CHAPTER 3

METHODOLOGY
Chapter - III

METHODODOLOGY

The present chapter deal with the operational aspect of the study, the methodological and procedural design of the research work, the tools and statistical treatment of the data suited to the purpose and objectives.

The main thrust of the present research is to throw light on the phenomenon of over and under-achievement by exploring the effect of emotional intelligence and need achievement contribute to academic achievement and over and under-achievement of high school boys and girls.

Design

Three important variables needed to be studied by the researcher, namely emotional intelligence, need achievement and over and under-achievement. In any research the dependent variables are the measured changes in pupil performances attributable to the influence of the independent variable and the dependent variable. Independent variables are the conditions or characteristics that the experimenter manipulates in attempts to ascertain their relationship to observed phenomena. Hence in the above mentioned study, the dependent variable is over and under-achievement while emotional intelligence and need achievement are the independent variables. In order to ascertain the extent of relationship between the dependent and independent variable the entire work has been done.

The present research aims to explore the effect of emotional intelligence and need achievement on academic performance of students and of over and under achievers. It aims to find out how these variables that is emotional intelligence and need achievement contribute to over and under-achievement. The researcher felt that gender is another important psycho-social factor which should also be taken into account. Further five components of emotional intelligence i.e. Self awareness, Self regulation, Motivation, Empathy and Social skill also formed the part of the
study. Therefore two groups were formed in terms of each variable under study over achievers and underachievers, therefore appropriate analysis towards this end, reported under statistical analysis. Our design though predominantly a two group design has characteristics of co-relational design also.

The simplest of all experimental designs is the two-group posttest-only randomized experiment. In design notation, it has two lines one for each group with an R at the beginning of each line to indicate that the groups were randomly assigned. One group gets the treatment or program and the other group is the comparison group and doesn't get the program. The posttest-only randomized experimental design is, despite its simple structure, one of the best research designs for assessing cause-effect relationships. It is easy to execute because it uses only a posttest, is relatively inexpensive. Correlation is also used as design in this study, because different variables were correlated with each other.

Sample

It is not feasible to investigate any phenomenon on the entire population, thus representative sample of the entire population has to be selected in order to reduce unwanted expenditure, save time and efforts. Initially the sample consist of 774 students of which 417 Boys and 357 Girls of different schools in Aligarh. The Standard Progressive Matrices test was given to students in order to identify over and under achiever, after identification the sample comprised of 200 subjects (over achievers and under achievers) that includes 115 girls and 85 boys of class IX and X, which was the main concern of the study. The age range of the sample was 13-17 years. Drawing of sample through random procedure is undoubtedly desirable but even in pure experimental research it is a difficult proposition. According to Broota (1989) “Randomization is necessary to ensure the validity of independence assumptions in practice, it is generally difficult to follow dictates set forth by the theory of random sample. Usually we include as subjects those members of the population that are easily accessible to us. It is therefore advisable that the researcher should draw subjects at random from those subject that are accessible to him or her, In the present research too, this was followed.
Table III - The data was collected from the following institution.

<table>
<thead>
<tr>
<th>Schools</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ABK Union High School</td>
<td>248</td>
<td>-</td>
</tr>
<tr>
<td>2 ABK Union High School</td>
<td>-</td>
<td>242</td>
</tr>
<tr>
<td>3 STS High School</td>
<td>91</td>
<td>-</td>
</tr>
<tr>
<td>4 Abdullah Girls High School</td>
<td>-</td>
<td>68</td>
</tr>
<tr>
<td>5 Iqra Public School (Girls)</td>
<td>-</td>
<td>47</td>
</tr>
<tr>
<td>6 Iqra Public School (Boys)</td>
<td>78</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>417</td>
<td>357</td>
</tr>
</tbody>
</table>

Tools of the study

The meaningfulness of the results of any research work depends upon the appropriateness of the tools and measures employed in the study. They should be reasonably valid and reliable as well as suited to the age and ability levels of the sample involved in the research work. For its purpose the present investigation required the following tools:

- Raven’s Progressive Matrices (SPM)
- Deo-Mohan’s Achievement Motivation Scale (DMAMS)
- Emotional Intelligence Scale (EIS) by investigator.

Measure of intelligence – Raven’s standard progressive matrices (SPM)

For obtaining intelligence score the researcher went through various test of intelligence. Finally the Ravens Progressive Matrices (RPM) prepared by Dr. John C Ravens, J.H. Code in 1938 was used here. There are different types of intelligence test given below.
Types of intelligence Test

Intelligence is a property of mind that encompasses many related mental abilities, such as the capacities to reason, plan, solve problems, think abstractly, comprehend ideas, language, and learn.

