CHAPTER 3

METHODOLOGY

3.0 INTRODUCTION

In Chapter 2 an attempt was made to review the earlier studies conducted in the field of emotional intelligence and learning style and their determinants. The present chapter is devoted to describe the methods and techniques used to achieve the objectives of the study. This chapter is divided into 2 sections, section 1 and section 2. Section 1 gives an account of Chennai as an education hub of the country and narrates the significance of the study by identifying gaps in emotional intelligence and learning style literature. Section 2 describes the methodology adopted to carry out the present study.

SECTION 1

3.1 EMERGENCE OF CHENNAI AS AN EDUCATION HUB

Chennai city, the fourth largest metropolitan city of the country, finds 157th rank in the list of urban areas categorized by developed land area i.e. urban foot print. As per the study titled ‘Demography - World Urban Areas and Population Projections’ (2009), Chennai (comprising the Chennai city corporation and the immediate developed areas) occupies 157th position in the world on the basis of developed land area with a population of 64.25 lakhs during 2001 and an area of over 609 sq km with a population density of 10,550 persons per sq km. On the basis of population density, Chennai is placed at 139th rank in the world. Chennai urban area is expected to attain a population of 100.70 lakh in the year 2025.
Chennai with the population of 7.5 million, as on date, is one of the prominent educational destinations of India where one can get quality education. Many reputed colleges and universities are situated in Chennai where students can pursue their degree courses. Worldeduhub.com brings the list of colleges and universities in Chennai. There are boards like Tamil Nadu State Board, the Matriculation Board, Central Board of Secondary Education (CBSE), Indian Certificate of Secondary Education (ICSE) Board and Anglo-Indian Board to which schools in Chennai are affiliated. As the main language, these schools use either Tamil or English.

India has the third largest higher education system in the world in terms of enrolments, after China and the US. India is also acknowledged to have the largest higher education system in the world in terms of number of institutes. The university and higher education system comprises 610 universities and in addition, there are 33,023 colleges. Chennai is one of the favorable destinations of education in India, as many old and prominent universities and colleges are situated here. Madras University was established in 1857 especially for science, arts and commerce degrees. Along with this, there are many colleges and institutions in Chennai like Indian Institute of Technology, Madras (IIT Madras), Anna University, Madras Medical College (MMC), Stanley Medical College (SMC), Kilpauk Medical College (KMC), Sri Ramachandra Medical College and Research Institute (SRMC), Central Leather Research Institute (CLRI), the Central Electronics Engineering Research Institute (CEERI) and the Institute for Financial Management and Research (IFMR).

Education plays a major role in promoting the economic well-being of people of the country. In fact, education is the key which unlocks the doors to modernization. There is strong evidence to prove that cognitive and emotional skills of the population – rather than mere school attainment – are
powerfully related to individual earnings, to the distribution of income and to economic growth. Empirical results show the importance of both minimal and high level skills, the complementarities of skills and the quality of economic institutions and the robustness of the relationship between skills and growth. International comparisons incorporating expanded data on cognitive and emotive skills reveal large skill deficits in developing countries, particularly in India. Given that, quality education plays an important role in economic growth, understanding of emotional intelligence in the learning environment especially in a country like India and in particular in Chennai, where the study was conducted, would enable the learners to acquire the required skills and become productive citizens of the country.

3.2 IDENTIFICATION OF GAPS IN EI AND LS LITERATURE-RATIONALE OF THE PRESENT STUDY

Emotional intelligence and learning styles have been studied frequently as separate research topics (Nilson, 2003; Rivera & Beatriz, 2004; Scott, 2004; BeShears, 2004; Boyd, 2004; Leavitt, 2004; Wells, 2004; Miles, 2004; Kolb & Kolb, 2005; Benson, 2005; Briody, 2005; Spector, 2005; Yahr, 2005; Contessa et al., 2005; Knoll, 2006; Paul-Odouard, 2006; Phillips, 2005; Smith, 2006, Yancey-Bragg, 2006; Can, 2009; Cesur, 2011; Komarraju, 2011; Panboli & Gobu, 2011; Jahanbakhsh, 2012; Orhun, 2012; Okay, 2012; Talbure, 2012) both in western and in Indian context. However, there is lack of researches involving both emotional intelligence and learning styles and their effects on adult learners, especially in India. Lack of studies in this area (emotional intelligence and learning styles) indicates the need for further research in understanding the relationship between emotional intelligence and learning styles and how do they impact the academic performance of the students. Examination of these two concepts can lead to better understanding of the impact of emotional intelligence on learning styles of adult learners. It
can also help adult learners to enhance their classroom skills. Understanding one’s learning styles can help the learner to improve his/her achievement in class (Honigsfeld & Dunn, 2006), but understanding of how emotional intelligence correlate with learning styles can open new doors to an adult in learning skills. With this background in mind, researcher has attempted to assess the relationship between emotional intelligence and learning style of adult students. The need for this study can be clearly defined in the following two points:

1. Due to high academic pressure and severe competition faced by Indian students, their physical and mental well being is at stake. Shifting from traditional individual learning methods to more innovative, group based learning methods, which the modern education system demands, require the learners to be good team players. To be a successful team player means one should have good emotional competencies. Moreover, students should have a combination of different learning styles to address the complexities of modern school and college education. Since it is believed that emotional intelligence influences learning styles, the need of the hour is to develop a model by which the emotional quotient of the students can be enhanced so as to equip them with the required skills to face the challenges posed by the current educational system of India.

