CHAPTER 3

PRE-EOE TRAINING ANALYSIS

3.1 INTRODUCTION

This chapter presents the details about the research methodology followed for analysing Pre-EOE Training intervention. The assessment and comparison for pre-EOE training was done using the control group with the experimental group in Company A. The statistical tools used to perform the comparisons between the employees groups are explained first, followed by a summary of the hypotheses to be tested.

For the pre-intervention assessment or pre-EOE training, each hypothesis is tested to reach a conclusion as to whether it should be rejected or accepted. The hypothesis testing and discussion format are similar for all hypotheses. The following format is followed: Each of the respondents’ typical perceptions regarding EOE factors are summarised, using descriptive statistics such as the mean and standard deviation; differences between the perceptions of the various stratification groups, i.e. manager and non-managerial employees; gender: male and female employees; age groups of employees; experience levels of employees in the current organisation, current designation and overall work experience; and employees’ education levels are all analysed.

The following sections will give description of the research methodology for the research study undertaken.
3.2 RESEARCH METHODOLOGY

Any research study attempts and focuses towards achievement of the objectives of the study. Empirical research methods, strives to adopt and achieve the research aims and goals of the study. Here the Chapter 3 explains the pre-EOE training analysis assessment and the methodology followed in the following sections.

3.2.1 Research Strategy

The Case study research includes both single and multiple case studies, multi-sited or within site, case focused or issues focused, and allows for the inclusion of quantitative evidence, as outlined by Stake (1995) and Yin (1994). Of the available qualitative research strategies, the case study method was identified to be the most appropriate for this research study:

1) The notion of EOE is at a formative stage; there is less prior knowledge of what the variables of interest are and how they will be measured.
2) The case method emphasises a deeper understanding of the rich data. It allows for the context to be implicitly studied, leading to greater knowledge and understanding of the research phenomenon at hand in the view of Eisenhardt (1989), Stake (1995) and Yin (1994).
3) Samples were selected based on their potential after various level discussions with the top level management on the potentiality of the employees for the sample study, and the employees were chosen from Company A. The research study is longitudinal in nature. The purposive sample technique was adopted. This study adopts the single case design because it permits the researcher to strive towards understanding the phenomenon of interest by the evidence from case throughout the overall study and is therefore regarded as being more robust.
Babbie (1993) opines that a survey strategy can be “an excellent vehicle for measuring the attitudes and orientation in a large population”. The Survey approach was used to obtain data from the respondents with a self-administered questionnaire with back up interview. The study was descriptive in nature. The type of sampling used was Purposive. Purposive sampling is a sampling method in which the elements are chosen based on the purpose of the research study undertaken.

3.2.2 Sampling Procedure

A convenience sampling procedure was followed and two validated questionnaires were used. They are: 1) The EOE Questionnaire (Appendix 1) and 2) EOE Training Effectiveness Questionnaire (Appendix 2) were used as survey instruments to collect data from the respondents. The EOE Questionnaire was administered to all the employees of the organisations, to ascertain the pre-EOE and post-EOE level scores. EOE Training Effectiveness Questionnaire was administered to the reporting authorities of the participant employees who were EOE trained to ascertain the employees’ performance post-EOE training.

3.2.3 Statistical Significance Testing

Testing for statistical significance follows a well-defined process. Cooper and Schindler (2003) recommend a six-stage sequence of steps, as follows:

1. State the null hypothesis. Both the null hypotheses and the research or alternative hypotheses are stated.
2. Choose the statistical test. To test a hypothesis, one must choose an appropriate statistical test from a variety of tests and using a number of criteria that are both measurement-level and testing-situation dependent.

3. Select the desired level of significance. The exact level to choose is largely determined by how much risk there is of accepting the null hypothesis when in truth it should be rejected (type 1 error or \( \alpha \)). For the purposes of this study, a 5% level of significance is chosen.

4. Compute the calculated difference value. After the empirical data have been collected, the significance value (\( F, t, \chi^2 \) (Chi-square) or other measure) is calculated, based on the test of significance chosen under step 2 above. For the purposes of this study, the SPSS package version 16.0 has been used for computation of the significance values.

5. Obtain the critical test value. After the difference value (\( F \) or other) is calculated, the critical value is obtained from the appropriate table for that distribution.

