Chapter III

METHODOLOGY

➢ Variables
➢ Objectives
➢ Hypotheses
➢ Samples used for the study
➢ Tools used for the study
➢ Data collection procedure
➢ Scoring and consolidation of data
➢ Statistical techniques used for the study
METHODOLOGY

The procedure or technique employed in a research study is known as methodology of research. The adopted methods and tools determine the validity of the study and the accuracy of the result. The methodology of the chapter points to the generalizability of the result by the collection and the analysis of the relevant data.

The study that the investigator conducted was intended to find out the influence of Intellectual Styles, Motivational Belief and Techno Culture on Moral Maturity Behavior of B.Ed Teacher Trainees of Kerala. The study was based on the sub samples gender, locality, Subject of Study, parental qualification, Parental Employment and type of management. The design of the study is described under the following major sections.

1. Variables
2. Objectives
3. Hypotheses
4. Samples used for the study
5. Tools used for the study
6. Data collection procedure
7. Scoring and consolidation of data
8. Statistical techniques used for the study

The details of each of the above are given below;

**Variables**

a. Intellectual Styles of B.Ed Teacher Trainees (independent variable).
b. Techno Culture of B.Ed Teacher Trainees (Independent variable).
c. Motivational Belief of B.Ed Teacher Trainees (Independent variable).
d. Moral Maturity Behavior of B.Ed Teacher Trainees (Dependent variable).

The classificatory variables like gender, locality, Subject of Study, parental qualification, Parental Employment and type of management are taken as the independent variables of the study.
Objectives

The present study was conducted with the following objectives:

1. To compare the mean scores of Intellectual Styles, Motivational Belief, Techno Culture and Moral Maturity Behavior of B.Ed Teacher Trainees for the subsamples based on
   a) Gender 
   b) Subject of study 
   c) Locale 
   d) Parental Qualification 
   e) Type of Management 
   f) Parental Employment

2. To find out the main effect and interaction effect of Intellectual Styles, Motivational Belief and Techno Culture on Moral Maturity Behavior of B.Ed Teacher Trainees of Kerala for the total and subsamples based on
   a) Gender 
   b) Subject of study 
   c) Locale 
   d) Parental Qualification 
   e) Type of Management 
   f) Parental Employment

3. To predict the individual and joint contribution of Intellectual Styles, Motivational Belief and Techno Culture on Moral Maturity Behavior of B.Ed Teacher Trainees of Kerala for total sample.

Hypotheses

The following hypotheses were formulated for the present study;

1. There exists significant difference in the mean scores of Intellectual Styles, Motivational Belief, Techno Culture and Moral Maturity Behavior of B.Ed Teacher Trainees for the subsamples based on
   a) Gender 
   b) Subject of study 
   c) Locale 
   d) Parental Qualification 
   e) Type of Management 
   f) Parental Employment

2. There exists significant main and interaction effect of Intellectual Styles, Motivational Belief and Techno Culture on Moral Maturity Behavior of B.Ed Teacher Trainees in Kerala for total and subsamples based on
   a) Gender 
   b) Subject of study 
   c) Locale 
   d) Parental Qualification 
   e) Type of Management 
   f) Parental Employment
3. There exists individual and joint contribution of Intellectual Styles, Motivational Belief and Techno Culture on Moral Maturity Behavior of B.Ed Teacher Trainees in Kerala for total sample.

**Samples Used for the Study**

The population for the present study covers the B.Ed Teacher Trainees from Kerala state. The sample of the study was selected from Calicut, Malappuram, Palakkad, Kannur, Ernakulam, Trivandrum and Wayanad districts. The list of B.Ed colleges selected for the study and the sample size chosen were given below.

**TABLE 1**

*List of Colleges Selected for the Study*

<table>
<thead>
<tr>
<th>Type of College</th>
<th>Serial No.</th>
<th>Name of the college</th>
<th>District</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aided</td>
<td>1</td>
<td>SreeNarayana Training College, Nedunganda</td>
<td>Trivandrum</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>NSS training college, Ottapalam</td>
<td>Palakkad</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Farook Training college, Farook College</td>
<td>Kozhikode</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Avila college of Teacher Education, Edakochi</td>
<td>Ernakulam</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Majma Training College, Kavanoor</td>
<td>Malappuram</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>FarookB.Ed College, Kottakkal</td>
<td>Malappuram</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>MCT B.Ed college, Melmuri</td>
<td>Malappuram</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>DarulUloom Training college, Vazhakkad</td>
<td>Malappuram</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>SreeNarayana College of Teacher Education, Chelannur</td>
<td>Kozhikode</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>St. GregoriousB.Ed College, Meenangadi</td>
<td>Wayanad</td>
<td>50</td>
</tr>
<tr>
<td>Government</td>
<td>1</td>
<td>Govt. Teachers Training College, Thalasseri</td>
<td>Kannore</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Govt. College of Teacher Education</td>
<td>Kozhikode</td>
<td>60</td>
</tr>
</tbody>
</table>
The following points were considered for the selection of the sample for the study.

