Chapter 3

Methodology

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Chapter 3
Methodology

3.0 Introduction

Keeping in view the vast advancement in sampling techniques, research tools, control of variables, field experiment designs, it becomes essential to use the recent trends in the measurement of variables understudy as scientific research depends largely upon the nature of methodological sophistication. However, the relevance of findings not only depends upon the application of methodological sophistication but also upon the objectivity, dependability and techniques of the sample selection. The methods and procedures followed by controls and precautions in the application of variables are also key steps in selection.

3.1 The Universe

The investigation has been designed to study the impact of sex consciousness, sex and temperament on academic achievement of adolescence. The universe of the study, therefore, was located to middle and higher secondary public schools of Raipur.

Raipur was a very small town in fifties but due to the foundation of Bhilai Steel Plant it has become a big city. It is located approx 240 km east of Nagpur and is situated on main route of Mumbai, Howrah via Nagpur rail route.

Since the formation of a new state Chhattisgarh in 2000, Raipur has been declared the capital of the state to meet the needs and demands of the society.
3.11 Population

There are 27 Schools situated in the town which are governed by the state government 128 schools, 13 public schools affiliated to CBSE board and only seven schools which are controlled by govt aided organisations. There are 14978 students studying in 8th class, 11,801 in class 10th and 9424 in 12th class.

3.12 Sample

Sample is one of the aspect by which the researcher gets the data which presents the identity with the data of the population because for a scientific research, the sample is a true replica of the population and the obtained result from the sample will be accurate & valid. Secondly findings from a great population will be a time consuming, expensive and impractical process.

In this research the study has been conducted only on two public schools of Raipur and hence the sample has been taken from two public schools only. The technique employed for sample, in this, is stratified random sampling since there are different kinds of schools as mentioned in population, the sex-consciousness, sex and temperament will vary from schools to schools as different schools will have different social, financial, academic environment. The different kinds of boards viz. Chhattisgarh board, Central Board of Secondary Education (CBSE) and Indian Certificate of School Education (ICSE) will create different kinds of academic, social, cultural environments. The freedom of different kinds of schools and different kinds of status will create different kinds of awareness about sex-consciousness and temperament in students studying in different standards. To have a pattern of cultural,
social, financial and academic environment and to control the intervening or extraneous variables, sample has been selected only from two public schools. By doing this, it is tried to control other variables. The following steps have been taken to control other variables and to have a uniform pattern of sample from VIII, X & XII class pupils.

1. Similar pattern of schools were taken for the study.
2. Schools, having the same board, were taken into considerations.
3. Medium of instructions in the schools were also one of the steps in the selections of the schools.
4. Similar academic environment, discipline of schools, mode of teaching, curriculum and age were given priorities in the selection of the sample.
5. Out of 3, ICSE affiliated public schools, two schools were selected by way of random method.
6. The total students studying in VIII, X & XII class of the selected schools, were taken for the sample.
7. The students who scored high and low on the sex - consciousness scale were identified and their academic achievement were collected from their schools.
8. The Temperament of students, who scored high and low on the test of sex consciousness group were taken for the study.
9. To employ, Analysis of Variance & for finding the impact of independent variables 40 students from low and 40 students from high sex - conscious group were selected were taken from VIII, X & XII grade pupils. Thus 240 pupils (80 from VIII, 80 from X & 80 from XII class) were selected and is presented in Table III :I

Table III:1 : Showing Sample drawn from the schools

<table>
<thead>
<tr>
<th></th>
<th>VIII</th>
<th></th>
<th>XIII</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>T</td>
</tr>
<tr>
<td>School No. 1</td>
<td>100</td>
<td>40</td>
<td>140</td>
</tr>
<tr>
<td>School No. 2</td>
<td>96</td>
<td>59</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>196</td>
<td>99</td>
<td>295</td>
</tr>
</tbody>
</table>
3.2 Research Design

In this study the independent and dependent variables were identified and are presented below:

