CHAPTER -III

METHODOLOGY
Methodology

Choice of a suitable methodology is the back bone of any research undertaking. The choice is more difficult because every method has its own merits and demerits. It depends mainly on the nature of the problem. The present research in ex post facto type of research. It intends to find out the relationship between two variables- anxiety and creativity. It also endeavors to see the effect of variables such as- age, sex, family back-ground and academic profile of the students.

The Data:

Data are the basic requirement for the empirical type of the research. The present study involves, as it is evident, some variables that are qualitative and others are quantitative or at least quantitative proxies can represent them.

The study is carried out on basic of primary data collected from different Intermediate Collage located in Allahabad. The data are collected on the basis of questionnaire composed of two scales to measure anxiety level and creativity abilities together with other personal information of the students.
The variables under discussion are-

Age, sex, Family Background, Academic Profile, Anxiety and Creativity

**Age**: The Age of the students is directly observed.

**Sex**: The Sex of the students is also directly observed.

**Family Background**: The Family Background is captured by the average family income.

**Academic Profile**: The Academic Profile of the students is represented by the average marks scored by the students over three preceding years. It is considered that cognitive ability of the student can be represented by such average.

**Anxiety**: In experimental psychology, a large volume of work has been centered around the observed differential in behavior of high and low anxiety subjects. The development of the Manifest of Anxiety Scale (MAS) by Taylor (1953) provided a readily available measure of anxiety to the experimentalists and has stimulated a large volume of work on its correlates. Since Taylor's scale provided a quick and reliable measure of anxiety,
its popularity was assured though it is doubtful if it measures the same anxiety as by Rorchach (Eichler, 1951) or as conceived by clinicians.

Other anxiety tests have also become popular. Sarason and Mandler (1952) have developed their Test Anxiety questionnaire (TAQ) and Cattell's IPTA Anxiety Scale (1957) provide a total anxiety scale as well as a break down into overt, symptomatic and covert not consciously displayed.

In India, test of anxiety was developed systematically by Sinha in 1961 (Sinha 1961). Since then a large number of anxiety tests both general and for specific situations like taking a test, job anxiety and so on have been developed. Hundal and Kaur (1947) have adapted Cattell's IPTA anxiety test and Nijhawan (1972) has developed both Hindi and Punjabi version of Sarson's Test Anxiety Inventory, its Hindi version has been developed and standardized (Spiclberger, Sharma and Singh 1972) and has become a commonly used measure in anxiety research in the country.

The present endeavor used the anxiety test developed and improved by D. Sinha namely 'Sinha Anxiety Scale' published
by Rupa Psychological Centre, Varanasi. The test includes questions regarding-

(1) Health, appearance, injury,
(2) Area of ambition,
(3) Family anxiety,
(4) Anxiety regarding friendship and love,
(5) Social relation and social approval,
(6) Worries regarding the future,
(7) Worries regarding civilization, war, virtue,
(8) Guilt and shame,
(9) Physical psychological manifestation.

The question are of yes-no type it is assumed that anxiety would be revealed by reported behavior not in any one situation but by his average behavior in a great number of these situations. A more anxious person would tend to be anxious in a greater number of different situations than would a less anxious person.

**The reliability of the test:** Following table displays the reliability of the test:

<table>
<thead>
<tr>
<th>Method</th>
<th>N</th>
<th>R</th>
<th>Index of Reliability</th>
<th>S. E. M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split Half</td>
<td>239</td>
<td>.86</td>
<td>.92</td>
<td></td>
</tr>
</tbody>
</table>

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As it obvious from the above table, the test has high reliability both by the split- half and test retest method. The standard error of measurement is found to be 6.10 indicating that the true score do not deviate from their true value.

Validity of the Test: the score on Taylor's MAS was used as the first validation criterion. For a sample of size 70, the correlation was found to be .69, indicating that the two tests were measuring almost same thing. Another validating evidence found by the author was the comparison of the score by that of patients Creativity of high anxiety. The result were significant at .01 level.

: measuring creativity is not an easy task: the methods used in the evaluating of creative aptitude and ability are numerous and as ingenious the argument investigated demands them to be. Summarizing the different criteria used for measuring creativity, Howard (1982) reviewed ten main categories:

1. Tests of divergent thinking
2. Attitude and Interest inventories
3. Personality inventories
4. Biographical inventories
5. Teacher nominations
6. Peer nominations
7. Supervisor ratings
8. Judgment of products
9. Eminence
10. Self-reported creative activities and achievements

Most of these techniques are based on third person rating. Although inter-rater agreement is generally obtained, the problems of "who judges the judges", and what the judges should be looking for, remain unresolved.

Attempts have been made to develop tests for creativity, especially in the United States. It goes without saying that all psychological tests, whether verbal or nonverbal, are culturally loaded and as such are not wholly applicable to a different culture. Therefore, the present endeavor uses the test battery namely "Thinking Creatively with Words", developed by Dr. Bakar Mahadi of Jamia Millia Islamia, New Delhi and published by Mrs. Qamar Fatima, Aligarh, 1981.