1. Gender viz; Male and Female
2. Type of management of institutions viz; Aided, Government and Unaided
3. Educational qualification of parents viz; Plus two & Above and Below plus two
4. Locality viz; Urban and Rural
5. Subject of Study viz; Science and Arts
6. Parental Employment viz; Coolie, Business and Professional

Stratified Random Sampling techniques were used to select the sample. Due representation was given to strata such as gender, locality, Subject of Study, parental qualification, Parental Employment and type of management. The study was conducted on 600 students from twelve B.Ed colleges across Calicut, Malappuram, Palakkad, Kannore, Ernakulam, Trivandrum and Wayanad districts.

**Tools Used for the Study**

Data collection is the major part of the research process. For an effective data collection, an effective tool / technique have to be selected and the necessary step in the preparation of the tool or conduction of technique was to be adopted. The tools or technique may vary as per the complexity, design, administration and interpretation of the research.

The investigator used the following tools for the study:

1. Intellectual Style Questionnaire Revised II (Sternberg & Wagner, 2002)
2. Techno Culture Scale (Musthafa and Anees, 2012)
3. Motivational Beliefs scale (Musthafa and Anees, 2012)
4. Moral Maturity Behavior Scale (Musthafa and Anees, 2012)
5. General Data cum Response Sheets
Description of the tools

Intellectual Style Questionnaire

Intellectual Style Questionnaire was developed by Sternberg and Wagner. The tool was adopted and modified to measure the intellectual styles of B.Ed teacher trainees. It consists of 65 items based on two styles; Type 1 and Type 2 intellectual styles.

Types of Intellectual Styles

The components for the Scale on Intellectual Style were categorized into two major components. They are;

Type I Intellectual Styles

Type I Intellectual styles are the one that tend to be more creativity-generating and that denote higher levels of cognitive complexity. These include the legislative (being creative), judicial (evaluative of other people or products), hierarchical (prioritising one's tasks), global (focusing on the whole picture), liberal (taking new approaches to tasks), oligarchic (working on multiple tasks with no priority) and internal (working on one's own) styles.

Type II Intellectual Styles

Type II styles denote lower levels of cognitive complexity. It includes the executive (implementing tasks with given orders), local (focusing on concrete details), monarchic (working on one task at a time), the anarchic (characterised by working on whatever tasks that come along), external (working with others) and conservative (using traditional approaches to tasks) styles.

Zhang (2002) tested the relationship between thinking styles and modes of thinking. Results from both studies revealed that Type I styles were significantly related to the holistic mode of thinking (i.e., right-brain dominated) and that Type II styles were significantly related to the analytic mode of thinking (i.e., left-brain dominated).
Components of Intellectual Styles

The definition of the 13 Intellectual Style components is given in brief as follows:

*Legislative style*

Legislative people like to come up with their own styles and they stick on to their own natives. They are more creative and constructive.

*Executive style*

Executive people like to follow rules and prefer problems that are pre-structured or pre-fabricated. They like to bridge the gaps within existing structures rather than to create structures themselves.

*Judicial style*

Judicial people like to evaluate rules and procedures, and prefer problems in which one analyses and judges existing things and ideas. They possess more judging capacity than others.

*Monarchic style*

A monarchic person is someone who is single-minded and driven. The individual doesn’t allow anything to get in the way of his or her solving a problem. They tend to be more stubborn in their nature.

*Hierarchic style*

The hierarchic person has a hierarchy of goals and recognizes the need to set priorities, as all goals cannot always be fulfilled or at least fulfilled equally well.

*Oligarchic style*

The oligarchic people are multi-talented and are able to concentrate in more than one thing simultaneously. Oligarchic person is like an hierarchic person in having a desire to do multi-tasking within the same time frame. But unlike hierarchic people, oligarchic people tend to be motivated by several, often competing goals of equal perceived importance.
Anarchic style

The anarchic person seems to be motivated by a potpourri of needs and goals that can be difficult for him or her, as well as for others, to sort-out.

Global style

Global individuals tend to concentrate on the overall achievement. They prefer to deal with relatively large and abstract issues. They ignore or don’t like details, and prefer to see the forest rather than the trees.