- The Binet-Simon test was the first intelligence test developed in France by Alfred Binet, a French educator, in 1905. The Binet-Simon test underwent a major revision in 1916 and was renamed the Stanford-Binet Intelligence Test.

- Wechsler Adult Intelligence Scale - The first test to measure intelligence in adults was designed by Dr. David Wechsler and was called the "Wechsler Adult Intelligence Scale" (WAIS). He also created a test for children called the "Wechsler Intelligence Scale for Children" (WISC). The unique thing about these tests is that they report separate scores for verbal and performance IQ. This gives the ability to judge intelligence independent of verbal ability. These tests are still in use today.

- Peabody Picture Vocabulary Test – A person is given a word and asked to select a picture, from a group of four, which best defines the word.

- Raven's Progressive Matrices – The person is shown a matrix of patterns, with one pattern missing, and he/she must work out the rules governing the patterns and consequently, the item which best fills the missing pattern.

- Visual Illusions (Psychophysics) – This measures a person’s ability to perform a visual task by seeing how well the brain reacts to that task. This test is particularly good for seeing how illusions question our perception.

- Elementary Cognitive Tasks – These tests try to aim the psychological and physiological aspects of intelligence and therefore determine how fast the brain works. They do this by assessing a person’s response to stimuli and tasks which become progressively more complicated.

- Psychometric Tests (Aptitude Tests) – Commonly used during recruitment and even academic selection, in test centers, these tests focus on specific abilities required for a certain job or role and
thus try to predict a candidate's future performance in a particular field, rather than measure their overall general intelligence.

Qualities of Raven's Standard Progressive Matrices (SPM) test.

Raven's Progressive Matrices tests measure the two main components of general intelligence (originally identified by Spearman), the ability to think clearly and make sense of complexity, which is known as educative ability (from the Latin root "educere", meaning "to draw out") and the ability to store and reproduce information, known as reproductive ability.

Arthur Jensen, Professor Emeritus of Educational Psychology at the University of California, Berkeley, has called Raven's Progressive Matrices "One of the best tests for measuring g" the general intelligence factor that all IQ tests measure to a greater or lesser degree. He also said that it is a test of inductive reasoning, unadulterated by verbal, numerical, spatial, mechanical, or musical interference.

In 2007 M. Dawson, I. Soulieres, M. A. Gernsbacher and L. Mottron provided evidence that autistics score relatively higher in Raven's tests than in Wechsler tests. In addition the autistics were providing correct answers to the Raven's test in less time, though erring as often as non-autistics.

- Tests may be individual as well as group.
- Typically designated as performance, non-language or nonverbal tests.
- Tests designed for groups such as infants, preschoolers, mentally retarded people, physically disabled (hearing, visual, motor) and multicultural populations (language & cultural issues)
- The major non-verbal test in use is Raven's progressive matrices

This test was originally developed in the mid 1930s and was revised and standardized many times in 1938, 1943, 1948, 1972, 1979 and 1983, the present investigation has used the SPM of 1983 editions. The scale is intended to cover
whole range of intellectual development from the time a child is able to grasp the
idea of finding a missing piece to complete a pattern and to be sufficiently long to
access a person's maximum capacity to form comparison and reasons by analogy
without being unduly exhausting. The scores obtained by adults tend to cluster in
the upper half of the scale but there are enough difficult problems to differentiate
satisfactorily between them.

The Standard Progressive Matrices (SPM) (Sets A B C D and E) is a test of
persons capacity at the time of the test to apprehend meaningless figures presented
for his observation, see the relation between them, conceive the nature of the figure
by completing each system of relations presented, and by so doing develop a
systematic method of reasoning. The scale consists of 60 problems divided in to
five sets of 12 each. Each of the sets, the first problem is easy and the problem
becomes comparatively difficult as one proceeds on.

Purpose to use this test

- SPM was designed to cover the widest possible range of mental
  ability and to be equally useful with persons of all ages irrespec-
  tive of their education background, nationality or physical
  standing. It means that it is a culture free test.

- SPM also provide a reliable estimate of a persons capacity to think
  clearly when he was allowed to work steadily at his own speed,
  from the beginning to the end without interruption.