The battery is meant to identify creative talent at all stages of education except pre-primary and primary. As
The theoretical frame of the test rests on the empirical works on creativity. In the studies, two types of abilities are differentiated, viz. convergent thinking and divergent thinking. The divergent thinking is defined as a kind of mental operation in which we think in different direction, some times searching and some times seeking varieties. Unlike convergent thinking where the information leads tone right answer or a recognized best answer of convention answer. Divergent production leads to novel responses to given stimuli. The unique feature of the divergent thinking is that a variety of responses is produced. The primary traits related to divergent thinking and therefore to creative have been enumerated as under-

- Sensitivity to problem
- Fluency of thinking
- Flexibility of thinking consisting of two factors, namely; spontaneous flexibility and adaptive flexibility
- Originality, indicated by unusualness of responses
- Redefinition
Elaboration

The present test uses only four of the six traits, viz. fluency, flexibility, originality, and elaboration. In the item analysis, all four activities were found to significantly related to the total scores. On the other hand, test - retest reliability were as under:

<table>
<thead>
<tr>
<th>Fluency</th>
<th>Flexibility</th>
<th>Originality</th>
<th>Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>.945</td>
<td>.921</td>
<td>.896</td>
<td>.959</td>
</tr>
</tbody>
</table>

As is seen the reliability is quite high.

Validity: The validity of the present scale is established by correlating the score by that of the rating of the teacher. The results are as under:

<table>
<thead>
<tr>
<th>Fluency</th>
<th>Flexibility</th>
<th>Originality</th>
<th>Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>.40</td>
<td>.32</td>
<td>.34</td>
<td>.39</td>
</tr>
</tbody>
</table>

All correlations are significant beyond .01 level. The validity coefficients for factor scores and the total creativity score are high enough (significant beyond 0.01 level) to place
confidence in the use of test. Higher correlations with teacher ratings are usually not obtained due to the unreliability of the rating.

**Time of Survey:**

The data are collected during August to November 2013.

**Population, Sample and Sample Size:**

Intermediate students of Allahabad District constitute the population of the study.

**Sampling procedure:**

Two stage sampling method is used for selection of sample units. At first twenty colleges are selected randomly from the intermediate colleges of Allahabad District.

They are as under-

1. Mangala Prasad Intermediate Collage, Bampur Allahabad
2. V.S.S. Intermediate Collage Mahewakala Allahabad
3. JilaParisd Intermediate Collage Aunta Allahabad
4. Sri BrijMangal Singh Intermediate Collage Rampur Allahabad
5. Kishan Inter Collage Sarapatipur Allahabad
6. Mahatma Gandhi Inter Collage Patel Nagar Allahabad
7. National Inter Collage Handia Allahabad
8. Madan Mohan Malveeya Inter Collage Karchhana Allahabad
9. NandKishor Inter Collage Sohagaura Nagar Allahabad
10. Maharshi Krishna Inter Collage Handia Allahabad
11. Carnelganj Inter Collage Carnelganj Allahabad
12. K.P. Inter Collage Allahabad
13. LalaManmohan Das Inter CollageJhunsi Allahabad
14. Central Academy Jhunshi Allahabad
15. M.P. Birla VidhyaBhawan and Inter Collage Jhunsi Allahabad
16. Jwala Devi SaraswatiVidhyaMandirInter Collage Civil Line Allahabad
17. SarojVidhya Shankar Inter Collage Jhunsi Allahabad
18. Rani Rewati Devi SaraswatiVidhyaNiketanInter Collage NainiAllahabad
19. SaligramJaiswal Inter Collage Allahabad
20. Phool Patti Devi Inter Collage Allahabad

At the second stage equal number of students is selected from each of the college, randomly.
Sample Size:

There are two possible methods, generally used to determine the sample size (Sukhatme and Sukhatme, 1972, p. 82). One is by minimizing variance for the given cost and the other is minimizing cost for the given variance. But for both the methods the population variance of the variable should be known in advance. In the case of present study this is not known. Therefore again "Two Stage Sampling Method is used that gives sufficient precision (Sukhatme, Krisna, Sukhatme, Sukhatme, and Ashok 1982, p. 42). The sample size is determined by following formula.

\[ N_0 = \left( s \cdot t (a/2, m-1)/d \right)^2, \]

Where \( s^2 \) is sample Root Mean Square, \( t (a/2, m-1) \) is tabulated value of \( t \)-statistic for \( a/2 \) level of significance, with \((m-1)\) degree of Freedom \( 'd' \) is equal to \((\text{Mean} \times e)\); \( e \) being the permissible error.

In the present study the problem is to choose between variables anxiety and creativity. Anxiety is the cause variable and creativity is considered to be a more stable variable. Therefore mean and root mean square is calculated for anxiety for the determination of sample size. The following table gives mean, S. D. Root mean Square and the estimated sample size there on-
<table>
<thead>
<tr>
<th>Mean</th>
<th>S.Dev.</th>
<th>Root M. Sq.</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>31.1176</td>
<td>4.10178</td>
<td>4.34305</td>
</tr>
</tbody>
</table>

\( \alpha/2 = 0.01 \) and \( (m-1) = 17 \)

To attain the suitable size, \( N = 300 \) is chosen as sample size. This is almost equally distributed over the Intermediate Collages mentioned as above. That is to say 15 each from twenty College.

![Fig.1 Structure of the sample based on age variable](image-url)
Fig. 2 Structure of the sample based on sex variable

Fig. 3 Structure of the sample based on class variable
Tabulation of Data:

The scores for anxiety and creativity (with its dimensions) together with age, sex, academic profile and family income are mentioned in different columns (Appendix-I). The variables are standardized by deducting respective means from the observation and dividing it by respective standard deviations. Absolute values (neglecting sign) are taken as standard data. The standardized value (neglecting sign) are taken as standard data. The standardized value for each variable is also given in continuation that is used for statistical analysis. Such standardization would not affect the correlations but on the contrary they would pur the data on same scale and would enrich statistical comparability.

Statistical Tools Used:

Simple statistical tools like- Mean Standard Deviations, Correlation and regression is used to meet requirements of the objectives proposed in the study. The results would also be tested for generalization. For calculations, statistical package for windows, namely- SPSS 19.00 is used.