Local style

Local individuals like concrete problems requiring working with details. They tend to be oriented toward the pragmatics of a situation, and are down to earth.

Internal style

Internal individuals are tending to be very personal and possess intra personal intelligence. They are concerned with internal affairs- that is to say, these individuals turn inward.

External Style

External individuals tend to be extrovert, outgoing, and people oriented. Often they are socially sensitive and aware of what is going on with others.

The Subscales

The Intellectual Style Questionnaire consists of 13 subscales measuring two categories of Intellectual Styles. The items selected for each subscales of the Intellectual Style Questionnaire are given in table 2.
TABLE 2

Component Wise Items Selected for the Variable Intellectual Style

<table>
<thead>
<tr>
<th>Style Category</th>
<th>Subscale</th>
<th>Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Legislative</td>
<td>5, 10, 14, 32, 49</td>
</tr>
<tr>
<td></td>
<td>Judicial</td>
<td>20, 23, 42, 51, 57</td>
</tr>
<tr>
<td>Type I</td>
<td>Hierarchical</td>
<td>4, 19, 33, 25, 56</td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>7, 18, 38, 48, 61</td>
</tr>
<tr>
<td></td>
<td>Liberal</td>
<td>45, 53, 58, 64, 65</td>
</tr>
<tr>
<td></td>
<td>Oligarchic</td>
<td>27, 29, 30, 52, 59</td>
</tr>
<tr>
<td></td>
<td>internal</td>
<td>9, 15, 37, 55, 63</td>
</tr>
<tr>
<td></td>
<td>Executive</td>
<td>8, 11, 12, 31, 39</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td>1, 6, 24, 44, 62</td>
</tr>
<tr>
<td></td>
<td>Monarchic</td>
<td>2, 43, 50, 54, 60</td>
</tr>
<tr>
<td>Type II</td>
<td>Conservative</td>
<td>13, 22, 26, 28, 36</td>
</tr>
<tr>
<td></td>
<td>Anarchic</td>
<td>16, 21, 35, 40, 47</td>
</tr>
<tr>
<td></td>
<td>External</td>
<td>3, 17, 34, 41, 46</td>
</tr>
</tbody>
</table>

Scoring Procedure

The original Intellectual Style Questionnaire is a seven point scale but the investigator modified the scale into a three point scale taking into consider the time limit. The responses to the statements are presented as Always, Sometimes and Never and the responses were scored as 3, 2 and 1 respectively. The total score obtained in Type I and Type II styles were calculated and converted these scores into a comparable value. Students’ score in each of these Style categories were compared and if a Students score in one style is higher than other category, he will be belonging to that particular style category.

Validity and Reliability of the Tool

Validity of the Intellectual Style Questionnaire was calculated using criterion related validity method. The score obtained by the Intellectual Style Questionnaire is correlated with Myres Briggs Type Indicator and Gregoric Style Delineator. The correlation coefficient obtained was 0.54 for Myres Briggs Type Indicator and 0.50 for Gregoric Style Delineator.
Reliability of the tool was established using Cronbach Coefficient Alpha for each of the subscale. The Cronbach alpha for 9th and 10th graders for the subscale Legislative style was 0.73, Executive Style 0.73, Judicial Style 0.64, Global Style 0.54, Local Style 0.43, Liberal Style 0.72, Conservative Style 0.79, Hierarchic Style 0.72, Monarchic Style 0.35, Oligarchic Style 0.74, Anarchic Style 0.51, Internal Style 0.72 and External Style 0.72. Intellectual Style Questionnaire – Revised (Sternberg & Wagner, 2007) English Version of the tool is presented in Appendix I.

Techno culture Scale

Techno Culture scale is constructed and standardised by the investigator. No standardised tool was available to measure the Techno culture. Hence the investigator decided to construct and standardise a tool to measure techno culture.

The investigator initially considered various definitions available for the Techno Culture. From the various definitions and descriptions, the investigator analysed and pooled a list of the components for each of the terms, which would comprehensively represent them as per their operational definitions given by the investigator. From reviewing many studies related with Techno Culture and also from the discussion with the supervising teacher and other experts, the investigator developed a final list of relevant components for the preparation of the tool.

Identification of the components of Techno culture

Description of each component and items for illustration are given in the following section. The Techno culture Scale was prepared by the investigator with the help of the supervising teacher to measure Techno culture of B.Ed Teacher Trainees. The scale consists of 61 items based on four dimensions viz., Relational addiction, techno-tainment, information overload and cyber sexual addiction.

