

## **CHAPTER 3**

### **METHODOLOGY**

#### **1.0. INTRODUCTION**

Methodology plays a significant role in any piece of research work. It facilitates the scholar in carrying out the process of research logically and scientifically. It includes the illustration and the idea of the researcher's "perspective on social reality and truth and generalizations of research findings" which would validate the selection and use of the research method. It is defined as a "highly intellectual human activity used in the investigation of nature and the matter and deals especially with the manner in which data are collected, analyzed and interpreted" (Li, Liping, & Khan, 2018, p.18). A research method is a logical approach towards a certain observable fact. It familiarizes the researchers with various steps adopted to study the research problem, along with the underlying reason behind them. There are different steps regarding the plan of action to be adopted in the completion of the process of research such as the way research problems are formulated, extensive literature survey, choice of subject for investigation, the definition of the terms, validation of tools for data collection, selection of the representative sample, collection of data, analysis and interpretation of data, hypothesis testing, and the process of inferences and generalization.

In Educational research scientific method is used in order to find a solution to educational problems. According to Mouly (1963), “Scientific problem can be solved only on the basis of data and the major responsibility of the scientist is to set up a research design capable of providing the data necessary to the solution of a problem”. Barr (1960), viewed that the “Machinery of methodology occupies a very important position in any kind of research. The research cannot perform its function without it since it is the methodology which lays out that formal research is to be carried out and outlines the detain description of the research procedure”.

C.R McClure and P. Hersson (1991) opined that research is an inquest procedure that has well-defined parameters and aims to find or construct knowledge, build theory, test, verify, review, refute knowledge and theory or investigate a problem for local decision making. Kerlinger (1979) viewed that scientific research is a “systematic, controlled, empirical, critical investigation of hypothetical propositions about the presumed relations among natural phenomena”. Taking into consideration the views of different scholars, the present study was carried out by adopting the following segments to accomplish the objectives and hypotheses of the study:

3.1: Research method

3.2: Universe and Selection of Sample

3.3: Selection of tools

3.4: Procedure for data collection

3.5: Scoring Procedures

3.6: Tabulation and organization of data

3.7: Analysis of Data

### **3.1. RESEARCH METHOD**

The selection of research method depends on the nature of the research problem and the researcher need to judiciously select the appropriate research method for the concerned study in hand. In the present study, the researcher has adopted descriptive cum normative survey method of educational research, as the purpose of this study was to obtain relevant and precise information concerning the current status of human rights education in the curriculum of secondary teacher education programme, awareness and attitude towards human rights education among the pupil teachers of secondary teacher

education in Nagaland. The cross-section research design was implemented and the nature of the study is quantitative approach in general and qualitative description was inducted as and when required.

### 3.2. UNIVERSE AND SELECTION OF SAMPLE

The universe of the present study covers all the pupil teachers enrolled in 2 years secondary teacher education programme in Nagaland. It has been recorded that there are 9 secondary teacher education institutions spread over 3 districts of Nagaland state viz., Kohima district, Dimapur district and Mokokchung district and the total enrollment of pupil teachers were found to be 1599 for the session 2017-2019 and 2018-2020 batch which could be considered for the present study. For this study sampling was done at two stages, firstly, 5 secondary teacher education institutions were selected by making use of random sampling technique from all the 3 districts. Secondly, 640 pupil teachers were randomly selected from the sampled institutions, that is 40 per cent of the total population. The researcher ensured that the selected sample was a true representative of the universe. The details of the population and a selected sample of secondary teacher education institutions and pupil teachers have been put in the table- 3.1 and table- 3.2

**Table-3.1: Total Population of Secondary Teacher Education Institutions and Pupil teachers**

Sl. No.	Name of Secondary Teacher Education Institutions	District	No. of pupil teachers enrolled (2017-19) & (2018-20)
1	Modern Institute of Teacher Education	Kohima	196
2	State College of Teacher Education	Kohima	202
3	Ura College of Teacher Education	Kohima	197
4	Sazolie College of Teacher Education	Kohima	100
5	Mokokchung College of Teacher Education	Mokokchung	120
6	Bosco College of Teacher Education	Dimapur	196
7	Unity College of Teacher Education	Dimapur	197
8	Salt Christian College of Teacher Education	Dimapur	197
9	Mount Mary College of Teacher Education	Dimapur	194
			Grand Total = 1599

**Table-3.2: Selected Sample of Secondary Teacher Education Institutions and Pupil teachers**

Sl. No	Name of Secondary Teacher Education Institutions	District	No. of pupil teachers enrolled (2017-19) & (2018-20)	No. of samples taken		
				Male	Female	Total Respondent
1.	Modern Institute of Teacher Education	Kohima	196	52	93	145
2.	State College of Teacher Education	Kohima	202	55	94	149
3.	Mokokchung College of Teacher Education	Mokokchung	120	34	31	65
4.	Bosco College of Teacher Education	Dimapur	196	56	81	137
5.	Unity College of Teacher Education	Dimapur	197	57	87	144
			Total= 911	Grand Total= 640		

### 3.3. SELECTION OF TOOLS

For any research study, the researcher must collect data and based on that data, he/she draws a conclusion and arrives at generalization. To gather reliable and valid information, one should make use of reliable and valid tools for data gathering. Further, the selection of appropriate tools for a particular study depends upon the objectives of the study. Therefore, the researcher needs to select the tools very cautiously. Keeping in mind the nature and objectives of the present study the researcher developed and used the following tools:

- i. Human Rights Education Awareness test.
- ii. Attitude Scale to assess the attitude of the pupil teachers towards Human Rights and Human Rights Education.
- iii. Intelligence test developed by S. Jalota.
- iv. Socio-Economic Status Scale developed by Ashok K. Kalia & Sudhir Sahu.
- v. Achievement scores of pupil teachers were taken from the record of the previous exam.

The researcher developed a human rights education awareness test and attitude scale towards human rights education. The description of each tool is put as under:

### **3.3.1. Development of Human Rights Education Awareness Test for Pupil teachers of Secondary Teacher Education**

The researcher constructed and standardized human rights education awareness test to find out the level of awareness on human rights education among the pupil teachers and the following steps were used for the purpose:

**Step-I: Selection of Items:** At the outset, the items for the Human Rights Education Awareness Test were prepared keeping in mind the objectives of the study. Various books, kinds of literature, documents, dissertations, journals, and standardized tools relating to human rights and human rights education were consulted to select the contents for human rights education awareness test. Subject experts were also consulted in order to select the dimensions to assess the awareness of human rights education based on the level of secondary teacher education pupil teachers. After reviewing all the available materials and documents on human rights and human rights education and discussion with the subject experts' three dimensions were taken into consideration for constructing the test; i) knowledge and concepts of human rights and human rights education, ii) knowledge related to human rights documents, iii) knowledge related to violation and non-violation of human rights. In the preliminary draft, a list of 80 items was prepared to assess the human rights education awareness of pupil teachers of secondary teacher education. The questions/ statements were constructed by reviewing the available literature on human

rights and human rights education. The test was divided into four sections: A B C and D. Section –A is of multiple-choice items with 25 questions where each item contains four alternative choices, Section –B true/ false with 25 positive and negative statements, Section –C fill in the blank with 15 questions, and Section-D consists of 15 short answer type questions. The scoring key was also developed for this test i.e., 1 score each for every correct answer and 0 for the wrong answer for section- A, section- B and section- C and 2 scores for section –D for every correct answer and 0 for the wrong answer.

**Step-II: Editing of Test Items:** A preliminary draft of 80 items was typed with every care and a copy of this preliminary draft was given to four content experts who examined each item of the test from a content point of view and approved all the 80 items of the test with some suggestions. Similarly, the copy of the test was handed over to two language experts and they look into the test items. Some modifications were suggested in respect to the language of the 5 items and those modifications were made in these items. Finally, the draft of 80 items was approved by the content and language experts.

