{(692262 - 600(88.78)^2) \times (5395.18 - 600(7.24)^2)}}$$

$$r_3 = +0.38$$

+ve

Interpretation:

Since the coefficient of correlation is (+0.38) which is positive. It means that Socio-economic status is negligibly correlated to the attitude of urban students of high schools. Therefore hypothesis no. 3 is rejected.

HYPOTHESIS No. 4

There is negligible correlation between the attitude and socio-economic status of rural area students towards education.

- The square of the scores of socio-economic status (Σx^2) and attitude (Σy^2).
- Summation of the product of scores of socio-economic status and attitude (Σxy).
- Mean of socio-economic status scores and attitude scores (M_x), (M_y) respectively.

Table no.4 for rural students

Area	Σx^2	Σy^2	Σxy	Mean (M_x)	Mean (M_y)	Total (N)
Rural students	613806.16	4432.94	81256.56	74.55	6.54	600

Calculation of Coefficient of Correlation:

$$r = \frac{\Sigma xy - N.M_x.M_y}{\sqrt{(\Sigma x^2 - N.M_x^2)(\Sigma y^2 - N.M_y^2)}}$$

$$= \frac{81256.56 - 600 \times 74.55 \times 6.54}{\sqrt{(613806.16 - 600(74.55)^2) \times (4432.94 - 600(6.54)^2)}}$$

$$r_4 = +0.69$$

+ve

Interpretation:

Since the coefficient of correlation is (+0.69) which is positive. It means that Socio-economic status is subsequently correlated to the attitude of rural students of high schools. Therefore hypothesis no. 4 is rejected.

HYPOTHESIS No. 5

There is negligible correlation between the attitude and socio-economic status of the students of English medium schools towards education.

- The square of the scores of socio-economic status (Σx^2) and attitude (Σy^2).
- Summation of the product of scores of socio-economic status and attitude (Σxy).
- Mean of socio-economic status scores and attitude scores (M_x), (M_y) respectively.

Table no.5 for English medium students

Area	Σx^2	Σy^2	Σxy	Mean (M_x)	Mean (M_y)	Total (N)
English medium students	960095.45	5819.24	54864.47	98.70	7.55	400

Calculation of Coefficient of Correlation:

$$r = \frac{\Sigma xy - N.M_x.M_y}{\sqrt{(\Sigma x^2 - N.M_x^2)(\Sigma y^2 - N.M_y^2)}}$$

$$= \frac{54864.47 - 400 \times 98.70 \times 7.55}{\sqrt{(960095.45 - 400(98.70)^2) \times (5819.24 - 400(7.55)^2)}}$$

$$r_s = +0.55$$

+ve

Interpretation:

Since the coefficient of correlation is (+0.55) which is positive. It means that Socio-economic status is moderately correlated to the attitude of English medium high school students. Therefore hypothesis no. 5 is rejected.

HYPOTHESIS No. 6

There is negligible correlation between the attitude and socio-economic status of the students of Marathi medium schools towards education.

- The square of the scores of socio-economic status (Σx^2) and attitude (Σy^2).
- Summation of the product of scores of socio-economic status and attitude (Σxy).
- Mean of socio-economic status scores and attitude scores (M_x), (M_y) respectively.

Table no.6 for Marathi medium students

Area	Σx^2	Σy^2	Σxy	Mean (M_x)	Mean (M_y)	Total (N)
Marathi medium students	595125.25	4431.15	89700.1	74.05	6.71	400

Calculation of Coefficient of Correlation:

$$r = \frac{\Sigma xy - N.M_x.M_y}{\sqrt{(\Sigma x^2 - N.M_x^2)(\Sigma y^2 - N.M_y^2)}}$$

$$= \frac{89700.1 - 400 \times 74.05 \times 6.71}{\sqrt{(595125.25 - 400(74.05)^2) \times (4431.15 - 400(6.71)^2)}}$$

$$r_6 = +0.70$$

+ve

Interpretation:

Since the coefficient of correlation is (+0.70) which is positive. It means that Socio-economic status is fairly correlated to the attitude of Marathi medium high schools students. Therefore hypothesis no. 6 is rejected.

HYPOTHESIS No. 7

There is negligible correlation between the attitude and socio-economic status of the students of Urdu medium schools towards education.

- The square of the scores of socio-economic status (Σx^2) and attitude (Σy^2).
- Summation of the product of scores of socio-economic status and attitude (Σxy).
- Mean of socio-economic status scores and attitude scores (M_x), (M_y) respectively.

Table no.7 for Urdu medium students

Area	Σx^2	Σy^2	Σxy	Mean (M_x)	Mean (M_y)	Total (N)
Urdu medium students	582899.75	4491.79	457856.4	72.25	6.41	400

Calculation of Coefficient of Correlation:

$$r = \frac{\Sigma xy - N.M_x.M_y}{\sqrt{(\Sigma x^2 - N.M_x^2)(\Sigma y^2 - N.M_y^2)}}$$

$$= \frac{457856.4 - 400 \times 72.25 \times 6.41}{\sqrt{(582899.75 - 400(72.25)^2) \times (4491.79 - 400(6.41)^2)}}$$

$$r_7 = +0.83$$

+ve

Interpretation:

Since the coefficient of correlation is (+0.83) which is positive. It means that Socio-economic status is highly correlated to the attitude of Urdu medium high schools students. Therefore hypothesis no. 7 is rejected.

HYPOTHESIS No. 8

There is no significant difference between the attitude of urban and rural area students towards education.

TABLE No. 8

Urban Area Schools			Rural Area Schools			Critical Ratio (C.R.)
Mean (M_1)	Total (N_1)	Std. Dev. (σ_1)	Mean (M_2)	Total (N_2)	Std. Dev. (σ_2)	
7.24	600	1.14	6.52	600	1.05	11.42

Calculation of Critical Ratio :-

$$T = \frac{M_1 - M_2}{S_{EM}} = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

$$T = \frac{7.24 - 6.52}{\sqrt{\frac{(1.14)^2}{600} + \frac{(1.05)^2}{600}}} = 11.42$$

$$C.R. = 11.42$$

Interpretation:

Since C.R. 11.42 is greater than 2.58, hence, there is significant difference between the mean at 0.01 level in between the attitude of urban and rural students. And it is inferred that urban students are better in attitude towards education than rural students, as the mean of urban students (7.25) is greater than the mean of rural students (6.54).

Therefore hypothesis no. 8 is rejected.

HYPOTHESIS No. 9

There is no significant difference between the attitude of male and female students towards education.

TABLE No. 9

Male students			Female students			Critical Ratio (C.R.)
Mean (M_1)	Total (N_1)	Std. Dev. (σ_1)	Mean (M_2)	Total (N_2)	Std. Dev. (σ_2)	
7.09	600	1.14	6.68	600	1.05	6.5

Calculation of Critical Ratio :-

$$T = \frac{M_1 - M_2}{S_{EM}} = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

$$T = \frac{7.09 - 6.68}{\sqrt{\frac{(1.14)^2}{600} + \frac{(1.05)^2}{600}}} = 6.5$$

$$C.R. = 6.5$$

Interpretation:

Since C.R. 6.5 is greater than 2.58, hence, there is significant difference between the mean at 0.01 level in between the attitude of male and female students. And it is inferred that male students are better in attitude towards education than female students, as the mean of male students (7.09) is greater than the mean of female students (6.68).

Therefore hypothesis no. 9 is rejected.