2. According to Plato, every learning has an emotional basis. Emotions can facilitate or mar the learning process. Identification of one’s emotions and learning styles allows the learners to capitalize on their strengths and improve self advocacy and skills. Hence, assessing these relationships among students would help to understand their behavior and ability to learn the content well.
3.3 SIGNIFICANCE OF THE STUDY

In spite of the technological advances in the last 30 years, today’s college students are not content with aspects that technology cannot address: emotional self-awareness, interpersonal skills, adaptability, impulse control and many other unique human challenges. Even academically competent students may be in jeopardy when entering college if certain aspects of emotional competence are lacking. Recent studies (Schutte & Malouff, 2002; LaCivita, 2003; Parker et al., 2005; Crossman, 2007) suggest that students are under increasing levels of stress and their ability to manage the stress, adapt to a rapidly changing and dynamic environment while managing impulse control in check, are all factors that may jeopardize a first year student’s successful transition to the second year of college.

Education is a tri-polar process where teacher, learner and curriculum are inseparably intertwined. Understanding the emotional intelligence of students using a reliable assessment of emotional intelligence and studying the correlation of traditional measures of academic success such as GPA/CGPA and persistence might help institutions to identify students who are at risk of dropping out or failing for nonacademic reasons beyond those which have already been identified as financial hardship. Identifying ‘at risk students’ might be particularly significant at the community colleges, where only few studies related to emotional intelligence have been conducted. By focusing more on the fundamental constructs of learning styles rather than learning in general, perhaps a more practical understanding of how students in different environments learn, what are their learning difficulties, to what extent these difficulties are due to the cultural assumptions they have in their minds and what preparatory work could be useful in eradicating these difficulties might emerge.

The Management Education Task Force (METF) of the Association of Advanced Collegiate Schools of Business (AACSB) issued a report in
April, 2002 that called for increased communication, leadership and interpersonal skills to make the curricula more relevant to “today’s global workplace” (Doria, Rozanski and Cohen, 2003). The ability to gather, interpret, analyze and respond to data may be a function of technical competency, but the ability to receive, interpret and respond to messages, both internal and external, is regulated by one’s emotional intelligence. Myers and Tucker (2005) in their paper on “increasing awareness of emotional intelligence in a business curriculum” described the ways to enhance the standard of business curriculum by building student knowledge of EI through individual and group assessment, role-plays and discussions, primary research, analysis and synthesis.

It should be noted that those organizations which are successful in today’s dynamic business world take a more proactive approach to develop a positive work climate. It follows that excellent service with positive emotional content, is most likely to be facilitated by employees who are emotionally self aware and who understand others on a more emotional level. Positive reinforcement of an emotionally intelligent environment in the organizations will enable the development of a service oriented climate which is authentic in nature and therefore more effective. This could happen by training the graduates at the college level itself for improving their emotional intelligence so that their effectiveness as employees may be enhanced once they are hired by the organizations.

The findings of the present study would be useful for students, teachers, administrators, for curriculum developers, for the department of collegiate education and other research workers, who are concerned with the philosophy and practices of college education to understand the problems connected with developing emotional competence in the learners, learning styles differences among students and its management in pedagogy to
introduce innovations and changes in these fields, so that the national goals and objectives of education will be achieved. With this end in view, this humble attempt was made at exploring the relationship between various dimensions of emotional intelligence and different learning styles of adult learners which were so long neglected in the state of Tamil Nadu.

The suggestions and recommendations of this study, which are based on empirical findings, if implemented, are expected to bring radical changes in training the students to develop emotional competencies so as to enable them to face the complexities of the world outside. The findings can also be utilized to develop appropriate curriculum for college education which incorporate lessons in emotional intelligence and accommodate different learning styles of students, bringing ‘glittering moments of joy and happiness’ in the life of students, society and nation.

SECTION 2

Section 1 highlighted the gap in emotion al intelligence and learning style literature. Problem statement, conceptual model framework, research questions, theoretical and operational definitions of the important terms used in the present study and methodology of the research work is given in the following section, that is, section 2.

3.4 STATEMENT OF THE PROBLEM

The role of emotions suggests that individual differences in learning might reflect emotion-processing competencies of the learners. However, studies failed to confirm the hypothesized facilitative influence of EI on learning to discriminate the target category when the relevant cues were emotional ones (subject to the power limitations of the design). The failure to obtain the predicted association between EI and learning so far is surprising, given the theoretical underpinnings of the prediction, derived from emotional
facilitation of thought in the conceptual models of EI (Mayer et al., 2004; Fiori, 2009) and the applied literature demonstrating the trainability of socio-emotional learning (Durlak et al., 2011). The null result may support the view that self-report scales are inadequate for assessing the abilities that are usually measured by objectively-scored maximum performance items (Matthews et al., 2002; Zeidner et al., 2009). Indeed, the extent to which discrimination learning tasks are supported by implicit processes (Dienes & Perner, 1999), self-report scales may be less effective as predictors of EI than performance-based tests. Poldrack and Packard (2003) reviewed evidences suggesting that implicit and explicit memory systems may operate competitively. If self-report scales index explicit rather than implicit emotional competencies, then superiority of higher scorers on the TMMS in explicit learning may be accompanied by disruption of implicit learning. Although a speculative suggestion, a competition mechanism might explain why TMMS attention and clarity were initially negatively associated with performance on the target discrimination task.