Scoring Procedure

Techno culture Scale is a 3 point scale in which each item can be responded as Always, Sometimes and Never and scored as 3, 2 and 1. Negative items were scored reversely.
Pilot Testing

The draft scale was administered to a representative group of 370 students from the original sample. Due representation was given to different subsample while selecting the sample. The responses of each item by all the students in the sample were scored and subjected to item analysis.

Item Analysis

Item analysis is done using the procedure suggested by Likert (1932). The responses collected from the 370 students were first arranged in ascending order from low scoring students to high scoring students. The Upper 27 Percentage and Lower 27 Percentage of student’s responses sheet were taken separately for item analysis. The number of students in lower and upper 27 percent is 100 each. The responses for each item in lower and upper group were scored and subjected to item analysis. For this the t value for each item were calculated. The Mean and Standard Deviation of each item were calculated separately for lower and upper groups. Items having the t-value above 2.58 were selected for the final version of Technoculture Scale. The t-values were calculated using the following formula.

\[
t \text{value} = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum (X_H - X_H)^2 + \sum (X_L - X_L)^2}{n(n-1)}}}
\]

where,

\[
\sum (X_H - X_H)^2 = \frac{\Sigma X_H^2 - (\Sigma X_H)^2}{n}
\]

\[
\sum (X_L - X_L)^2 = \frac{\Sigma X_L^2 - (\Sigma X_L)^2}{n}
\]

\[
\bar{X}_H = \text{Mean score on the given statement for the high group}
\]

\[
\bar{X}_L = \text{Mean score on the given statement for the low group}
\]

\[
\Sigma X_H^2 = \text{Sum of squares of the individual scores of the given statement for the high group}
\]
\[ \sum X_L^2 \] = Sum of squares of the individual scores of the given statement for the low group

\[ (\sum X_H)^2 \] = Square of the sum of the scores of the given statement for the high group

\[ (\sum X_L)^2 \] = Square of the sum of the scores of the given statement for the low group

\[ n \] = Number of respondents in each group

**Components of Techno Culture**

The components for the Scale on Techno Culture were categorized into four major components. They are;

*Relational Addiction*

This component includes the subcomponents like online dating, chatting, social networking, online relationships and online friendships. The people with cyber affair or relational addiction will always be obsessed with the thought of making and keeping human relations through technology.

*Eg:* Technology has increased the life span of living beings.

*Techno-tainment*

Technology used for the entertainment like watching movies, hearing music, travelling and video gaming. The net compulsions denote the online activities like online gaming, online gambling, eBay, virtual casinos, interactive games, online shopping, online movies and business addiction.

*Eg:* The technology had grown up to make a picnic to moon.

*Information Overload*

People use internet for database searches and to organize information. For completion of assignments, projects and other academic related activities one can’t think of doing it without the help of technology.

*Eg:* Technology reduces individual’s systematic and deep thinking
Cyber Emotions

People use internet for satisfying their instincts and expressing emotions. It includes the acts like online posting of emotions, real time interactions and the use of multimedia software. The activities in cyber world affect its consumers badly.

Eg: The vulgar and mischievous news coming in our daily and other media makes our society to think in a bad way.

Preparation

After planning the components suitable for the variable Techno Culture, it was decided to prepare a 3-point scale with three responses viz; Always, Sometimes and Never. The items selected for each subscales of the Techno Culture Scale are given in table 3.

TABLE 3

Component Wise Items Selected for the Variable Techno Culture

<table>
<thead>
<tr>
<th>Variable</th>
<th>Serial no.</th>
<th>Components</th>
<th>Positive Items</th>
<th>Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Techno Culture</td>
<td>1</td>
<td>Relational Addiction</td>
<td>1,4,13,17,18,21,22,23,51,52</td>
<td>10,50,55,61</td>
</tr>
<tr>
<td>2</td>
<td>Techno-Tainment</td>
<td>6,14,19,39,44,45,46,48,49,55,57,58</td>
<td>12,54</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Information Overload</td>
<td>2,3,7,8,11,18,24,26,29,30,31,32,38</td>
<td>20,36,60</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cyber Emotions</td>
<td>5, 9,15,16,33,40,41,42</td>
<td>37,56</td>
<td></td>
</tr>
</tbody>
</table>

Construction of the items

65 items were constructed in the draft version of the Techno culture Inventory and after consultation with the experts four items were deleted. The final version of the draft consists of 61 items.
Establishment of Validity and Reliability

Validity of the tool was established using face validity and content validity, which were established in consultation with experts. The reliability of the scale was established using Cronbach’s alpha, $\alpha$, which is the most common measure of reliability. Cronbach’s alpha is calculated measuring splitting data into every possible way and computing the correlation coefficient for each split. The average of these values is equivalent to Cronbach’s alpha. The Cronbach’s alpha obtained for the Techno Culture Scale is 0.91. Final Version of the tool in English is presented in Appendix II.

