CHAPTER IV

METHODOLOGY

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CHAPTER IV
METHODOLOGY

INTRODUCTION

In this chapter the methodology adopted for the study is presented in detail. Since the title of the study is “Preparation and Validation of Culture-fair Emotional Intelligence tools Relevant for the Educative use in the schools of Kerala the suitable methodology for the study was selected by the investigator.

The methodology followed by the investigator can be given under the following subtitles.

4:1. Research Design

4:2. Sample selected

4:3. Variables established


4:5. Item Analysis

4:5:1. Selection of Items for the final tool

4:5:2. Reliability of the tool

4:5:3. Validity of the tool

4:5:4. Procedure of data collection

4:5:5. Scoring and Consolidation of data

4:6. Techniques of Analysis

4:7. Conclusion
4:1. RESEARCH DESIGN.

The Normative Survey method of Educational Research was used in this study. The investigator was well-cogniscent that this method is widely utilized in educational research. The investigator was aware of the different types of information that survey could collect and the characteristics of Normative Survey method like the relative large number of cases from which the data is collected, its cross-sectional nature and it is concerned with a representative sample and not with individuals. The clearly defined objectives demand the role of experts in planning the survey, of the techniques of analysis and interpretation of data gathered. The logical and skilled reporting demands the role in the solution of logical problems and solving current problems also by giving weightage to all these characteristics of the study, the sample was selected.

4:2. SAMPLES SELECTED.

The population for the present study was secondary school students and teachers of Kerala. Since covering the whole sample is time consuming the investigator had to select a representative sample. Before selection the following factors were given serious consideration.

1. The investigator selected schools from which she can obtained necessary cooperation for the collection of data.

2. The school selected had representative sample of 9th standard students and secondary school teachers. Though the study was focused on the secondary school students and teachers as sample of student population only 9th standard students were selected since they were the really representative
sample of secondary school students, the 8th standard students manifesting the entry behavior and 10th standard students the terminal behavior.

While fixing the size of the sample the investigator considered the following aspects.

1. The size of the sample must be compact enough to permit a close study. Since an inventory had to be administered the investigator had to limit the sample to a manageable size.

2. The size selected was vulnerable for statistical treatment. Simple random sampling was used for selection to ensure avoiding bias. Keeping in mind the already narrated factors, the investigator fixed 1500 students from 9th standard students and 500 teachers from secondary schools of Kerala. While selecting the students sample it was ensured that boys and girls were present in almost equal numbers.

3. Regional wise representation was ensured by selecting schools from the three regions of the state of Kerala.

On the basis of the above assumptions the investigator decided to select the sample from about 56 secondary schools from three regions-north, south, and central regions of Kerala. From the Northern region Waynad, Calicut and Kannur districts, from central region Idukki, Eranakulam and Trissur and from southern region Kollom, Thiruvanthapuram districts were identified for the study.

4:3. VARIABLES OF THE STUDY.

The different components of Emotional Intelligence formed the dependent variables of the study. Independent variables were gender and educational level and socio-economic status of parents of 9th standard students and gender, marital status,
educational qualification, type of schools they work and teaching experience of teachers.

The investigator selected the following components of Emotional Intelligence for the present study. They were

- Self Awareness
- Managing Emotions
- Motivating Oneself
- Empathy and
- Handling Relationship

Each component of Emotional Intelligence selected for the present study is described in chapter II.

After the selection of the problem and the variables of the study, the investigator went through the related literature, journals and various psychological tests to locate a tool to measure the Emotional Intelligence of the secondary school students and teachers. The investigator decided to construct two Emotional Intelligence inventories, one for teachers and other for students.

4:4. PROCEDURE ADOPTED IN THE CONSTRUCTION OF TOOLS.

After holding a series of discussions with supervising teacher, eminent experts, and educationists the investigator decided to construct two inventories-

1. Emotional Intelligence Inventory (Culture-Fair) for Secondary School Teachers.
2. Emotional Intelligence Inventory (Culture-Fair) for Secondary School Students.
Considering the expert opinions the investigator decided to construct a 5 point scale Inventory to measure Emotional Intelligence. The following were the steps taken by the investigator before the final tools were accepted.

1. Identified the components of Emotional Intelligence to be selected.

2. Construction of Items.

3. Preparation of the draft inventory

4. Pilot study.

5. Try out and evaluation of the inventory

6. Preparation of the final inventory.

1. Identified the components of Emotional Intelligence to be selected.

In the present study the investigator used certain components relating to Emotional Intelligence for deciding the content, utilized with the help of the available literature on Emotional Intelligence. While selecting the content enough weightage was given for the five areas of Emotional Intelligence namely Self Awareness, Motivating oneself, Managing emotions, Handling Relationship, and Empathy.