**Step-III: Try Out:** The try out of the test was done in the last week of September 2018. The edited and corrected preliminary draft of 80 items was administered randomly to a sample of 30 pupil teachers (not included in the present study) and was supervised by the researcher. Proper instructions regarding the test were given verbally to the respondents as well as it was outlined on the front page of the test. The respondents were asked to respond to each item of the test carefully. After the completion of the test, the booklets were collected, and scoring was done with the help of the scoring key. With the completion of the scoring procedure, the booklets were arranged in descending order based on the scores obtained. Only the 25 per cent top and 25 per cent bottom scores were used for item analysis and the rest was discarded.

**Step-IV: Item analysis:** For item analysis, the investigator computed the Index of Item Difficulty and an Index of Item Discrimination by adopting the following procedures:

- i) **An Index of Item Difficulty:** It was computed by using the following formula:

$$\text{Index of Difficulty} = \frac{\text{Number of students responded correctly}}{\text{Total number of students}}$$

- a) When all have responded correctly then the Item Difficulty level is:  $\frac{30}{30} = 1.0$   
(considered very easy item)
- b) When nobody has given the correct respond:  $\frac{0}{30} = 0.0$

By adopting this procedure, Index of difficulty for each item of the test was computed and the items falling within .33 to .67 index of difficulty were kept in the final draft of the test as shown in table- 3.3.

**Table- 3.3: Index of item Difficulty for each Item of Human Rights Education Awareness Test**

Item Number	Value of Index Difficulty	Item Number	Value of Index Difficulty
1	.66	23	.50
3	.62	26	.63
6	.51	27	.50
7	.40	28	.36
8	.37	29	.58
10	.37	30	.62
12	.48	31	.51
13	.38	32	.40
16	.38	33	.62
17	.49	34	.63
18	.41	35	.39
19	.50	36	.53
20	.35	37	.65
21	.62	38	.37
22	.40	39	.62

Item Number	Value of Index Difficulty	Item Number	Value of Index Difficulty
42	.35	62	.59
43	.40	63	.47
44	.51	64	.50
46	.38	65	.72
47	.42	66	.35
48	.50	67	.37
49	.48	68	.62
50	.37	70	.49
51	.53	72	.63
52	.61	73	.40
53	.40	75	.43
54	.35	76	.50
55	.62	77	.41
57	.40	78	.63
61	.38	79	.37

- ii) **Index of Discrimination (ID):** Sample: 30 Pupil teachers. By taking in account the scores of 30 pupil teachers, the sample of 30 pupil teachers were divided into two groups by taking 25 per cent from the higher side of the scores and 25 per cent from the lower side of the scores.

$$\text{Item-I: Correct Response of High Group} = \frac{5}{7} = .71$$

$$p_1 = .71$$

$$q_1 = .29$$

$$\text{Correct Response of Lower Group} = \frac{2}{7} = .29$$

$$p_2 = .29$$

$$q_2 = .71$$

$$\text{Total } p = \frac{7}{14} = .5$$

$$q = \frac{7}{14} = .5$$

$$SE_{DP} = \sqrt{\frac{p \times q}{14}} = \sqrt{\frac{.5 \times .5}{14}} = 0.13$$

$$t = \frac{p_1 - p_2}{SE_{DP}}$$

$$SE_{DP}$$

$$t = \frac{.71 - .29}{0.13} = \frac{.42}{0.13} = 3.23$$

The computed t-value (3.23) has been found significant at 0.5 level of significance for 12 degrees of freedom (df) (2.179 table value). So, the item no.1 was selected for the final draft of the test. Similarly, the index of item discrimination for other items was computed and out of 80 items 20 items got rejected, the remaining 60 items were kept for the final draft. The details of the final draft are put in table- 3.4

**Table- 3.4: t- Values for each Item of Human Rights Education Awareness Test**

Item Number	't' - Value	Item Number	't' - Value
1	3.23	23	3.30
3	3.30	26	2.23
6	2.23	27	3.30
7	4.38	28	6.61
8	3.23	29	3.30
10	3.30	30	3.30
12	3.30	31	4.30
13	3.30	32	3.30
16	4.38	33	3.30
17	2.23	34	3.23
18	4.46	35	4.30
19	2.23	36	3.23
20	3.30	37	5.46
21	3.23	38	4.38
22	2.23	39	3.30

Item Number	't' – Value	Item Number	't' - Value
42	2.23	62	3.23
43	3.23	63	6.53
44	3.30	64	3.23
46	3.30	65	3.30
47	4.46	66	3.23
48	5.53	67	5.53
49	3.23	68	3.23
50	3.30	70	4.38
51	2.23	72	2.23
52	3.30	73	2.23
53	3.23	75	2.23
54	4.38	76	3.30
55	5.46	77	4.38
57	3.23	78	5.46
61	4.38	79	2.2

As the computed values of all the 60 items have been more than the table value (2.179), therefore, all the 60 items were kept for the final draft. The details of the distribution of the items and the scorings are given in table-3.5 and table-3.6.

**Table-3.5: Distribution of Items in Human Rights Education Awareness Test for Pupil teachers of Secondary Teacher Education**

Sections	A	B	C	D	Total
Type of items	Multiple choices	True/False	Fill in the blanks	Short answer	
No. of questions	20	20	10	10	60
Percentage	33.33	33.33	16.67	16.67	100

**Scoring:** The scoring for each item in all the four sections were done using the following procedure given in table-3.6

**Table-3.6: Distribution of Scores for each Item in Human Rights Education**

**Awareness Test for Pupil teachers of Secondary Teacher Education**

Sections	A	B	C	D	Total
Type of items	Multiple choices	True/False	Fill in the blanks	Short answer	
No. of questions	20	20	10	10	60
Scores	1	1	1	2	70

The sum of the score for the test can range from 0 to 70 indicating the least to the highest level of human rights education awareness.

**Step-V: Evaluation:** The final draft of 60 items was evaluated in terms of its validity and reliability.

- i) **Validity:** The content validity was covered by the researcher while selecting the test items and she tried her level best to cover all the dimensions of human rights and human rights education. Second, the draft of the test was given to four content experts to examine from the content point of view. The content experts made some suggestions which were incorporated and ensured the content validity of the test.
- ii) **Reliability:** The reliability of the test was computed by using the Test and Re-test method. The Human Rights Education Awareness test was given to a selected sample of 30 Pupil teachers of secondary teacher education with a time interval of 15 days between the two test administrations. The reliability was calculated by making use of the Product Moment of Co-efficient Correlation. The coefficient of correlation of the two tests came out to be 0.872 which indicated that the test scores are reliable. The final copy of the test on human

rights education awareness for pupil teachers of secondary teacher education has been arranged in order and is enclosed in Appendix 1.

### **3.3.2. Development of Attitude Scale Towards Human Rights Education for Pupil teachers of Secondary Teacher Education**

To measure the attitude of pupil teachers towards Human Rights and Human Rights Education the researcher constructed and standardized an attitude scale by adopting the following procedure suggested by Likert (1932):

**Step-I: Collection and Editing of Statements:** For collecting the items several books, documents, kinds of literature, journals, dissertations, standardized attitude scales and questionnaires were consulted. After a thorough study, a list of 43 items was prepared with 27 positive statements and 16 negative statements through which one may express an opinion towards human rights and human rights education. The draft of 43 statements was given to four subject experts and two language experts for necessary correction and editing, keeping in mind the suggested criteria given by Wang (1932), Thurstone and Chave (1929), Likert (1932), Bird (1940), and Edwards and Kilpatrick (1948).