Motivational Belief Scale

For measuring Motivational Belief of B.Ed Teacher Trainees, a Motivational Belief Scale was constructed and standardised by the investigator. Motivational Belief is essential to Morality because it enables individuals to better manage their affective domain and to determine the strength and weaknesses. Weaknesses can be corrected by constructing new affective skills. Recent research indicates that motivational belief helps learners to perform better and allowing individuals to plan, sequence and monitor their learning in a way that directly improves performance. Since Motivational Belief is a non-cognitive construct, the investigator constructed a rating scale referring previous standardized tools. The motivational belief scale was developed by the investigator with the help of the supervising teacher to measure the motivational belief of B.Ed teacher trainees. It consists of 55 items based on the dimensions of self – efficacy beliefs, task value beliefs and goal orientations.

Planning

The investigator initially considered various theories of motivations and definitions available for the concept Motivational Belief. From the various definitions and descriptions, the investigator analyses and pooled a list of the components for each of the terms, which would comprehensively represent them as per their operational definitions given by the investigator.
From reviewing many studies related with Motivational Belief and also from the discussion with the supervising teacher and other experts, the investigator developed a final list of relevant components for the preparation of the tool.

**Components of Motivational Beliefs**

The components for the Scale on Motivational Belief were categorized into three major components. They are;

**Self-efficacy Beliefs**

Self-efficacy Beliefs has been defined as one’s judgment of his ability to plan and execute actions that lead to achieving a specific goal. (Tanner & Jones, 2003). In other words, self-efficacy Beliefs is a self-appraised belief concerning one’s competence to succeed in a task

_Eg:-I can undertake heavy responsibilities_

**Task Value Beliefs**

Task value beliefs refer to the student's evaluation about the value of the task. Pintrich (1999) has proposed that a student may be motivated towards working on a task if the task itself is important, interesting and useful for him. It has been found that task value beliefs are correlated to performance, even though not as strongly as self-efficacy correlates.

_Eg:-A goal directed activity is smooth than the activities which do not have a goal._

**Goal Orientation**

Goal orientation refers to the student’s perception of the reasons why to engage in a learning task. Although a number of studies have discussed goal orientation using alternative terms and definitions, in the present study the investigator focus on intrinsic and extrinsic goal orientation. Intrinsic goal orientation concerns the degree to which a student perceives himself to be participating in a task for reasons such as challenge, curiosity and mastery, using self-set standards and self-improvement. Extrinsic goal orientation denotes that a student participate in a task for reasons such as grades,
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rewards, performance, evaluations by other and competition (Hamilton & Ghatala, 1994)

_Eg:_I ignore the difficulties made to others while trying to achieve my goals._

**Preparation**

After planning the components suitable for the variable Motivational Belief, it was decided to prepare a 3-point scale with three responses viz; Always, Sometimes and Never. The items selected for each subscales of the Motivational Belief Scale are given in table 4.

**TABLE 4**

*Component Wise Items Selected for the Variable Motivational Belief*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Serial No.</th>
<th>Components</th>
<th>Positive Items</th>
<th>Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivational Belief</td>
<td>1</td>
<td>Self-Efficacy Beliefs</td>
<td>1,3,6,8,9,16,20,30,31,32,33,34,37,38,40,44,47,50</td>
<td>10,17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Task Value Beliefs</td>
<td>2,5,11,12,13,15,18,19,25,27,29,35,36,39,41,46,49,51,52,55</td>
<td>24,42</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Goal Orientation</td>
<td>4,7,21,22,23,26,28,45,48,53</td>
<td>14,43,54</td>
</tr>
</tbody>
</table>

**Pilot Testing**

The draft tool was administered to a sample of 370 B.Ed Teacher Trainees. Due representation was given to different subgroups of the population. Necessary instructions were given before administering the tool. The scores obtained in the pilot testing were subjected to item analysis.