6. Interpret the test. For this step, the conclusion is stated in terms of rejecting or not rejecting the null hypothesis, depending on whether or not the calculated value (step 4) is more extreme than the critical value (step 5).

3.2.4 **Probability Values**

The Probability values are known as p-Values. There are several ways of carrying out hypothesis testing. One can carry out a formal test using Cooper and Schindler (2002) with the help of the six-step procedure
described above, or one can compute a p-value to do the test, or one can use a confidence interval as a hypothesis test. These methods are equivalent to one another and they all lead to the same conclusion. The formal, six-step method is the easiest to grasp initially; the p-value method is commonly used by the computer statistical analysis packages, such as the SAS program (1998), and the confidence interval approach is easy to interpret in the view of Hildebrand and Ott (1996). SPSS 16.0 version for the purpose of data analysis, was used, for the research study.

The p-value indicates the weight of evidence, or the conclusiveness index for rejecting a null hypothesis. In other words, the p-value is the probability (assuming a $H_0$) of a test statistic value equal to or more extreme than the actual observed value. Therefore, the Universal Rejection Region is stated as:

Reject the null hypothesis if, and only if, the p-value is less than $\alpha$, bearing in mind the basic hypothesis-testing strategy of trying to support the research hypothesis, and to reject $H_0$ by showing that the data are highly unlikely, assuming that Null Hypothesis ($H_0$) is true, the p-value is interpreted as follows:

The farther within the rejection region the test statistic falls, the smaller the p-value is, and the stronger evidence there is to reject the Null Hypothesis and support the research hypothesis.

3.2.5 Analysis of Variance

The Analysis of variance in short is known as the ANOVA. Hildebrand and Ott (1996) note that in empirical research that the most notable trends in management over the past few decades have been the use of
scientifically controlled and carefully designed experiments. Especially in the
case of controlled experiments, the assessment of the likely effect of changes
and the improvement in management trends lies in the fact that well-designed
experiments convert a discussion from speculative opinion to the assessment
of actual data. Typically the data resulting from an experiment consist of
multiple samples. The statistical method for testing the Null Hypothesis (H₀),
viz. that the means of several samples of a population or means of
populations are equal, is the analysis of variance (ANOVA). The ANOVA
method leads to a single statistic for comparing all the means, so the overall
risk of type 1 error can be controlled.

The ANOVA was used to determine significant differences
between the individual mean or means and the consensus value, and to
establish the direction of the deviations. The results of the control group in
Company A are compared with those of the experimental group employees in
Company A, to ascertain significant differences.

The analysis of variance is based on ‘taking apart’ the variability in
the data into the part attributable to the variation between groups, and the
remaining part attributable to the variation within groups. The variation is
assessed by the sums of squares (SS) as outlined by Hildebrand and Ott
(1996).

The test statistic for ANOVA is the F ratio. The calculation of an F
ratio can be computed by the SAS program (1988) and most other statistical
packages. To begin with, one (or the computer program) calculates the total
sum of squares (SS (Total)) as the sum of squared deviations of individual
values around the grand mean of all the scores. Thus, SS (Total) is by
definition the sum of all squared deviations around the grand mean, and
is partitioned into two components, SS SS (Between) and SS (Within)
(Sum of Squares). SS (Between), also called SS (Factor), is the variability between groups. It is the sum of the squared deviations of each group mean from the grand mean, multiplied by the sample size for the group. If the means for the various groups (the various levels of the experimental factor) are nearly the same, there is little variability attributable to the factor and SS (Between) will be small.

SS (Within) is the variability within groups. If all the data in each group are close together and therefore close to the group mean, then the variances and SS (Within) will be small, in the views of Hildebrand and Ott (1996). The degrees of freedom for SS (Within) can be found by realising that there is n-1 degrees of freedom (d.f) for the squared deviations within a group. Similarly, the degrees of freedom for SS (Between) can be found by realising that there is I-1 d.f for I number of groups. Dividing the sum of squares by their degrees of freedom results in mean squares (MS). Using this terminology, the ANOVA (test statistic) for testing the equality of I group means is expressed as follows and given by the formula:

Test for Significance (T.S.) : $F = \frac{MS \text{ (Between)}}{MS \text{ (Within)}}$

$$= \frac{\Sigma i n_i (y_i - \bar{y})^2}{(I-1) / \Sigma ij (y_{ij} - \bar{y})^2 / (n-I)}$$

The rejection rule (R.R) for the null hypothesis is expressed as: R.R.: For a specified $\alpha$, reject $H_0$ if $F > F_{\alpha}$, where $F_{\alpha}$ cuts off a right-tail area of $\alpha$ in the F distribution with I-1 numerator and n-1 denominator d.f. (degrees of freedom) as explained by Hildebrand and Ott (1996).