**Step-II: Try out:** For the purpose of the try out of the preliminary draft of the attitude scale, a sample of 30 pupil teachers were selected and the preliminary draft of the constructed attitude scale was administered. After the process of administration, the scoring work was completed by following weightage 5, 4, 3, 2, 1 to Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD) respectively in case of positive statements. On the other hand, weightage 1, 2, 3, 4, and 5 to Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD) respectively in case of negative statements as shown in table- 3.7

**Table- 3.7: Weightage of Attitude Scale**

Statements	SA	A	U	D	SD
Positive	5	4	3	2	1
Negative	1	2	3	4	5

After the completion of scoring work, these attitude scores were used for item analysis as described in step-III.

**Step-III: Item Analysis:** For item analysis, the frequency distribution scores based upon the responses to all statements were taken into consideration. For item analysis, the selected sample 30 pupil teachers were divided into two groups by selecting 27 per cent cases from the high performers and 27 per cent cases from the low performers on the attitude scale.

For evaluating the responses of the high and low groups to the individual statement 't' value needs to be calculated by using the formula given below;

$$t = \frac{M_H - M_L}{\sqrt{\frac{\sum (X_H - M_H)^2 + \sum (X_L - M_H)^2}{n(n-1)}}}$$

$M_H$  = the mean score of the high group for a given statement

$M_L$  = the mean score of the low group for a given statement

$X_H$  = the score of a given individual for the statement in the high group

$X_L$  = the score of a given individual for the statement in the low group

$n$  = number of subjects in the criterion groups

The 't' value determines the extent to which a certain statement differentiates between the high and low groups. "As an approximate rule of thumb, the 't' value which is equal to or greater than 1.75 indicates that the average response of the high and low groups to a statement differs significantly" (Edwards, 1957, p 153) and this statement is selected for the final draft of the scale.

The illustration of the calculated 't' – value using the above formula is given in table -3.8

**Table-3.8: Calculation of 't' – Value for Item No.1**

Response Categories	High Group				Low Group			
	x	f	fx	fx <sup>2</sup>	x	f	fx	fx <sup>2</sup>
SA	5	7	35	175	5	0	0	0
A	4	1	4	16	4	0	0	0
U	3	0	0	0	3	1	3	9
D	2	0	0	0	2	1	2	4
SD	1	0	0	0	1	6	6	6
Total		8	∑fx = 39	191		8	∑fx =11	19

$$M_H = \frac{\sum fx}{n} = \frac{39}{8} = 4.87$$

$$M_L = \frac{\sum fx}{n} = \frac{11}{8} = 1.3$$

$$\text{Mean difference} = 4.87 - 1.37 = 3.5$$

$$t = \frac{M_H - M_L}{\sqrt{\frac{\sum (X_H - M_H)^2 + \sum (X_L - M_L)^2}{n(n-1)}}}$$

$$\text{Where } \sum (X_H - M_H)^2 = \sum X_H^2 - \frac{(\sum X_H)^2}{n}$$

$$\sum (X_H - M_H)^2 = 191 - \frac{(39)^2}{8} = .088$$

$$\sum (X_L - M_L)^2 = \sum X_L^2 - \frac{(\sum X_L)^2}{n}$$

$$\sum (X_L - M_L)^2 = 19 - \frac{(11)^2}{8} = 3.88$$

$$t = \frac{4.87 - 1.37}{\sqrt{\frac{0.88 + 3.88}{56}}}$$

$$t = \frac{3.5}{\sqrt{\frac{4.76}{56}}} = \frac{3.5}{\sqrt{0.08}} = \frac{3.5}{0.28} = 12.5$$

Likewise, the 't' value of the remaining items was also calculated and the result obtained is given under the following table-3.9

**Table-3.9: Details of Calculated 't' Values of all the 43 Statements**

Item Number	't' - Value	Item Number	't' - Value
1	12.5*	23	1.79*
2	1.0	24	1.33
3	6.25*	25	1.39
4	2.98*	26	4.34*
5	5.12*	27	3.63*
6	2.68*	28	0.13
7	4.31*	29	2.11*
8	3.82*	30	3.24*
9	0.87	31	1.06
10	0.37	32	4.38*
11	3.21*	33	2.18*
12	2.85*	34	2.78*
13	0.84	35	5.0*
14	5.81*	36	1.31
15	3.58*	37	4.91*
16	0.15	38	2.59*
17	0.33	39	7.51*
18	3.11*	40	1.42
19	3.20*	41	5.36*
20	3.83*	42	11.20*
21	2.96*	43	3.67*
22	1.05		

\* These statements were kept in the final draft of the scale

**Step-IV: Validity and Reliability:** The content validity was established by making use of the opinions of four content experts. For reliability of attitude scale, Test and Re-test method was used. Attitude scale towards human rights education was given to a selected sample 30 Pupil teachers of secondary teacher education with a time interval of 15 days between the two test administrations. The reliability was computed by making use of the Product Moment of Coefficient Correlation. The coefficient of correlation of the two tests came out to be 0.82 which showed that the attitude scores were reliable. The final copy of Attitude Scale has been put as an Appendix 2.

### 3.3.3. Intelligence Test for Pupil teachers

In the present study to measure the intelligence of pupil teachers, an intelligence test which was constructed and standardized by Dr. S. Jalota was used. The test consists of 100 items. The interpretation of the total score is based on 11-point C-scale on a 7-point Intelligence Grading. The centile position can be determined by reference to the centile norm and IQ Reckoner is provided for the range 60-140. The details of the norms are given in table-10;

**Table-3.10: Given Norms**

C-Scale		Centile Norms		I.Q. Reckoner	
Grade	Range	%ile	Score	I.Q.	Score
10	88 +	97%	84 +	140	85
9	80-87	95%	77-83	130	80
8	71-79	90%	72-76	125	76
7	63-70	80%	67-71	120	72
6	55-62	75%	64-66	115	68
5	47-54	70%	62-63	110	64
4	39-46	60%	57-61	105	58
3	31-38	50%	53-56	100	51
2	23-30	40%	48-52	95	46
1	15-22	30%	43-47	90	40
0	0-14	25%	40-42	85	34
		20%	36-39	80	28
		16%	27-35	75	24
		5%	22-26	70	19
		2%	16-21	65	15
				60	10

Further descriptions of the Norms and Intelligence grades have been put in the manual of the test which has been enclosed along with the test items in Appendix 3.

#### **3.3.4. Socio-Economic Status Scale**

To measure the socio-economic status of the pupil-teacher the investigator used socio-economic status scale constructed by Dr. Ashok K. Kalia and Dr. Sudhir Sahu. This scale was designed to measure the social position of an individual in urban and rural areas. The scale comprised of 40 statements based on five different dimensions of socio-economic parameters. The dimensions included are i) socio-cultural component, ii) economic component, iii) possession of goods and services, iv) health component, and v) educational component (+ information on stream) making it to 42 items.

As the tool was standardized in other parts of India the researchers felt the need to do a small try out to check the suitability of the socio-economic status scale to the local context of the study and it was found that item no. 27 which comes under the possession of goods and services i.e. In which of the following sports hobby your family members participate? And options given are a) Polo, b) Horse Riding, c) Billiards, d) Rock-climbing, e) Paragliding, f) Skating. As the options provided in the original scale do not have suitable options for the local context, the researchers made some changes regarding the options provided in the original scale to adapt according to the local context. The changed options provided are: a) grease bamboo pole climbing, b) Top spinning, c) Arm wrestling, d) Rock-climbing f) None. The scoring for each option is 1 score in the original scale, so no changes were made regarding the scoring for this item no.27.

**Reliability of Socio-Economic Status Scale:** For the reliability of the scale split-half and test-retest method was applied and the result of the scale was highly reliable. For the split-half, the computed value was .68 in the English version and .72 in Hindi version and for the test-retest method, it was .86 in the English version and .89 in Hindi version.