Reliability of SPM

Since SPM is a homogenous test one would expect a high correlation to
emerge with split half measure of reliability, the majority of studies giving consist-
tency data report correlation of at least 0.90 with a modal value of 0.91. Over 40
studies dealing with the reliability of the SPM have been reported in the literature.
Reports of pretest reliability are contained in over 20 papers they differ widely in
their methodology and the time intervals between test ranges from one week to
three years.
From the original studies on SPM Raven’s 1948 and Folds and Raven’s 1948 found reliabilities ranging from 0.83 to 0.93 with higher values being associated with younger subject. Well conducted study therefore indicates satisfactory retest reliability for SPM in the period up to one year. Beyond this the evidence is limited chiefly by uncertainties over sample size and lost of subject from initial sample.

Reliability

According to our data the reliability of SPM is found to be 0.25 by using Split Half Method.

Validity

The concurrent and predictive validities of SPM vary with the age, possible sex and homogeneity of the sample, the method of assessment of the criterion to which the test will be related and the reliabilities of the test, criterion measures in the context considered adolescent reliable correlation of SPM with the Binet & Wechsler scales range from +0.54 to +0.86.

The external criterion commonly adopted in predictive validity investigation in scholastic achievement assessment sometime after administration of SPM. Validity coefficient reported in studies with English and Non–English speaking children and adolescent generally range +0.70.

Administering the SPM

The individual test appears to introduce emotional factors which are less operative when a person is allowed to work quietly at his own speed. The self administered or group test appears to provide a reliable sample of a persons output of intellectual activity during the test.

The researcher explains the intelligence test to the students distributing the booklets to them, along with the answer sheets. The researcher pointed out to the figure of set of A of A1 then explains that there were 6-8 Fig given and 1 figure
exactly fit into the above missing picture which complete the figure. The researchers asked them to write the answer in the answer sheets provided to them. Once the subject had grasped the nature of the initial problem, the researcher gave no further assistance in the method of reasoning. The total time taken for the administration of the intelligence test was about 35 minutes.

**Table IV - Norms for Standard Progressive Matrices (Age 13-25 Yrs)**

<table>
<thead>
<tr>
<th>Percentile Points</th>
<th>Scores (Age 13 – 25 Yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>55</td>
</tr>
<tr>
<td>90</td>
<td>54</td>
</tr>
<tr>
<td>75</td>
<td>49</td>
</tr>
<tr>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

**Measure of Academic Achievement**

For the achievement measure the investigator had to depend upon the school subject record of examination marks. Much as lack of reliability of school examination marks is proverbial, there was no other way to get the measure of academic achievement. It would had been no doubt far better if standardized achievement test could have been employed, for this purpose but no such test were available for the school subject for the study and suited to the grades on which the student was made.

Next best alternative was to construct an achievement test of own and standardized it to the extent that was possible. In such a case the reliability and validity of achievement measure could have been ensured. Hence, the school records and results of exams had to be relied upon. In order to ensure better reliability of achievement scores results of all the exams, half yearly and annuals were taken into account for each of the two graded IX and X, the total marks of the subject yielded the raw score for every individual.
Measure of Need Achievement - Deo-Mohan Achievement Motivation (DMAMS)

For studying achievement motivation for students the investigator employed Deo-Mohan Achievement Motivation (n-Ach) scale by Mrs. Pratibha Deo and Asha Mohan of National Psychological Corporation Agra. There are various tests already being used in different researches like TAT, picture completion.

The Achievement Motivation Test for adults is 90 multiple-choice item questionnaires for the measurement of three motives. Achievement Motivation Inventory (AMI) is an adaptation of Mehta's (1969) objective test version of the Thematic Apperception Test for achievement motivation, Mukherjee test of n-ach etc.

But these tests are much time taken compared to DMAMS test. A projective test generally used for measuring achievement motivation is time consuming in administration and the scoring procedure is somewhat complicated.

Qualities of Deo-Mohan Achievement Motivation (DMAMS)

Researcher required a quick scoring tool which can be easily administered and used for research and for studying pupil.

- It is a self rating type and may be administered to individual and to the group with 5 point to rate, i.e. always, frequently sometime, rarely and never.

- It has no fix time limit

- It is handy and convenient for administration and scoring secondly many scales that are available measure achievement motivation in particular field such as academic motivation at the high\higher secondary college or university level.

- A standard measure which sufficiently measures the achievement motivation in general is desired.
• The present scale fulfills that need thirdly for validating the projective test of achievement motivation, the verbal scale will found to be a very useful and valuable instrument.

