

**A STUDY OF LEARNING AND THINKING STYLES IN  
RELATION TO SELECTED COGNITIVE AND NON-  
COGNITIVE FACTORS OF PUPIL-TEACHERS OF  
MORADABAD DIVISION**

**THESIS**

**Submitted for the Award of the Degree of**

*Doctor of Philosophy*

**in**

**EDUCATION**

**Submitted by**

**GOPAL SINGH**

**Under the Supervision of**

**Dr. HARISHANKAR SINGH**

**BABASAHEB  
BHIMRAO  
AMBEDKAR  
UNIVERSITY**



**LUCKNOW**  
**प्रज्ञा शील करुणा**  
**ESTABLISHED 1996**

**DEPARTMENT OF EDUCATION**

**(School of Education)**

**BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY**

**(A Central University)**

**Lucknow- 226025 (U.P.)**

**Enrolment No. 1020/16**

**Year - 2019**

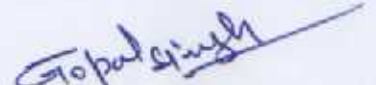
## DECLARATION

I, hereby declare that the entire thesis entitled "A STUDY OF LEARNING AND THINKING STYLES IN RELATION TO SELECTED COGNITIVE AND NON-COGNITIVE FACTORS OF PUPIL-TEACHERS OF MORADABAD DIVISION" submitted to the Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow for the award of Degree of Doctor of Philosophy (Ph.D.) in Education. It is my original work and it has not previously been produced for the award of any degree, diploma, and fellowship or similar other titles anywhere, this research study is carried out under the supervision of **Dr. Harishankar Singh**, Department of Education and School for Education (SOE), Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India. I also declare that the thesis submitted by me is essentially free from all kinds of plagiarism.

Date: 06.06.2019

Place: Lucknow

Researcher

  
Gopal Singh

Date: 06/06/2019

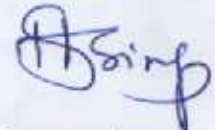
## CERTIFICATE

This is to certify that the thesis titled "A STUDY OF LEARNING AND THINKING STYLES IN RELATION TO SELECTED COGNITIVE AND NON-COGNITIVE FACTORS OF PUPIL-TEACHERS OF MORADABAD DIVISION" submitted by **Gopal Singh** is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

The thesis submitted to Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow satisfies all the requirement as stipulated in the Doctor of Philosophy (Ph.D.) regulations-1999 as amended in 2008/2010/2013 and it is fit for submission and evaluation for the award of the degree of Doctor of Philosophy of University.

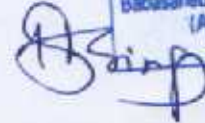
Date: 06/06/2019

Place: Lucknow



Supervisor

Dr. Harishankar Singh  
Associate Professor  
Dept. of Education  
Babasaheb Bhimrao Ambedkar University  
(A Central University)  
Lucknow



Head of the Department

HEAD

विभागाध्यक्ष

Department of Education

शिक्षाशास्त्र विभाग

Babasaheb Bhimrao Ambedkar University

(A Central University) Lucknow

बाबासाहेब भीमराव अम्बेडकर विश्वविद्यालय

(केन्द्रीय विश्वविद्यालय) लखनऊ

## ACKNOWLEDGEMENT

It is a matter of deep pleasure to bring out this investigation to see in the light of the day. It often happens that beginning of something to be explored upon, at first it seems very difficult, specially when the way is not familiar. While getting this task difficult to accomplish I set down benighted with my arms folded and despair of accomplishing it. The Almighty gave me courage to guard my thoughts. Instantly, to my sheer luck **Dr. Harishankar Singh**, Associate Professor and Head, Department of Education, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow came to my rescue, as my Guru, Guide and Supervisor. I have no hesitation in admitting that without **Dr. Harishakar Singh's** scholarly guidance, encouraging attitude throughout this thesis work cordial support in leading me almost by the hand I can not be able to perform my work properly.

I express my deepest sense of gratitude to **Prof. Arbind Kumar Jha**, Dean, School of Education, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow. Next to them, all the respected departmental teachers **Dr. Victoria Susan Ijjina, Dr. Shanu Singh, Dr. Sangeeta Chauhan, Dr. Rajesh Ekka, Dr. Lalima, Dr. Subhash Misra and Dr. Vivek Nath Tripathi**. I am much grateful for their suggestions, encouragement and support throughout my research period.

In that journey by the gracious support and work I was blessed to have the blessings of my respected father **Sri Nakshatra Pal Singh** and mother **Smt. Shashi**, who proved to be the most important pavement of the ladder that I was trying to ascent. I am also obliged to my wife **Mrs. Anshu Pal**, who not only inspired me but also supported me whenever I become nervous.

I am conveying my heartiest thanks to my batch mate **Ms. Meena V. Rakshe** and all research scholars of the department of Education for their full co-operation in this research work. I am also thankful to my departmental office staff members **Mr. Rajiv Ranjan Pandey, Mrs. Neelam Awasthi, Mr. Rajkumar, Ms. Priyanka Gupta and Ms. Chhaya Singh**, who helped me from time to time in my efforts to complete the present work.

I would also like to thank all Principals/Heads and staff members of the colleges chosen for data collection for providing me an opportunity to collect the samples for the study. Last but not the least all Pupil-Teachers, who took part of data collection survey for their whole hearted cooperation.

**(Gopal Singh)**

# CONTENTS

	DECLARATION	i
	CERTIFICATE	ii
	ACKNOWLEDGEMENT	iii-iv
	LIST OF TABLES	vii-viii
	LIST OF GRAPHS	ix-x
<b>CHAPTER - I</b>	<b>INTRODUCTION</b>	<b>1-29</b>
	<ul style="list-style-type: none"><li>• INTRODUCTION</li><li>• STATEMENT OF THE PROBLEM</li><li>• NEED AND JUSTIFICATION OF THE STUDY</li><li>• OBJECTIVES</li><li>• HYPOTHESIS</li><li>• SCOPE AND DELIMITATIONS</li><li>• DEFINITION OF THE KEY TERMS USED</li></ul>	
<b>CHAPTER - II</b>	<b>REVIEW OF RELATED LITERATURE</b>	<b>30-94</b>
	<ul style="list-style-type: none"><li>• STUDY RELATED TO STYLE OF LEARNING AND THINKING</li><li>• STUDY RELATED TO COGNITIVE FACTORS</li><li>• STUDY RELATED TO NON-COGNITIVE FACTORS</li></ul>	
<b>CHAPTER - III</b>	<b>METHODOLOGY</b>	<b>95-118</b>
	<ul style="list-style-type: none"><li>• METHOD OF RESEARCH</li><li>• POPULATION OF THE STUDY</li><li>• SAMPLE OF THE STUDY</li><li>• VARIABLES OF THE STUDY</li><li>• TOOLS USED</li><li>• DATA COLLECTION</li><li>• STATISTICAL TECHNIQUES USED</li></ul>	
<b>CHAPTER - IV</b>	<b>DATA ANALYSIS AND INTERPRETATION</b>	<b>119-157</b>
	<ul style="list-style-type: none"><li>• INTRODUCTION</li><li>• LEARNING AND THINKING STYLES IN RELATION TO ACADEMIC ACHIEVEMENT</li><li>• LEARNING AND THINKING STYLES IN RELATION TO GENDER</li></ul>	

- LEARNING AND THINKING STYLES IN RELATION TO STREAM
- LEARNING AND THINKING STYLES IN RELATION TO PERSONALITY
- LEARNING AND THINKING STYLES IN RELATION TO EMOTIONAL INTELLIGENCE

**CHAPTER - V FINDINGS, CONCLUSIONS AND SUGGESTIONS 158-169**

- MAIN FINDINGS
- CONCLUSIONS
- EDUCATIONAL IMPLICATIONS OF FINDINGS
- SUGGESTIONS FOR FURTHER RESEARCH

**BIBLIOGRAPHY 170-184**

**APPENDICES**

- LEARNING AND THINKING STYLES: ALITERATURE REVIEW (RESEARCH PAPER)
- A STUDY OF LEARNING AND THINKING STYLES (RESEARCH PAPER)
- STYLE OF LEARNING AND THINKING (SOLAT)
- MOUDSLEY PERSONALITY INVENTORY (MPI)
- MANGAL EMOTIONAL INTELLIGENCE INVENTORY (MEII)
- LIST OF COLLEGES
- DATA COLLECTION COMPLETION CERTIFICATE

## **LIST OF TABLES**

<b>Sr. No.</b>	<b>Particulars</b>	<b>Page No.</b>
<b>1.</b>	One-way ANOVA for the scores of Left Hemispheric style in regard to Academic Achievement Groups	<b>120</b>
<b>2.</b>	One-way ANOVA for the scores of Right Hemispheric style in regard to Academic Achievement Groups	<b>121</b>
<b>3.</b>	Mean Scores of Right Hemispheric style of Learning and Thinking in regard to High, Average and Low Achiever pupil-teachers	<b>122</b>
<b>4.</b>	One-way ANOVA for the scores of Integrated style of Learning and Thinking in regard to Academic Achievement Groups	<b>124</b>
<b>5.</b>	Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.	<b>125</b>
<b>6.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.	<b>127</b>
<b>7.</b>	Mean scores of Integrated Style of learning and thinking in regard to Male and Female pupil-teachers.	<b>129</b>
<b>8.</b>	One-way ANOVA for the scores of Left Hemispheric style of Learning and Thinking in regard to Streams.	<b>131</b>
<b>9.</b>	Mean Scores of Left Hemispheric Style of Learning and Thinking in regard to Science, Arts and Commerce Streams.	<b>132</b>
<b>10.</b>	One-way ANOVA for the scores of Right Hemispheric style of Learning and Thinking in regard to Streams.	<b>134</b>
<b>11.</b>	Mean Scores of Right Hemispheric style of Learning and Thinking in regard to Science, Art and Commerce Streams.	<b>135</b>
<b>12.</b>	One-way ANOVA for the scores of Integrated Hemispheric style of Learning and Thinking in regard to Streams.	<b>137</b>

<b>13.</b>	Mean scores of Left Hemispheric style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.	<b>138</b>
<b>14.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.	<b>141</b>
<b>15.</b>	Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.	<b>143</b>
<b>16.</b>	Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.	<b>145</b>
<b>17.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.	<b>147</b>
<b>18.</b>	Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.	<b>149</b>
<b>19.</b>	Mean scores of Left Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional Intelligence.	<b>151</b>
<b>20.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional Intelligence and Low Emotional Intelligence	<b>154</b>
<b>21.</b>	Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional intelligence	<b>156</b>

## **LIST OF GRAPHS**

<b>Sr. No.</b>	<b>Particulars</b>	<b>Page No.</b>
<b>1.</b>	Mean Scores of Right Hemispheric style of Learning and Thinking in regard to High, Average and Low Achiever pupil-teachers	<b>123</b>
<b>2.</b>	Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.	<b>126</b>
<b>3.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.	<b>128</b>
<b>4.</b>	Mean scores of Integrated Style of Learning and Thinking in regard to Male and Female pupil-teachers.	<b>130</b>
<b>5.</b>	Mean Scores of Left Hemispheric Style of Learning and Thinking in regard to Science, Arts and Commerce Streams.	<b>133</b>
<b>6.</b>	Mean Scores of Right Hemispheric style of Learning and Thinking in regard to Science, Art and Commerce Streams.	<b>136</b>
<b>7.</b>	Mean scores of Left Hemispheric style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.	<b>140</b>
<b>8.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.	<b>142</b>
<b>9.</b>	Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.	<b>144</b>
<b>10.</b>	Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.	<b>146</b>
<b>11.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.	<b>148</b>
<b>12.</b>	Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.	<b>150</b>

<b>13.</b>	Mean scores of Left Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional Intelligence.	<b>153</b>
<b>14.</b>	Mean scores of Right Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional Intelligence and Low Emotional Intelligence	<b>155</b>
<b>15.</b>	Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional intelligence	<b>157</b>

# **CHAPTER - I**

## **INTRODUCTION**

As per the report of the World Bank (knowledge for development, 1999) the process of acquiring and absorbing knowledge and communicating the knowledge must be strengthened between the developing and the developed societies. In the present time, knowledge is the mightiest means of development. The modern world great economic are being built not only by accumulating human skills and capital but the foundation of information, learning and adaptation plays the greater role. Thus, knowledge is the chief source of development in the developing world. Different types of thinking, e.g., convergent and divergent thinking has contributed a lot to growth and development of economies, though it depends a lot in the thinking level and style of learners concerned. Thinking styles are ways to exploit thinking abilities. Thus, it can be concluded that the development and application of variety of Learning, thinking styles is greatly repressible for the development.