It is observed that conventional intelligence failed to predict performance. The ability scales may not have identified individual differences in implicit processing ability and studies show that implicit learning is not consistently related to general intelligence (Gebauer & Mackintosh, 2007). Indeed, studies correlating alternative explicit and implicit measures of traits including anxiety and self-esteem (Egloff & Schmukle, 2004) have typically found small associations across measures (rs < .20). Development of implicit scales to measure socio-emotional competence may be necessary to predict learning tasks of the present kind.

Thus, the problem of the present is stated as “The effect of emotional intelligence on learning styles of adult learners in selected colleges of Chennai city”.

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3.5 CONCEPTUAL MODEL FRAMEWORK OF THE PRESENT STUDY

The conceptual model framework developed by the researcher which shows the entire theme of the research is shown below (Figure 3.1). The inter-relationships among the selected variables (socio-demographic and economic factors, emotional intelligence, learning styles and academic performance) and their components are clearly shown in the Chart.

Figure 3.1
Conceptual Model Framework
It is clear from Chart 2 that emotional intelligence, learning styles and academic performance of the students are affected by socio-demographic and economic factors. Emotional intelligence has impact on learning styles and academic performance of the students. Academic performance is also influenced by learning styles as is depicted in the Chart. The study also measured the relationships among the various components of the selected variables and is shown in the Chart. All inter-relationships are clearly depicted. Based on the inter-relationships, hypotheses were formulated and tested in the study.

3.6 RESEARCH QUESTIONS

Based on the significant knowledge gaps identified in EI and LS literature and as described in the rationale of the study, the following research questions were investigated to achieve the purpose of the study.

1. What is the relationship between the four branches of emotional intelligence as measured by the Wang and Lee emotional intelligence test and learning styles as measured by the four mediation abilities of the Honey and Mumford learning style questionnaire?

2. What is the relationship between the four branches of emotional intelligence as measured by the Wang and Lee emotional intelligence test and the four mediation abilities of the Honey and Mumford learning style questionnaire based on gender, age, education, income, medium of education, year of study, branch of study and mother tongue?

3. What is the association between emotional intelligence of a student and his/her academic performance?
4. What is the association between the learning styles adopted by a student and his/her academic performance?

5. What is the association between the emotional intelligence of a student and his/her choice of academic program?

6. What is the association between the learning style adopted by a student and his/her choice of academic program?

3.7 THEORETICAL DEFINITIONS OF IMPORTANT TERMS USED IN THE PRESENT STUDY

All the important terms used in the present study (emotions, intelligence, emotional intelligence, emotional quotient, learning styles, adult learners) and their theoretical definitions along with the author/authors are given in Table 3.1.

Table 3.1

Theoretical definitions of important terms used in the present study

<table>
<thead>
<tr>
<th>S.No</th>
<th>Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Emotions</td>
<td>Are responses to an event, either internal or external, that has a positively or negatively valence meaning for the individual (Salovey &amp; Mayer, 1990, p. 186).</td>
</tr>
<tr>
<td>2</td>
<td>Intelligence</td>
<td>A characterization of how well the cognitive sphere operates, e.g., how quickly someone can learn, how well they can judge and think, and so on (Mayer &amp; Salovey, 1997, p. 23).</td>
</tr>
<tr>
<td>3.</td>
<td>Emotional intelligence</td>
<td>Is the capacity for recognizing our own feelings and those of other, for motivating ourselves, and for managing emotions well in ourselves and in our relationships (Goleman, 1998, p. 317).</td>
</tr>
</tbody>
</table>
4. **Emotional Quotient (EQ)**

(El) refers to the ability to perceive, control, and evaluate emotions. Some researchers suggest that emotional intelligence can be learned and strengthened, while other claim it is an inborn characteristic. (Bar-On, R. 2004).

5. **Learning styles (LS)**

The way each learner begins to concentrate on, process and retain new and difficult information (Dunn & Dunn, 1993, p. 2).

6. **Adult learners**

Any student who is 18 years old and above and is attending a college for various reasons.

### 3.8 OPERARTIONAL DEFINITIONS OF IMPORTANT TERMS USED IN THE PRESENT STUDY

Apart from the theoretical definitions given above, the operational definitions of the various components of emotional intelligence and learning styles are given in Table 3.2.