The scale has designed for use with the subjects ranging from 13-25 years and above. The scale was in the statements form, covering the areas of academic factors, factors of general field of interest, competition in curricular and co-curricular activities and social interest. Total number of items was 50 having the following distribution.

Table V - Showing the distribution of items in achievement motivation scale

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Factors</th>
<th>No of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Academic motivation</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>N-Achievement</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Academic challenge</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Achievement anxiety</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>Importance of grades/ marks</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>Meaningfulness of tasks</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>Relevance of school/ college to future goals</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>Attitude towards education</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>Work methods</td>
<td>5</td>
</tr>
<tr>
<td>10.</td>
<td>Attitude towards teachers</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>Interpersonal relations</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>Individual concern</td>
<td>2</td>
</tr>
<tr>
<td>13.</td>
<td>General interest</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>Dramatics</td>
<td>2</td>
</tr>
<tr>
<td>15.</td>
<td>Sports</td>
<td>5</td>
</tr>
</tbody>
</table>

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50
Out of these items 13 items were negative i.e. the item no 1 12, 13, 14, 17, 18, 19, 20, 21, 22, 32, 34, 37 and remaining 37 items were positive items.

**Reliability of the scale**

Coefficient of the reliability are sufficiently high (0.69) and the scale can be considered as reliable for use. Test retest method was applied to obtain the reliability coefficient of the scale. Taking different set of sample, the administration of the test was repeated on several occasion, the results are given below:

**Table VI - Showing the reliability coefficient of DMAMS**

<table>
<thead>
<tr>
<th>Sample</th>
<th>No</th>
<th>Interval</th>
<th>R</th>
<th>Significant Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Group</td>
<td>51</td>
<td>4 weeks</td>
<td>0.60</td>
<td>0.01</td>
</tr>
<tr>
<td>Males</td>
<td>33</td>
<td>5-6 weeks</td>
<td>0.67</td>
<td>0.01</td>
</tr>
<tr>
<td>Females</td>
<td>50</td>
<td>5-6 weeks</td>
<td>0.78</td>
<td>0.01</td>
</tr>
</tbody>
</table>

These co-efficient of reliability are sufficiently high and the scale can be taken as quite reliable for use.

**Reliability**

According to over data the reliability of SPM is found to be 0.31 by using Split Half Method.

**Validity of the scale**

As far as validity is concerned in the first instance the item validity established by high low discrimination method was accepted as the validity of the whole measure. Beside this scale was also used for validating the projective test of achievement motivation. The coefficient of correlation between the scale and the projective test was observed to be 0.54 which deal for the validity of the score also, the validity of the concurrent nature. Finally the scale scores were also correlated with the scores obtained by administering the Aberdeen Academic Motivation Inventory of Entwistle (1968) yielding the coefficient of the correlation as 0.75 for
mixed sample of 0.93. This correlation is high enough to establish the validity of the scale. Regarding the $r$ of 0.54 between the scale and projective test McClelland explain that self descriptive and projective measure are usually not correlating high with each other, even Carney (1966) observed that questionnaire measure correlated poorly with McClelland projective measures. These explanations support the result of the present scale of achievement motivation to be sufficiently valid for use for measuring achievement motivation.

**Scoring**

Two stencil keys were used for scoring, one for positive items and one for negative items. Positive items carry the weight of 4, 3, 2, 1 and 0 respectively, for the categories of Always, Frequently, Sometime, Rarely and Never. The negative items for the scores 0, 1, 2, 3 and 4 for the same categories respectively that are given above, separate keys for positive and negative items were provided, and total score is the summation of all the positive and negative items scores. The minimum scores obtained can be zero and maximum can be 200 other score ranging in between.

**Administration of the scale**

The scale can be administered individually as well as in groups. The subjects should be seated comfortably at some distance from each other and all within such distance that every subject can clearly hear the tester's voice. First the answer sheet was to be distributed, one to each subject and the subject should be asked to write down his/ her particulars i.e. Name, Age, Gender, and College/School name and address, etc. after ensuring that this is properly done by all the subjects, the tester should distribute the scale booklets giving one to each subject. The directions should be properly clarified and explained. The subjects should be told that there is no time limit but they are expected to work fast and give their honest, frank and first response to each item. After the subjects finished marking their response, the test booklets should be collected along with the answer sheets. That completes the procedure of administration.
Table VII - Percentile Scores for DMAMS Test