**Item Analysis**

Item analysis is done using the procedure suggested by Likert (1932). The responses collected from the 370 students were first arranged in ascending order from low scoring students to high scoring students. The Upper 27 Percentage and Lower 27 Percentage of student’s responses sheet were taken separately for item analysis.
number of students in lower and upper 27 percent is 100 each. The responses for each item in lower and upper group were scored and subjected to item analysis. For this the t value for each item were calculated. The Mean and Standard Deviation of each item were calculated separately for lower and upper groups. Items having the t-value above 2.58 were selected for the final version of Techno culture Scale. The t-values were calculated using the following formula.

\[
t value = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum (X_H - \bar{X}_H)^2 + \sum (X_L - \bar{X}_L)^2}{n(n-1)}}}
\]

where,

\[
\bar{X}_H = \text{Mean score on the given statement for the high group}
\]
\[
\bar{X}_L = \text{Mean score on the given statement for the low group}
\]
\[
\sum X_H^2 = \text{Sum of squares of the individual scores of the given statement for the high group}
\]
\[
\sum X_L^2 = \text{Sum of squares of the individual scores of the given statement for the low group}
\]
\[
(\sum X_H)^2 = \text{Square of the sum of the scores of the given statement for the high group}
\]
\[
(\sum X_L)^2 = \text{Square of the sum of the scores of the given statement for the low group}
\]

Establishment of Validity and Reliability

The face validity and content validity of the tool was established initially by consulting experts in the field. The construct validity is also ensured by analysing the theoretical studies related with motivational belief.

The reliability of the tool was established using Cronbach’s alpha. It is the average of the correlations to the scores of all possible split of the tool. The Cronbach’s
alpha obtained is 0.87 which ensured the reliability of Motivational Belief Scale. The final version of the tool in English is presented in Appendix III.

**Moral Maturity Behavior Scale**

Moral Maturity Behavior Scale was prepared by the investigator with the help of the supervising teacher to measure Moral Maturity Behavior of B.Ed Teacher Trainees. 66 situational statements were made on seven dimensions viz., The Sense of Self, Harnessing Cognitive Ability, Harnessing Emotional Resources, Using Social Skill, Using Principles, Respecting Others and Developing a Sense of Purpose.

**Planning**

The investigator initially considered various theories and definitions available for the concepts Moral Maturity Behavior. From the various studies, definitions and descriptions, the investigator analyses and pooled a list of the components for each of the terms, which would comprehensively represent them as per their operational definitions given by the investigator.

From reviewing many studies related with Moral Maturity Behavior and also from the discussion with the supervising teacher and other experts, the investigator developed a final list of relevant components for the preparation of the tool.

**Components of Moral Maturity Behavior**

The components identified for the Moral Maturity scale was categorized into seven major components. They are:

**The Sense of Self**

Moral agency means that people see themselves as having the ability to make decisions and act on them. The sense of self enables the person to recognize his own self and choose the behaviors.

*Eg:- When an accident takes place in which a boy is bleeding badly. People crowded there are not helping him. Then I take initiative in taking the boy to the hospital.*
**Harnessing Cognitive Ability**

The act of moral reasoning demands cognitive ability which involves abstract reasoning. It enables the person to think, analyze and act abstractly on the different matters.

*Eg:* There is a troublesome situation in the family. All the family members express their views. You have another view. Then I express my anger towards family members.

**Harnessing Emotional Resources**

Our behavior is controlled by our emotions. Morally matured persons take into account their own and other’s emotions while dealing with some event.

*Eg:* The optional leader gives you the responsibility of completing a work and the things went wrong. Then I will accept my mistake and rectify it.

**Using Social Skill**

Social skill is the skill that a person needs to participate in the social world. The people with social skill can understand others, make themselves understood to others.

*Eg:* You bring a small piece of cake to home. All the family members are present there. Then I will take the cake secretly to the room.

**Using Principles**

A principle is an abstract moral idea applied across situations. Morally matured persons are aware of the conflict between principles that underlie dilemmas.

*Eg:* You come to know that there is unhappiness and misunderstanding prevailing in the family. Then I take the help of a third person to solve the problem.

**Respecting Others**

A morally matured person shows respect to others in several ways. It is evident in their behavior, interaction, etc.

*Eg:* When the members of an opposition party approach you for their campaigning. Then i will respect them and listen to their views.
Developing a Sense of Purpose

This implies the sense of life purpose. Purposes may be of different types as per the ability and interests of the person. But if they are morally matured, they seem to fulfill it.

Eg:- I take the favor of other family member when the head of the family scolds you for some reason.

Preparation

After planning the components suitable for the variable Moral Maturity Behavior, it was decided to prepare a 3-point scale with three responses viz; Always, Sometimes and Never. The items selected for each subscales of the Moral Maturity Behavior Scale are given in table 5.