**Validity:** The content validity of the scale was done through various experts opinion and language specialist. The scale was given to nine experts and the expert's opinion came out to be favourable in terms of the relevance of each item in the scale. The criterion validity was measured by correlating it with socio-economic status scale by Prof. Rajbir Singh, Dr.

Radhey Shyam and Dr. S. Kumar (2006) and it came out to be 0.85 which is highly significant.

To measure the internal consistency all the 42 items (including caste and academic stream) were analyzed through Pearson's Product Moment, Kendall's tau\_ b and Spearman's rho correlation method. The computed result for Pearson Product Moment correlation for each component are; i) Socio-cultural- 1.000, ii) Economic -.999, iii) Possession of goods and services- 1.000, iv) Health- 1.000, v) Education – 1.000 which is significant at 0.01 level.

For Kendall's tau\_ b correlation the values for each component are; i) Socio-cultural- .542, ii) Economic- .639, iii) Possession of goods and services- .508, iv) Health- .351, v) Education - .341. The correlation is significant at 0.01 and 0.05 level of confidence.

In Spearman's rho Correlation the computed values are; i) Socio-cultural - .663, ii) Economic - .783, iii) Possession of goods and services - .665, iv) Health - .464, v) Education - .470 and the whole came out to be 1.00, which is significant at 0.01 and 0.05 level. The other descriptions and scoring procedure for each item are given in the manual and it has been enclosed as Appendix 4.

### **3.3.5. Observation**

To collect primary information observation is one method. It is an orderly, purposeful and selective way of watching and listening to an interaction or events as it takes place either in a controlled or natural condition. Generally, there are two types of observation i.e. participant observation and non-participant observation. In participant observation, the “researcher participates in the activities of the group being observed, in the same manner as its members with or without their knowing as they are being observed” (Kumar, 2014 p.173-174). Whereas in non-participant observation the researcher or “observer does not participate in what is going on in the social setting” (Bryman, 2016 p. 217) or does not participate in any activities in the group but rather remain a “passive observer, watching and listening to its activities and draws conclusion from this” (Kumar, 2014 p.174). In the present study, the researcher used non-participant observation and remained a “passive observer” to gather the required information. The observation done in

the present study was under natural setting or condition because the researcher did not interfere in normal activities.

### **3.3.6. Interview**

The interview method of collecting information involves oral-verbal interaction in which the interviewee or subjects provides the required information in a face-to-face situation or it can be done through telephone interviews as well. Interviews are classified into different type depending on the degree of flexibility such as unstructured interviews, structured interviews and semi-structured interviews. It also varies in its design or structure as in some situations it may be an individual interview and sometimes because of time constraint or resources it is preferable to collect data by interviewing the individuals in the group. Such a group is called ‘focus group’ (Koul, 2009; Kumar, 2014). In the present study, the researcher adopted the semi-structured interview to get the required information in understanding the teaching-learning process and practices of human rights education in secondary teacher education institutions. The teacher educators were interviewed individually through face to face interaction. About 9 teacher educators from the sampled institutions were interviewed. Whereas, for the pupil teachers a group interview was conducted due to constraint of time, to know their problems in the learning of human rights education. The group size was about 6 pupil teachers from all the sampled institutions. The semi-structured interview schedule has been enclosed as Appendix 5 (a) and Appendix 5 (b)

## **3.4. PROCEDURE FOR DATA COLLECTION**

For collecting the data, the tests and scales namely, Human Rights Education Awareness Test, Attitude scale towards Human Rights Education, Intelligence Test, and Socio-Economic Status Scale were administered on 640 pupil teachers. The researcher personally, visited all the five selected secondary teacher education institutions from three districts which are included in the sample of the study to collect the requisite data from the pupil teachers. Firstly, the researcher took permission from the heads of each institution and after getting permission to proceed further the researcher apprised the pupil teacher regarding the purpose of the tests and scales and the research study. Before administrating

the tools, a good rapport built with the pupil teachers and they were motivated to take the test.

Secondly, general instructions were imparted to the pupil teachers regarding the first test i.e., human rights education awareness test. The procedure of attempting each section of the test was explained with the help of some example and the pupil teachers were asked to attempt this test within one hour as it was found adequate to complete the test. As per the direction the pupil teachers completed the test within a stipulated time given. After giving a gap of 45 minutes the pupil teachers were ready for the second task. The pupil teachers were given instructions about the attitude scale towards human rights education. Every aspect of the attitude scale was explained with some suitable examples. The pupil teachers were asked to go through each statement of the attitude scale and give their response within 45 minutes. The pupil teachers completed the task within 45 minutes. Likewise, the same procedure was followed the next day for an intelligence test and socio-economic status scale. In this way, the data collection was completed.

Besides the use of test and scales, to acquire more information the researcher also used non-participant observation and semi-structured interview. The researcher interviewed with 9 selected teacher educators to understand the teaching process of human rights education and also a group interview (6 pupil teachers from the sample institutions) was conducted with the pupil teachers to know the problems they face in the learning process of human rights education.

### **3.5. SCORING PROCEDURES**

i) **Human Rights Education Awareness Test of Pupil teachers:** The scoring keys of human rights education awareness test was developed by the researchers and by using those scoring keys the scoring work was done accordingly. The weightage for each item is 1 score for multiple-choice, 1 score for true/false, 1 score for fill in the blank, and 2 scores for short answer type respectively. The scores of pupil teachers on human rights education awareness have been enclosed as Appendix 6.

ii) **Attitude Scale:** The scale comprises of 30 statements and each statement of the scale have five categories of responses, i.e. Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. The scale consists of both positive and negative statements and the

points for positive statements are given as 5, 4, 3, 2, and 1 for SA, A, U, D, and SD respectively. On the other hand, for negative statements the points given are 1, 2, 3, 4, and 5 to the respondent's categories SD, D, U, A, and SA respectively. The researchers completed the scoring work of all the copies of the attitude scale of 640 pupil teachers and the attitude scores of the pupil teachers are enclosed in Appendix 6.

**iii) Intelligence Test:** The scoring of the intelligence test of pupil teachers was done by making use of the scoring key of this test and following the instructions indicated in the manual of the test. The scores obtained by the pupil teachers on the intelligence test have been enclosed in Appendix 6.

**iv) Socio-Economic Status Scale:** The scores of the socio-economic status scale were done as per the scoring key is given in the manual of this scale. Proper instructions and directions of the manual were followed while giving the scores. The socio-economic status scale was divided into two parts, Part-A and Part-B. Part-A consists of scores from information such as caste and academic stream which carries 3, 2, and 1 for caste and 3, 2, and 1 for academic stream respectively. Further Part-B is divided into five dimensions and each dimension has different items and scorings weightage. Dimension-I: socio-cultural component consist of 15 items and the scorings are: Item 1; 2, 1, Item 2; 1,0, Item 3; 1,0, Item 4; 2, 1, 0, Item 5; 2, 1, 0, Item 6; 2, 1, 0, Item 7; 2, 1, 0, Item 8; 0, 1, 2, Item 9; 4,3,2,1, Item 10; 6,5,4,3,2,1,0, Item 11; -1, 1, Item 12; 3,2,1,0, Item 13; 3,2,1,0, Item 14; 4,3,2,1,0, Item 15; 4,3,2,1,0.

Dimension-II: Economic component consist of 4 items and the scorings are: Item 16; 6,5,4,3,2,1, Item 17; 5,4,3,2,1,0, Item 18; 4,3,2,1,0, Item 19; 1,0, Item 20: 2,1.