Large positive values of MS (Between) relative to MS (Within) indicate differences among the population means and lead to the rejection of the null hypothesis. Like all statistical inference procedures, the F-test is based on certain assumptions. The three basic assumptions are
population normality; equal group variances; and independence of observations.

The changes in an organisations’ entrepreneurial climate, attitudes, or behaviors are common areas of interest to organisational behaviour analysts. This study assesses the probable results of a change in training, knowledge, process, or policy, by performing an experiment on carefully chosen samples, making the changes, and measuring the results with reference to the EOE Training imparted on the employees of Company A.

3.2.6 Multiple Comparison Tests

The ANOVA does not indicate which individual mean or means are different from the consensus value and in which direction they deviate. Multiple comparisons test the difference between each pair of means and indicate significantly different group means at a specified $\alpha$ level. Multiple comparison tests use the group means and incorporate $MS_{\text{error}}$ term of the F ratio. Together they produce confidence intervals for the population means and a criterion score. Differences between the mean values may be compared as outlined by Cooper and Schindler (2003).

3.2.7 Mean and Standard Deviation

Descriptive statistics, such as the means and standard deviations are useful in performing an initial summary of the collected data and to check for errors. The mean (X), or arithmetic average, is a common measure of location and has been used in this study to determine a typical (average) response by all respondents to a question. The standard deviation (S) summarises typically how far the data values are away from the average values.
3.3 STATISTICAL TOOLS

The statistical tools used for the present study are discussed in the following sections viz., 3.3.1) ANOVA, 3.3.2) Chi Square test, 3.3.3). The t-test, 3.3.4) Correlation and 3.3.5) Regression.

3.3.1 ANOVA

ANOVA uses traditional standardized terminology. The definitional equation of sample variance is given by the formula shown in equation 3.1:

\[ S^2 = \frac{1}{n-1} \sum (y_i - \bar{y})^2 \]  
\hspace{1cm} (3.1)

The divisor is called the degrees of freedom (DF), the summation is called the sum of squares (SS), the result is called the mean square (MS) and the squared terms are deviations from the sample mean. ANOVA estimates 3 sample variances: a total variance based on all the observation deviations from the grand mean, an error variance based on all the observation deviations from their appropriate treatment means and a treatment variance.

The treatment variance is based on the deviations of treatment means from the grand mean, the result being multiplied by the number of observations in each treatment to account for the difference between the variance of observations and the variance of means. If the null hypothesis is true, all three variance estimates are equal (within sampling error). The fundamental technique is a partitioning of the total sum of squares SS into components related to the effects used in the model.
3.3.2 Chi-Square Test

A chi-squared test, also referred to as Chi-square test or $\chi^2$ test, is a statistical hypothesis test in which the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true, meaning that the sampling distribution (if the null hypothesis is true) can be made to approximate a chi-squared distribution as closely as desired by making the sample size large enough. The test-statistic is given by the formula shown in equation 3.2

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

(3.2)

where $\chi^2$ = Pearson's cumulative test statistic, which asymptotically approaches a $\chi^2$ distribution.

- $O_i$ = an observed frequency;
- $E_i$ = an expected (theoretical) frequency, asserted by the null hypothesis;
- $n$ = the number of cells in the table.

3.3.3 The t-test

The origin of the student’s t-test is an interesting one. For the purpose of solving problems stemming from his employment in a brewery, “Student" the real name being W.S. Gossett during [1876-1937] developed. Student's t-test. It deals with the problems associated with inference based on "small" samples: the calculated mean ($X_{avg}$) and standard deviation ($\sigma$) may by chance deviate from the "real" mean and standard deviation. For example, it it likely that the true mean size of maple leaves is "close" to the mean
calculated from a sample of $N$ randomly collected leaves. The one-sample t-test is a parametric test of the location parameter when the population standard deviation is unknown. The test statistic is given in equation 3.3 as below:

$$t = \frac{\bar{x} - \mu}{s / \sqrt{n}}$$

(3.3)

where, $\bar{x}$ is the sample mean, $\mu$ is the hypothesized population mean, $s$ is the sample standard deviation, and $n$ is the sample size. Under the null hypothesis, the test statistic has Student's t distribution with $n - 1$ degrees of freedom.