TABLE 5

Component Wise Items Selected for the Variable Moral Maturity Behavior

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sl. No</th>
<th>Components</th>
<th>Positive Items</th>
<th>Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moral Maturity Behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>The Sense of Self</td>
<td>9,36,45,50,60,61,65</td>
<td>1,5,13,18,34,37</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Harnessing Cognitive Ability</td>
<td>2,11,19,42,58,66</td>
<td>6,23,41,52,56</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Harnessing Emotional Resources</td>
<td>3,7,15,39,48,63</td>
<td>10,25,38,62</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Using Social Skills</td>
<td>27,30,35,44</td>
<td>12,29,46,49</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Using Principles</td>
<td>21,28,31,47,49</td>
<td>14,33,51</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Respecting Others</td>
<td>16,22,26,40,55</td>
<td>17,20,24,59</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Developing a sense of Purpose</td>
<td>4,8,10,43,54,57</td>
<td>21,32,64</td>
<td></td>
</tr>
</tbody>
</table>

Pilot Testing

The draft tool was administered to a sample of 370 B.Ed Teacher Trainees. Due representation was given to different subgroups of the population. Necessary instructions were given before administering the tool. The scores obtained in the pilot testing were subjected to item analysis.
**Methodology**

**Item Analysis**

Item analysis is done using the procedure suggested by Likert (1932). The responses collected from the 370 students were first arranged in ascending order from low scoring students to high scoring students. The Upper 27 Percentage and Lower 27 Percentage of student’s responses sheet were taken separately for item analysis. The number of students in lower and upper 27 percent is 100 each. The responses for each item in lower and upper group were scored and subjected to item analysis. For this the t value for each item were calculated. The Mean and Standard Deviation of each item were calculated separately for lower and upper groups. Items having the t-value above 2.58 were selected for the final version of Technoculture Scale. The t-values were calculated using the following formula.

\[
t \text{value} = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum (X_H - X_H)^2 + \sum (X_L - X_L)^2}{n(n-1)}}}
\]

where,

\[
\sum (X_H - X_H)^2 = \frac{\sum X_H^2 - (\sum X_H)^2}{n}
\]

\[
\sum (X_L - X_L)^2 = \frac{\sum X_L^2 - (\sum X_L)^2}{n}
\]

\[
\bar{X}_H = \text{Mean score on the given statement for the high group}
\]

\[
\bar{X}_L = \text{Mean score on the given statement for the low group}
\]

\[
\sum X_H^2 = \text{Sum of squares of the individual scores of the given statement for the high group}
\]

\[
\sum X_L^2 = \text{Sum of squares of the individual scores of the given statement for the low group}
\]

\[
(\sum X_H)^2 = \text{Square of the sum of the scores of the given statement for the high group}
\]

\[
(\sum X_L)^2 = \text{Square of the sum of the scores of the given statement for the low group}
\]

\[
n = \text{Number of respondents in each group}
\]
**Establishment of Validity and Reliability**

The face validity and content validity of the tool was established initially by consulting experts in the field. The construct validity is also ensured by analysing the theoretical studies related with moral maturity behavior.

The reliability of the tool was established using Cronbach’s alpha. It is the average of the correlations to the scores of all possible split of the tool. The Cronbach’s alpha obtained is 0.88 which ensures the reliability of Moral Maturity Behavior Scale. The final version of the tool in English is presented in Appendix IV.

**General Data cum Response Sheet**

The General Data cum Response Sheet contains space for general information like gender, locality, Subject of Study, parental qualification, Parental Employment and type of management, and the response columns for the sakes. It is presented in Appendix V.

**Data Collection Procedure**

The data were collected from the sample drawn. As the first step investigator visited the colleges and sought permission for data collection. After getting administrative permission, data were collected from each college. The mode of responding to the tools was briefed to the students before administering. All the four tools were administered to B.Ed teacher trainees in selected colleges. Necessary directions were given to students while administering the tools. It was difficult to administer all the four tools at a stretch. Hence, Investigator administered two tools in one day and remaining two tools in the next day. All the students enthusiastically filled up the response sheets. Investigator ensured that students are responding to all the items. Necessary time was allotted to respond each tool. It took four periods of one hour duration to administer all the tools. The data collected were consolidated and codified suitably for the analysis.
Scoring and Consolidation of data

According to the scoring scheme of the scales prepared, all the responses were scored. All the scales included positive as well as negative items but the intellectual style questionnaire has only positive items. The responses for positive statements were arranged as Always, Sometimes and Never and scores arranged were 3, 2 and 1 respectively. The negative statements were scored inversely.

Statistical Techniques Used for the Study

For testing the hypotheses formulated, different Statistical Techniques were used. As the first step of the analysis, the three Independent Variables selected for the study were classified into two levels. The classification technique of each independent variable is presented in the following section.