#### Table 3.2

**Operational definitions**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Terms used</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Self-emotional appraisal and expression</td>
<td>People with high emotional intelligence are usually very self-aware. They understand their emotions, and because of this, they don't let their feelings rule them. They are confident – because they trust their intuition and don't let their emotions get out of control. (Wong, C. S. and Law, K. S. 2002)</td>
</tr>
<tr>
<td>2</td>
<td>Emotional appraisal and expression in others</td>
<td>Recognizing the feelings of others, even when those feelings may not be obvious. As a result, empathetic people are usually excellent at managing relationships, listening, and relating to others. (Goleman 1998)</td>
</tr>
</tbody>
</table>
### Terms used and Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Self-regulation of emotions</td>
<td>This is the ability to control emotions and impulses. People who self-regulate typically don't allow themselves to become too angry or jealous, and they don't make impulsive, careless decisions. They think before they act. Characteristics of self-regulation are thoughtfulness, comfort with change, integrity, and the ability to say no. (Abraham, A. 2006)</td>
</tr>
<tr>
<td>4 Facilitation of emotions</td>
<td>People with a high degree of emotional intelligence are usually motivated. They're willing to defer immediate results for long-term success. They're highly productive, love a challenge, and are very effective in whatever they do. (Goleman 1998)</td>
</tr>
<tr>
<td>5 Activist</td>
<td>Prefers doing and experiencing (Honey, P. and Mumford, A. 2000)</td>
</tr>
<tr>
<td>6 Reflector</td>
<td>Observes and reflects (Honey, P. and Mumford, A. 2000)</td>
</tr>
<tr>
<td>7 Theorist</td>
<td>Wants to understand underlying reasons, concepts, and relationships. (Honey, P. and Mumford, A. (2000)</td>
</tr>
<tr>
<td>8 Pragmatist</td>
<td>Likes to have a go, try things and see if they work. Honey, P. and Mumford, A. (2000)</td>
</tr>
</tbody>
</table>

### 3.9 RESEARCH METHODOLOGY

In the following section, objectives of the present study, variables considered in the present study, hypotheses formulated for testing in the study, data collection procedure, sample and sampling techniques and determination of sample size are discussed.
3.9.1 Objectives of the present study

It is clear from the review of earlier researches that emotional intelligence and learning styles are studied as separate research topics and no study has been conducted so far to explore into the relationship between emotional intelligence and learning styles. The broad objective of this thesis is to find out the extent of relationship between emotional intelligence (independent variable) and learning styles (dependent variable) and their relationship with the select demographic variables and academic performance of the students. The study also intends to generate a model for enhancing the emotional competencies in the young adults. The specific objectives of this study are:

1. To examine the effect of emotional intelligence of adult learners on their learning styles
2. To find out the relationship between socio-demographic and economic factors, emotional intelligence, learning styles and academic performance of adult learners
3. To find out the relationship between emotional intelligence and academic performance of adult learners.
4. To examine the extent of relationship between learning styles of adult learners and their academic performance.
5. To validate the conceptual model developed by the researcher with regard to emotional intelligence and learning styles of adult learners through Structural Equation Modelling (SEM).

3.9.2 Variables taken for the study

The dependent variables and independent variables taken for the study are given in Table 3.3.
Table 3.3

Variables taken in the study

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Emotional intelligence</td>
<td>Socio-demographic and economic factors</td>
</tr>
<tr>
<td>2. Learning styles</td>
<td>Socio-demographic and economic factors</td>
</tr>
<tr>
<td>3. Academic performance</td>
<td>Socio-demographic and economic factors</td>
</tr>
<tr>
<td>4. Learning styles</td>
<td>Emotional intelligence</td>
</tr>
<tr>
<td>5. Academic performance</td>
<td>Emotional intelligence</td>
</tr>
<tr>
<td>6. Academic performance</td>
<td>Learning styles</td>
</tr>
</tbody>
</table>

Table 3.3 shows that there are six dependent variables and six independent variables. It should be noted that Structural Equation Modelling (SEM), estimates a series of separate, but interdependent, multiple regression equations simultaneously by specifying the structural model used by the statistical program. Some dependent variables become independent variables in subsequent relationships, giving rise to the interdependent nature of the structural model. The structural model expresses these relationships among independent and dependent variables, even when a dependent variable becomes an independent variable in other relationships. It is clear from the table that initially, emotional intelligence, learning styles and academic performance are considered as dependent variables whereas socio-demographic and economic factors are taken as independent variable. In the next series of relationships, learning styles and academic performance have become the dependent variables and emotional intelligence is taken as independent variable. In the final series of relationship, academic performance is taken as dependent variable where as learning style is taken as independent variable.
3.9.3 Statement of Hypothesis

On the basis of the theoretical framework described in Chapter 1 and on the basis of the review of related studies given in Chapter 2, the following hypotheses were formulated for the present study:

1. There is no relationship between emotional intelligence (self emotional appraisal, emotional appraisal in others, self regulation and facilitation of emotional performance) of adult learners and their learning styles (activist, reflector, pragmatist and theorist)

2. There is no relationship between socio-demographic and economic factors (age, gender, education, income, medium of education, year of study, branch of study, mother tongue) and emotional intelligence, learning styles and academic performance of adult learners.