### 3.3.4 Correlation

Correlation refers to any of a broad class of statistical relationships involving dependence. Correlation is computed into what is known as the correlation coefficient, which ranges between -1 and +1. For example, perfect positive correlation (a correlation coefficient of +1) implies that as one security moves, either up or down, the other security will move in lockstep, in the same direction. Alternatively, perfect negative correlation means that if one security moves in either direction the security that is perfectly negatively correlated will move in the opposite direction. If the correlation is 0, the movements of the securities are said to have no correlation; they are completely random.

Pearson's correlation coefficient between two variables is defined as the covariance of the two variables divided by the product of their standard deviations. The form of the definition involves a "product moment", that is,
the mean (the first moment about the origin) of the product of the mean-adjusted random variables; hence the modifier product-moment in the name.

For a population, Pearson’s correlation coefficient when applied to a population is commonly represented by the Greek letter \( \rho \) (rho) and may be referred to as the population correlation coefficient or the population Pearson correlation coefficient. The formula for \( \rho \) is given in the equation 3.4:

\[
\rho_{X,Y} = \frac{\text{COV}(X,Y)}{\sigma_X \sigma_Y} = \frac{E[(X-\mu_X)(Y-\mu_Y)]}{\sigma_X \sigma_Y}
\] (3.4)

For a sample, Pearson’s correlation coefficient when applied to a sample is commonly represented by the letter \( r \) and may be referred to as the sample correlation coefficient or the sample Pearson correlation coefficient. We can obtain a formula for ‘\( r \)’ by substituting estimates of the covariances and variances based on a sample into the formula above. The formula for ‘\( r \)’ is given in equation 3.5

\[
r = \frac{\sum_{i=1}^{n} (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^{n} (X_i - \bar{X})^2} \sqrt{\sum_{i=1}^{n} (Y_i - \bar{Y})^2}}
\] (3.5)

### 3.3.5 Regression

Simple linear regression predicts the value of one variable from the value of one other variable. Multiple regressions predict the value of one variable from the values of two or more variables. Using two or more predictor variables usually lowers the standard error of the estimate and makes more accurate prediction possible.
where

\[
y = a + bx \quad b = \frac{\sum (X_i - \bar{X})(Y_i - \bar{Y})}{\sum (X_i - \bar{X})^2}
\]  

(3.6)

The formula for the regression equation is given in equation 3.6 above, where \( \bar{y} \) = estimated \( y \) and is the value on the \( y \) axis across from the point on the regression line for the predictor \( x \) value. (Sometimes represented by \( \hat{y} \) or \( y' \).) This is the estimated value of the criterion variable given a value of the predictor variable. \( a \) = the intercept point of the regression line and the \( y \) axis. It is calculated through the equation \( a = \bar{y} - bx \); therefore, the means of both variables in the sample and the value of \( b \) must be known before \( a \) can be calculated. \( b \) = the slope of the regression line and is calculated by this If the Pearson Product Moment Correlation can be calculated, when all the components of this equation are known. \( x \) = an arbitrarily chosen value of the predictor variable for which the corresponding value of the criterion variable is desired.

### 3.4 RESEARCH DESIGN

The research design in the first phase of the study is descriptive research. Descriptive research is selected, for understanding the samples to be chosen for the intervention technique in the second phase. Descriptive research is the best method to collect the required information, as it includes surveys. In this design the researcher prepares a questionnaire (EOE Questionnaire) (Appendix 1 to gather all essential information for further studies. The second phase involves experimental design (Refer Chapter 4). This technique is chosen by researchers as the nature of the employees and their availability for the study was much difficult. Without affecting the purpose of the study as well as looking for the benefit of the organisation, the
The experimental design selected for the present study was “before and after without control design”.