Many of the students have the abilities to succeed if they are guided properly by teachers. Failure of students in most of the caves is not the failure of students but their respective teachers who fail to recognize their students thinking and learning styles. It was found by Sternberg (1977) who suggested that the educational implications stemming from convergent divergent thinking styles are for reaching. For sciences and mathematics convergent thinking styles are considered to be more conducive and for arts, teaching and divergent thinking styles. It was found by Hudson (1966) that generally formal problems and tasks that are better structural and demand greater logical ability than the more opened problems are preferred by individual with convergent thinking styles. This is why; we need styles of students if we intend them to exhibit their mental capacities to the utmost. This further suggests that there is need to further investigate the thinking styles of students.

## 1.1 STYLES OF LEARNING AND THINKING

Thinking and learning styles of students influence their scholastic achievement. These thinking include students learning and thinking styles preference, their interest in the material to be studied and the learning environment.

A learning and thinking styles preference refers to the way the student responds to a stimuli in the context of learning as well as their characteristic way of acquiring and using the acquired information. These learning styles show the way a student leaves and the way be interprets the acquired material (Bailey and Garratt (2002).

### 1.1.1 Meaning and Definitions of Learning and Thinking Style :

According to James and **Gardner (1995)**, Learning styles are the ways individual learners react to the overall environment.

According to **Ausubel, Novak and Hanesian**, Learning and Thinking styles are self consistent, enduring individual differences in cognitive organization and functioning.

According to **Gregorc (1979)**, learning and thinking styles are distinctive behaviors which serve as indicators of how a person leaves from and adapts to his environment. It also gives a clue of as to how persons mind operates.

According to **Dunn and Dunn (1993)**, Learning styles are the way each learner begins to concentrate on process, and retain new and difficult information.

According to **Grasha (1990)**, Learning styles are preferences that students have for thinking, relating to others and for various classroom environments and experiences.

According to **Keefe (1987)**, Learning styles are a consistent way of functioning that reflects the underlying causes of learning behavior.

**Dunn and Dunn (1991)**, has stated that Learning Styles differ among students. Some of the ways learning styles between individuals can differ are amongst achievement levels, gender, age and culture individuals, achievement levels can be high versus low academic

achievement. High and low achievers are not likely to perform well with the same methods of learning.

Further **Dunn and Griggs (1995)**, have found that- “Differences in gender environment than females. They are more or teacher motivated.”

**Pizzo, Dunn and Dunn (1990)**, found that- ‘Females, more than males while learning and learning, styles may change as individual grow older. It was further found by Dunn and Griggs (1995) that some individuals change uniquely while others do not change at all with the increasing age. Physiological, emotional and sociological preferences of individuals change with them increasing age. For example, sociological preferences indicate whether an individual chooses to learn alone or with a group. Emotional preferences refer to motivation which fluctuates from day to day, class to class and teacher to teacher. A student’s motivation tends to be greater if he interested in a topic and presenters teaching style matches the student’s learning style. While the individual get older their sound preferences, temperature preferences and reality preferences tend to changes.

Emotional preferences are the need for breaks for interaction. Older adults require less structure.

So for physiological preferences are concerned with tactual learning, kinesthetic learning and virtual learning. It includes time preferences and their length and also mobility preferences.

Diversity in learning styles among different cultures has also been found and to it is not good for teachers to approach students with a cultural mindset. Instead, learning styles of each student and interventions that are compatible with there preferences must be designed.

### **1.1.2 Learning Styles Models**

To test a person’s learning style, there types of learning styles models are used. There are instructional preference models, information processing models and personality models. Instructional models that examine the attitudes, habits and strategies of learners are also

known as social-interaction models. Such models examine how people engage with their peers while learning.

Information processing models are designed to observe the way a person remembers information, senses, solves problems and things. Personality models study how a person reacts and feels about different situations.

### **Hemisphericity of Mind:**

According to **venkataraman (1989)**, Hemisphericity is the cerebral dominance of an individual in retaining and processing models of information in his own style of learning & thinking.

Researches conducted during the 60s and 70s show that the human left cerebral is found to be functioning specially for verbal, abstract, analytical, temporal and digital operations.

These researches were carried on by **Bogen (1964), Gazzaniga (1970), Ornstein (1972), Kinsbourne (1975) and Zelinsky and Marsh (1976)**.

Findings by the above researchers revealed that the right cerebral hemisphere is specialized for well lateralized and keeps on working throughout the normal life span of an individual.

### **Split-Brain Experiments**

Two neuroscientists, Roger Sperry who also won the Nobel prize in 1981 and Gazzaniga, studied patients who had surgery to cut the corpus callosum. After surgery the patients appeared very normal and were doing walking, talking, reading, playing and doing other daily tasks as were doing prior to surgery. These studies were called split brain experiments that isolated information from reading the other hemisphere.

A tachistoscope was used by Dr. Sperry to present visual information of both the hemispheres. Each half of the visual field projects to the opposite side of the brain, it is possible to project a picture of either of the two hemispheres. When a split-brain patient was sitting down, looking straight ahead focusing on a dot in the middle of a screen, a picture of a spoon was flashed to the right side of the dot. It was observed that the visual

information about the spoon crossed in the optic chiasm and rounded up in the Left Hemisphere. When the person was asked about the picture, he had no problem identifying the spoon. Significantly when the spoon was flashed to the left of the dot, the visual information would have travelled to the Right Hemisphere and nothing was seen by the patients. When the same patient was asked to pick out an object with his left hand, he was able to pick out the spoon. It was because from the left hand the touch information crossed over to the Right Hemisphere in which the spoon was seen. Further, when the same person is asked again to identify the object (Spoon) that is in his hand person was not able to say what it was because the right hemisphere can not talk because it has no ability for languages.

Another type of experiment performance with split-brain patients was using chimerical figures in which the face on the left is a woman and on the right is a man. Now if the patient centers his focus on the spot in the middle of the forehead, the visual information above the female face passes to the right cerebral hemisphere and similarly the information about the male face will go to the left cerebral hemisphere. If a split brain patient is asked to point to a whole picture of the face, the patient usually picks out the female face passes to the right cerebral hemisphere and similarly the information about the male face will go to the left cerebral hemisphere. If a split brain patient is asked to point to a whole picture of the face, the patient usually picks out the female pictures. Further when the patient was asked whether the picture was that of a man or a woman, the reply was man. It was found that if the patient is required to do an action, either left or right hemisphere dominates. For recognition the faces when the special is not required the right hemisphere was found to be dominated.

According to **Felder (1993)**, 'alignment between a student's learning style and an instructor's teaching style tends to better recall and understanding and the more positive post-course attitudes.

From student to student these learning style preferences vary as well as the mode of instruction. Teaching has been found to be most effective if it caters to the need of a number of learning and thinking styles. If consideration is given to the student learning and style preferences it is essential to know if the scholastic performance of students

depends upon their learning and thinking style. The mind is very unique and authentic. To compass the divergent learning and processing information human attributes are to be designed individually and collectively. The ideology of learning style was adopted so that different ways in which people respond, think, hear, see, touch, rationalize and formulate learning may be known. In our society at present the learning styles have gained prime importance. Researcher said developed path ways regarding the learning styles. Due and significant of contribution in this field has been made by psychologist, educationist, sociologist, doctors and lawyers. Researchers, by the use of evidence from learning styles are fulfilling the needs of the learners. Numerous strategies and techniques are being used in classroom structure by educators. Significant researchers in this field had been made by Benson (2005), Bloom (1956), Dunn & Dunn (1993), Gregorc (1982), Jung (1971), Kolb (1985), Leavitt (2004), Lindsay (2006), Miles (2004), Schmeck (1988), Smith (2006) and Yahr (2005). If a student learning style is identify by using appropriate assessment tools, there is greater appreciation, deeper inside and better understanding by the professionals regarding the ways individuals learns. If a student's style of learning is cultivated and nurtured the learner is equipped with powerful tool to function effectively in the school environment and he further satisfies his intellectual needs.

The awareness of individual learning preferences and a understanding of his learning style can help educators developed instructional styles. The learners are also required to have the knowledge of learning style so that the maximum learning replaced and every one who is involved to the learning process may feel successful. In the leaning environment diversity is where is significant gradient. Technology of teaching is used by teachers and educators so that the students may have rich learning experience and also to create opportunities to learners. To design weve based courses the colleges and universities work cooperatively with instructors. In online web based course a number of methods can be used and the students can identified course work according to the designed based suitable for the learning styles.

### **1.1.3 Models of Thinking Style**

#### **Guilford's Model of Thinking Styles**

In Guilford's model the term 'convergent and divergent' were used. Convergent refers to an individual ability in dealing with problems requiring one correct answer that can be opted from the content provided. The Divergent thinking is when a person is highly adept in problems requiring a generation of several equally acceptable answers where the emphasis is laid on quantity, variety and originality of responses. It was found Getzels and Jackson (1962) that, teachers prefer learners having divergent thinking style than those who have convergent thinking style.

#### **Das, Kirby and Jarman (1975) Model of Thinking Styles**

This model of thinking styles states that any information in the brain is integrated in two ways – simultaneous and successive processing. Simultaneous process style is characterized by involving the synthesis of separate elements groups. This type of processing is required in the discovery of relationship between two or more objectives.

Successive processing style is the integration of separate elements in two groups whose essential nature is temporal. This process is necessary for the information or production of any ordered series of events.

#### **Kirton (1980) Model of Thinking Styles**

Kirton identified two approaches for problem solving – abdication and innovation at one end and of these are the individuals adopters such individuals solve problems within the boundaries established by conventional approaches. At the other end are those individuals that are characterized by innovation. In order to assess these thinking styles, Kirton developed an inventory named as Kirton Adaption – Innovation inventory having 32 items and one blind item. There are three sub-scales –

- (a) Originality (Creativity)
- (b) Efficiency (resistless, reliability and disable)

(c) Rule-Group Confirmative (Showing the proper respect for authority and rules).

### **Harrison and Bramson (1977, 1982) Model of Thinking Styles**

Harrison and Bramson find thinking styles as ways of apprehending. They identified five preferred thinking styles – synthesis's, idealists, analysis's, realists and pragmatist. The synthesis's style focusing upon essential factors, assumptions and conceptual aspects. Idealists style focuses on process, relationship, values and expressions. Analysis's style focuses on method and plan where as realists style focuses upon step by step thinking.

### **Torrance et al. Model of Thinking Styles**

This model is based on the specialized functioning on the cerebral hemisphere. It was assumed that the left cerebral hemisphere is the centre of logical, analytical and linear propositional thought. The right cerebral hemisphere is the locus of Visio-spatial and oppositional thought and imagination and processes information simultaneously handling a variety of information.

### **Basadur and Associate (1990) Model of Thinking Styles**

Basadur and his associates introduce the concepts that a unique personal style a creative problem solving can be identified two dimensions of the process of problem solving were stipulated by him. The first dimension of coprasie of two opposite ways of gaining knowledge for ideation and evaluation for assessing the problem solving style, the creative problem solving inventory was developed.

### **Epstein et.al. (1996) Model of Thinking Styles**

Epstein et. Al. developed two model of thinking styles, namely intuitive - experimental and analytical rational thinking style based on cognitive self theory of personality. In experimental style the characteristic like holistic affective, pleasure – pain oriented, associative connections, behavior mediated by vibes from past events, reality is concrete images, metaphors and narratives are focused upon. Rationale style is analytic and is intentional, effort fully, logical reason oriented like abstract symbols, words and numbers etc. are focused upon. Initially Epstein Meier (1989) developed convent

inventory containing 108 items. Later on , on the basis of factor loading ., short version of the inventory containing 31 items was prepared.

#### **1.1.4 THE PRINCIPLES OF LEARNING AND THINKING STYLES**

**Sternberg (1997)** has identified 15 general points understand about learning and thing styles:

1. Styles can be taught.
2. Styles can be measured.
3. Styles can be valued at one time but at another can not valued.
4. Styles can be valued in one place but may not be valued in another place.
5. Styles can vary across the life span.
6. Stylistic flexibility differs from person to person.
7. Styles are socialized.
8. Styles can vary across task's and situation.
9. People can different patterns of styles instead of a single style.
10. Life choices are needed to fit styles.
11. Styles are preferences in the use of ability and not ability themselves.
12. Synergy is created if there is match between style and ability.
13. Stylistic fit is confused with levels of abilities.
14. Style are a question of fit , not and average , good or bad.