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>188</td>
</tr>
<tr>
<td>95</td>
<td>180</td>
</tr>
<tr>
<td>90</td>
<td>176</td>
</tr>
<tr>
<td>80</td>
<td>168</td>
</tr>
<tr>
<td>70</td>
<td>162</td>
</tr>
<tr>
<td>60</td>
<td>157</td>
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<tr>
<td>50</td>
<td>152</td>
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<tr>
<td>40</td>
<td>146</td>
</tr>
<tr>
<td>30</td>
<td>140</td>
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<tr>
<td>20</td>
<td>131</td>
</tr>
<tr>
<td>10</td>
<td>118</td>
</tr>
<tr>
<td>5</td>
<td>108</td>
</tr>
<tr>
<td>2</td>
<td>104</td>
</tr>
</tbody>
</table>

Emotional Intelligence Scale (EIS).

Appropriate tools for studying intelligence and need achievement were available. The researcher reviewed the various tests available to study emotional intelligence, but those were not appropriate according to the present study. Thus it became necessary to develop a test to measure emotional intelligence. Therefore another major dimension was added to the present research, namely devising of measure to study emotional intelligence.

Test construction is one of the most challenging and crucial activities in research. Preparing a good test is both time consuming and involves exercise of great care and control. According to Kelly (1969) and Hasan (1997), there are three strategies for construction of questionnaire.

1) Rational theoretical.
2) Empirical.
3) Factor analytic.
The present researcher used the rational theoretical method for construction of emotional intelligence scale. Details in this regard have been covered in the section on “tools of study” in the forthcoming pages.

After surveying and scrutinizing the various tests available for studying emotional intelligence, the researcher felt that in view of the age group being studied and the test that was available was not suitable for the present research, therefore it was necessary that an appropriate tool be developed.

The measurement of emotional intelligence has been rather slow to progress and to culminate into an empirically sound existence in comparison to the concept of emotional intelligence itself. Various methods are available for measuring emotional intelligence, which are categorized by Salovey, Woolery and Mayer, (1999) as task-based measures and the self-report measures. Task-based scales include measures like levels of emotional awareness (LEAS) by Lane, Quinlan, Schwartz, and Zeitlin (1990), emotional creativity by Averill and Nunley (1992), connecting thoughts and emotions Mayer and Geher (1996) and the multi-factor emotional intelligence scale (MEIS) by Mayer, Caruso and Salovey, 1998.

Wong’s Emotional Intelligence Scale (WEIS) is a self-report EI measure developed for Chinese respondents (Wong et al., 2007). WEIS is a scale based on the four ability dimensions described in the domain of EI, and some others are given in the table below.
## Commonly Used Measures of Emotional Intelligence

<table>
<thead>
<tr>
<th>Measure</th>
<th>Corresponding Theorist</th>
<th>Mode of Measure</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)</td>
<td>Mayer and Salovey</td>
<td>Performance-Based</td>
<td>Specific tasks are used to measure level of ability of each. Branch of emotional intelligence.</td>
</tr>
<tr>
<td>Emotional Quotient Inventory (EQ-i)</td>
<td>Bar-On</td>
<td>Self-Report</td>
<td>133 self-report items measure total IQ and each of the 5 components of the Bar-On model</td>
</tr>
<tr>
<td>Emotional Competency Inventory (ECI)</td>
<td>Goleman</td>
<td>Self-Report And Other-Report</td>
<td>A multi-rater instrument that provides ratings on a series of behavioral indicators of emotional intelligence</td>
</tr>
<tr>
<td>Emotional Intelligence Appraisal (EIA)</td>
<td>Goleman</td>
<td>Self-Report And Other-Report</td>
<td>A 7-minute assessment meant to measure the existence of Goleman's four components of emotional intelligence</td>
</tr>
<tr>
<td>Work Profile Questionnaire-Emotional Intelligence Version (WPQEVI)</td>
<td>Goleman</td>
<td>Self-Report</td>
<td>Measures 7 of Goleman's competencies thought of as most essential for effective work performance</td>
</tr>
<tr>
<td>Levels of Emotional Awareness Scale (LEAS)</td>
<td>Other</td>
<td>Self-Report</td>
<td>Measures levels of awareness of emotions in oneself and others</td>
</tr>
<tr>
<td>Self-Report Emotional Intelligence Test (SREIT)</td>
<td>Salovey and Mayer Or Other</td>
<td>Self-Report</td>
<td>A 33-item measure of Salovey and Mayer's original concept of emotional intelligence</td>
</tr>
</tbody>
</table>