### 3.4.1 Sampling Design

The sampling technique used for the present study is in two phases as the study demands. In the first phase wherein the sample for the experimental design needs to be selected is purposive sampling. Purposive sampling means deliberate selection of samples for the study. Since the study involves intervention, researcher selected Company A, among the sample population within the six companies viz, A, B, C, D, E and F. Since convenience sampling is used the samples are selected based on various level discussion with the top level management on the potentiality of the employees and thus the sample for the study is selected in the first phase. In the first phase a total sample of 144 i.e., employees from Company A, were selected. Table 3.1 below presents the employees’ designation, which is classified into two categories viz; Executives and Managers, who constitute a sample size of 75 and 69 respectively. Breakdown of the sample are as follows:

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Designation</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Executives</td>
<td>75</td>
<td>52.1</td>
</tr>
<tr>
<td>2</td>
<td>Managers</td>
<td>69</td>
<td>47.9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>144</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The sampling design utilized was “one group only”, pre-post test design. The total population consisted of 627 respondents who are employees
at various levels in organisations. The sample breakup is as follows: 
1) Company A: 144 respondents belong to the IT/ITES services, 2) Company 
B: 37 respondents belong to the Manufacturing Services, 3) Company C: 106 
respondents belong to IT/ITES services, 4) Company D: 102 respondents 
belong to Engineering Services, 5) Company E: 138 respondents belong to 
Manufacturing services. 6) Company F: 100 respondents from the IT/ITES 
services. The organisation chosen for the Case study was Company A as per 
the convenience sampling procedure; here the sample size was 144 
respondents. The sample size is 144 employees from Company A and the 
classification based on designation of the employees is given in Table 3.2.

Table 3.2 Classification of Designation of the Employees in Company A

<table>
<thead>
<tr>
<th>Classification by Designation</th>
<th>Managers</th>
<th>Executives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the designation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Assistant Vice President (AVP)</td>
<td>1. Quality Assurance Trainee</td>
</tr>
<tr>
<td>2.</td>
<td>Project Head</td>
<td>2. Technical Recruiter</td>
</tr>
<tr>
<td>3.</td>
<td>Manager</td>
<td>3. Executive Solutions Development</td>
</tr>
<tr>
<td>4.</td>
<td>Account Manager</td>
<td>4. Client Services Representative</td>
</tr>
<tr>
<td>5.</td>
<td>Senior Manager IT</td>
<td>5. Quality Assurance Executive</td>
</tr>
<tr>
<td>6.</td>
<td>Assistant Manager</td>
<td>6. Supply Chain Executive</td>
</tr>
<tr>
<td>7.</td>
<td>Deputy Manager</td>
<td>7. Quality Assurance Analyst</td>
</tr>
<tr>
<td>8.</td>
<td>Resource Manager</td>
<td>8. Deputy Team Lead</td>
</tr>
<tr>
<td>10.</td>
<td>Business Development Manager</td>
<td>10. Executive HR</td>
</tr>
<tr>
<td>11.</td>
<td>Manager</td>
<td>11. Client Service Representative Trainee</td>
</tr>
<tr>
<td>12.</td>
<td>Sales Manager</td>
<td>12. Software Executive</td>
</tr>
<tr>
<td>15.</td>
<td>Senior Process Executive</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Senior Process Associate</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Senior Software Executive</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Senior Client Service Rep</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Senior Software Client Executive</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Senior Executive HR</td>
<td></td>
</tr>
</tbody>
</table>
3.4.2 Research Instrument

Rao TV (1985) has developed the EO inventory, the same is being derived for the preparation of the EOE questionnaire. The already available tools did not serve all the variables to be studied under the present study, and hence it was essential for the research study undertaken and a new instrument by customising the Entrepreneurial Orientation Inventory developed by Rao TV (1985) was developed. The EOE Questionnaire stands for Entrepreneurial Orientation for Employees Questionnaire. The instrument used for data collection in the present study is the EOE Questionnaire and Discussion.