#### **1.1.5 DEVELOPMENT OF LEARNING AND THINKING STYLES**

##### **(VARIABLES IN STYLISTIC DEVELOPMENT)**

According to Sternberg (1997)- the following variables are very lightly to affect development of learning and thinking styles –

- **Culture:** This variable is lightly to affect the development of thinking style. Some cultures than some other ones are more regarding of certain style for example the national heroes of one kind are the other tend to be heroes by virtue of their contribution for example Thomas Elva Edition as inventor , Einstein as a scientist, ford as entrepreneur and earnest as author. In some other society for example Japan

emphasizes conformity and the tradition may be more lightly conservative. In some culture, children from an early age, are taught not to question certain religious tenets or not to question the government. In such cultures conservative styles are regarded or liberal style of punished. Internal and external style may be found in both kind of culture in which internalism is highly valued by the individually cultured and externalism is highly valued by collective culture.

- **Gender-** Gender is such a variable that is political to the development of styles. Studies have showed that males have a legislative, internal liberal style. Whereas females have executive, external and conservative style. This difference is because males and females are socialized in different ways since their birth.

According to Sternberg (1997), “Traditionally a legislative, liberal pattern of styles has been more acceptable in males than in females. Men were supported to set rules and women to follow them.” But in many cultures, these traditional styles have been found to be changing.

- **Age-** The third variable, i.e., age, also affects the development of thinking styles. Pre-school children are generally encouraged to be legislative and creative powers in the open environment of pre-schools and some homes. As the children start going to school, the period of legislative encouragement draws closer and children are socialized into confirming values of school they join. Teachers decide the course of section as to what their students should do and for the most part it is down by the students.
- **Parenting Style-** The fourth variable the parenting style plays very significant role in the development of thinking style of children. A monarchic father approves and appreciates the behavior of a child who shows monarchic behavior. In the same way an anarchic father would disapprove his child’s monarchic style and is more likely to suppress it. The global style is encouraged by each parents as medicate the child in ways that point to smaller issues but those parents who do not generalize, encourage local styles of thinking. This shows that the styles of thinking of children are affected by the ways their parents react. If the parents encourage the children ask questions

and seek answer, children are more likely to develop legislative style. In the same way if the children are asked to evaluate, to compare and contrast, they are very likely to develop judicial style.

- **Schooling-** Schooling is another variable that develops thinking styles of children. Different schools develop different styles of thinking. Schools work as social agents and in most countries of the world are regarding local, executive and conservative styles of thinking.
- **Occupations-** Occupation is another variable responsible for the development of thinking styles of children. Various thinking styles are likely to be either encouraged or discouraged as children respond to the reward system of their chosen pursuit.
- **Socio-** It has been found that the S.E.S. of children also affects the thinking styles of children. Children coming from low SES families show greater authoritarianism in style. Thus SES is responsible for the development of judicial, local conservative and oligarchic styles of children.

#### **1.1.6 EDUCATIONAL IMPORTANCE OF LEARNING AND THINKING STYLES**

The important contributions of thinking styles to education is given as under:

- **Improving Instructional Methods**

Improving Instructional Methods thinking styles affect the presentation and the functional characteristics of learners for maximum learning to achieve education goals. For stimulating growth and flexibility, students may pursue such instructional demands that are congenial to their thinking styles.

Thus instructional treatments are to be matched with learner's characteristics with the object of achieving higher goals ultimately for the good learners. This matching should be facilitated for enhancing achievement. Quite contrary to this, mismatching may also be needed to promote flexible and creative thinking obstacles. At the same time opposition, conflict and challenge is also equally important to stimulate individual development. Curriculum and procedure might be devised in

stylistic terms with regard to instructional aims. Cognitive control and stylistic abilities serve to increase functional options.

- **Enriching Teacher Behavior and Conceptions**

Teachers awareness about thinking styles may change and improve their instructional methodology and performance. It may also change teacher-student communication as their sensitivity will be increased to verbal and non-verbal stylistic cues of learning. Students and teachers having similar thinking styles are supported to have greater mutual esteem in comparison to those whose thinking styles mismatch. If teachers and students are well aware of each other's stylistic differences, the mismatching may be minimized resulting in improved communication and effective instruction.

- **Enhancing Student Learning and Thinking Strategies**

If students awareness about their thinking styles is increased, teachers may provide a new range of alternative thinking styles and strategies that are congenial to the enhancement of their learning. Since strategies are learnt more easily than styles, students strategic repertoire may be increased and also the strategies that are strategically congenial will be appropriately applied.

- **Expanding Guidance and Vocational Decision-Making**

There are quite good chances of expanding guidance services for enriching thinking styles suitable to achieve scholastic performance. Since thinking styles are related to vocational preferences these are very likely to contribute to improved educational decision making. Thinking styles also contribute to the ways of selecting and processing the information, they can be significant in optimizing the involvement of students in guidance activities.

- **Broadening Educational Goals and outcomes**

If the educational institutions are concerned with the student's thinking styles as well as they are concerned with the acquisition of knowledge, the educational goals

can be broadened, for this schools & colleges must have well-balanced alignment with the thinking styles of their students.

- **Turning the Stylistic Demands of Learning Environment**

Environment of educational institutions makes stylistic as well as intellectual demands. Very often the stylistic demands of different programs are so inter mixed that they do not match with the thinking styles of students. Hence the thinking styles should be well aligned with the educational environment.

Now the need is to explore the stylistic requirements of learning environment so that the style consistent models of teaching methods may be developed. This will help the teachers in understanding, assessing and appreciating the stylistic demands of learners.

- **Render Help in Adopting Suitable Assessment Methods**

Thinking styles of students can be benefited with the short answer type tests have been found to be the most compatible to local, hierarchal and executive thinking styles and there are some styles that are not benefited by essay type tests. Thus, need is to have a well balanced coordination between different thinking styles and the assessment tests. If the teachers are equipped with the knowledge of thinking styles and the tests of assessment, they are in a position to adopt the suitable methods of assessment of learners.

Hence, for facilitating learners with the use of thinking styles and understanding the learners as well and for creating such environment in which the diversity can think, the knowledge of thinking styles and development of suitable testing tools is of utmost importance for teachers so that they may be helpful to learners in achieving the educational and vocational goals.

## **1.2.0 CONCEPT OF PERSONALITY**

The term “Personality has been derived from the Latin word- ‘Persona’ which means a ‘mask’ which Greek actors used to wear while doing acting. Different approaches have been used by different psychologists to define personality, for example,

integrative approach, formative approach and totality approach. For the assessment of personality, the system of complex characteristics by which the life pattern of a person has to be identified.

According to Torrance (1965), “It becomes absolutely necessary that various attempts must be made to ensure the creative development.” He further says that- ‘Deplorable waste of human talent is to be prevented and if creatively students are not to use the path of delinquency, mental issues or at least the life of mediocrity and unrealized potentiates.

According to **Parnes (1971)**, “Society’s mental health can be described as the difference between the potential and actual civilization of every person.”

While defined the ‘Personality’ the social scientists kept in mind the three thing about a person-

- a. External appearance and behavior.
- b. Awareness of self
- c. Organization of measurable traits, inner as well outer

According to **Ruch (1967)**, ‘An individual’s social stimulus value is the effect he has upon others. It is determined by all those characteristics and qualities of the individual that act as a stimuli for other people.” He further says that the individual’s concept of self is an important factor in guiding both, his immediate behavior and the further development of his personality.

### **Personality-Traits:**

Studying measurable traits of an individual is another approach to study and define personality. Traits are the characteristics that can be observed and tested objectivity. Traits are very often referred to as dimension of personality as they can be measured and defined.

Among a number of definitions given by different psychologists, **Allport's (1961)** view is widely accepted. Allport defines personality as “the dynamic organization within the individual of those psycho-physical systems that determine his characteristics behavior and thought.’

**Cattell (1952)**, observed personality as a ‘truism the most human affairs, political, social, commercial, cultural, domestic hinge on issues of personality’.

According to **Sochacht (1971)**, “distinctive personality is not simply a lofty idea but amounts to an existential imperative. A person is not as he should be in to the extent he fails to develop a distinctive personality.”

Making distinctive personality is to bring creative energies to bear on the activities of everyday existence and the reorganization of parts into a whole and meaningful entity.

Eysenck derived three basic dimensions and defined these-

- a) Introversion, Extroversion
- b) Neuroticism (Emotional instability-emotional stability)
- c) Psychoticism

The high end on extroversion refers to sociable, outgoing, impulsive, optimistic and jolly while the high and introverts are quite, introspective, reserved, disciplined and well ordered individuals.

The second type, suggested by Eysenck is the emotional stability and emotional instability.

At the lower end people are touchy, moody, restless and anxious while at the upper end they are calm, carefree, stable, dependable and even tempered.

The third dimension is ‘psychoticism’. The persons on high end at this dimension are solitary, insensitive, egocentric, impersonal, impulsive and opposed to social norms while those who are at low end are empathetic, non-adventurous and bold.

Based on two dimensions extroversion and Neuroticism is Maudsley personality inventory.

### **1.2.1 EDUCATIONAL IMPORTANCE OF PERSONALITY**

Eysenck's test of personality (EPQ 1975) is designed to measure neuroticism, stability, extroversion introversion and High and low psychoticism.

Cattell's Test measures 16 traits. It has who been attempted in a number of studies to show the relationship between Cattell's and Eysenck's tests but disappointing results have come so far, for example, some link has been found between extroversion and success at primary school level and between Neuroticism and certain kinds of success and failure in higher education but the correlations are small, though it doesn't convey the sense that the dimensions isolated by Cattell or Eysenck are not significant.

At primary school level extroverts may do significantly better in comparison to introverts, provided their teachers are also extroverts. Similarly sometimes neurotic children may also task quite happy if their teacher sensitive to their problems. Methodology of teaching and the use of teaching learning material has also an important role to play in it. Arts subjects can be more suitable for introverts whereas for extroverts science-subjects may be easier but a lot depends upon the teacher and instructional methodology and the study habits of students. There is significant effect of age and ability level. Complexity of classroom interactions also affects the personality of students which further affect their achievement. Teaching learning process is also affected by the conveyed teachers personality. Good teachers have been found to have cat in identifiable characteristics of personality since as outgoing and extroverts and will be balanced and stable.

Teacher's personality, as the researchers have found, is also responsible for students' achievement to a great extent. Besides, it also affects their ways of thinking and learning. It has been found that extroverts are more field independent than introverts. Very little consistent difference has been found between neurotics and stable subjects so far as the field independence is concerned.

It was found by Arora and Murthy (1975) clinical neurotics were more field independent than the normal ones. It indicates that the personality type has relationship with thinking styles and also that teachers personality also plays a very important role in education.

### **1.3.0 CONCEPT OF EMOTIONAL INTELLIGENCE**

The term 'Emotional intelligent' has been derived from the social intelligence. It was coined by Thorndike in 1920.

“Emotional Quotient” (EQ) is used interchangeable with 'Emotional Intelligence'. In the first time **Salovey and Mayer (1990)** conceptualized the term emotional intelligence that consisted of three different categories of adaptive abilities. Firstly, it is appraisal and expression of the self as well as others. In the self there are verbal and non-verbal components, in the other there are non-verbal perception and empathy. Secondly, there is a regulation of emotion in the self and others. Thirdly, it is utilization of emotion that includes flexible planning, creative thinking, redirected attention and motivation. **Goleman (1995)** then subsumed this definition with a lot of personality characteristics, which he believed would contribute positively to success in any domain of life. Further, **Mayer and Salovey (1997)** revised their own definition stressing the cognitive components of emotional intelligence and described emotional intelligence as an ability which perceives accurately and appraises and expresses emotions. It is the ability that accesses and generates feelings.

It is the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth.” This definition was referred to the mental abilities of the organism. But this definition is hardly comprehensive for the present situation. A more formal academic organism. But this definition is hardly comprehensive for the present situation. A more formal academic definition refers to emotional awareness and emotional management skills, which provide the ability to balance emotion and reason so as to maximize long-term happiness. In general we can define emotional intelligence as the accumulation of all cognitive, non-cognitive and non-physical capabilities, competencies and skills a person has, that help

him/her to deal with the demands and pressures of every day life (**Dash and Behera, 2004**).