Dimension-III: Possession of goods and services consist of 10 items and the scorings are: Item 21; 7,6,5,4,3,2,1, Item 22; 4,3,2,1,0, Item 23; 4,3,2,1,0, Item 24; 1,1,1,2,1,1,2,1,1,1,1,1,1,2, Item 25; 3,2,1,0, Item 26; 1,1,1,1,1,0, Item 27; 1,1,1,1,1,1, Item 28; 2,1,0, Item 29; 2,1,0, Item 30; 1,0.

Dimension-IV: Health component consist of 5 items and the scorings are: Item 31; 2,1, -1, Item 32; -1,1, Item 33; -1,1, Item 34; -1,1, Item 35; 4,3,2,1.

Dimension-V: Educational component consist of 5 items and the scorings are: Item 36; 4,3,2,1, Item 37; 3,2,1,0, Item 38; 5,4,3,2,1, Item 39; 5,4,3,2,1,0, Item 40; 5,4,3,2,1,0.

In this way, the scoring of the socio-economic status of 640 pupil teachers was completed. A copy of the scores obtained by the pupil teachers is enclosed in Appendix- 6.

v) **Academic Achievement:** For Academic Achievement, the marks of pupil teachers obtained in their previous end semester exam were taken into consideration. A copy of the marks obtained has been enclosed in Appendix 6.

### 3.6. TABULATION AND ORGANIZATION OF DATA

The raw scores of pupil teachers on human rights education awareness test and Attitude scale towards human rights education have been organized in the form of frequency distribution tables in relation to cognitive variables like – gender, locality and socio-economic status and non-cognitive variables like – streams of study, intelligence and academic achievement.

Firstly, the raw scores of 640 pupil teachers on Socio-Economic Status, Intelligence and Academic Achievement have been taken into consideration for preparing the frequency table which is used for deciding the low and high socio-economic status, low and high intelligent pupil teachers and low and high academic achievements of pupil teachers.

All these frequency distribution tables have been put under the following tables:

**Table-3.11: Frequency Table of Socio-Economic Status Scores of Pupil teachers**

Class Interval	f	c f
105-119	2	640
90-104	43	638
75-89	159	595
60-74	244	436
45-59	150	192
30-44	37	42
15-29	5	5

N = 640

In order to determine the low and high socio-economic status among the pupil teachers, 33<sup>rd</sup> and 66<sup>th</sup> percentile scores of pupil teachers were computed.

$$\begin{aligned}
 P_{33} &= L + \frac{\left(\frac{N}{3} - fb\right)}{fw} \times i \\
 &= 59.5 + \frac{(213 - 192)}{244} \times 15 \\
 &= 59.5 + 1.29 \\
 &= 60.79
 \end{aligned}
 \qquad
 \begin{aligned}
 P_{66} &= L + \frac{\left(\frac{N2}{3} - fb\right)}{fw} \times i \\
 &= 59.5 + \left(\frac{422 - 192}{244}\right) \times 15 \\
 &= 59.5 + 14.13 \\
 &= 73.63
 \end{aligned}$$

As per the computation of the 33<sup>rd</sup> and 66<sup>th</sup> percentile pupil teachers who scored 61 and below were considered having low socio-economic status and those who scored 74 and above were considered having high socio-economic status.

**Table-3.12: Frequency Table of Intelligence Test Scores of Pupil teachers**

Class Interval	f	c f
91-100	11	640
81-90	26	629
71-80	89	603
61-70	178	514
51-60	156	336
41-50	105	180
31-40	53	75
21-30	17	22
10-20	5	5

N = 640

In order to determine the low and high intelligence level of pupil teachers, 33<sup>rd</sup> and 66<sup>th</sup> percentile scores were computed.

$$\begin{aligned}
 P_{33} &= L + \frac{\left(\frac{N}{3} - fb\right)}{fw} \times i \\
 &= 50.5 + \frac{(213 - 180)}{156} \times 10 \\
 &= 50.5 + 2.11 \\
 &= 52.61
 \end{aligned}
 \qquad
 \begin{aligned}
 P_{66} &= L + \frac{\left(\frac{N2}{3} - fb\right)}{fw} \times i \\
 &= 60.5 + \left(\frac{426 - 336}{178}\right) \times 10 \\
 &= 60.5 + 5.05 \\
 &= 65.55
 \end{aligned}$$

As per the computation of the 33<sup>rd</sup> and 66<sup>th</sup> percentile pupil teachers who scored 53 and below were considered low intelligence group and those who scored 66 and above were considered high intelligence group.

**Table-3.13: Frequency Table of Academic Achievement Scores of Pupil teachers**

Class Interval	f	c f
81-90	2	640
71-80	74	638
61-70	430	564
51-60	131	134
41-50	3	3

N =640

To determine the two groups of low and high academic achiever among the pupil teachers, 33<sup>rd</sup> and 66<sup>th</sup> percentile scores were computed.

$$\begin{aligned}
 P_{33} &= L + \frac{\left(\frac{N}{3} - fb\right)}{fw} \times i \\
 &= 60.5 + \frac{(213 - 134)}{430} \times 10 \\
 &= 60.5 + 1.83 \\
 &= 62.33
 \end{aligned}
 \qquad
 \begin{aligned}
 P_{66} &= L + \frac{\left(\frac{N2}{3} - fb\right)}{fw} \times i \\
 &= 60.5 + \left(\frac{426 - 134}{430}\right) \times 10 \\
 &= 60.5 + 6.79 \\
 &= 67.29
 \end{aligned}$$

As per the computation of the 33<sup>rd</sup> and 66<sup>th</sup> percentile pupil teachers who scored 62 per cent and below were considered low achievers and those who scored 67 per cent and above were considered high achievers.

**Table-3.14: Frequency Distribution Table of Human Rights Education Awareness Scores of Pupil teachers in relation to Cognitive Variables**

Overall		Arts		Science		Low Intelligence	
Scores	Frequency	Scores	Frequency	Scores	Frequency	Scores	Frequency
36-40	10	36-40	9	36-40	1	36-40	1
31-35	36	31-35	27	31-35	9	31-35	9
26-30	131	26-30	82	26-30	49	26-30	47
21-25	238	21-25	137	21-25	101	21-25	87
16-20	148	16-20	70	16-20	78	16-20	49
11-15	44	11-15	27	11-15	17	11-15	14
6-10	16	6-10	7	6-10	9	6-10	7
1-5	17	1-5	13	1-5	4	1-5	7
Total	640	Total	372	Total	268	Total	221

High Intelligence		Low Achievement		High Achievement	
Scores	Frequency	Scores	Frequency	Scores	Frequency
36-40	4	36-40	4	36-40	3
31-35	16	31-35	13	31-35	15
26-30	46	26-30	44	26-30	57
21-25	63	21-25	84	21-25	76
16-20	45	16-20	46	16-20	49
11-15	18	11-15	15	11-15	22
6-10	4	6-10	6	6-10	6
1-5	5	1-5	3	1-5	7
Total	201	Total	215	Total	235

**Table-3.15: Frequency Distribution Table of Human Rights Education Awareness Scores of Pupil teachers in relation to Non-Cognitive Variables**

Overall		Male		Female		Urban	
Scores	Frequency	Scores	Frequency	Scores	Frequency	Scores	Frequency
36-40	10	36-40	0	36-40	10	36-40	6
31-35	36	31-35	11	31-35	25	31-35	19
26-30	131	26-30	60	26-30	71	26-30	74
21-25	238	21-25	95	21-25	143	21-25	129
16-20	148	16-20	64	16-20	84	16-20	70
11-15	44	11-15	15	11-15	29	11-15	22
6-10	16	6-10	5	6-10	11	6-10	6
1-5	17	1-5	4	1-5	13	1-5	6
Total	640	Total	254	Total	386	Total	332