Pilot testing on a sample of 40 employees was done and appropriate modifications were done, based on the objectives of the study. The EOE Questionnaire contains 77 statements and each statement has a pair of sub-statements, totaling to 154 items in all. An itemised rating scale was used as the scaling technique. This scaling technique was preferred to the rating scale, because this will give the respondents for the clarity on what and how precisely they can evaluate these statements, and record their responses. The instructions to the respondents regarding the EOE questionnaire were given, while administering the instrument by direct contact method and also by e-mail. The EOE Questionnaire (Refer Appendix 1) has one statement with each pair of sub-statements measuring the polarity of the variables. For example, the respondent has to rate the statement out of total score of 5, that is, 0- 5, 1- 4, 2- 3, 3- 2, 4- 1, 5- 0. For example:

1. When I hear about new things
   a. I listen to them carefully and ask a lot of questions
   b. I listen to them carefully and would suggest my view points
3.4.3 Draft Scale

For preparing the draft scale, initially several rounds of discussions were held with experts in the field. The discussions were to understand the aspects that need to be involved in the questionnaire. Based on the discussions and with reference to the Literature Review undertaken (Chapter 2), 10 EOE factors were selected, namely, Achievement motivation, Affiliation need, Creativity, Risk-taking propensity, Learning and Development, Training and Development, Locus of Control, Tolerance for ambiguity, Decision-making and Commitment. These were considered as important factors that contribute to enhance EO. Research has stated that Achievement motivation, Risk-taking propensity, Creativity and Decision-making are part of entrepreneurial orientation. In the present study, however, the investigator attempted to emphasize that there are some other factors also that can lead to enhancement of EO among employees.

The itemised rating scale was used as the scaling technique. This scaling technique was preferred to the rating scale in order to give the respondents clarity on what they are and how precisely they can evaluate these statements. Usually in the itemised rating scale we have a number of statements ordered progressively as more or less, in terms of some aspect.

However, for the present study the researcher has proposed polarity in the statement using the itemised rating scale. Initially 105 statements were included. After, scrutiny and discussions with the field experts, some of the statements were deleted as they lacked clarity, or were not somehow measuring the proposed variables.
Finally 90 paired statements were selected in the draft scale and were administered to a sample of 40 to perform the item analysis. In the draft scale, the items representing the variables are shown in Table 3.3 below:

**Table 3.3 EOE variables in the Draft Scale**

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>EOE Variable</th>
<th>Total Number of items (90)</th>
<th>Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Achievement Motivation</td>
<td>10</td>
<td>5, 4, 21, 31, 43, 52, 60, 70, 77, 84</td>
</tr>
<tr>
<td>2</td>
<td>Affiliation Need</td>
<td>10</td>
<td>4, 12, 23, 32, 41, 51, 61, 69, 83, 87</td>
</tr>
<tr>
<td>3</td>
<td>Creativity</td>
<td>10</td>
<td>2, 11, 22, 34, 44, 59, 68, 76, 80, 90</td>
</tr>
<tr>
<td>5</td>
<td>Learning and Development</td>
<td>8</td>
<td>8, 18, 27, 37, 47, 57, 66, 75</td>
</tr>
<tr>
<td>6</td>
<td>Training and Development</td>
<td>5</td>
<td>10, 20, 25, 39, 45</td>
</tr>
<tr>
<td>7</td>
<td>Locus of Control</td>
<td>10</td>
<td>1, 15, 30, 40, 50, 54, 63, 72, 79, 86</td>
</tr>
<tr>
<td>8</td>
<td>Tolerance for ambiguity</td>
<td>10</td>
<td>6, 16, 19, 29, 35, 49, 55, 64, 73, 82, 88</td>
</tr>
<tr>
<td>9</td>
<td>Decision-making</td>
<td>7</td>
<td>9, 14, 26, 38, 46, 58, 67</td>
</tr>
<tr>
<td>10</td>
<td>Commitment</td>
<td>10</td>
<td>7, 17, 28, 36, 48, 56, 65, 74, 81, 89</td>
</tr>
</tbody>
</table>

**3.4.4 Item Analysis**

The Item analysis was done for the EOE questionnaire to eliminate all those statements that are not fit to measure the purpose of the
questionnaire. Inter-item consistency method to select the items for the final scale was chosen. From total of 90 statements, 13 statements were eliminated and hence a total of 77 items were selected for the final scale. However the questionnaire still had to undergo standardization process, that is, test of reliability and validity.