In the light of above discussion it can be defined that emotional intelligence is the ability to understand emotions and their causes, the capability to effectively regulate these emotions in oneself and in others and most importantly being able to use the emotions as a source of information for problem solving, being creative and dealing with social situations. In simple terms we can say that EQ can be defined as knowing what feels good, what feels bad and how to get from bad to good.

### **1.3.1 Characteristics of Emotional Intelligence:**

- It is a non-cognitive and non-physical capacity of the organism.
- It is an internal or psychological process, which motivates the organism to perform its activities properly.
- It is nurturable.
- It energizes the organism to accomplish the required tasks.
- Level of emotional intelligence is neither genetically fixed nor does it develop only in early childhood and develop through out life.

### **1.3.2 Components of Emotional Intelligence**

According to **Salovey and Mayer (1990)** Emotional Intelligence comprises components like self-awareness, managing emotion, motivating oneself, empathy and handling relationships.

- **Self-awareness:** Observing own –self and recognize of feeling as it happens.  
Managing emotions: Handling feelings, so that they are appropriate to realize what is behind a feeling, finding ways to handle fears and anxiety, anger and sadness.
- **Motivating Oneself:** Channeling emotions in the service of a goal; emotional self-controls carrying gratification and stifling impulses.
- **Empathy:** Sensitivity to other’s feelings and concerns and taking their perspective, appreciating the differences in how people feel about things.

- **Handling Relationship:** Managing emotions in others, social competence and social skills.

Wagner and Sternberg (in Dash and Behera, 2004) classified it into three categories as follows:

- **Managing Self:** This refers to the ability in administering or managing self in every day to get the highest results such as sequencing of activities; selfinstigation and inducement to achievement; build up good self-inducement; be daring for ventures; not to be discouraged; know the limit of one's own potentiality.
- **Managing Others:** This is the skill in managing the subordinates, and the social relations; the ability in getting along with others; the ability to entrust would accord the aptitude of the person.
- **Managing Career:** This is the matter of building up a good impact to the community, the organization and the country, building up one's own fame and reputation. A person should arrange his own needs to be in consistency with the organization's point of interest. He should also influence associated persons to give their concurrence. We can combine all the components given by Salovey and Mayer (1990) and Wagner and Sternberg on emotional intelligence.

### 1.3.3 Differences between Emotional Intelligence (EQ) and General Intelligence (IQ)

Dash and Behera (2004) in their study shown following differences that lies between Emotional Intelligence (EQ) and General Intelligence (IQ):

- The Emotional intelligence is the capacity or ability to understand ones own emotions, the emotions of other and act appropriately based on these emotions.
- IQ refers to the cognitive aspect of the organism. The measures the intelligence quotient, there is a specific mathematical formula, i.e.  $MA/CA \times 100$ . But there is no specific mathematical formula like general intelligence to find out the level of emotional intelligence till today, since EQ delineates to the non-cognitive and non-physical aspects of the organism.

- Intelligence refers to the cognitive abilities of the organism. However, emotional intelligence refers to the non-cognitive and non-physical capacities of the organism. So, emotional intelligence is nurturable and general intelligence is inherited and not nurturable.
- Level of general intelligence is genetically fixed, where as emotional intelligence is neither genetically fixed nor does it develops only in early child hood and develop throughout life.
- Our past research evidences suggest that “Emotional intelligence can be more powerful than intelligent quotient. When IQ defines how smart a person is? In the mean time emotional intelligence defines how well a person use what smarts he is?
- According to **Goleman (1995)**, IQ accounts for only about 20 per cent of a persons success in life. The remaining 80 per cent depend largely on persons emotional intelligence i.e. EQ.
- After all we can say, why emotional intelligence is significant for every sphere of life in general, and teaching-learning situation in particular? In general, it is necessary for the leaders, supervisors, managers, colleagues and others in the workplace, to understand their emotions and their workers to get the quality productivity. In particular parents, teachers, supervisor, administrators, head of the institutions and others in the teaching-learning situations to know and understand their emotions and also their children’s for getting outstanding results in their respective areas. The following points help us to understand the significance of EQ in the present society.

#### **1.3.4 Role of Emotional Intelligence in Learner’s Life:**

Keeping the characteristics of EQ and various researches and literatures in the field of emotional intelligence the importance is summarized as under:

- Emotional intelligence plays a pivotal role in designing the required personality; build up the emotional maturity suitable to the age; build up the ability in his self-adaptation for solving the stress problems and the pressure of life in the competing status of an individual.
- The enhancement of the harmonious personality of the individual depends to a large extent on his/her emotional intelligence. It enables a man to achieve highest pinnacle and deepest reach in his search for self-fulfillment as well as others fulfillment.
- Emotional intelligence re-enforces the concomitant drive to increase individualism. It enables to express ones feeling and emotion at the appropriate occasion, with the understanding of the feeling of self and others. A person with emotional intelligence knows how to smile? He knows how to listen patiently to other people's problem? He will not be alienated from the people or from his own life.
- Emotional Intelligence gives the introspective insight before getting to know others. The knowing of oneself and of others would induce interaction among themselves; where by the potentiality can be used in full and the family life would be happy through the understanding of each other.
- Emotional Intelligence enhances the talent of artful leader in utilizing people and in capturing their hearts. It gives chance for the administrator to study and develop the staff. It can influence people to accomplish required task. Encouraging individual competition rather than team spirit.
- Attributing quantitative values to qualitative phenomena that is evident from the all-pervasive marks system which rapidly becomes the dominant goal of pupils. Therefore, emotional intelligence is a very important aspect on which depends the future career of the children.

- Emotional intelligence can enable teachers to resolve past issues and both external as well as internal conflicts help them to attain emotional power and accomplish their goals at all levels physical, mental, spiritual and emotional; and also improve psychological abilities such as: memory, clarity of thinking and decision-making.
- It is believed that learning difficulty as well as various problems at work place have their origin in poorly developed emotional awareness in early childhood; In this state emotional intelligence enable the human beings to respond to the right degree, at the right time, for the right purpose and in the right way to a verity of environmental situations.
- Emotional intelligence is a primary factor in healthy ageing permitting the human being to live long as well and it is positively impacts to the individual ability to sustain both mental and physical health. Emotional intelligence also enables to assume responsibility for an individual feeling by saying “I feel” instead of ‘I should not have.’
- Emotional intelligence helps in stimulating motivation, improving communication, reducing stress and enhancing decision-making power of teachers, administrators, students and also parents.
- Emotional intelligence also helps to cope with stressful situations. Stress management, therefore largely depends upon striking an emotional balance between a potential stress condition and reaction to it.
- Researches (**Gill, 2003; Ghosh, 2003**) have described that pupils with high EQ are more confident, are better learners, have higher self-esteem, have few behavioral problems, are more optimistic and happier, handle their emotions better and even to be successful entrepreneur one needs to have a high emotional intelligence.

Further, the study of **Abraham (1999)** revealed that EQ as theorized to have a positive effect on organizational outcomes of work group-cohesion, congruence between

self and supervisor appraisals of performance, employee performance, organizational commitment and organizational citizenship. It may also prevent emotional dissonance ethical role conflict and job insecurity from effecting organizational commitment. The most beneficial effects of emotional intelligence may occur in environment in which there is a high degree of job control.

Emotional intelligence (EI) has recently attracted a lot of interest in the academic literature (**Charbonneau & Nicol, 2002; Ciarrochi, Deane, & Anderson, 2002; Mayer, Salovey, & Caruso, 2000; Palmer, Donaldson, & Stough, 2002; Petrides & Furnham, 2003; Roberts, Ziedner, & Matthews, 2001; Saklofske, Austin, & Minski, 2003**). The distal roots of EI can be traced back to the concept of ‘social intelligence,’ coined by **E.L. Thorndike (1920)** to refer to the ability to understand and manage people and to act wisely in human relations. Its proximal roots lie in the work of **Gardner (1983)** and, more specifically, in his concepts of intrapersonal and interpersonal intelligence. EI as a term has been present in the literature for a relatively long time (**Greenspan, 1989; Leuner, 1966**), although it was not until 1990 that the construct was introduced in its present form (**Salovey & Mayer, 1990**). EI was propelled into prominence by **Goleman’s (1995)** best-selling book and a subsequent lead article in TIME magazine (**Gibbs, 1995**). Thereafter, articles on EI began to appear with increasing frequency across a wide range of academic and popular outlets. Nevertheless, the quantity of empirical work carried out on the construct, including the development of appropriate measures, seems to bear an inverse relationship to the interest it has attracted in the scientific and popular literature. At present in America, it has been found that emotional intelligence has a great impact in society. In work place it has been found to be a crucial factor and in academic performance as well.

A number of challenges are faced by us in day to day life and in order to be a well-organized individual, we must possess skills to cope up with the problems that come in the way. These are skills to play, motivate, control and manage feelings and handle relationships. For approaching different tasks we need to be equipped with emotional intelligence skills. We should be able to rise above obstacles and adapt to day to day encounters efficiently. Student’s emotional intelligence should be in corporate in

classrooms. If a student's emotional social skills are redressed and their interpersonal relationships also improve. There is a great demand for such individuals who are able to perform effectively in a team environment. Individuals should be able to manage emotions in the work place and deal with the public successfully. So that the positions out comes may be produced. Parents can also play good roles in developing emotional skills in children by communicating right type of information. Parents communicate by touching, expressions and speaking and provide a support system during emotional disturbances. Parents also help in building self esteem, self control, self awareness and confidence when they work with children.

Emotional intelligence is most needed to cope up with the emotional challenges of life that come before us. For this we must have ability to manage such situations effectively.

A number of researchers in their separate researches have studied emotional intelligence and learning styles eg. Benson (2005), BeShears (2004), Boyd (2004), Briody (2005) Knoll (2006), Leavitt (2004), Paul-Odouard (2006), Phillips (2005), Rivera & Beatriz (2004), Scott (2004), Smith (2006), Spector (2005), Wells (2004), Yahr (2005), Yancey Bragg (2006).

Yet there is a lot of scope and need to study learning styles and emotional intelligence and their effect on learners. The limited number of researches in this field pave a further way for research to that the correlation between emotional intelligence and learning styles may be found on academic performance.

#### **1.4. STATEMENT OF THE PROBLEM**

Through various researches and approaches to college teaching have been made in the post years, yet no method or approach has been found to be consistently superior. Now the important question that arises is as to under what conditions pupils can learn best. The emerging area having a lot of scope is the 'Pupils' styles of learning and thinking. It is also very new and challenging, specially. For Indian teacher and researchers. Several variable are there that are needed to be investigated with regard to learning and the thinking styles of thinking styles of the pupils academic achievement,

sex and academic discipline, emotional intelligence and personality type are significant among them. The proposed study has been designed with a view to address the following investigative questions-

1. Are there significant differences in the pupils' styles of learning and thinking with ranging levels of scholastic achievement (High, Average and low)?
2. Are there significant sex (gender) difference in the styles of learning and thinking of pupil teachers?
3. Whether pupil-teachers belonging to differences streams (Arts, Commerce & Science) last significant differences in styles of learning and thinking?
4. Whether significant differences exist in sty of thinking and learning of pupil teachers having different types of personality?
5. Whether pupil-teachers with high and low level of emotional intelligence have significant difference in their thinking and learning styles.

The research questions raised above will form the integral part of the research problem in the present study.

The following is the problem to be studied:

**“A STUDY OF LEARNING AND THINKING STYLES IN RELATION TO  
SELECTED COGNITIVE AND NON-COGNITIVE FACTORS OF PUPIL-  
TEACHERS OF MORADABAD DIVISION”**

## **1.5 NEED AND JUSTIFICATION OF THE STUDY**

It has been observed that different pupils learn and think in their unique individualized ways irrespective of their level (school, college or university) for every society of developed or developing countries, post-secondary education, high education and teacher education in becoming increasingly important. It is more important for the society of such people as make mid-life change in their career or also for those who in their leisure count to achieve teacher education and further contribute to the increasing demand of teachers through formal or non-formal modes.

Now the pertinent question is as to how to teach pupil-teachers more effectively and efficiently? In some countries abroad some work has been done on the thinking and learning styles of pupils. In our country, no such attempts has been made so far. Therefore, a considerable scope is seen in the area of learning and thinking styles of pupil-teachers in socio-cultural arena of Indian society. Learning and thinking styles are significant components of the learning. Process of teacher-training education. For obtaining a comprehensive picture of learning process of pupil teachers, their understanding is highly derivable so that their teaching efforts may be enriched. In order to enhance quality control in education process. The need for the proposed study is vividly clear in view of the above and the same prompted the researcher to undertake the present study.