3. There is no relationship between emotional intelligence and academic performance of adult learners

4. There is no relationship between learning styles of adult learners and their academic performance.

3.9.4 Data collection

Data were collected through well-designed questionnaires on the various components of emotional intelligence and learning styles. Information on emotional intelligence of college going students was collected through Wang and Lee emotional intelligence test. Information on learning styles was collected through Honey and Mumford learning style questionnaire. A sample of 700 adult learners was selected from various colleges located in Chennai city.
3.9.5 Sampling Technique

Stratified sampling technique was used to select colleges (n=6) for the study. Students from the selected colleges were chosen using judgement sampling (n=700). The stratification was done on the basis of the total sample size, in which the male and female are equally distributed with 350. Out of 350 male students, UG students were 177 and PG students were 173. Of the selected 350 female students, UG students were 177 and PG students were 173. Figure 3.2 and table 3.4 show the sampling plan.

Figure 3.2
Sampling Design
<table>
<thead>
<tr>
<th>Gender</th>
<th>Education</th>
<th>Branch of study</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Undergraduate</td>
<td>Basic sciences</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arts</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engineering</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commerce</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humanities</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>177</strong></td>
</tr>
<tr>
<td></td>
<td>Postgraduate</td>
<td>Basic sciences</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arts</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engineering</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commerce</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humanities</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>173</strong></td>
</tr>
<tr>
<td>Female</td>
<td>Undergraduate</td>
<td>Basic sciences</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arts</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engineering</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commerce</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humanities</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paramedical</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>173</strong></td>
</tr>
<tr>
<td></td>
<td>Postgraduate</td>
<td>Basic sciences</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arts</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engineering</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commerce</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humanities</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paramedical</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>177</strong></td>
</tr>
</tbody>
</table>
3. 10 DETERMINATION OF SAMPLE SIZE

A number of formulae have been devised for determining the sample size depending upon the availability of information. A formula is given below:

\[ n = \left( \frac{ZS}{E} \right)^2 \]

Where

\[ Z = \text{standardised value corresponding to a confidence level of 95\% = 1.96} \]
\[ S = \text{sample standard deviation from pilot study of 200 sample = 0.675} \]
\[ E = \text{acceptable error} = 5\% = 0.05 \]

Hence, sample size

\[ n = \left( \frac{1.96 \times 0.675}{0.05} \right)^2 \]
\[ = 700.13 \]
\[ = 700 \]

For the present study, the final sample size was 700. Since the total number of college going students in the various colleges of Chennai city was not available, the sample size of 700 was fixed after consulting the research guide and other academic experts (a minimum of 200 samples is essential to test the conceptual model using SEM).

3.11 DESCRIPTION OF THE TOOLS USED TO MEASURE EMOTIONAL INTELLIGENCE AND LEARNING STYLES

As mentioned above, the two measurement tools used to measure the emotional intelligence and learning styles of adult learners were Wang and Lee emotional intelligence scale (WLEIS) and Honey and Mumford learning style questionnaire (HMLSQ) respectively. Taking into consideration
the cultural differences where the tools were originally developed and where the tools are presently used, the researcher re-validated the tools to use them on adult learners in Indian culture. The procedure of re-validating the tools is given in the following sections:

### 3.11.1 Wang and Lee Emotional Intelligence Scale (WLEIS)

Wang and Lee emotional intelligence test was used to measure the emotional intelligence of the participants. As a measurement tool to measure the social and emotive capability of young adults in higher education background, the WLEIS is better suited than the Bar-On EQ-i (1997) due to its lesser length (33/ items vs. 133 items), its incorporation of a lesser scope of intrapersonal outlook (Mayer, Salovey & Caruso, 2008) and strategies to construct the tool obtainable at a comparatively lesser price for utilization by establishments of higher education. Moreover, the stated cross-verification research of the WLEIS with the Bar-On EQ-i (1997) offers proof that even as the WLEIS carry out assessment of a few features of social and emotive capability comparable to what is calculated by the Bar-On EQi, it also offers an exclusive input in measuring ‘Flexibility in Perspective-Taking and Behavior’. The cross-verification research of the WLEIS with the MSCEIT (2002) illustrates that, generally, the WLEIS has fewer theoretical similarities with the MSCEIT than with the Bar-On EQ-i, taking into consideration the dissimilarities in the hypothetical methods essential to the WLEIS and the MSCEIT. Nevertheless, the findings further recommend that the WLEIS measures with the help of self-reporting certain talents and MSCEIT measures with the help of performances which could be time consuming. For these reasons, the researcher chose WLEIS as the measurement tool to measure the emotional intelligence of the students who participated in the study.
3.11.1.1 Pilot study using WLEIS to measure emotional intelligence

The pilot study was conducted on a sample of 200 adult learners selected from different colleges of Chennai city. To re-validate the scale for the present study, reliability analysis for each multi-item scale using Cronbach’s alpha was performed. Table 3.5 presents the result of the reliability analysis along with the descriptive statistics for each variable. Overall, the study reported strong reliability with coefficient alphas ranging from 0.868 to 0.876 which demonstrated that scale shows good reliability and can be used in Indian conditions.

Table 3.5

Reliability coefficient of emotional intelligence scale

<table>
<thead>
<tr>
<th>Cronbach’s alpha value</th>
<th>No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.876</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 3.5 reveals that overall Cronbach alpha value of emotional intelligence scale (21 items) is 0.876.