1. Construction of Items

While constructing the items the following points were considered.

a) Simple, clear and direct language was used.

b) Double negatives were avoided.

c) Five responses namely strongly agree, agree, uncertain.
d) Each statement was framed so as to indicate only one complete thought, disagree, strongly disagree were given out of which has to be marked.

2. Preparation of the draft tool

Based on the objectives of the study the five point scale was prepared. For this purpose the investigator took the help of books, journals, magazines, articles and theses that provided the necessary details about the present problem. Experts in the field of education were also consulted. The items were prepared in such a way that they would give valid and reliable responses. The preparation of the tool was a time consuming process.

The investigator prepared an initial draft of 80 items on the basis of clarity and specificity. The numbers of items having positive response and negative responses was approximately equal. With the help of the supervising teacher all the items were evaluated and those statements with overlapping ideas were excluded from the inventory.

3. Pilot Study

The pilot study was used by the investigator to get an idea about the time required and also to check the ambiguity, if any, in the wording of the inventories. The inventories prepared were administered to 400 students of 9th standard. Time taken by students to complete the statements of the inventory was noted. It ranged from 30 to 45 minutes. Thus the time for answering the tool was fixed as 45 minutes for students. The time for answering the statements of the inventory for the teachers was not restricted. The difficulties of each item were taken care of and the defects were rectified. After the pilot testing 70 items for students and 50 items for teachers
were printed along with necessary instructions in the form of a booklet. Score sheets were also printed to mark the responses in the same items.

4. **Try out and evaluation of the tool**

A representative sample of 400 students studying in the secondary schools and 100 teachers from secondary schools were chosen for try out testing.

The scoring method of this scale is as follows. The responses that indicate presence of Emotional Intelligence Inventory would get 5 scores each. It consisted of strongly agree, agree, uncertain, disagree, strongly disagree.

A copy of each of the draft tools are given as appendices respectively.

5. **Preparation of final tools**

The Strong prerequisite of the inventory was ensuring its validity and reliability. The following procedure was adopted to ensure the same.

Distribution of items in the inventory for students is presented in table no 4:1.

<table>
<thead>
<tr>
<th>Components</th>
<th>Corresponding Question Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Awareness 1,2,3,4,5,6,7,8,9,10,11,12</td>
<td></td>
</tr>
<tr>
<td>Managing Emotions 13,14,15,16,17,18,19,20,21,22,23,24,25,26</td>
<td></td>
</tr>
<tr>
<td>Motivating oneself 27,28,29,30,31,32,33,34,35,36,37,38,39,40</td>
<td></td>
</tr>
<tr>
<td>Empathy 41,42,43,44,45,46,47,48,49,50,51,52,53,54</td>
<td></td>
</tr>
<tr>
<td>Handling Relationships 55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70</td>
<td></td>
</tr>
</tbody>
</table>
Components wise distribution of items in the inventory for Teachers is presented in table no: 4:2

Table No. 4:2.
Components of Emotional Intelligence Inventory for Secondary School Teachers

<table>
<thead>
<tr>
<th>Components</th>
<th>Corresponding Question Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Awareness</td>
<td>1,2,3,4,5,6,7</td>
</tr>
<tr>
<td>Managing Emotions</td>
<td>8,9,10,11,12,13,14,15,16</td>
</tr>
<tr>
<td>Motivating oneself</td>
<td>17,18,19,20,21,22,23,24,25,26,27,28</td>
</tr>
<tr>
<td>Empathy</td>
<td>29,30,31,32,33,34,35,36,37,38,39,40,41,42</td>
</tr>
<tr>
<td>Handling Relationships</td>
<td>43,44,45,46,47,48,49,50</td>
</tr>
</tbody>
</table>

4:5. ITEM ANALYSIS

It was necessary to analyze each item in order to retain only those that suit the purpose and rationale of the tool being constructed. So as to help the inventories, constructor is to appraise the test as a whole. Item Analysis is thus an integral part of both reliability and validity for a tool of measurement.

To ensure the validity and reliability of the inventories for students and teachers the following procedure was adopted. 370 score sheets out of 400 were randomly selected and scored. Then they were arranged in the order of score from high to low. 27 percent from the bottom of each item, 100 sheets having the lowest scores were grouped and termed as lower group. The 27 percent of each item from the top having the highest scores were grouped and termed as the upper group. Then, item by item, how many among upper and lower groups had scored on each
item was found out. The data were tabulated. Determination and discrimination indices were based upon the procedure suggested by Edwards (1957).