So that the teasing may be convenient and easy to undertake, each hypothesis has been devised into specific hypotheses based on learning and thinking styles of pupil teacher.

## **1.6 OBJECTIVES**

The following objectives were realized in the proposed study:

- 1.** To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Academic Achievement.
- 2.** To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Gender.

3. To Study the difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.
4. To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Personality Type.
5. To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Emotional Intelligence.

### **1.7 HYPOTHESES**

The following hypotheses have been tested in the proposed study:

1. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High, Average and Low levels of Academic Achievement.
2. There is no significant difference in Learning and Thinking Styles of Male and Female Pupil-Teachers.
3. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.
4. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having:
  - 4(a) Extrovert Type and Introvert Type Personality
  - 4(b) Neurotic Type and Stable Type Personality
5. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High and Low levels of Emotional Intelligence.

However, for the sake of convenience of testing each hypothesis was into specific hypotheses based on learning and thinking styles.

## **1.8 SCOPE AND DELIMITATIONS**

In terms of the objectives of the study, hypotheses formulated and the research methodology adopted, the present study work may be assessed and evaluated. Besides, the population, samples, variables, tools and statistical techniques adopted are also to be taken into account. In terms of the objectives, this study was delimited as these are concerned with determining the differences in thinking and learning styles with relation to cognitive and non-cognitive factors of pupil-teachers. Academic achievement in the cognitive factor and the sex, stream of study, personality type and emotional intelligence are the non-cognitive factors. Further the study is concerned with the testing of the null hypothesis and the descriptive methods of research were applied. The population of the study is comprised of the pupil teachers belonging to three disciplines, Arts, commerce and Science the sample was drawn from the colleges of Moradabad Division -Govt., Govt. aided & privately managed colleges. The institutions were randomly selected and the random stratified sampling technique was adopted.

In terms of variables also the study was delimited. The Academic Achievement was treated as dependent variable and the independent variables were learning and thinking styles, gender stream, personality type and emotional intelligence.

The tools for collecting the present data were SOLAT by Venkatraman (Torrance et.al's), Eysenck's MPI and Mangal Emotional Inventory. The Institute gazette was the source of Academic Achievement (marks obtained by the students). The t-Test and One-way analysis of variance technique were used to analyze the data. For depicting differences in the mean scores of Learning and Thinking Style in respect of various groups, graphs have been used. The terms of the limitation of time and financial resources, the study needed to be delimited.

## **1.9 DEFINATION OF THE KEY TERMS USED**

To bring precision and clarity, the key terms used in the present study are being defined as under-

**LEARNING AND THINKING STYLE :** The way one prefers to learn and think using one's mental abilities and capacities.

- **Left hemispheric style:** It is one's inclination to use the left hemisphere of one's brain for processing the information received.
- **Right hemispheric style :** For processing the received information, one's inclination to use the right sphere of one's brain is referred as Right Hemispheric Style.
- **Integrative style :** For processing the information, inclination to use both (the hemispheres the left and the right) is referred as integrative style.

**PERSONALITY TYPE :** Refers to one's personality traits- Extroversive or Introversive and Neurotic or Stable as measured by Eysenck.

- **Extrovert (Extroversive) Type:** One who is least centered around shyness and withdrawal and is more social.
- **Introvert (Introversive) Type:** One who is shy and prefer to be alone..
- **Neurotic Type:** One who is emotionally over responsive and break down emotionally when under stress.
- **Stable Type :** Refers to one's neurotic stability even when one is under stress.

**EMOTIONAL INTELLIGENCE:** Refers to the capacity of one's brain to handle different emotional situation and responses thereafter.

- **COGNITIVE FACTORS:** Refers to one's Academic Achievement and Emotional Intelligence.
- **NON COGNITIVE FACTORS:** Reference is made to Sex or Gender, Stream chosen and the type of Personality of individuals.

## **CHAPTER – II**

### **REVIEW OF RELATED LITERATURE**

The review of related literature enables the researcher to have proper perspective in the topic of research. That is why Borg (1965) pointed out its significance as *“Literature forms the foundation upon which all the future work is built.”* The review of the related literature cautions the researcher against the duplication of what has already been done and is helpful in significant investigation without wasting time. It provides meaning to the research work and helpful to formulate the problem clearly to carry out the research activity systematically.

#### **2.0 IMPORTANCE OF THE REVIEW OF THE RELATED STUDIES**

The search for related material is a time consuming but fruitful phase of any research programme. The review is helpful to any investigation to know what already has been found and also to know what has already been attempted, what methods of study have been fruitful and what is left to be solved by further investigations.

The importance of the review of the related literature according to Singh & Bajpall (2007), "For any specific research project the researcher must be thoroughly familiar with both previous theory and research. To assure this familiarity, every research project has as one of its early stage, a review of the theoretical and research literature."

According to Brog & Gall (1963), "The literature in any field forms the foundation upon which all further work will be built."

Wiersma (1976) states that, "Educational research is not or at least should not be, carried out in an informational vacuum."

Purposes of the survey of related literature according to Good, Barr and Scats (as cited in Sukhia & Mehrotra, 1996) are as follows:

1. To show whether the evidence already available solves the problem adequately without further investigation and thus to avoid the risk of duplication.

2. To provide ideas, theories, explanations or hypotheses valuable in formulating the problem.
3. To suggest methods of research appropriate to the problem.
4. To locate comparative data useful in the interpretation of results.
5. To contribute to the general scholarship of the investigator.

A review of related literature not only helps researcher for planning of research work, but also provides a degree of familiarity to the researcher with past work done, as well as inputs to the research the vast knowledge pool that has already been tapped. Hence, it becomes extremely crucial to locate, reveal and evaluate the past research reports.

## **2.1 GENERAL GUIDELINES FOR THE SOURCE OF THE PREVIOUS STUDIES**

The concept of Metacognition is in its infant stage in the field of Psychological testing. In developing country like India, researches regarding Metacognition are very few in numbers. In such situation, the investigator has to depend upon the international resources available from the internet for the reviews of the past research done in this field. The investigator has downloaded the scholarly articles and research papers from the internet with the help of INFLIBNET center, Ahmedabad. INFLIBNET - Information and Library Network Centre ([www. Inflibnet.ac.in](http://www.Inflibnet.ac.in) or mirror at [www. Inflibnet.ernet.in](http://www. Inflibnet.ernet.in)) is an Autonomous Inter University Centre (IUC) of University Grants Commission (UGC) involved in creating infrastructure for sharing of library and information resources and services among Academic and Research Institutions. INFLIBNET works collaboratively with Indian university libraries to shape the future of the academic libraries in the evolving information environment. Further more, some articles and research papers which are not freely downloadable from the INFLIBNET centre were purchased online from their publishers.

The investigator has reviewed untested reports of previous researches, dissertations, articles, surveys, books and internet sources. Thus in this chapter, researcher

has presented the findings, opinions, statements of various researches and authors which have a bearing on the present study. It has been attempted to present the review of research studies on different variables selected for the present study and also to establish the need for the study. It has been presented under different heading as follows:

- Studies related to Learning and Thinking Styles
- Studies related to Cognitive Factors- Academic Achievement and Emotional Intelligence
- Studies related to Non-Cognitive Factors- Personality Types

## **2.2 STUDY RELATED TO STYLES OF LEARNING AND THINKING**

Style of learning and thinking indicate the hemisphericity preferences of the brain area left cerebral hemisphere is to be specialized for primarily verbal, analytical, temporal and digital operations and right cerebral hemisphere is to be specialized for primarily non-verbal holistic, concrete, creative, analogy and aesthetic functions. Thus, the studies pertaining to some of these factors were reviewed and presented below:

### **2.2.1 Studies Conducted Abroad:**

**Gazzaniga (1977)** conducted a study on review of the split brain. Children, who have been classified as gifted, talented, or disabled in reading and writing skills, may be predominantly right hemisphere learners. Thus, non-verbal visual-spatial strategies should be a part of their reading and writing training if they are to succeed. Learning styles seem to be affected by the child's dominant hemisphere; therefore, if either hemisphere is limited in its processing ability the picture is not whole and the individual's perspective is limited.

**Shock (1981)** conducted research on the two brains and the education process. Study find out that the different functions of the hemispheres are simply assumptions which have been accepted as facts by researchers. He concludes that the two-brain theory has very little significance in planning education. The altercations may never be dispelled, but they can be validated. Through this study, possibly will come a small ray of light, which will help in casting out the darkness which has to long enshroud the right-brain capabilities.

Even a small ray of light has its greatest effect in a very dark room. The controversy continues to flow as a river does. Soon it will spread out and slow down, and then, only then will the right brain have a chance to manifest its great intellectual abilities.

**Stahl (1982)** conducted a study on the right brain: An active partner in written literacy. The current philosophy permeating education was brought about as a result of elementary and high school students' unsatisfactory scores on standardized instruments, as well as a growing public concern. These events fostered a back-to-basics movement and demanded teacher and administrator accountability. Back-to-basics refers to a return to the "3Rs"-reading, writing and arithmetic. Curricula that stress the "3Rs" educate only one hemisphere of the brain, while leaving half of an individual's intellectual capabilities in a recessive state.

**Vitale (1982)** shows that unicorns are real a right-brained approach to learning. If a child is right-brained, that is he or she uses the right hemisphere of the brain to a greater extent than the left hemisphere, then this child's learning style is whole-to-part, or holistic. He or she starts with the answer or sees the whole pattern and discovers a divergent conclusion. He or she has difficulty with sequential thought. The right hemispheric child must have concrete experience. He perceives through the senses by doing, touching, and moving. Since feelings and emotions are in the right hemisphere, when these children are asked to retell a story they may seem to exaggerate, in our terms, but they are just being themselves. These children are intuitive; that is, the answers come to them out of no where and they are usually unable to explain how they arrived at the answer. These children have difficulty expressing themselves, and often try to change the environment to meet their needs. The right-brained child has no sense of time. That's why he usually does not complete his work on time.

**Yellin, (in Griffin 1985)** show that children that are right-brained can meet success in a curriculum that uses the holistic or right-brained approach to learning. This approach to learning takes into consideration the physical, the emotional and the cognitive abilities which not only educate the right brain but the left brain as well). So, if curricula were redesigned fit the brain processes then fewer children would suffer failure due to instructional strategies that do not take hemispheric specialization into consideration.

Even though education and society are not enthused over the holistic approach, they must be made to realize the importance of this method. The holistic approach is greatly concerned with the children who are experiencing difficulties understanding new concepts that are introduced in the school settings. Utilization of the right-brained approach to learning will strengthen the right hemisphere and possibly create a more intelligent being.

**Dianne (1983)** conducted a study on hemispheric dominance patterns and reading achievement. Investigation was made to (1) accumulate researcher visual, auditory, and kinesthetic left and right hemispheric reading behaviors and to (2) determine if modality-specific brain dominance patterns were related to reading achievement. From previous research similar numbers of left and right hemispheric reading behaviours were accumulated implying the importance of each hemisphere to reading. When 346 right handed, seven and eight year old children's reading achievement was compared using ANOVA statistical design to eight varied modality-specific hemispheric dominance patterns, the following resulted (1) neither children with predominantly left nor right hemispheric dominance patterns were significantly greater in achievement (2) children with crossed dominance patterns were weaker in achievements than children with unilateral dominance of either hemisphere, and (3) children , comprising 8.7% of the sample who were right handed with heavy left handed latency and who were more right ear dominant, had significantly lower reading achievement at the 0.21 level using F-test measures than any other hemispheric pattern. Typically, though statistically no longer as significant, these pupils were also visually dominant with their left eye creating a double crossed dominance with their left eye creating a double crossed dominance between left eye and right hand ear and left handed latency.