### Need to construct the test

As we know that there are various tests of emotional intelligence available as given in the above table prepared by different experts of the field but all of these are time consuming, so there is a need to develop a test of own. The purpose of preparing a scale is to provide the researcher with such a tool which will found to be handy and convenient for administration and scoring, the present scale fulfill that need. Although preparing a test is time consuming and need exercise of efforts. Test construction is also considered a valuable activity for the researcher. A
researcher required a quick scoring tool which will found to be easy in scoring and items are easily understandable to the subjects

**Development of the test**

For the construction of the scale the researcher used rational theoretical approach as stated earlier. The following steps were involved in scale construction. The first step was defining of construct. In this, the definition of the trait is to be enunciated. With the help of literature and various studies, the researcher defined emotional intelligence in terms of self-awareness, self-regulation, motivation, empathy and social skills. These factors or components of emotional intelligence were found predominantly in most definition of emotional intelligence.

A pool of item which reflected each of the factors defining emotional intelligence was created, with help of teacher of the department and other teacher of other department of that field. Initially more than 100 items were formulated. Each item highlighted a situation reflecting particular factors. Experts subjected these question scrutiny. Five teachers of the field participated in this procedure. Their comments were incorporated, further adjusted the construction and wording of statement. Many unrelated question were deleted.

The next step was editing and improving language of items. Since one of the fundamental assumptions of rational theoretical approach is that the responses given by a subject are the verbal representation of his mental interior, the items in the instrument should convey the same meaning to all the subjects so as to have a sample of their same kind of mental interior. To ensure that all the subjects get the same meaning of the statements, the statements should be easy to understand and not open to more than one interpretation. Some informal criteria for the editing of statement given by Edward (1969) can be used for the selection of items the criteria are:

- Avoid statements, which are likely to be endorsed by everyone or almost by no one.
• Select statements that cover the entire range of variations along the continuum.

• Keep language of statements simple, clear and direct.

• Keep statements short.

• Keep statement should contain one complete reference of feeling or behavior.

• Statements should avoid such word as “always”, “all”, “none”, “never”, etc because universals introduce ambiguity.

• Word such as only just nearly and others of similar nature should be used with care and moderation in writing statements.

• As far as possible statements should be in the form of simple rather than complex sentence.

• Avoid statements, which can be interpreted in more than one way.

• Avoid words that are not understood by those who have to give response.

• Avoid use of double negative.

This was diligently followed in the next step undertaking was screening and rewording of items, which was done with the help of experienced researcher. So in the end after further streaming on the basis of steps explain in the next paragraph 50 question were retained in the questionnaire. This helps to establish face validity.

Items homogeneity was also determined. In order to this the researcher conducted a pre test method on the live identified samples. This consist of testing the emotional intelligence scale on 10 individual who on observation and prior knowledge were high on emotional intelligence and 10 individual who were low on emotional intelligence. The results of these two groups were analyzed and it was observed that on a large number of items both groups differed in a marked way. Only 50 items were retained.
Procedure for the construction of the test

The Emotional Intelligence scale developed by the investigator is based on rational theoretical approach. The investigator started to develop the scale first by clarify the concept of emotional intelligence and the theory on which it is based. The test is based on Goleman's Theory of EI which includes five dimensions self awareness, self regulation, motivation, empathy & social skill. Later on the investigator collected various items of the test which included the above five components of EI.

Self-Awareness (SA) - Self-awareness is the explicit understanding that one exists. In addition, it includes the concept that one exists as an individual, separate from other people, with private thoughts. It may also comprise the understanding that other people are similarly self-aware.

Example:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self awareness</td>
<td>I express my feelings honestly</td>
</tr>
</tbody>
</table>

Self-Regulation (SR) - It is about being able to manage and control and your emotional state, the keywords being manage and control, if we learn to tolerate an emotion than some thing changes it is not griming and bearing it. It is about managing feelings so that you behave in a manner that is appropriate for the circumstances.

Example:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Regulation</td>
<td>I easily forget things that upsets me</td>
</tr>
</tbody>
</table>

Motivation (M) - It refers to the forces that energies and direct behavior that helps us individually and in group to achieve our goal. We need to be sufficiently self aware in order to appreciate what it is that drive us to achieve from time to time and in different situation. Similarly we have to be able to control and regulate
our emotional energies in order to perform to the best of our ability specially when under pressure.