The scoring was done following the procedure mentioned elsewhere. The number of correct responses for each item of the upper group and lower group were recorded separately. In evaluating the responses of high and low groups to the individual statements, a ratio of ‘t’ was found out. The value of ‘t’ is a measure of the extent to which a given item differentiates between the high and low groups. The t-value equal to or greater than 1.75 indicates that the average responses of the high and low groups to an item differs significantly.

The ‘t’ value was calculated for each item by using the formula of Cronbach Alpha co-efficient correlation.

4:5:1. Selection of Items for the Final Tool

The items having a t-value below 1.75 were rejected. The rejected items show that the predicted value of Emotional Intelligence Inventory in the behavior is not too high. The testing for internal consistency helps in eliminating statements that are ambiguous or that are not of the same type as the rest of the scale. Thus 70 items for students and 50 items for teachers having a ‘t’ value of above 3.37 i.e. greater than 1.96 were selected for the final tool. The items were rearranged according to their item validity. Thus the inventories were reconstructed.

The responses that indicate Emotional Intelligence would get five scores each indicates Strongly Agree, Agree, Uncertain, Disagree, Strongly disagree.
The ‘t’ value of the items of the draft tool is given as Appendix. The final tool, its scoring key and the response sheet of both English, Malayalam versions of the Emotional Intelligence inventories are given in appendix No.1

4:5:2. Reliability of the inventories

The Reliability of the inventories were calculated by the investigator using the formulae provided by Cronbach’s Alpha Coefficient Correlation. The reliability of the inventories were estimated to be 0.83. It shows that the tool is highly reliable.

Though there are a variety of techniques for the estimate of reliability the technique of estimations of internal consistency was applied for the present inventories. The internal consistency reliability estimation was calculated using single measurement instrument administered to a group of people on one occasion to estimate reliability. In effect the reliability is judged by estimating how the items will reflect the same construct, yield similar results being looked for how consistent the results are for different items for the same construct within the measure.

The investigator used Cronbach’s Alpha Coefficient formulae i.e.

\[
\alpha = \frac{N}{N-1} \left( 1 - \sum \frac{\sigma^2 y_i}{\sigma^2 x} \right) \]

for calculating the reliability.

Where N is the number of components (items or test lets), \(\sigma^2 x\) is the variance of the observed total test scores for the current sample of persons, and \(\sigma^2 y_i\) is the variance of component for the current sample of persons.

The reliability of the tool was found to be 0.83. It shows that the tool is highly reliable.
4:5:3. Validity of the tool

The investigator previously determined the objectives and had represented in the tool almost all aspects of the variable under study. Therefore, the tool enjoys content validity.

All the items were selected after consultation with experts, who are veterans in the field of Education. This gives the inventories face validity.

The investigator was very careful in selecting the criteria for preparing the items. Before the items were prepared thorough reading was made, experts consulted and item wise discussion made. This ensured construct validity.

As no other tool was available to measure the variable under study the investigator was not able to fix the concurrent validity.

The reliability was calculated by using Cronbach’s Alpha Coefficient correlation and was found to be 0.83 which confirms its high validity.

4:5:4. Procedure of Data Collection

All the required materials for administration of the inventories i.e., the Emotional Intelligence Inventories and the score sheets were printed in the respective inventories. The tool and allied attachments were in Malayalam, the mother tongue for students and in English for teachers. Administration of the tool and data collection was given high importance by the investigator. The investigator visited the selected secondary schools in Kerala and approached the administration and teachers for their co-operation. The collection of data was conducted during the month from September to December 2011. Before administrating the inventory proper and adequate instructions were given to the students and teachers. After the
completion of the inventories, the response sheets and the inventory question
booklets were collected back from students and teachers.

Thus 1500 response sheets were collected from students and were considered
for the present study. 500 response sheets were collected from teachers. The
response sheets were scored according to the scoring key prepared.

Thus, the actual sample obtained for the study was 1500 students studying in
different schools and 500 teachers teaching different subjects in three regions of
Kerala. The details of the actual sample are given in Table: 4:3.

Table No. 4:3.
Split up of actual sample obtained for study.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Name of the Tool</th>
<th>Number of sample collected</th>
<th>Number of rejected sample</th>
<th>Total Number of Accepted sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Emotional Intelligence Inventory for Secondary School Students</td>
<td>1500</td>
<td>102</td>
<td>1398</td>
</tr>
<tr>
<td>2</td>
<td>Emotional Intelligence Inventory for Secondary School Teachers</td>
<td>500</td>
<td>68</td>
<td>432</td>
</tr>
</tbody>
</table>

4:5:5. Scoring and Consolidation of Data

After the collection of data, scoring and consolidation were done. Only those
score sheets, which were found complete in every respect, were considered for
consolidation purpose. Thus 102 numbers of student’s response were rejected and 68
teacher’s responses were also not considered for study since they are incomplete. As
the name of the subjects was irrelevant, they were numbered from 1 to 1398. Thus,
in the accepted number is 432. The scores obtained were entered in the consolidation sheet in a systematic way. Analysis of the data was done later.