Rural		Low SES		High SES	
Scores	Frequency	Scores	Frequency	Scores	Frequency
36-40	4	36-40	3	36-40	4
31-35	17	31-35	15	31-35	12
26-30	57	26-30	42	26-30	42
21-25	109	21-25	84	21-25	90
16-20	78	16-20	55	16-20	40
11-15	22	11-15	13	11-15	18
6-10	10	6-10	6	6-10	4
1-5	1	1-5	5	1-5	6
Total	308	Total	223	Total	216

**Table-3.16: Frequency Distribution Table of Attitude Scores of Pupil teachers towards Human Rights Education in relation to Cognitive Variables**

Overall		Arts		Science		Low Intelligence	
Scores	Frequency	Scores	Frequency	Scores	Frequency	Scores	Frequency
131-145	3	131-145	2	131-145	1	131-145	1
116-130	96	116-130	57	116-130	39	116-130	32
101-115	374	101-115	217	101-115	157	101-115	131
86-100	124	86-100	73	86-100	51	86-100	38
71-85	29	71-85	16	71-85	13	71-85	15
56-70	10	56-70	5	56-70	5	56-70	3
41-55	3	41-55	2	41-55	2	41-55	1
26-40	0	26-40	0	26-40	0	26-40	0
11-25	1	11-25	0	11-25	0	11-25	0
Total	640	Total	372	Total	268	Total	221

High Intelligence		Low Achievement		High Achievement	
Scores	Frequency	Scores	Frequency	Scores	Frequency
131-145	0	131-145	2	131-145	0
116-130	34	116-130	34	116-130	39
101-115	112	101-115	127	101-115	134
86-100	46	86-100	37	86-100	48
71-85	5	71-85	9	71-85	10
56-70	3	56-70	4	56-70	3
41-55	0	41-55	2	41-55	0
26-40	0	26-40	0	26-40	0
11-25	1	11-25	0	11-25	1
Total	201	Total	215	Total	235

**Table-3.17: Frequency Distribution Table of Attitude Scores of Pupil teachers towards Human Rights Education in relation to Non-Cognitive Variables**

Overall		Male		Female		Urban	
Scores	Frequency	Scores	Frequency	Scores	Frequency	Scores	Frequency
131-145	3	131-145	1	131-145	2	131-145	0
116-130	96	116-130	32	116-130	64	116-130	53
101-115	374	101-115	143	101-115	231	101-115	198
86-100	124	86-100	56	86-100	68	86-100	60
71-85	29	71-85	15	71-85	14	71-85	16
56-70	10	56-70	5	56-70	5	56-70	3
41-55	3	41-55	2	41-55	1	41-55	1
26-40	0	26-40	0	26-40	0	26-40	0
11-25	1	11-25	0	11-25	1	11-25	1
Total	640	Total	254	Total	386	Total	332

Rural		Low SES		High SES	
Scores	Frequency	Scores	Frequency	Scores	Frequency
131-145	3	131-145	1	131-145	0
116-130	43	116-130	39	116-130	37
101-115	176	101-115	125	101-115	117
86-100	64	86-100	41	86-100	47
71-85	13	71-85	13	71-85	8
56-70	7	56-70	3	56-70	4
41-55	2	41-55	1	41-55	2
26-40	0	26-40	0	26-40	0
11-25	0	11-25	0	11-25	1
Total	308	Total	223	Total	216

**Table-3.18: Human Rights Education Awareness Test Scores of Secondary Teacher Education Pupil teachers of Arts and Science Stream, Low and High Intelligence and Low and High Academic Achievement (Cognitive Variables).**

ALILAA	ALIHA A	AHILA A	AHIHA A	SLILA A	SLIHA A	SHILA A	SHIHA A
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
20	19	22	27	21	2	24	14
24	20	19	25	10	20	29	16
27	20	29	11	22	20	24	23
23	26	30	30	25	36	21	28
22	29	29	35	28	26	18	26
26	22	27	12	22	19	25	25
23	22	35	21	25	24	25	26
24	25	25	23	28	11	30	22
23	18	34	26	19	19	24	19
18	22	21	24	16	10	19	26
22	26	28	20	22	23	24	23
23	28	26	24	22	29	22	21
15	24	27	14	16	18	16	19
28	22	25	23	26	16	25	18
30	27	20	26	22	22	29	12
21	27	25	27	20	26	27	23
18	25	19	21	32	23	12	21
21	21	19	23	23	32	22	21
22	29	17	26	20	17	2	17
21	19	27	30	32	19	20	20
21	15	29	19	26	20	18	20
20	12	15	24	17	18	22	19
24	26	20	22	3	17	22	12
14	17	20	20	22	28	17	23
25	23	25	23	23	9	25	13
$\Sigma 555$	$\Sigma 564$	$\Sigma 613$	$\Sigma 576$	$\Sigma 542$	$\Sigma 504$	$\Sigma 542$	$\Sigma 507$

$$\Sigma x = 4403$$

**Table-3.19: Squared Data of Human Rights Education Awareness Test Scores of Secondary Teacher Education Pupil teachers of Arts and Science Stream, Low and High Intelligence and Low and High Academic Achievement (Cognitive Variables).**

ALILAA	ALIHAA	AHILAA	AHIHAA	SLILAA	SLIHAA	SHILAA	SHIHAA
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
400	361	484	729	441	4	576	196
576	400	361	625	100	400	841	256
729	400	841	121	484	400	576	529
529	676	900	900	625	1296	441	784
484	841	841	1225	784	676	324	676
676	484	729	144	484	361	625	625
529	484	1225	441	625	576	625	676
576	625	625	529	784	121	900	484
529	324	1156	676	361	361	576	361
324	484	441	576	256	100	361	676
484	676	784	400	484	529	576	529
529	784	676	576	484	841	484	441
225	576	729	196	256	324	256	361
784	484	625	529	676	256	625	324
900	729	400	676	484	484	841	144
441	729	625	729	400	676	729	529
324	625	361	441	1024	529	144	441
441	441	361	529	529	1024	484	441
484	841	289	676	400	289	4	289
441	361	729	900	1024	361	400	400
441	225	841	361	676	400	324	400
400	144	225	576	289	324	484	361
576	676	400	484	9	289	484	144
196	289	400	400	484	784	289	529
625	529	625	529	529	81	625	169
$\Sigma 12643$	$\Sigma 13188$	$\Sigma 15673$	$\Sigma 13968$	$\Sigma 12692$	$\Sigma 11486$	$\Sigma 12594$	$\Sigma 10765$

$$\Sigma x^2 = 103009$$

**Table-3.20: Human Rights Education Awareness Test Scores of Secondary Teacher Education Pupil teachers of Male and Female, Urban and Rural, Low and High Socio-Economic Status (Non-Cognitive Variables).**

MULSES	MUHSES	MRLSES	MRHSES	FULSES	FUHSES	FRLSES	FRHSES
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
17	25	20	14	25	24	22	22
20	24	16	17	23	23	20	26
22	21	22	24	18	22	22	25
24	22	23	27	23	24	27	21
29	24	19	33	19	21	18	22
25	23	22	26	24	24	18	23
24	20	24	24	20	22	22	23
23	25	15	20	18	22	19	16
16	26	22	18	26	25	22	14
26	20	18	25	24	25	18	22
18	21	26	22	23	21	20	24
23	22	26	20	22	25	22	19
23	22	22	25	23	23	31	22
22	25	24	25	25	23	23	21
18	23	24	20	18	22	16	24
23	23	22	23	25	18	26	18
26	24	22	18	19	20	24	22
22	26	21	22	26	25	19	23
19	23	27	28	23	22	22	16
17	18	23	22	26	23	22	23
23	23	21	22	21	21	22	23
22	21	24	23	24	24	21	25
24	22	23	17	19	23	21	22
16	28	22	27	22	22	22	22
22	22	21	17	25	19	23	17
23	23	20	23	19	22	21	20
24	21	21	22	18	18	22	18
25	23	27	26	20	23	24	20
25	27	25	21	25	23	20	19
20	24	20	22	24	25	23	21
Σ661	Σ691	Σ662	Σ673	Σ667	Σ674	Σ652	Σ633