**Arambula (1984)** conducted a study on cerebral hemisphericity and its relationship to academic achievement, sex and career preference of high school and mathematics students. This study was undertaken to help assess the need for such restructuring by teaching different sections of a high school biology class (N=83) for one academic quarter term, using methods based upon right-and left-hemisphere capabilities. Supplemental data were gathered by means of analyzing high school students (N=101)

hemisphericity scores in relationship to their scores on a standardized science achievement test, and by surveying students (n=990) in northern Illinois high schools in efforts to determine whether or not hemispheric cognitive style could be related with sex or preferred college major. Hemisphericity of students was determined using Torrance's Your Style of Learning and Thinking hemisphericity questionnaire. Results indicated that, at least for the mostly white, middle socioeconomic class population of high school students from which study samples were drawn, there is a significant relationship between most of the variables. None of the main effects of instructional method, brain dominance, or sex, considered alone, affected a significant difference in student achievement. However, two-way interactions between all three of the independent variables did result in significant increases in student achievement. Implications of this study for education are discussed, with cautions that such studies must be replicated with similar as well as with different populations before definitive conclusions regarding educational restructuring can be drawn.

**Griffin (1985)** conducted a study on right brain . The purpose of this study is to show that instructional methods designed for right-brained students will make a significant difference in the reading achievement scores of the students when compared with the scores of right-brained sixth grade students not receiving these instructional methods. The subject were sixth grade students who use the right hemisphere of the brain to a greater degree than the left hemisphere. The subjects cerebral preference was determined by a test known as the Cerebral Preference Index (CPI). Ten students each were chosen from two sixth grade classes. The study consisted of a Control Group and Experimental Group received eight weeks of instructional strategies that take hemispheric specialization into consideration. The results indicated that there was no significant difference in the reading achievement scores of those students who received the instructional methods designed for right brained students. The analysis of data did suggest that those scoring high on the pre-test scored high on the post test. The results indicated the same outcome for low scores.

**Stellern; et. al. (1986)** conducted a study on hemispheric dominance of native American Indian students. Native American Indians are presumed to be right hemisphere dominant, and therefore need special teaching techniques. This study examined the language and

spatial lateralization of American Indian students by means of the cognitive-manual dual task model as well as psycho educational assessment technique. The results indicated that the Indian students were lateralized to the left hemisphere for spatial function. Also, as scores went up on test of right hemisphere dominance, behavior problems, and spatial function, scores went down on tests of reading, spelling, left hemisphere dominance, and being a good student. Two major conclusions are that the Indian students of this study were not right hemisphere dominant, and that right hemisphere dominance appears to be associated with a risk of learning and behaviour problems.

**Albaili (1993)** Conducted a study on inferred hemispheric thinking styles, gender, and academic major among united Arab Emirates college students. To examine the relationships between the inferred hemispheric thinking style, gender, and academic major, 190 undergraduate men and women in social science and applied science classes were administered the Your Style of Learning and Thinking to assess their thinking styles. Although endorsements of an integrated style were highest for all subjects, analysis indicated men tended to endorse the right-hemisphere style items in processing information more than women, while the latter tended to endorse items of an integrated style in processing information. Applied science majors appeared to endorse items of a more right-hemisphere style in processing information than social science majors. These results were discussed in view of contemporary biological, psychosocial and educational perspective.

**Leng; et.al. (1998)** conducted a study on different brain functioning profiles among adolescents mathematics achievers. The study compares the brain functioning profiles among the adolescent mathematics achievers, namely the high, above average, average, and low. A total number of 1340 sixteen and seventeen year old Singapore adolescents mathematics achievers from 17 secondary were surveyed. Students performances in the right (A) or left (P) brain functioning tasks were directly related to their mathematics achievement. A and P scores increased with increasing mathematics achievement. There was significant difference among the four mathematics achievement groups in their performances of both the right (A) and left (P) brain functioning tasks. Regardless of achievement groups, all the mathematics achievers had a left cognitive profile. The

higher their mathematics achievement, the more left was the cognitive profile. There was a tendency towards the right cognitive profile among the low and average mathematics achievers.

**Gadzell (1999)** conducted a study on differences among cognitive processing styles groups on personality traits. Differences among cognitive processing styles (hemispheric dominance) group on personality traits were investigated. From responses to the Human Information Processing Survey, (HIPS), 17 students were identified using primarily the left hemispheric mode in processing information, 19 students the right hemispheric mode, and 19 students the integrated mode (both left and right hemispheric modes). Responses to the eight second order 16 PF scales showed significant personality trait differences among the three groups. The left hemispheric group had better leadership qualities than the right hemispheric group, more self-control than the right and integrated groups, and more anxiety than the integrated group. The right hemispheric group showed more extraversion and independence than the left hemispheric group and more anxiety than the integrated group. The integrated hemispheric group showed more extraversion and independence and better leadership skills than the left hemispheric group, and more self-control and better adjustment and leadership skills than the right group.

**Zhang (2000)** conducted a study on are thinking styles and personality types related. The relationship between thinking types is investigated within the contexts of Sternberg's theory of mental self-government and Holland's theory of personality types. A total of 600 university students from Hong Kong responded to the Thinking Styles Inventory (TSI) and the Short-version Self-directed Search (SVSDS) that was specially designed for the present study. A major finding of this study is that thinking styles and personality types overlap to a degree. A secondary finding is that the SVSDS is sufficiently reliable and valid for assessing Holland's personality types.

**Zhang (2001)** conducted a study on thinking styles, self-esteem, and extracurricular experiences. This study had two objectives. The first was to examine the relationship between thinking styles and self-esteem. The second objective was to investigate the relationship of the participants' extracurricular experience to both thinking styles and self-esteem. Seven-hundred and ninety-four university students from Hong Kong participated

in the study. Participants responded to the Thinking Styles Inventory (Sternberg & Wagner, 1992) and the Self-Esteem Inventory (Adult Form, Coppersmith, 1981) as well as to a questionnaire designed to elicit both personal and situational characteristics. It was found that thinking styles and self-esteem are statically related. Meanwhile both thinking styles and self-esteem are statistically related to the participants extracurricular experience. Implications of these findings for teachers are discussed.

**Leng and Tin (2002)** conducted a study on Singapore adolescents also got style. Brain functioning in relation to hemisphericity or cerebral dominance is one of the newest elements of the psychological domain of learning style research. Brain researchers yield evidence to support brain asymmetry that the two sides of the brain are different and that our mental abilities are lateralized. The performance bias towards the left-brain functioning tasks (verbal, sequential, analytic, symbolic, abstract, temporal, digital, logical and linear) or the right-brain functioning tasks (visual, spatial, holistic, intuitive, synthetic, and non-verbal) becomes a measure of hemisphericity. The above results reveal that individual and group adolescent students differ in their learning styles. In short, they think, learn, perceive, and process information differently. However, in the brain functioning domain, there is a certain trend in the students, cognitive profiles that will enable the researcher to predict their achievement level. Students with a tendency towards right brain functioning, favouring visual-spatial skills, is at greater risk for poor academic achievement. An integrated brain functioning profile with high performance scores in both the right and left-brain functioning task is usually associated with high academic achievement.

**Zhang (2002)** conducted a study on thinking styles: Their relationship with modes of thinking and academic performance. This study aimed at investigating the nature of thinking styles as described in the theory of mental self government. Method : Students from three research universities in the United State (One from California, one from Low, and one from Texas) Participated in the study. Among the 212 participants, 85 were male students and 126 were female students (one participant did not indicate gender). The ages of participants ranged from 17 to 50, with a mean age of 22 years. The participants were studying in a variety of academic fields, including arts, business, education, medicine,

science, and social sciences. There were 83 freshmen, 15 sophomores, 33 juniors, 56 seniors, and 23 graduate students (two participants did not report their academic year). Findings : The three thinking styles explained 10% of variance in the data over and above what is contributed by self-rated abilities. (ii) The liberal and global thinking styles negatively contributed to achievement, and that the conservative thinking style positively contributed to achievement.

**Van der Jagt; et.al. (2003)** conducted a study on hemisphericity modes, learning styles, and environmental preferences of students in an introduction to special education course. It was the purpose of this study to determine if a selected sample of preservice teachers had different brain hemispheric processing modes, learning styles, and environmental preferences. The population for this study was 89 students enrolled in an undergraduate introductory special education course at a doctoral level university in Florida. Forty-four (44) of the students were selected using a systematic random sampling procedure to participate as subjects. Between subjects (e.g., Gender, Ethnicity, Predominant Geographic Area, Laterality, and Major) and within-subjects (e.g., PEPS Environmental Preferences) designs were used to conduct the study. Dependent variables included the subjects Hemispheric Mode Indicator, Learning Style Inventory, and Productivity Environmental Preference Survey findings and selected responses on a researcher developed questionnaire. SPSS/PC+7.5 descriptive and inferential statistical procedures were used to analyze the data. Null hypotheses were tested at the .05 alpha level. Results indicated that subjects had different hemisphericity modes, preferred left and right processing and their hemisphericity was associated with their predominant geographic area urbanities preferred right mode processing while suburbanites preferred left). Subjects also had different learning styles, tended to be assimilators, accommodators, and convergers, but their learning styles were not associated with their gender, ethnicity, predominant geographic area, laterality, and major. Finally, subjects had different environmental preferences (e.g., noise level), and gender, ethnicity, and laterality affected these preferences.

**Sidtis (2004)** conducted a study on when only the right hemisphere is left: Studies in language and communication. An adult of above normal intelligence, BL underwent left

hemispherectomy at age five, and subsequently graduated from college and has been regularly employed. Using standardized neuropsychological instruments, previous extensive testing had revealed optimal performance for a hemispherectomized subject. To probe communicative abilities in greater detail, and to examine current questions about linguistic superiority of the left hemisphere and “crowding” of right hemisphere function, 12 additional protocols were administered. BL performed at normal or above on nearly all protocols. However, performance on production of phonemically complex words was effortful, and deficits were seen on two tests requiring comprehension of linguistic contrasts in prosody (Linguistic Prosody Test) and syntax (the Active-Passive Test). These findings support previous claims of reduced ability in specific, circumscribed linguistic functions in the left hemispherectomized person, and lead to suggestion for further testing of communicative competence in individuals with a single intact hemisphere.

**Yeung; Read and Schmid (2005)** conducted a study on students learning styles and academic performance in first year chemistry. Many factors influence students learning such factors include (but are not limited to) students learning style preferences, their interest in the material under study, and the learning environment. A student's learning style preference refers to the way they respond to stimuli in a learning context, and to their characteristic way of acquiring and using information. These learning styles recognize that individuals learn in different ways, and thus that the students in any course will place a variety of different interpretations onto their lessons (Bailey and Garrat 2002). Felder (1993) reported that alignment between students learning styles and an instructor's teaching style leads to better recall and understanding, as well as to more positive post-course attitudes. Since learning style preferences vary between students, the most effective mode of instruction will also vary. Furthermore, it has been reported that teachings most effective when it caters for a range of learning styles, in part because occasionally having to learn in a less preferred style helps to broaden student's range of skills (Felder and Dietz 2002). If any consideration is to be given to accommodating student's learning style preferences within a student cohort must be known. This paper reports the distribution of learning styles amongst first year chemistry students at the University of Sydney, and investigates the relationship between academic performance in

the end of semester examination and these styles. Some of the implications of these findings for teaching and learning are also discussed.

**Fabbri; et.al. (2007)** conducted a study on circadian typology and style of thinking differences. The purpose of the present study aims to investigate the relationship between circadian typology and learning-thinking styles conceptualized as a preference toward information processing typical of the right vs. the left cerebral hemisphere. A sample of 1254 undergraduates (380 boys and 874 girls; mean age =21.86±2.37,) was administered the reduced version of the Morningness-Eveningness Questionnaire (r-MEQ), which detects three chronotypes (morning-, intermediate- or evening-types), and the Style of Learning And Thinking (SOLAT) questionnaire, conceived as a tool to measure the tendency toward the right-, integrated-, and left thinking. A two-way ANOVA on SOLAT scores with morning-types scored higher in the left-thinking scale than intermediate- and evening-types, and that evening-types obtained significant higher scores for right-thinking styles than intermediate- and morning-types. This circadian typology effect was also confirmed by multiple regression.

**Alves; et.al. (2008)** conducted a study on models of brain asymmetry in emotional processing. Two models of brain asymmetry in emotional processing were reviewed: the right hemisphere and the valence hypotheses. The first states a dominant role for the right hemisphere in emotional processing, whereas the second assumes that the left hemisphere is dominant for positive emotions and the right hemisphere for negative ones. Different methods, such as the divided visual field technique, have supported both hypotheses. The amygdale and the prefrontal cortex are presented as important structures involved on brain asymmetry in emotional processing. The paper ends pointing out new perspectives for the study of the neural substrates of different components of emotions.