3.4.5 Final Scale

The final scale consists of 77 statements with the 10 EOE variables. The EOE Metrics have the number of items selected for each variable (Refer Appendix 1) and are given in Table 3.4 as below:

Table 3.4 EOE variables in the Final Scale

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>EOE Variables</th>
<th>Total Number of items (77)</th>
<th>Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Achievement Motivation</td>
<td>8</td>
<td>11, 18, 26, 36, 44, 52, 61, 67</td>
</tr>
<tr>
<td>2</td>
<td>Affiliation Need</td>
<td>9</td>
<td>2, 9, 19, 35, 43, 53, 60, 71, 74</td>
</tr>
<tr>
<td>3</td>
<td>Creativity</td>
<td>8</td>
<td>1, 8, 28, 37, 51, 59, 66, 77</td>
</tr>
<tr>
<td>4</td>
<td>Risk-taking Propensity</td>
<td>7</td>
<td>10, 20, 27, 45, 54, 62, 72</td>
</tr>
<tr>
<td>5</td>
<td>Learning and Development</td>
<td>8</td>
<td>5, 15, 23, 31, 40, 49, 57, 65</td>
</tr>
<tr>
<td>6</td>
<td>Training and Development</td>
<td>5</td>
<td>7, 17, 21, 33, 38</td>
</tr>
<tr>
<td>7</td>
<td>Locus of Control</td>
<td>5</td>
<td>12, 34, 46, 68, 73</td>
</tr>
<tr>
<td>8</td>
<td>Tolerance for ambiguity</td>
<td>10</td>
<td>3, 13, 25, 29, 42, 47, 55, 63, 70, 75</td>
</tr>
<tr>
<td>9</td>
<td>Decision-making</td>
<td>7</td>
<td>6, 16, 22, 32, 39, 50, 58</td>
</tr>
<tr>
<td>10</td>
<td>Commitment</td>
<td>10</td>
<td>4, 14, 24, 30, 41, 48, 56, 64, 69, 76</td>
</tr>
</tbody>
</table>
3.5 ANALYSIS OF RELIABILITY

Cronbach’s Alpha ($\alpha$) is regarded as one of the most important reliability estimates. It measures the internal consistency (reliability) by determining the degree to which instrument items are homogeneous and reflect the same underlying construct(s) as outlined by Cooper and Schindler (2003). It detects whether the indicators of a construct, also known as variables, have an acceptable fit on a single factor. A Cronbach’s Alpha “$\alpha$” value of above 0.5 is regarded as an indication of reliability. The Cronbach’s Alpha analysis is appropriate when individuals respond to items on multiple levels. It is particularly useful for the Likert-type scale mapping rule, i.e. 1-Strongly disagree, 2-Disagree, 3-Not sure, 4-Agree, to 5-Strongly agree, used to measure empirical responses of respondents in the pre-test - post-test observations of the study.

3.5.1 Reliability

For testing the reliability and validity, the EOE questionnaire with 77 statements, with all the Ten EOE factors were distributed among the EOE questionnaire was administered for pilot testing, to a sample of 40 respondents. The reliability coefficient Cronbach’s alpha found for the EOE questionnaire was $\alpha = 0.95$ (Refer Figure 3.1). Similarly, the computed overall alpha value for the EOE Post Training Effectiveness Questionnaire was $\alpha = 0.98$ (Refer Figure 3.2).

Hence the research instruments used indicates a strong internal consistency and a strong degree to which instrument items are homogeneous and reflect the same underlying the construct as outlined by Cooper and Schindler (2003).
Figure 3.1 Cronbach’s Alpha for EOE Questionnaire

Figure 3.2 Cronbach’s Alpha for EOE Post Training Effectiveness Questionnaire

It is evident that both the research instruments used are reliable (Refer Appendix 1 and 2) items are reliable; and that the constructs are measuring what they are supposed to measure, indicating a good and reliable instrument. The adapted and refined instrument is reliable and valid. It can be applied, in its modified and refined state, on the post-test experimental group (observation 2) Post-EOE Training Effectiveness Questionnaire, on the pre-EOE Test/Experimental group.
3.6 VALIDITY

The test for validity for the both the questionnaires was face validity. The validity was done by the experts in the field for both the EOE Questionnaire and EOE post training effectiveness questionnaire. Both were found to possess face validity which is essential for research studies are empirical in nature.

3.6.1 Administration of EOE Questionnaire

The EOE Questionnaire (Refer Appendix1 (A1) ) was administered with the following instructions to the respondents. The EOE Questionnaire was administered to both Test group and Experimental Group, to obtain the Pre-EOE scores. Given below are certain statements that are related to respondents in reacting/responding/understanding a situation. There is no best style, because the situation determines what style is best. However, based on their experience, every individual will have their own way of looking at things and thereby responding to the situation.