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sex Consciousness</td>
<td>1. Academic achievement</td>
</tr>
<tr>
<td>2. Sex</td>
<td></td>
</tr>
<tr>
<td>3. Temperament</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Instruments

To have valid findings it has become mandatory to select such tools/instruments for the measurement of the variables which are scientific in nature. In absence of an objective, reliable and valid instrument for the measurement of sex consciousness of adolescence, the researcher has developed a reliable and valid tool which would suit to the need of the researcher and to the investigation. For sex variable it has been classified on the basis of their physiological structure and development. For the measurement of temperament, a valid and reliable prepared and standardized tool was used.

3.3.1 Sex Consciousness Scale

3.3.1.1 Description

In the present study Sex - Consciousness Scale prepared by the researcher for the measurement of sex - consciousness of adolescence studying in standard 8th, 10th and 12th class was used.

For the preparation of the sex - consciousness Scale, 4 eminent persons namely - one educationist, two psychologists and one sociologist were
They were asked to prepare innumerable number of statements which can help in the measurement of sex-consciousness. In such a way 81 statements were obtained from these eminent personalities. These statements were categorically analysed and common statements were chosen for the scale. In this process 17 statements were identified and selected for the scale which had been given similar weightage by the eminent personalities. In this process remaining 49 statements were again discussed with the personalities and a test containing 66 items (17+49 items) were taken into consideration for the first try out.

The prepared scale was administered on 30 adolescents (10 from 8th class, 10 from 10th class and 10 from 12th class). After obtaining the scores a 't' value was employed to know the level of significance. No significant difference were observed. Newly prepared test was administered again on the same pupils of the same class after a gap of 16 days and a correlation was obtained which shows that the reliability of this scale is of high cadre. The reliability was calculated by tests and re-test method which were obtained as .79 for class VIII, .72 for class X, .77 for class XII.

5.3.12 Scoring

The sex-consciousness scale was prepared by Dr. P.K. Srivastava and Smt. Sushma Jha (2003). This test contains 32 items on the basis of weightage selected by a group of judges containing one educationist, 2 psychologists and one sociologist. The test was based on 5 point rating scale. These points are strongly Agree, Agree, undecided, disagree and strongly disagree. The points 4,3,2,1 and 0 were allotted to these rating scale in the same order in the positive statements. Those statements which are negative will be given 0,1,2,3 & 4. Thus in total maximum 128 score will be obtained by each student.
3-3.2 Sex

For having a study based on the sex the sex has been considered as an independent variable. In this context male & female have been taken as independent variables.

From the above 66 items only 32 items were selected again by the eminent personalities on the basis of the need and gravity of the situation. Out of these 32 items, three were negative. These are 9,12 & 30. This final test containing 32 items were administered again on 30 students of different standards after a gap of 10 days and again the coefficient of correlation was calculated which came to .87 for 8th standard, .76 for 10th standard and .79 for 12th standard. This coefficient of correlation indicates that the final test is having a high reliability in all the 3 stages.

3-3.3 Dimensions of Temperamental Scale (DTS)

To measure the temperament of the adolescence of different standards (8th, 10th, 12th) the dimensions of the temperamental scale (DTS) prepared by Chhada and Chandana (1984) was selected for this study.

3-3.3.1 Description of the test :- In this test the temperament has been defined as characteristic phenomenon of an individual's nature including his susceptibility to emotional situations.