**Aripin; et.al. (2008)** conducted a study on students learning styles and academic performance. The objectives of this study are to ascertain the dominant learning styles of the students and to discover the relationship between learning styles and academic performance. The subjects (672) of this study were semester students undergoing various preparatory programs at INTEC. Cluster analysis was used to pigment the subjects into clusters of similar characteristics in terms of learning styles, while discriminate analysis

was used to understand the characteristics of the resulting clusters better. Even though there is no strong correlation can be concluded between learning styles and academic performance, there is an indication that those who are more participative tend to perform better academically at the end of their first semester at INTEC. There is also an indication that high independent learners (ignoring the level of the others learning styles) are more likely to achieve better grades than those who are not.

**Warn (2009)** conducted a study on students' learning style and their academic achievement for taxation course-A. This paper asserts to determine if there is any difference in the students' learning style for subjects with different assessment orientation (theoretical verses computational) and if there is any association between students' learning style and their academic performance in two final year subjects, with and without controlling for their previous academic achievement, Kolb's (1976) Learning Style Inventory (LSI) was used to gauge the learning style of the final year accounting students of an institute of higher learning. The students were required to complete two sets of LSI questionnaires in relation to two final year subjects with different final assessment orientation, such as Malaysian Taxation which is mainly computational oriented and Financial Strategy which is mainly theoretical oriented. The students' final examination results for both subjects were extracted for study of its association with their learning style. Students' learning style is "Converger" dominant for Malaysian Taxation subject, but it's "Accomodator" dominant for Financial Strategy subject. As such, there is a difference between learning style for subject with different assessment orientation. However, there is no significant association between the students' learning style and their academic performance, with or without controlling for their previous academic achievement. Future research could consider combining learning style with some other factors, such as study strategy, and test their association with the academic performance.

### **2.2.2 Studies Conducted in India:**

**Verma (1997)** conducted a study on learning style preference of intellectually gifted adolescents and implications for instruction. The present study examines whether intellectually gifted adolescents exhibit certain learning style preferences. Objectives To find out the difference in preference of intellectually gifted adolescents from flexible vs.

non-flexible; individualistic vs. non –flexible; individualistic vs. nonindividualistic; visual vs. aural; field-independent vs. field dependent; short attention span vs. long attention span; motivation centred vs. motivation non-centred and environment oriented vs. environment free learning styles. Methodology: Initially 560 subjects of both the sexes studying in Class XI in 14 government senior secondary schools of Delhi were selected by random method. Thereafter, 30 students were identified as intellectually gifted on the basis of administration of a verbal test of general mental ability. Tools used to collect the data were the General Mental Ability Test (Hindi Version) developed by Joshi and Learning Style Inventory by Agarwal. The collected data were analyzed using chi-square. Findings - It was found that intellectually gifted adolescents as a group, had preference for individualistic, flexible, visual, field-independent long attention span, motivation centered and environment oriented learning styles over non-individualistic, non-flexible, aural, field-dependent, short attention span motivation non-centered and environment free learning style, respectively.

**Mishra (2000)** conducted a study on students learning styles across the academic streams. The present study aims at analyzing the differences in learning styles among students belonging to various streams like arts, science and commerce in the Indian context. Through random sampling technique 285 students equally distributed over three academic streams (i.e. arts, science and commerce) were selected. For the present study, learning styles was treated as dependent variable and academic streams as independent variable. In order to measure the learning styles of the subjects. “Learning Styles Inventory” of Agarwal (1983) and adapted by Panigrahi (1993) in oriya was used. For the analysis of data. Chi-square technique was applied. The results indicted that there was some relationship between learning styles and academic streams.

**Mohanasundaram and Kumar (2000)** conducted a study on hemisphericity and achievement of class XI students studying history in higher secondary school. To find out the significant difference, if any, in achievement in history of higher secondary students with right, left and integrated hemisphere dominance and find out the correlation, if any, between hemisphericity and achievement of higher secondary students in history. Descriptive normative survey method was adopted in the study. A Sample of

300 students studying History at Class IX in Higher Secondary schools in Thanjavur District in Tamil Nadu, using stratified random sampling technique was adopted for the study. The tools used were style of learning and thinking test and achievement. Findings - There was significant difference in achievement between the students with right and integrated hemisphere dominance. There was no significant difference in achievement in history between the students with left and right and left and integrated hemisphere dominance. There was significant correlation between right and integrated hemisphere dominance and achievement in history of the students. It is inferred that achievement is higher in students with right hemisphere dominance than the integrated hemisphere dominance. The study suggested for further study that by activating the right hemisphere of the brain, the achievement of the students in history subject can be improved. It can be implemented in other subjects also. The study cites ten references.

**Verma, S. (2001)**, “Learning styles, study-habits and study involvement across academic streams.” The study was undertaken to find out the difference in learning styles, study habits and study involvement of senior secondary women students of science, arts and commerce streams. The sample comprised of 180 subjects, 60 from each of the three streams. The data were collected through Grasha-Riechmann’s students Learning style Scale, Patel’s Study Habits Inventory and Asha Bhatnagar’s Study Involvement Inventory. The results obtained through ‘t’ test revealed that stream differences were found for three learning styles (dependent, competitive, and avoidant), study habits and study involvement.

**Singh (2005)** conducted a study on learning styles of high school students in relation to their self concept. The present study is related to see the relationship between learning style preferences and self-concept of urban and rural boys & girls. It was found that self-concept was positively related with flexible, non-individualistic, long attention span and motivation learning style preferences whereas self-concept level was negatively with non-flexible, individualistic, short and need motivation central learning styles.

**Malathi and Malini (2006)** conducted a study on learning style in higher secondary students of Tamil Nadu. The purpose of the study to find out the learning style of students in Classes XI and XII and find out the relationship of learning style with

achievement of students. To see the learning style of higher secondary students in terms of their sex, classes and type of school. The sample consisted 160 higher secondary students from private and government schools. The tools used in this study for data collections were Felder's Learning Style Inventory by Barbara A. Soloman. Cronbach's alpha test. And 't' test was used for data analysis. Findings – The learning style of higher secondary students was found to be good and there was no significant difference in the learning style of higher secondary students in terms of their class and type of school. There was significant difference in the learning style between boys and girls studying in higher secondary schools and the correlation in higher between learning style and achievement which indicates at higher the achievement scores, the better the learning styles among higher secondary students. The study cites twelve references.

**Ali (2007)** conducted a study on association between brain Hemisphericity, learning styles and confidence in using graphics calculator for mathematics.” This paper presents the preliminary results of a study conducted to investigate the differences in brain hemisphericity and learning styles on students' confidence in using the graphics calculator (GC) to learn mathematics. Data were collected from a sample of 44 undergraduate mathematics students in Malaysia using Brain-Dominance Questionnaire, Index of Learning style Inventory, and Confidence in Using GC to Learn Mathematics Questionnaire. Statistical analysis revealed that the sample differ significantly in their hemispheric preference and learning styles. In addition, sequential global and sensing - intuitive learning styles were found to associate significantly with brain hemisphericity. However, there was no significant association between brain hemisphericity with gender, race, and program of study. Finally, the study also revealed that GC confidence ratings are not significantly different across brain hemisphericity as well as learning styles.

**Kalpana and Mridula (2007)** conducted a study on styles of learning and thinking. The objective of the study to measure right hemisphere for information processing in children. Method : The sample consists of 250 students of class VII which included both boys and girls from five schools. Findings : There was significant difference in the right and left (brain) hemisphere preference for information processing among children and that boys were more right hemispheric oriented and girls were more left hemispheric oriented in

information processing. Significant difference in the styles of learning and thinking and concept preference among right hemisphere and left hemisphere dominant children was also observed with respect to both gender.

**Garg and Gakhar (2009)** conducted a study on explaining academic achievement in secondary teacher training program through distance mode. The study was designed to identify the factors/variables which may best predict their academic performance teacher trainees in distance education. It would provide an insight to strengthen the teacher education programme through distance mode. A sample of 200 distance teacher trainees was extracted from the 500 trainees enrolled in B.Ed. at Department of Correspondence studies, Punjab University (PU) Chandigarh during session 2004-05. For selecting sample of the trainees in distance mode, random sampling technique was adopted. Findings - Among distance teacher trainees, a significant correlation has been observed between left-hemispheric learning styles and academic performance learning styles and academic performance at B.Ed. level as reflected by marks in theory papers ( $r_1 = .143, p < 0.5$ ), skill in teaching ( $r_2 = .243, p < .01$ ) and overall academic performance ( $r_3 = .160, p < .05$ ). This indicates that trainees in distance education, who employ left-brained learning styles i.e. prefer verbal and structured content, and use convergent approach for learning are in the academics (In terms marks obtained). In other words, greater is the use of left hemisphere in learning higher is the academic achievement.

**Gafoor (2010)** conducted a study on relationship of thinking style with physics achievement among higher secondary students of Kerala. This study examined whether thinking styles that favour short-term and long-term achievement in science are different, among senior secondary students in Kerala ( $n = 617$ ). The hypothesis that type I thinking (legislative, judicial, global and liberal styles) favours long-term but not short-term achievement and type II thinking (executive, local, monarchic, and conservative styles) favours short-term but not long-term achievement' could be accepted only partially. Legislative (among girls) and judicial (among boys) styles contribute to long-term achievement and executive (boys) style is unfavourable to long-term achievement. However, local style is favourable and global styles has negative influence on short-term and long-term achievement of girls and long-term achievement of boys.

**Madhvi and Ramnathkishan (2010)** conducted a study on hemisphericity dominance among children and their academic performance. The objective of the study to find out the hemisphericity dominance and academic performance of boys and girls. A total of 60 students were selected as the sample. Among them, 30 students were boys and the remaining 30 were girls. From among thirty subject, the mothers of 15 students were working and 15 others were non working in both the cases i.e. boys and girls. It can be concluded that according to hypothesis-I, the subjects are likely to make use of both the hemispheres. Further, it can be concluded that the mother's working or non-working nature is unlikely to affect the children's academic performance has been proved contrary to the results. It can also be concluded that the girls are more likely to perform better than the boys.

**Mohanasundaram and Kumaran (2011)** conducted a study on cognitive progress, hemisphericity and personality of teacher trainees of B.Ed. Course. To find out the correlation, if any, between cognitive process and hemisphericity and personality of the teacher trainees and find out the interaction, effects, if any, of sex and locality, sex and subject and sex and management on cognitive process of teacher trainees. Descriptive normative survey method and quantitative approach was adopted for the study. A sample of 654 teacher trainees of B.Ed. using probability sampling method was taken. The tools used in the study were the cognitive process test, SOLAT test and Scale of Introversion-Extroversion. Findings -There was significant relationship between the cognitive process and sex, locality and management. The women teacher trainees are at a higher level than the men teacher trainees; the urban teacher trainees are at a higher level than the rural teacher trainees; the teacher trainees studying in the government colleges of education are at a higher level than the teacher trainees studying in the private colleges of education in their cognitive process. There was significant relationship between cognitive process and hemisphere dominance. The right hemisphere dominant teacher trainees are at a higher level than the left hemisphere dominant teacher trainees in their cognitive process. There was significant relationship between cognitive process and personality types. The extrovert teacher trainees are at a higher level than the ambivert teacher trainees in their cognitive process. There was no interaction of sex and locality, sex and subject of

specialization and sex and management of the colleges of education on cognitive process of the teacher trainees. Fourteen reference were included in the study.

**Venkataraman (2012)** conducted a study on judgement of students' emotional actions in relation to their brain dominance. The main objective of the study is to judge the emotional actions on seeing photographs in relations to hemisphericity dominance of students. The study is contemplated to identify which type of brain dominance activates more in judging various types of emotional actions. The study is about judgment of emotional actions by the students on seeing photographs in relation to their hemisphericity dominance. The style of learning and thinking tool devised by the investigator was administered on 100 boys and 100 girls of tenth standard, to identify their brain dominance. After identification of the students' brain dominance, photographs depicting various emotions were given to the students. The students were asked to identify the type of emotions from each photograph. Identification of various types of emotions observed from the photograph by the students in relation to their brain dominance was analyzed applying the statistical technique. The analysis indicated that the students belonging to right brain dominance are able to discriminate various types of emotions correctly than the other brain dominants.