Σx=5313

**Table-3.21: Squared Data of Human Rights Education Awareness Test Scores of Secondary Teacher Education Pupil teachers of Male and Female, Urban and Rural, Low and High Socio-Economic Status (Non-Cognitive Variables).**

MULSES	MUHSES	MRLSES	MRHSES	FULSES	FUHSES	FRLSES	FRHSES
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
289	625	400	196	625	576	484	484
400	576	256	289	529	529	400	676
484	441	484	576	324	484	484	625
576	484	529	729	529	576	729	441
841	576	361	1089	361	441	324	484
625	529	484	676	576	576	324	529
576	400	576	576	400	484	484	529
529	625	225	400	324	484	361	256
256	676	484	324	676	625	484	196
676	400	324	625	576	625	324	484
324	441	676	484	529	441	400	576
529	484	676	400	484	625	484	361
529	484	484	625	529	529	961	484
484	625	576	625	625	529	529	441
324	529	576	400	324	484	256	576
529	529	484	529	625	324	676	324
676	576	484	324	361	400	576	484
484	676	441	484	676	625	361	529
361	529	729	784	529	484	484	256
289	324	529	484	676	529	484	529
529	529	441	484	441	441	484	529
484	441	576	529	576	576	441	625
576	484	529	289	361	529	441	484
256	784	484	729	484	484	484	484
484	484	441	289	625	361	529	289
529	529	400	529	361	484	441	400
576	441	441	484	324	324	484	324
625	529	729	676	400	529	576	400
625	729	625	441	625	529	400	361
400	576	400	484	576	625	529	441
$\Sigma 14865$	$\Sigma 16055$	$\Sigma 14844$	$\Sigma 15553$	$\Sigma 15051$	$\Sigma 15252$	$\Sigma 14418$	$\Sigma 13601$

$$\Sigma \chi^2 = 119639$$

**Table-3.22: Attitude Scores of Secondary Teacher Education Pupil teachers of Arts and Science Stream, Low and High Intelligence and Low and High Academic Achievement (Cognitive Variables).**

ALILAA	ALIHA A	AHILA A	AHIHA A	SLILAA	SLIHA A	SHILA A	SHIHA A
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
111	103	110	98	113	101	102	112
92	88	112	120	113	128	108	95
107	110	99	108	105	108	118	107
110	112	116	110	114	115	115	111
118	107	114	116	102	72	117	108
108	101	105	107	117	106	65	110
105	106	119	92	84	73	105	105
116	105	97	103	72	105	111	111
114	104	107	111	104	89	99	115
117	107	106	114	107	76	109	108
113	109	109	115	111	69	98	101
89	106	114	106	76	88	115	105
107	115	92	109	112	101	114	110
113	111	101	121	100	88	114	92
119	92	115	75	107	97	112	98
96	101	100	100	97	115	105	108
101	100	111	101	115	100	56	121
106	99	101	97	98	123	102	110
103	106	111	100	115	98	117	92
100	116	107	104	102	101	110	94
101	102	114	119	106	101	96	112
104	106	90	102	112	91	108	113
111	107	98	110	108	119	103	81
109	114	124	89	108	107	109	109
102	113	108	105	108	111	118	98
$\Sigma 2672$	$\Sigma 2640$	$\Sigma 2680$	$\Sigma 2632$	$\Sigma 2606$	$\Sigma 2482$	$\Sigma 2626$	$\Sigma 2626$

$$\Sigma x = 20964$$

**Table-3.23: Squared Data of Attitude Scores of Secondary Teacher Education Pupil teachers of Arts and Science Stream, Low and High Intelligence and Low and High Academic Achievement (Cognitive Variables).**

ALILAA	ALIHAA	AHILAA	AHIHAA	SLILAA	SLIHAA	SHILAA	SHIHAA
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
12321	10609	12100	9604	12769	10201	10404	12544
8464	7744	12544	14400	12769	16384	11664	9025
11449	12100	9801	11664	11025	11664	13924	11449
12100	12544	13456	12100	12996	13225	13225	12321
13924	11449	12996	13456	10404	5184	13689	11664
11664	10201	11025	11449	13689	11236	4225	12100
11025	11236	14161	8464	7056	5329	11025	11025
13456	11025	9409	10609	5184	11025	12321	12321
12996	10816	11449	12321	10816	7921	9801	13225
13689	11449	11236	12996	11449	5776	11881	11664
12769	11881	11881	13225	12321	4761	9604	10201
7921	11236	12996	11236	5776	7744	13225	11025
11449	13225	8464	11881	12544	10201	12996	12100
12769	12321	10201	14641	10000	7744	12996	8464
14161	8464	13225	5625	11449	9409	12544	9604
9216	10201	10000	10000	9409	13225	11025	11664
10201	10000	12321	10201	13225	10000	3136	14641
11236	9801	10201	9409	9604	15129	10404	12100
10609	11236	12321	10000	13225	9604	13689	8464
10000	13456	11449	10816	10404	10201	12100	8836
10201	10404	12996	14161	11236	10201	9216	12544
10816	11236	8100	10404	12544	8281	11664	12769
12321	11449	9604	12100	11664	14161	10609	6561
11881	12996	15376	7921	11664	11449	11881	11881
10404	12769	11664	11025	11664	12321	13924	9604
$\Sigma 287042$	$\Sigma 279848$	$\Sigma 288976$	$\Sigma 279708$	$\Sigma 274886$	$\Sigma 252376$	$\Sigma 281172$	$\Sigma 277796$

$$\Sigma x^2 = 2221804$$

**Table-3.24: Attitude Scores of Secondary Teacher Education Pupil teachers of Male and Female, Urban and Rural, Low and High Socio-Economic Status (Non-Cognitive Variables).**

MULSES	MUHSES	MRLSES	MRHSES	FULSES	FUHSES	FRLSES	FRHSES
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
115	96	106	92	98	115	101	110
92	110	102	108	116	108	107	103
101	101	116	103	108	116	102	114
110	113	100	89	109	103	112	100
99	102	103	102	104	114	105	98
112	109	107	108	113	105	106	112
108	102	111	101	99	92	112	115
107	101	110	112	102	109	107	113
74	95	106	109	109	99	113	101
102	110	113	97	105	102	119	109
106	112	80	111	112	100	114	111
102	111	115	80	107	104	110	56
84	102	89	80	115	100	108	111
105	111	109	98	100	107	108	102
116	110	101	89	111	114	110	111
109	114	105	76	97	106	107	110
111	110	110	107	112	88	109	107
98	104	69	96	117	81	107	93
108	109	74	112	91	105	96	112
115	112	101	98	103	113	103	106
107	98	87	106	103	115	105	108
111	100	97	92	110	112	107	102
98	90	106	110	114	89	98	101
73	110	106	91	103	110	106	104
102	107	83	106	102	97	111	105
110	105	96	108	118	115	114	104
103	92	106	89	102	117	90	107
113	98	109	116	98	111	115	105
94	107	100	101	108	107	102	98
114	100	112	87	104	101	116	104
$\Sigma 3099$	$\Sigma 3141$	$\Sigma 3029$	$\Sigma 2974$	$\Sigma 3190$	$\Sigma 3155$	$\Sigma 3220$	$\Sigma 3132$