In this test 15 dimensions were included which are given as under :-
Table III : 2-showing reliability of different dimensions :

<table>
<thead>
<tr>
<th></th>
<th>Retest Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sociability</td>
<td>A</td>
</tr>
<tr>
<td>2. Ascendency</td>
<td>B</td>
</tr>
<tr>
<td>3. Secretiveness</td>
<td>C</td>
</tr>
<tr>
<td>4. Reflective</td>
<td>D</td>
</tr>
<tr>
<td>5. Impulsivity</td>
<td>E</td>
</tr>
<tr>
<td>6. Placid</td>
<td>F</td>
</tr>
<tr>
<td>7. Accepting</td>
<td>G</td>
</tr>
<tr>
<td>8. Responsible</td>
<td>H</td>
</tr>
<tr>
<td>9. Vigorous</td>
<td>I</td>
</tr>
<tr>
<td>10. Cooperative</td>
<td>J</td>
</tr>
<tr>
<td>11. Persistance</td>
<td>K</td>
</tr>
<tr>
<td>12. Warmth</td>
<td>L</td>
</tr>
<tr>
<td>13. Aggressiveness</td>
<td>M</td>
</tr>
<tr>
<td>14. Tolerance</td>
<td>N</td>
</tr>
<tr>
<td>15. Tough-minded</td>
<td>O</td>
</tr>
</tbody>
</table>

The following table presents the number of questions with their items in the different category of dimension.

In this test 119 questions are positive in nature and 33 questions are negative in nature.
3.3.32 Scoring

As per the scoring technique of the Dimensions of Temperamental Scale 1 score is to be given on Yes response in the positive questions and No score in case of no response in the positive questions.

1 Score is to be given for No in the negative questions whereas no score is to be given for Yes response in the negative questions.

Table III : 3 Showing items with dimensions

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Dimensions</th>
<th>Yes Response</th>
<th>No Response</th>
<th>Total Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sociability (A)</td>
<td>1,7,25,31,50,76,90,103,112,124</td>
<td>12,40</td>
<td>12</td>
</tr>
<tr>
<td>2.</td>
<td>Ascendant (B)</td>
<td>16,26,41,52,64,77,91,104</td>
<td>125</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>Secretiveness (C)</td>
<td>2,8,32,42,65,78,92,113</td>
<td>7,27</td>
<td>10</td>
</tr>
<tr>
<td>4.</td>
<td>Reflective (D)</td>
<td>3,18,33,53,66,79,93,105,114,126</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>Impulsivity (E)</td>
<td>43,54,80,127</td>
<td>67,94,106</td>
<td>7</td>
</tr>
<tr>
<td>6.</td>
<td>Placid (F)</td>
<td>4,55,81,107,115,134,138,151</td>
<td>34,95,128</td>
<td>11</td>
</tr>
<tr>
<td>7.</td>
<td>Accepting (G)</td>
<td>56,68,82,96</td>
<td>35,44</td>
<td>6</td>
</tr>
<tr>
<td>8.</td>
<td>Responsible (H)</td>
<td>5,19,45,57,69,83,94,116</td>
<td>36</td>
<td>9</td>
</tr>
<tr>
<td>9.</td>
<td>Vigorous (I)</td>
<td>9,20,58,117,129,135,140,142,144,145,147,149,152</td>
<td>70</td>
<td>14</td>
</tr>
<tr>
<td>10.</td>
<td>Cooperative (J)</td>
<td>2846,59,71,84,98,130,139,146</td>
<td>13,21,37,118,136</td>
<td>14</td>
</tr>
<tr>
<td>11.</td>
<td>Persistence (K)</td>
<td>10,29,60,85,119</td>
<td>22,99,131</td>
<td>8</td>
</tr>
<tr>
<td>12.</td>
<td>Warmth (L)</td>
<td>6,14,23,47,61,86,100,108,120,132,137,141,148</td>
<td>72</td>
<td>14</td>
</tr>
<tr>
<td>13.</td>
<td>Aggressiveness (M)</td>
<td>5,30,38,48,62,73,87,101,109,121</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>14.</td>
<td>Tolerance (N)</td>
<td>24,74,110,122,143,150</td>
<td>11,39,49,88,133</td>
<td>11</td>
</tr>
<tr>
<td>15.</td>
<td>Tough Minded (O)</td>
<td>51,63,123</td>
<td>75,89,102,111</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>119</td>
<td>33</td>
<td>152</td>
</tr>
</tbody>
</table>
3.3.3 Reliability

The reliability of the whole scale was found out to be .94 derived by Test & retest method which shows a high reliability. The validity of the whole test on cross-validation was found out to be .81. The results indicate that these values are positive and highly significant.