The scoring pattern for the inventory on both Emotional Intelligence Inventory were 5,4,3,2,1 for Strongly Agree, Agree, Uncertain, Disagree, Strongly Disagree respectively for positive statements, and 1,2,3,4,5 for negative statements. Scoring was done using the procedure given below for both tools:

Table No. 4:4.
Scoring of Emotional Intelligence Inventory (Culture-Fair) for Secondary School Students

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favourable</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Unfavourable</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Table No. 4:5.
Scoring of Emotional Intelligence Inventory (Culture-Fair) for Secondary School Teachers

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favourable</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Unfavourable</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

4:6. TECHNIQUES OF ANALYSIS.

The analyses were done using the ‘t’ Test and ANOVA techniques. The hypotheses of the study were tested by making an analysis of the collected data with the help of statistical techniques which are classified as descriptive statistics. Descriptive Statistical measures are used to describe the
characteristics of the sample or population in totality for both tools. In the present study the investigator used the following statistical techniques.

1. **ARITHMETIC MEAN**

   The mean was calculated using the formulae

   $$\text{Mean (M)} = A + \frac{\sum fd}{N} \times c$$

   Where, $A = \text{Assumed Mean of the score obtained.}$

   $f = \text{the frequency.}$

   $d = \text{the deviation of the scores from the assumed mean.}$

   $c = \text{class interval of the frequency distribution of the data.}$

   $N = \text{Total number of scores.}$

2. **STANDARD DEVIATION ($\sigma$)**

   In the present study investigator grouped the data in frequency distribution and then computed the Standard Deviation.

   $$\sigma = c \sqrt{\frac{\sum fd^2}{N} - \left[ \frac{\sum fd}{N} \right]^2}$$

   Where $C = \text{Class interval}$

   $N = \text{Total number of scores}$

   $f = \text{Frequency}$

   $d = \text{Deviation of scores from the assumed mean}$
3. **GRAPHICAL REPRESENTATION**

A graphical representation is a geometrical image of a set of data. It is an effective and economic device for the presentation, understanding and interpretation of the collected data. The present study includes the graphical representation like bar diagram.

4. **INFERENTIAL STATISTICS**

In the present study the investigator used t-test for making analysis and interpretations. ‘t’-test was used to find the significant level of difference between two groups of population. The ‘t’-values were calculated using the mean scores and standard deviation. The significant level of difference is 0.01 when the t-value is 2.58 and above, and the significant level of difference is 0.05 when the t-value is between 1.96 and 2.58.

5. **ESTIMATION OF PERCENTAGES**

The percentages of the scores on the tool used were calculated by using the following formula

\[
\text{Percentage} = \left( \frac{\text{sum of gained scores}}{\text{sum of maximum mark}} \right) \times 100
\]

The percentages yielded by the sample were extended to the population using the formula:

\[
\begin{align*}
\text{Lower limit} &= P - 1.96 \sqrt{\frac{p(1-p)}{N}} \\
\text{Upper limit} &= P + 1.96 \sqrt{\frac{p(1-p)}{N}}
\end{align*}
\]
where, $P =$ percentage in the sample

$Q = 100 - P$

$N =$ Number of subjects

6. ‘$t$’-TEST

$t$-value is calculated using the formula given below,

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

Where, $M_1 =$ Mean of the first group

$M_2 =$ Mean of the second group

$\sigma_1 =$ Standard Deviation of the first group

$\sigma_2 =$ Standard Deviation of the second group

$N_1 =$ Total number of the first group

$N_2 =$ Total number of the second group

7. ANOVA

In statistics, **analysis of variance** (ANOVA) is a collection of statistical models, and their associated procedures, in which the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form, ANOVA provides a statistical test of whether or not the means of several groups are all equal, and therefore generalizes $t$-test to more than two groups. Doing multiple two-sample $t$-tests would result in an increased chance of committing a type I error. For this reason, ANOVAs are useful in comparing two, three, or more means.
F value is calculated using the formula given below

\[ F = \frac{\text{Mean Square variance of between groups}}{\text{Mean Square variance of within groups}} \]

4.7. CONCLUSION

The data collected on the basis of the study was tabulated and subjected to already describe statistical proceedings. This treatment really unravels the problems raised as objectives of the study. The data when consolidated and interpreted helped to arrive at valid conclusions from where reliable educational implications were arrived at.