**Example:**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>I expect to do well on most things which I try.</td>
</tr>
</tbody>
</table>

Empathy (E) - The capacity to enter into someone else mind and personality and by so doing imaginably experienced that persons; subjective feeling or inner emotion. It include the ability to apply those skill and attributes at group and organizational level as well as person to person

**Example**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathy</td>
<td>I care what happens to other feelings</td>
</tr>
</tbody>
</table>

Social-Skill (SS) - Social skill are important component with in the complex system of interrelated competencies, it is our social skills that enable us to do such things as initiate and sustained personal relationship, become accepted and integrated in to groups, function effectively as member of the team, influence the attitude opinion and behavior of others, need other people prevent conflict from happening and manage them successfully when they do occur.

**Example:**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social-Skill</td>
<td>I arrange events others enjoy.</td>
</tr>
</tbody>
</table>

Initially there were 100 items in the test which was later on given to five experts of the field. For this purpose, the investigator went through various journals, books, websites and some items were self-prepared. Those items were selected which was three or four judges had same opinion, this process of item selection took a month. In this way, a final scale includes 50 items of which 10 of each respectively. The scale is based on five points. Given below in Table 3
Scoring for EI Test

<table>
<thead>
<tr>
<th>Items</th>
<th>Positive Items</th>
<th>Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Often</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Sometimes</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Rarely</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

There are 43 positive items and 7 negative items in the scales. The scoring for positive items is 5,4,3,2,1 and 1,2,3,4,5 for negative items respectively. The subject is required to select one of the alternative whichever suitable for him/her. Next step was how to classify the subject as High Emotionally Intelligent, Low Emotionally Intelligent & Average Emotional Intelligent. In order to this we calculate the quartile deviation (Q3 & Q1). After calculating the value, we have Q3 = 193 and Q1 = 166

Classification of subjects into different level according to the scores is given below

<table>
<thead>
<tr>
<th>Scores</th>
<th>Level EQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>193 and above</td>
<td>High</td>
</tr>
<tr>
<td>between 192 and 166</td>
<td>Moderate</td>
</tr>
<tr>
<td>165 and below</td>
<td>Low</td>
</tr>
</tbody>
</table>

Reliability of the EIS

A test is reliable to the extent it measure what ever it is measuring consistently. In test that have a high coefficient of reliability error of measurement have been reduced to a minimum. Reliable test are stable in whatever we measure and yield comparable score on repeated administration.

Different types of Reliability

- Test Re-test Reliability
- Equivalent or Parallel Forms
• Internal Consistency
• Split Half
• Inter Scorer Reliability
• Stability Over Testes
• Standard Error of measurement

Split Half Method is used to find out the reliability in this test. In this method the correlation coefficient is determined by comparing odd items of the measurement to the even items. The reliability of this test is found to be 0.25

Procedure

Administration of questionnaire is not a routine mechanical task; it is one of the most important activities in the conduct of research. It has to be conducted with sensitivity and because the subject serious and genuine reactions will come if rapport is established and confidence in researcher integrity in respectful confidentially is also there so vividly, it also becomes very interesting to interact with individual, the researcher has a rich variety of experience while collecting data, as results of personal interaction with the subject. In this phase the investigator started the work by arranging meeting with class teacher to fix the period for this purpose, afterwards work started with the cooperation of the teacher and students. The data was collected in two phase.

1. Administrator the test of Intelligence (SPM)

In order to find out over and under achievers, Ravens test was administered to the subjects which found to be very interesting, students did the test with great interest and enthusiasm. The investigator instructs the subjects of how to complete the test it require 35 min to complete the test. So one period needed to conduct the test, in this way the SPM test was given to subject of different schools, there was 774 students on which the test was conducted
Identification of over and under-achievement

After obtaining the data, the first task before the investigator was to identify the cases of over and under-achievement in general. In the present study the technique suggested by Thorndike (1963) was used. This technique is based on the correlation and regression between the achievement scores and the predictor variable.

The problem essentially involved the prediction of 'the expected achievement' against which the positive and negative discrepancies were to be worked out, cases of positive discrepancy being the over achievers and those of negative discrepancy the under achiever. For this purpose of statistically recognizing over and under-achievement 'regression equation' or the 'prediction equation' between intelligence and achievement scores was worked out for each individual. The formula for working out regression equations was as follows:

\[
\bar{Y} = r \frac{\sigma_y}{\sigma_x} (x - M_x) + M_y
\]

\(\bar{Y}\) = the predicted value of criterion (achievement)

\(r\) = the coefficient of correlation between the prediction (intelligence) and the criterion (achievement) variables.

\(\sigma_y\) = standard deviation of the criterion scores.

\(\sigma_x\) = standard deviation of the predictor scores.