3.11.2 Honey and Mumford Learning style questionnaire

The tool used to measure the learning styles of students was Honey and Mumford learning styles questionnaire. This was re-validated to use in Indian conditions by establishing the reliability coefficients (Cronbach alpha).

In the year 1982, the Manual of Learning Styles was brought out, in 1992 it was re-written and later in 2000, the Learning Styles Helper’s Guide and the Learning Style Questionnaire (LSQ) substituted it. As stated by Honey and Mumford, their scale have been translated into several other languages and are at present utilized all over the world, in all segments of business and learning and are accepted excessively (Honey and Mumford...
The handbook for the LSQ (Honey and Mumford, 1992) comprises of various recommendations to assist individuals to reinforce an underutilized method, together with maintaining an educational record to support individuals to re-examine their understanding, to protract the programs they have studied and to structure strategies to accomplish things differently and in a better manner. The goals of the LSQ are lucid all through – to proffer realistic assistance to persons, either in supporting their assets as students or in growing as multitalented individuals or both. This kind of realistic assistance is derived from the conviction of Honey and Mumford that, as favorites have been educated, they can be customized and enhanced further. The main feature of the tool according to Mumford (1992) is that the LSQ allows executives to ‘develop their educational procedures, not just identify them’.

In the concluding section of the Learning Styles Helper’s Guide (2000), Honey and Mumford offer some numerical information on the LSQ. Pertaining to dependability, an assessment, re-assessment investigation of 50 individuals, with a time gap of 14 days in-between the assessments, presented a connection of 0.89. The researchers state that the face legitimacy of LSQ is not to be distrusted, yet there is no other kind of validity that has been investigated by the researchers. One work out was concluded to assess the number of people who have strong liking for one method and here ‘strong’ refers to the first 30% of grades. Given below are the findings from random sample of 300 executives:-

1. 35% - 1 strong liking
2. 24 % - 2 strong likings
3. 20% - 3 strong likings
4. 2% - 4 strong likings
5. 19% - no strong liking
These findings can be interpreted that an approximately 59% of the executives have one or two strong likings and approximately only 2% seem to be multi-talented learners. On the other hand, it could be interpreted that about 65% do not reveal one strong liking and therefore classifying individuals as ‘theorists’ or ‘pragmatists’ can possibly be correct in only one third of the cases.

Sadler-Smith (2001a) scrutinized the statement of Swailes and Senior (1998) by handing out the LSQ to 233 undergraduates who have taken business and management as their core subjects and employed confirmatory factor examination to investigate the Honey and Mumford prototype against rival justifications. His statistics reveal that ‘the LSQ does not gauge two diverse aspects of educational patterns as could be expected from its beginning in the hypothesis by Kolb (1984)’. Relatively, the LSQ and Honey and Mumford’s account of the educational sequence seem to comprise of four similar features’ (Sadler-Smith 2001a, 212). In a vital reply, Swailes and Senior (1998) cited Mumford as declaring in a private message that ‘the LSQ is not founded on Kolb’s bi-polar arrangement as the educational society happens to think’ (2001). Regrettably, no substitute hypothetical composition has, to date, been recommended by Honey and Mumford.

3.11.3 Pilot study to measure the learning styles of adult learners using LSQ

A pilot study was conducted on a sample of 200 respondents with a view to establish the reliability, validity and workability of the research tool, LSQ. In addition, the face validity of the tool was measured. It was found to be r=0.83 (inter-rater reliability). The study used reliability analysis for each multi-item scale using Cronbach’s alpha. Table 3.6 presents the results of the reliability analysis along with the descriptive statistics for each variable.
Overall, the study reported strong reliability with coefficient alphas ranging from 0.851 to 0.857 which demonstrated that scale has high reliability.

Table 3.6
Reliability analysis of LSQ

<table>
<thead>
<tr>
<th>Cronbach’s alpha value</th>
<th>No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.857</td>
<td>80</td>
</tr>
</tbody>
</table>

Table 3.6 reveals that overall Cronbach alpha value for the LSQ is 0.857 (80 items).

3.12 STATISTICAL ANALYSIS

Data on emotional intelligence and learning styles of adult learners collected through the revalidated scales and their demographic characteristics converted into appropriate numerical values were analyzed using descriptive and inferential statistical measures. The raw data which was obtained from the survey questionnaire was transferred and recorded onto Microsoft Office, Excel 2007 spreadsheet using AMOS 5.0. All items obtained through CFA were considered in the Structural Equation Modeling (SEM) procedure. Cronbach’s alpha was applied to assess the reliability of factors used. SPSS version 20.0 was used for the analysis. P value <0.05 was considered significant. The statistical tools used for the analysis along with its purpose are presented in Table 3.7.
Table 3.7