$\Sigma x = 24940$

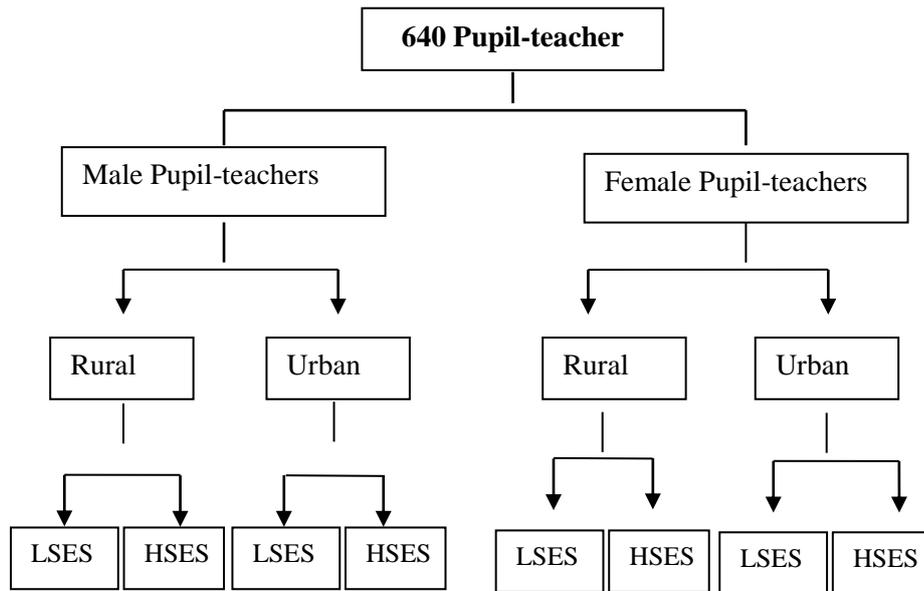
**Table-3.25: Squared Data of Attitude Scores of Secondary Teacher Education Pupil teachers of Male and Female, Urban and Rural, Low and High Socio-Economic Status (Non-Cognitive Variables).**

MULSES	MUHSES	MRLSES	MRHSES	FULSES	FUHSES	FRLSES	FRHSES
Category (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
13255	9216	11236	8464	9604	13225	10201	12100
8464	12100	10404	11664	13456	11664	11449	10609
10201	10201	13456	10609	11664	13456	10404	12996
12100	12769	10000	7921	11881	10609	12544	10000
9801	10404	10609	10404	10816	12996	11025	9604
12544	11881	11449	11664	12769	11025	11236	12544
11664	10404	12321	10201	9801	8464	12544	13225
11449	10201	12100	12544	10404	11881	11449	12769
5476	9025	11236	11881	11881	9801	12769	10201
10404	12100	12769	9409	11025	10404	14161	11881
11236	12544	6400	12321	12544	10000	12996	12321
10404	12321	13225	6400	11449	10816	12100	3136
7056	10404	7921	6400	13225	10000	11664	12321
11025	12321	11881	9604	10000	11449	11664	10404
13456	12100	10201	7921	12321	12996	12100	12321
11881	12996	11025	5776	9409	11236	11449	12100
12321	12100	12100	11449	12544	7744	11881	11449
9604	10816	4761	9216	13689	6561	11449	8649
11664	11881	5476	12544	8281	11025	9216	12544
13225	12544	10201	9604	10609	12769	10609	11236
11449	9604	7569	11236	10609	13225	11025	11664
12321	10000	9409	8464	12100	12544	11449	10404
9604	8100	11236	12100	12996	7921	9604	10201
5329	12100	11236	8281	10609	12100	11236	10816
10404	11449	6889	11236	10404	9409	12321	11025
12100	11025	9216	11664	13924	13225	12996	10816
10609	8464	11236	7921	10404	13689	8100	11449
12769	9604	11881	13456	9604	12321	13225	11025
8836	11449	10000	10201	11664	11449	10404	9604
12966	10000	12544	7569	10816	10201	13456	10816
$\Sigma$ 323617	$\Sigma$ 330123	$\Sigma$ 309987	$\Sigma$ 298124	$\Sigma$ 340502	$\Sigma$ 334205	$\Sigma$ 346726	$\Sigma$ 330230

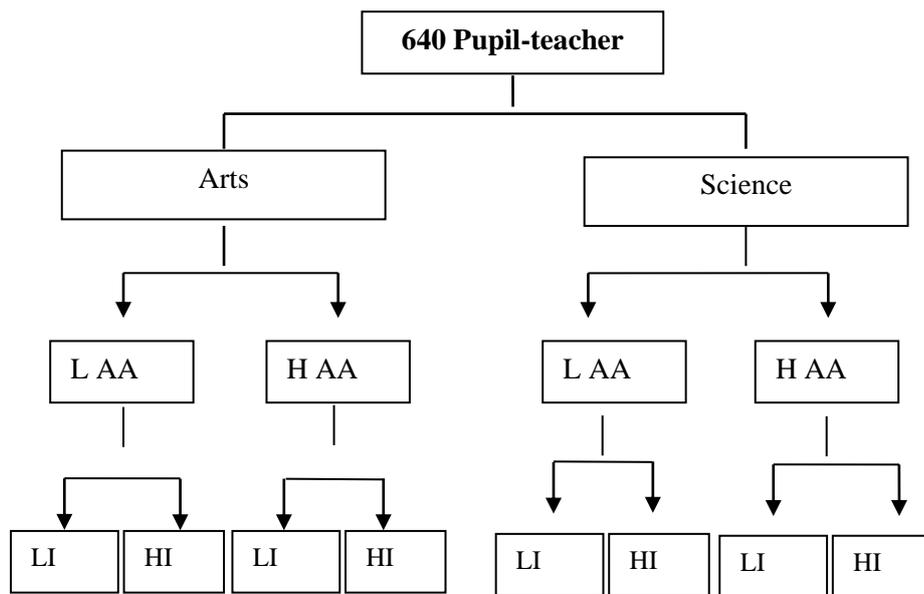
$$\Sigma x^2 = 2613514$$

### 3.7. ANALYSIS OF COLLECTED DATA

Based on the nature of collected data about the awareness and attitude scores of pupil-teachers in relation to different cognitive and non-cognitive variables, the researchers adopted the following design to analyze the data:



LSES = Low Socio-Economic Status; HSES = High Socio-Economic Status



L AA = Low Academic Achievement

H AA = High Academic Achievement

LI = Low Intelligence

HI = High Intelligence

As per the stated design, the researchers used an analysis of variance (2×2×2 factorial design)

For the purpose of analysis, the following categories of pupil teachers have been used:

<b>COGNITIVE VARIABLES</b>
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1. A, LI, L AA = Arts, Low Intelligence, Low Academic Achievement
2. A, LI, H AA = Arts, Low Intelligence, High Academic Achievement
3. A, HI, L AA = Arts, High Intelligence, Low Academic Achievement
4. A, HI, H AA = Arts, High Intelligence, High Academic Achievement
5. S, LI, L AA = Science, Low Intelligence, Low Academic Achievement
6. S, LI, H AA = Science, Low Intelligence, High Academic Achievement
7. S, HI, L AA = Science, High Intelligence, Low Academic Achievement
8. S, HI, H AA = Science, High Intelligence, High Academic Achievement

<b>NON- COGNITIVE VARIABLES</b>
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1. M, U, LSES = Male, Urban, Low Socio-Economic Status
2. M, U, HSES = Male, Urban, High Socio-Economic Status
3. M, R, LSES = Male, Rural, Low Socio-Economic Status
4. M, R, HSES = Male, Rural High Socio-Economic Status
5. F, U, LSES = Female, Urban, Low Socio-Economic Status
6. F, U, HSES = Female, Urban, High Socio-Economic Status
7. F, R, LSES = Female, Rural, Low Socio-Economic Status
8. F, R, HSES = Female, Rural High Socio-Economic Status