\(x\) = individual predictor score

\(y\) = individual criterion score

\(M_X\) = Mean of the predictor score
MY = mean of the criterion score

\( r \sigma_y / \sigma_y = \) regression coefficient

Since the prediction equation required means and standard deviations of the predictor and criterion variables as well as correlation coefficient between intelligence and achievement score. There were also utilized in working out the regression equation. The value thus obtained represented the expected achievement score for the individual concerned as predicted on the basis of intelligence. After obtaining the predicted scores, the discrepancies between the actual achievement scores and the predicted values were worked out for each individual, \((D = y - \bar{y})\) these discrepancies for each individual was compared with the corresponding standard error of estimate.

The concerned individual was classified either an over achiever or under achiever depending on whether the value of d was positive or negative. If the value of d was positive and greater than the associated standard error of estimate the individual was considered as an over achiever likewise, if the value of d was negative and larger than the associated standard error of estimate the concerned individual was classified as an under achiever. For identifying over and under achievers more precisely i.e., unaffected by the statistical errors of estimate, cases one SDE above their predicted achievement scores were designated as over achievers and those one SDE below as underachievers the formula for standard error of estimate is given below:

\[
SDe = SD \sqrt{1 - (r)^2}
\]

\((Garrett, 1981)\)

After identifying, 200 students were found to be over and underachievers. After a gap of 4-5 months, the test of emotional intelligence and need achievement was administered to the identified sample. In the same way the above test was
given to the subject, here the two questionnaires was given to the over and under achiever. There was no time limit for both the test and instruction was given to the subject of how to fill the questionnaire. Both the test of emotional intelligence and need achievement was given at the same time. After following the instruction the subject started to the test. It is also required to present the details of why to conduct the test, so students takes much interest in doing that test time. In this way the whole process of data collection was completed.

Techniques used for Data Analysis:

Use of appropriate statistical technique is also one of the important steps of the investigation. The following techniques were used by the researcher after organization of data.

**Mean:** Mean is defined as the value resulting from dividing the sum of scores by the numbers of scores.

The formula for mean

\[
M = \frac{\sum X}{N}
\]

Where, \( M = \) mean

\( \sum X = \) sum of scores

\( N = \) number of scores

**Standard Deviation:**

It is square-root of the arithmetic mean of the squared deviation of scores taken from there mean. The formula for SD

\[
SD = \sqrt{\frac{\sum x^2}{N}}
\]
Where,

\[ SD = \text{Standard Deviation} \]

\[ x = \text{deviation of scores of mean} \]

\[ N = \text{number of scores} \]

**t-Test**

It is used to compare in two traits. When the researcher wants to test the significant of difference between two means and when the size of the sample is more than 30.

The following formula is used.

\[ t = \frac{M_1 - M_2}{SE_D} \]

\[ SE_D = \text{Standard Error of Difference} \]

\[ SE_D = \sigma_{combined} \sqrt{\frac{N_1 + N_2}{N_1 \times N_2}} \]

\[ \sigma_{combined} = \sqrt{\frac{(\sigma_1)^2 \times N_1 - 1 + (\sigma_2)^2 \times N_2 - 1}{N_1 + N_2 - 2}} \]

**Correlation**

Correlation is the relationship between two or more paired variables or two or more paired set of data the degree of relationship is measured and represented by the coefficient of correlation. This coefficient may be calculated by the letter \( r \).
Greek letter 'rho' or other symbols depending on the data distribution and the way the coefficient has been calculated. The most often used and most precise coefficient of correlation is known as the Pearson's product moment coefficient ($r$) of correlation.

The following formula is used.

$$r = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{N \sum X^2 - (\sum X)^2} \sqrt{N \sum Y^2 - (\sum Y)^2}}$$

**Multiple Regression**

It is a term used for predicting $\bar{Y}$ from two or more independent variables combined.

The formula for multiple regression is given below

$$\bar{Y} = a + b_1x_1 + b_2x_2 + \ldots$$

Where, $\bar{Y}$ = the variable to be predicted.

- $a$ = the constant or intercept.
- $b_1$ = the slope of the first predictor.
- $b_2$ = the slope of the second predictor.
- $x_1$ = the score of first predictor.
- $x_2$ = the score of second predictor

The administering of the questionnaire is a great learning experience for a research scholar. It may be a taxing a venture to motivate responded and to ensure that they respond similarly, but it pays rich dividends for the research scholar, in creating a feeling that honest and genuine research has been conducted.