The statistical analysis performed

<table>
<thead>
<tr>
<th>S.No</th>
<th>Statistical tool</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reliability analysis</td>
<td>To find the reliability of the factors and variables identified by the developers of the scales used in the present study</td>
</tr>
<tr>
<td>2</td>
<td>Descriptive Statistics (Percentage analysis)</td>
<td>To describe the sample in terms of their demographic characteristics</td>
</tr>
<tr>
<td>3</td>
<td>t test</td>
<td>To find out whether there is any significant relation between emotional intelligence, learning styles and demographic and economic factors.</td>
</tr>
<tr>
<td>4</td>
<td>One way ANOVA</td>
<td>To find out the relationship between the demographic variables, various components of emotional intelligence and learning styles</td>
</tr>
<tr>
<td>5</td>
<td>Chi-square test</td>
<td>To find out the association between demographic variables and level of emotional intelligence</td>
</tr>
<tr>
<td>6</td>
<td>Friedman test</td>
<td>To find out the significant difference between mean ranks towards emotional intelligence and the types of learning style</td>
</tr>
<tr>
<td>7</td>
<td>Correlation (Pearson r)</td>
<td>To find out the relation between dimensions of emotional intelligence</td>
</tr>
<tr>
<td>8</td>
<td>Regression analysis</td>
<td>To measure the impact of emotional intelligence on learning styles, to measure the impact of emotional intelligence on academic performance, to measure the impact of learning styles on academic performance</td>
</tr>
<tr>
<td>9</td>
<td>SEM</td>
<td>To test the conceptual model which the researcher has developed</td>
</tr>
</tbody>
</table>
These different statistical techniques namely, Reliability analysis, Descriptive statistics, t test, one way ANOVA, Chi-square test, Friedman test, Correlation (Pearson r) and Regression analysis (Table 3.13) enabled the researcher to test the various hypotheses formulated in the present study so as to achieve the objectives of the study. A detailed explanation of these tests is given in the following section. It comprises of the descriptions of the numerical methodologies and their appropriateness to use in the particular analysis.

3.12.1 Percentage analysis

“Percentage method” refers to a specified kind of statistical analysis which is used in making comparison between two or more series of data. Percentages are based on descriptive relationship. It compares the relative items. Since the percentage reduces multiple observations to a common base, this method allows meaningful comparison among various set of data.

\[
\text{Percentage} = \frac{\text{Total number of responses}}{\text{Total no of respondents}} \times 100
\]

3.12.2 Independent samples t test

The independent samples t test allows researcher to evaluate the mean difference between two populations using the data from two samples. This test is used in situations where a researcher has no prior knowledge about either of the two populations being compared. The general purpose of the independent samples t test is to determine whether the sample mean difference obtained is a real difference between the two populations or simply the result of sampling error.
In this study t test is used to find out the significance difference between means of two independent samples. The two independent samples considered in this study are “male” and “female”, “UG” and “PG” students.

3.12.3 One way ANOVA

ANOVA is a statistical technique for examining the differences among means for two or more populations. The null hypothesis, typically, is that all means are equal. In one way ANOVA, the dependent variable is denoted by Y and the independent variable by X. X is a categorical variable having c categories. There are n observations on Y for each category of X.

In examining the differences among means, one way analysis of variance involves the decomposition of the total variation observed in the dependent variable. This variation is measured by the sums of squares corrected for the mean (SS). Analysis of variance is so named because it examines the variability or variation in the sample (dependent variable) and, based on the variability, determines whether there is reason to believe that the population means differ.

In analysis of variance, two measures of variation are estimated: within groups and between groups. Within groups variation is a measure of how much the observations, Y values, within the group vary. This is used to estimate the variance within a group in a population. It is assumed that all groups have the same mean; the variance of all observations cannot be calculated together. The variance for each of the groups must be calculated individually and these are combined into an “average” or “overall” variance.

In the present study one way ANOVA is used to find out the difference, if any, with respect to emotional intelligence and learning styles based on the demographic characteristics of students, namely, age, education levels, income levels and mother tongue.
3.12.4 Chi-square Test

A Chi-square is a statistical measure used in the context of sampling analysis for comparing a variance to a theoretical variance. As a non-parametric test, it can be used to determine if categorical data shows dependency or the two classifications are independent. It can also be used to make comparisons between theoretical populations and actual data when categories are used. Thus, the chi-square test is applicable in large number of problems. The test is, in fact, a technique through the use of which it is possible for all researchers to (1) test the goodness of fit (2) test the significance of association between two attributes and (3) test the homogeneity or the significance of population variance.

3.12.5 Friedman test

The Friedman test is a non-parametric test. Similar to the parametric measures like ANOVA, it is used to detect differences in treatments across multiple test attempts. The procedure involves ranking each row (or block) together, then considering the values of ranks by columns.

In the present study, Friedman test is used to test the significance difference between mean ranks towards emotional intelligence and the types of learning style.

3.12.6 Correlation analysis

The degree of relationship between the variables under consideration is measured through the correlation analysis. The measure of correlation or correlation index summarizes in one figure the direction and degree of correlation. The correlation analysis refers to the techniques used in measuring the closeness of the relationship between the variables. Thus, correlation is a statistical device which helps in analyzing the co-variation of
two or more variables. The detection and analysis of correlation (i.e., co-
variation) between two statistical variables requires relationship of some sort
which associated the observation in pairs, one of each pair being a value of
each of the two variables.

In the present study correlation (Pearson r) is used to find out the
correlation between the various components of emotional intelligence and
various components of learning styles.