Classification of Intellectual Style

The data collected using Intellectual Style Questionnaire was classified to identify the students belonging to Type I and Type II Intellectual Style. The tool consists of 65 items, five each from 13 dimensions of thinking styles. The Type I Intellectual Style includes seven dimensions of thinking styles while Type II Intellectual Style consists of six dimensions each. The scores of Type I and Type II Intellectual Styles were calculated by adding the scores of each items comes under these two types. If a student’s score in one particular category is higher than the other, the student will be considered to be belonging to that particular Intellectual Style Category. In this manner, the entire samples were classified into Type I and Type II Intellectual Style groups.

Classification of Techno Culture

Techno Culture was classified into two groups namely, High Techno Culture group and Low Techno Culture Group. For this, half of the maximum score of Techno Culture Scale was calculated first. Students who fall above the score were considered as High techno culture group, students who scored below this were considered as Low techno culture group.
Classification of Motivational Belief

The classification of Motivational Belief score were done using the same procedure adopted for Techno Culture. Half of the maximum score for motivational belief was calculated first, the scores obtained above and below of this score for Motivational Belief Scale was categorised into High and Low Motivational Belief groups respectively.

For analysing the data, different Statistical Techniques were used. The statistical Techniques used in the present study can be divided into four categories.

Preliminary analysis

Preliminary analysis was done in order to arrive at conclusion about the nature of the distribution. Basic Descriptive Statistics such as Mean, Median, Mode, Standard Deviation, Skewness and Kurtosis of each of the Independent Variables and Dependent Variable were calculated. Descriptive Statistics were calculated for total sample and separately for the category variables.

Mean Difference Analysis

Test of significance of difference between two means of large independent Sample were used to compare the mean scores. Test of significance of Difference Between Means for different categories was used to find out if there exist any significant difference in intellectual styles, techno culture, motivational belief and Moral Maturity Behavior between the relevant subsamples.

The test of significance of difference between means for different categories is known as ‘t’ test. The tabled value for 0.01 level of significance is 2.58 and the tabled value for 0.05 level of significance is 1.96.

\[ t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}} \]

Where,

\( \bar{X}_1 = \text{Mean of the Group I} \)
Methodology

\[
\bar{X}_2 = \text{Mean of the Group II}
\]
\[
\sigma_1 = \text{Standard Deviation of Group I}
\]
\[
\sigma_2 = \text{Standard Deviation of Group II}
\]
\[
N_1 = \text{Sample size of Group I}
\]
\[
N_2 = \text{Sample size of Group II}
\]

If the obtained critical ratio is greater than the required value for significance the mean difference is considered to be significant.

**3X3X3 Factorial ANOVA**

The main effect and Interaction effect of three Independent Variables on the Dependent Variable were estimated using three way Analysis of Variance. Three-way ANOVA is used to find out the main and interaction effect of Intellectual Styles, Motivational Belief and Techno Culture on Moral Maturity Behavior of B.Ed Teacher Trainees. Three fixed factors were identified for each of the independent variable. Intellectual Styles were classified into Type I and Type II Styles while Techno Culture was classified into High and Low levels. The levels of Motivational Belief were High and Low. Hence, 3X3X3 ANOVA, in which three Independent Variables at two levels, were used to analyse the data. Data were analysed for Total Sample and separately for the subsamples.

The investigator used one-way Analysis of Variance for the category variables types of management as aided, unaided and government and parental employment as coolie, professional and business. After grouping the scores of each variable Intellectual Styles, Motivational Belief, Techno Culture and Moral Maturity Behavior, the mean and the standard deviation is measured. The mean scores obtained for the three category variables were compared using one-way ANOVA.

The significance of an ‘F’ ratio is assessed with reference to the table of F with (N-1, N-n) degrees of freedom for either 0.05 or 0.01 level of significance.

If, for a required level of significance, value obtained for F is higher the table value of F, then the difference between the group means was said to be significant for the level of significance of the test. If the F value is significant in the case of selected
variables, two tailed test of significance of difference between means will be used to
find out where the difference lays among the groups. The significant F values were
subjected to Scheffe’s test of post hoc comparison.

**Multiple Regression Analysis**

To predict the individual and joint contribution of Independent Variables on the
Dependent Variable, Multiple Regression analysis was used. Multiple Regression was
done using enter method in which all Independent variables were entered
simultaneously. A regression equation was also developed to predict the Dependent
Variable from the select Independent Variables.

All Statistical Analysis has been done using SPSS for windows version 20. The
detailed description of the analysis is presented in chapter IV.