3.4 Criteria of selection of the tool

The followings are the criteria of selection of the instruments;

3.4.1 Sex consciousness scale

As there was no such scale available in the market as well as in the area for the measurement of sex-consciousness, the researcher prepared the scale with the help of psychologists, educationist and sociologists.

2. This test has been prepared for VIII, X and XII class students.

3. This test was prepared in the area of Chhattisgarh taking into consideration public school students.

3.4.2 Dimensions of temperament Scale

1. This test is having a high reliability as mentioned in table and validity .81.

2. This test is easily available and administratable.

3. The test is easily understandable by the subject and easy in scoring.

4. The scores obtained, by this test, is easily convertable as per the need.

5. This test also measures 15 dimensions in the temperament.
3.5 Statistical Treatment

As per the research design there are three independent variables viz. sex - consciousness, sex and temperament and only one dependent variable i.e. academic achievement of VIII, X & XII Class pupils. The impact of independent variable was studied on the dependent variable of VIII, X & XII class pupils.

For getting a concrete result a three way Analysis of Variance (version 14) was employed on the scores obtained from the sample on academic achievement as dependent variable and on the sex - consciousness, sex group and temperament as independent variable from VIII, X & XII grade pupils.

The formula employed in this, is given as under. However to have a fool proof work SPSS Software was used in calculation.
Analysis of Variance
(Three way)

Steps
1. \[
    C = \frac{\sum X^2}{N}
\]
2. \[
    \text{SS}_T \text{ (Sum of squares of all the scores)} = \frac{\sum [X_1^2 + X_2^2 + \ldots]}{N} - C
\]

Main effect
(Sex - Consciousness (A), Sex (B) and Temperament (C))
3. Sum of the squares between the groups for A, B & C (independent) variables
   \[
   \frac{\text{SSA} / \text{SSB} / \text{SSC}}{n} = \left[ \frac{\sum X_1 + \sum X_2}{n} \right]^2 + \left[ \frac{\sum Y_1 \sum Y_2}{n} \right]^2 - C
   \]

Interactional analysis (First order)
(Sex - Cons Vs Sex, Sex Con Vs Temp, Sex Vs Temp)
1. \[
    \text{SS AxB} = \text{SSTr} - (\text{SS}_A + \text{SS}_B)
        = \frac{(X_1)^2 + (Y_1)^2 + (X_2)^2 + (Y_2)^2}{n} \left[ \text{SSA} + \text{SSB} \right]
\]
2. \[
    \text{SS AxC} = \frac{(\Sigma X_1)^2 + (\Sigma Z_1)^2 + (\Sigma X_2)^2 + (\Sigma Z_2)^2}{n} - [\text{SSA} + \text{SSC}]
\]
3. \[
    \text{SS BxC} = \frac{(\Sigma Y_1)^2 + (\Sigma Z_1)^2 + (\Sigma Y_2)^2 + (\Sigma Z_2)^2}{n} - [\text{SSB} + \text{SSC}]
\]

Interactional analysis (Second Order)
1. \[
    \text{SSA x B x C}
    \]
   \[
    \frac{\text{SSTr} = \left[ (\Sigma X_1)^2 + (\Sigma Y_1)^2 + (\Sigma Y_1)^2 + (\Sigma Z_1)^2 + (\Sigma Z_2)^2 \right]}{n} - C \ldots \ldots (1)
   \]
II. \[
    \text{SSA} + \text{SSB} + \text{SSC} + \text{SS}_A + \text{SS}_B + \text{SS}_C + \text{SS}_A + \text{SS}_B + \text{SS}_C \ldots \ldots (2)
\]
III. \[
    \text{SS}_{A, B, C} = 2 \cdot 1
\]
6. \[
    \text{SSW} = \text{SS}_T - \text{SS}_{Tr}
\]