Kindly requested to give honest responses to the situations, in each pair of statements, the respondent may agree with one statement more than the other.

- The respondents have 5 points to distribute between the two statements.
- The respondent may distribute the 5 points in any of the following combinations: 0- 5, 1- 4, 2- 3, 3- 2, 4- 1, 5- 0.
- The total points given by the respondent to each pair of statements do not exceed a total sum of 5 altogether.
• For example:
  If the respondent agree slightly more with statement 'a' than with statement 'b', 3 points is assigned to 'a' and 2 points to 'b'.

  If the respondent agree completely with 'a' but do not agree with 'b', assign 5 points to 'a' and 0 points to 'b'.

• The 5 points cannot be divided equally between the two options.

The responses were kept highly confidential and were utilised for research purposes only.

3.6.2 Scoring

Scoring a research instrument is very important for analyzing the data, and hence, to interpret the same to derive the results. Since the EOE Questionnaire uses the polarity scale, the investigator based on the research studies, has selected the best statement out of the two that will help in measuring EO. The classification of scores was done for each of the variables as “High” and “Low” for Pre and Post-EOE scores, 50% above and below the maximum range; the coding of data was done accordingly, Refer Section 4.3. The EOE training modules contained the entrepreneurial characteristics which were identified from the literature review. The modules contained a combination of Lecture / Case presentation, Role play, Business Games, Simulation, Group discussion and Video presentation. The score attributed by the respondent to the given right statements are added to get scores for each of the EOE variables. EOE score is the total score derived from computing the individual scores of each of the ten EOE variables. The list of EOE variables, item numbers as there are right statements available in the EOE Questionnaire are also available. The range of scores with the
maximum being “385” and the minimum being “0” are also indicated therein, Table 3.5.

Table 3.5 EOE variables and the Scoring Range

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>EOE Variables</th>
<th>Item Numbers (Right statements)</th>
<th>Maximum EOE Score(385)</th>
<th>Minimum EOE Score (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Achievement Motivation</td>
<td>11b, 18b, 26b, 36a, 44b, 52a, 61a, 67a</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Affiliation Need</td>
<td>2b, 9a, 19a, 35b, 43a, 53a, 60a, 71a, 74a</td>
<td>45</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Creativity</td>
<td>1a, 8a, 28b, 37a, 51a, 59a, 66a, 77a</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Risk-taking Propensity</td>
<td>10b, 20a, 27a, 45a, 54b, 62b, 72a</td>
<td>35</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Learning and Development</td>
<td>5a, 15a, 23b, 31a, 40a, 49a, 57a, 65b</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Training and Development</td>
<td>7b, 17b, 21a, 33a, 38b</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Locus of Control</td>
<td>12a, 34a, 46b, 68b, 73b</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Tolerance for ambiguity</td>
<td>3b, 13b, 25b, 29b, 42b, 47b, 55b, 63a, 70b, 75b</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Decision-making</td>
<td>6a, 16b, 22b, 32a, 39b, 50b, 58b</td>
<td>35</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Commitment</td>
<td>4a, 14a, 24a, 30a, 41b, 48a, 56a, 64a, 69b, 76a</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>
3.7 DISCUSSION

Structured discussions were conducted. These discussions were highly essential to structure the questionnaire as well as to conduct the EOE training sessions. The structured discussions were conducted mainly to understand the sample in a better manner. The Company A was contacted well ahead of the conduct of the research study. There were several rounds of discussion with initially the lower level management, the middle level and also the top management.

Since the Company A is a MNC type, the heads of the departments, divisions etc were contacted by appointment, from the company Head quartered at Chennai, India with other offices round the globe. The planned meetings with the various cadre of employees in the organisation, facilitated both the researcher and the organisation (Company A), where the test/experimental group is identified to provide the employees and the management with the needed clarity and for the attainment of objectives of the research study coupled with the benefits to the organisation. Despite the 24 x 7 nature, functioning of the organisation, the utmost co-operation and co-ordination extended by all the employees in the organisation, necessarily deserves a mention. Chapter 4 entitled EOE Training - “A Case study” will describe in detail the questionnaire survey and the tabulated results.

3.7.1 Intervention

Chapter 4 will present a detailed discussion regarding, the intervention technique used in the present study, which is known as “Training for employees, on Entrepreneurial Orientation”. 