3.12.7 Multiple Regression Analysis

Multiple regression analysis is a statistical technique that allows the
researchers to use more than one independent variable to predict a single
dependent variable. It can also show how a set of independent variables
explain a proportion of the variance in a dependent variable at a significant
level. Brace, Kemp and Snelgar (2006) specify four conditions for using
multiple regression technique in statistical analysis:

- There are linear relationships between the predictor and
dependent variables (i.e., the relationship follows a straight
line).

- The criterion variable is measured on a continuous scale such as
interval or ratio scale

- The predictor variables are measured on a ratio, interval, or
ordinal scale.

- When there are a large number of observations, the number of
participants must substantially exceed the number of predictor
variables used in the regression. The absolute minimum is five
times the number of many participants as predictor variables.
In the present study, multiple regressions are applied to find out the impact of emotional intelligence on learning styles, impact of emotional intelligence on academic performance and impact of learning styles on academic performance of adult learners.

3.12.8 Structural equation modeling

Structural Equation Modeling (SEM) is a family of statistical models that seek to explain the relationships among multiple variables. In the process, the structure of inter-relationships expressed in a series of equations is examined, similar to a series of multiple regression equations. These equations depict all the relationships among the constructs (both dependent and independent). Constructs are unobservable or latent factors represented by multiple variables. A latent construct is a hypothesized and unobserved concept that can be represented by observable variables. It is measured indirectly by examining consistency among multiple measured variables, also referred to as manifest variables or indicators. SEM’s foundation lies in two familiar multivariate techniques: factor analysis and multiple regression analysis.

Structural Equation Modeling (SEM) is widely used in behavioral research. SEM is used in the present study because of the following three distinct characteristics:

1. Estimation of multiple and inter-related dependence relationships.

2. Ability to represent unobserved concepts/latent variables in these relationships and check for measurement error in the estimation process

3. Defining a model to explain the entire set of relationships
The most obvious difference between SEM and other multivariate techniques is the use of separate relationships for each set of dependent variables. In simple terms, SEM estimates a series of separate, but interdependent, multiple regression equations simultaneously by specifying the structural model used by the statistical program. Some dependent variables become independent variables in subsequent relationships, giving rise to the interdependent nature of the structural model. The structural model expresses these relationships among independent and dependent variables, even when a dependent variable becomes an independent variable in other relationships.

The proposed relationships are then translated into a series of structural equations (similar to regression equations) for each dependent variable. This feature sets SEM apart from multivariate analysis of variance and canonical correlation-in that they allow only single relationship between dependent and independent variables.

AMOS (Analysis of Moment Structures) is an easy to use Structural Equation Modeling (SEM) program that tests relations among observed and latent variables and then uses models to test hypotheses and confirm relationships. Some of the advantages of AMOS are: graphical language, no need to write equations or type commands, easy to learn user-friendly features such as drawing tools, configurable toolbars and drag and drop capabilities fast. Models that once took days to create can now be completed in minutes using AMOS.

In the present study SEM is used to test whether the conceptual model developed by the researcher is fit or not. The inter-relationships among the variables are also examined. In this model, there are six dependent and six independent variables (Table 3.3). The hypothesis made in the study is that emotional intelligence affects learning styles which in turn affects
academic performance of the students. Demographic variables also affect emotional intelligence, learning styles and academic performance of the students. Thus some dependent variables become independent variables in subsequent relationships, giving rise to the interdependent nature of the structural model. The conceptual model was tested using SEM and it was found that the model developed was fit.

3.13 LIMITATIONS OF THE STUDY

The present study, though carefully planned and executed, is not free from certain limitations. They are given below:

The variables under study may be affected by external factors which the study does not take into consideration. Studies conducted using the survey method for gathering data are dependent upon the respondents to answer factually and accurately. Questions are closed ended. Alternatives are fixed. The opportunity for subjects to express their true feelings and thoughts are obliterated. Hence, students’ ratings on their emotional intelligence and learning styles may result in tendencies to respond in set patterns which have little relation to the reality or content of the research.

Since this investigation covers only one area, the city of Chennai, problem of generalization may occur. Due to time and financial constraints, the study was conducted in Chennai city only. Hence, the conclusions apply only to this population and any broader generalization beyond this population will not be justified. Obviously, no perfection is claimed and it is admitted without any hesitation that the present study is only a fragmentary attempt in this field.
3.14 CONCLUSION

The research methodology adopted in the present study is explained in detail in this chapter. Identification of significant gaps in EI and LS literature is the rationale of the present study. As such this study intends to fill up those knowledge gaps by developing a new paradigm for establishing a learning environment in the colleges in Chennai city. It should be remembered that colleges train the students to be absorbed into the work force of the country. Hence, their physical and mental well being is of interest to the government and other stakeholders. As mentioned in the significance of the study, surveys and anecdotal evidences show that students in today’s world experience high levels of stress and burden due to pressure posed both by teachers and parents. Solutions should be found out for the various physical and emotional problems experienced by the students.

The chapter also discussed the objectives of the study, hypotheses, data collection method, sample and sampling techniques, re-establishing the reliability of emotional intelligence scale and learning styles questionnaire. The limitations of the study are also stated in this chapter. The analysis and interpretation of the collected data are given in Chapter 4.