## **2.3 STUDY RELATED TO COGNITIVE FACTORS**

### **2.3.1 ACADEMIC ACHIEVEMENT**

Academic achievement has become an index of student's future in the competitive world. Now a days students are becoming more career minded. In order to develop and identify in the society, they are becoming more and more concerned about their academic achievement. Students academic achievement differ from each other due to the various factors like gender, parents education, occupation, type of family, socio-economic status parental relationship and self concept affects the students academic achievement. Thus, the studies pertaining to some of these factors were reviewed and presented below:

### 2.3.1.1 Studies Conducted Abroad

**Maqsud (1991)** in his study shows relationships between Socio-economic Status, Locus of Control, Self-Concept, and Academic Achievement of Batswana Adolescents. Relationships between socio-economic status, locus of control, and academic achievement were explored in secondary school pupils in the Mahatho area of Bophuthatswana (Southern Africa). The analyses of data revealed the following: (a) both male and female Batswana adolescents were found significantly more externally oriented when compared against the normative data provided by NowickiStrickland (1973), (b) Socio-economic status was significantly positively associated with internality, self-concept, and academic achievement in English: (c) Externality was significantly negatively related to self- concept and achievement in English; (d) Self-concept was significantly positively correlated to measures of achievement in English and Mathematics and (e) Mathematics achievement of male students was significantly higher than female ones.

**Bempechat (1992)** conducted a study on the role of parent involvement in children's academic achievement. This paper examines research on parent involvement in their children's education by exploring socialization patterns that foster high achievement and describing the structure and effectiveness of parent involvement programs in this country. As will be shown, most parents, educators, and educational administrators are very much in favor of involving parents in children's learning. However, there is little consensus on which specific behaviour are likely to maximize children's achievement.

**Hinshaw (1992)** researched on externalizing behavior problems and academic under achievement in childhood and adolescent with causal relationships and underlying mechanisms. Reviews conceptual and measurement issues surrounding externalizing behavior problems and academic under achievement, the strength and specificity of the co-variation between these domains, and the viability of explanatory models that link these areas. In childhood, lack of attention and hyperactivity are strongly correlated to academic problems than aggression however, anti social behavior and delinquency by adolescents are clearly associated with under achievement. Whereas investigations with designs that allow accurate causal inference are scarce, unidirectional paths from one

domain to the other have received little support. The overlap of externalizing problems with cognitive and readiness deficits early in development suggests the influence of antecedent variables. Low socio-economic status (SES), family adversity, sub average IQ, language deficits, and neuro development delays are explored as possible underlying factors.

**Gonzales (1996)** gave effects on family, peer and neighborhood influences on Academic Achievement among African--American adolescents using a one year prospective design. This study examined the influence of family status variables (family income, parental education, family structure), parenting variables (material support and restrictive control), peer support, and neighborhood risk on the school performance of 120 African American junior high school students. In addition to main effects of these variables, neighborhood risk was examined as a moderator of the effects of parenting and peer support performance as indexed by self-reported grade point average. Maternal support as indexed by self-reported grade point average. Maternal support at Time 1 was prospectively related to adolescent grades at Time 2. Neighborhood risk was related to lower grades, while peer support predicted better grades in the prospective analyses. Neighborhood risk and peer also moderated the effects of maternal restrictive control and peer support on adolescent grads in prospective analyses.

**Ximyin (1997)** conducted a relation between academic achievement and social adjustment from Chinese children. A sample of children in Shanghai, P.R. China, initially aged 10 and 12 years, participated in this 2-years longitudinal project. Information on academic achievement and indexes of social adjustment, including social competence, aggression, social inhibition, leadership and peer acceptance was collected from multiple sources. It was found that academic achievement predicted children's social competence and peer acceptance. In turn, children's social functioning and adjustment, including social competence, aggression-disruption, leadership, and peer acceptance, uniquely contributed to academic achievement.

**Roeser (1998)** shows academic and emotional functioning in early adolescence with longitudinal relations, patterns, and prediction by experience in middle school. Adopting a motivational perspective on adolescent development, these studies examined the

longitudinal relations between early adolescents' school motivation (competence beliefs and values), achievement, emotional functioning (depressive symptoms and anger), and middle school perceptions using both variable and person centered analytic techniques. Data were collected from 1041 adolescents and their parents at the beginning of seventh and the end of eighth grade in middle school. Adolescents' perceptions of the middle school learning environment (support for competence and autonomy, quality of relationships with teachers) predicted their eighth grade motivation, achievement and emotional functioning after accounting for demographic and prior adjustment measures.

**Aunola (2000)** researched on parenting styles and adolescents achievement strategies. The aim of study was to investigate the extent to which adolescents achievement strategies are associated with ten parenting styles they experience in their families. Three hundred and fifty-four 14- years old adolescents completed a strategy and attribution questionnaire and a family parenting style inventory. Analogous questionnaires were also completed by the adolescents' parents. Based on adolescents report of the parenting styles, four types of families were identified: those with Authoritative, Authoritarian, Permissive, and Neglectful parenting styles. The results further showed that adolescents from authoritative families applied most adaptive achievement strategies characterized by low levels of failure expectations, taskirrelevant behaviour and passivity, and the use of self-enhancing attributions. Adolescents from neglectful families, in turn, applied maladaptive strategies characterized by high levels of task-irrelevant behaviour, passivity and a lack of selfenhancing attributions. The results provide a basis for understanding some of the processes by which parenting styles may influence adolescents academic achievement and performance.

**Barriga (2002)** shows relationship between problem behaviors and academic achievement in adolescents in relation with the unique role of attention problems. Numerous studies have documented relationship between a variety of problems, behaviors and academic achievement measures. However, the results of these studies should be interpreted cautiously, given the considerable co morbidity of problem behavior that often exists among school-age youth. This study addressed the relationship between 8 teachers reported problem behaviour syndromes (withdrawal, somatic

complaints, anxiety depression, social problems, thought problems, attention problems, delinquent behaviour, aggressive behaviour) and standardized measures of academic achievement (overall, reading, spelling arithmetic, performance). The sample comprised 41 boys and 17 girls ages 11 to 19 years ( $M=15.02$   $SD=1.90$ ) enrolled in an alternative school. Although withdrawn, somatic complaints, delinquent behaviour, and aggressive behavior syndromes exhibited significant zero-order correlations with the academic achievement measures, each of these relationships was mediated by attention problems. A post hoc analysis suggested that the observed association between attention problems and academic achievement was primarily due to the inattention component of the syndrome rather than the hyperactivity/impulsivity component.

**Park and Bauer (2002)** conducted a study on parenting practices, ethnicity, socioeconomic status and academic achievement in adolescents. This study was concerned with the relationship between parenting practices and academic achievement of high school students. A sample of 873 Asian Americans, 1449 Hispanics, 1176 African Americans and 8292 European Americans was selected from the first follow-up (1990) and second follow-up (1992) of the National Educational Longitudinal Study (NELS). Analysis of variance (ANOVA), hierarchical and stepwise multiple regression were employed to determine the extent to which parenting practice predicts academic achievement. The results of the study showed that European Americans are more authoritative than other ethnic groups, but the relationship between having an authoritative parenting style and student academic achievement is supported only for the majority group.

**McPherson(2004)** conducted a study on parenting behavior adolescent depression, alcohol use, tobacco use, and academic performance. This study examines the relationship of role parenting behaviours and adolescents depression in adolescent outcomes. Parenting behaviors considered were authoritative parenting, parental monitoring and parental care. Adolescent outcomes considered were depression, alcohol use, tobacco use, and grades. A path model was employed to examine these variables together. A sample of ( $n=3,174$ ) of 9th-12th grade high school students from seven contiguous counties in rural Virginia were examined on these variables. Authoritative

parenting predicted adolescent alcohol use and grades and parental care only predicted adolescent depression. Logistical regression revealed gender difference with parental care, authoritative parenting and male and female alcohol use and grads. Our findings suggest that parental care and authoritative parenting predict different outcomes in male and female adolescents.

**Johnson (2005)** conducted a study on students alienation, academic achievement , and web CT use. The current investigation sought to understand the relationships between college student's alienation, academic achievement and use of webCT. Fifty-three students enrolled in an undergraduate educational psychology course provided three types of data : 1) Self-rating of eight Likert scale alienation items, 2) Academic achievement measured with four types of multiple choice questions evaluating mastery of course content, and 3) use of webCT defined as total number of Hits, Articles Posted, and Articles Read. Learning alienation demonstrated an inverse relation to academic achievement. In most cases, significant predictive relationship between academic achievement and student use of webCT were curvilinear.

**Kaplan, Liu and Kaplan (2005)** conducted a study about school related stress in early adolescence and academic performance three years later: the conditional influence of self expression. The hypothesis was tested that educational expectations of junior high school students in interaction with school-related stress during early adolescents would adversely affect grades during high school. Multiple regression analyses of data from home interviews of 1034 students during junior high school and 3 years later during high school supported the hypothesis that early adolescents school related stress both independently and in interaction with high academic expectations negatively affected academic performance 3 years later. These results suggest that for students in high stress school environments, an increase in academic expectations may serve to increase their school related stress and impede their academic performance.

**Lazaratou (2005)** shows Sleep problem in adolescence A study of senior high school students in Greece. The aim of this study was to evaluate sleep habits and sleep-related problems in high school adolescents students in Greece through the Athens insomnia scale and to assess the relation of these problems to demographic and other variables.

Methods- The Athens insomnia Scale 5- items version (AIS-5) was administered to 713 adolescent senior high school students in the Greater Athens area. Data such as age, sex, school records, and time spent per week in school related and extracurricular activities were collected. Results- The sample's mean sleep duration was 7.5 h mean bedtime 00.20 a.m. and wake-up-time 7.15 a.m. Total sleep time was not affected by gender, but was influenced by item spend in various activities. Sleep complaints were related to delayed sleep, onset latency and insufficient total duration of sleep. Of the respondents, 30 % estimated that their sleep onset latency was markedly delayed and 30% reported that their total sleep time was markedly insufficient. Girls complained more the boys, while correlations showed that students with lower academic performance and those in second grade were more likely to have higher AIS-5 scores.

**Martin (2005)** conducted a study on perceived academic performance, self-esteem and locus of control of indicators of need for assessment of adolescent suicide risk: implications for teachers. There is currently a need for research into indicators that could be used by non-clinical professionals working with young people, to inform the need for referral for further clinical assessment of those at risk of suicide. Participants of this repeated measures longitudinal study, were 2603, 2485, and 2246 school students aged 13, 14 and 15, respectively, from 27 South Australian Schools. Perceived academic performance, self-esteem and locus of control are significantly associated with suicidality. Further, logistic regression of longitudinal results suggests that perceived academic performance, over the above self-esteem and locus of control, in some instances, is a good long-term predictor of suicidality.

**Rivkin (2005)** conducted a study on teachers, schools and academic achievement. This paper disentangles the impact of schools and teacher sin influencing achievement with special attention given to the potential problems of omitted or mismeasured variables and of students and school selection. Unique matched panel data from the UTD Texas Schools Project permit the identification of teacher quality based on student's performance along with the impact of specific, measured components of teachers and schools. Semi parametric lower bound estimates of the variance in teacher quality based entirely on within-school heterogeneity indicate that teachers have powerful effects on

reading and mathematics achievement, though little of the variation in teacher quality is explained by observable characteristics such as education or experience. The results suggest that the effects of a costly ten student reduction in class size are smaller than the benefit of moving one standard deviation up the teacher quality distribution, highlighting the importance of teacher effectiveness in the determination of school quality.

**Farmer (2006)** conducted a study on school adjustment and the academic success of rural African American early adolescents in the deep south.” This study examined the relationship between end-of-year grads and the academic, behavioural and social characteristics of rural African American youth. Participants included 392 7th and 8th grade students from 2 rural middle schools in the south. Participants were African American and were from 2 communities that have child poverty rates exceeding 50% for public school students. Girls were more likely to have positive characteristics than boys. Academic, behavioral, and social difficulties were linked to low end-of-year grades and positive characteristics were linked to high grades. Implications for supporting low-achieving African American students from low-communities are discussed.

**Marquer, et.al. (2006)** conducted a study relating emotional intelligence to social competence and academic achievement in high school students. This study investigated the discriminant, criterion and incremental validity of an ability measure of emotional intelligence (EI). As predicted, the MSCEIT was discriminable from well established measure of personality and intelligence. The test was also moderately related to social competence and predicted student’s final grade. Most of the findings remained significant after personality and academic intelligence were statistically controlled. The potential utility of EI in the context of academic institutions is discussed.

**Adeniyi (2008)** shows five variables as predictor of academic achievement among school going adolescents. This study explored the composite and individual contribution of five variables (child, family, school, society and government) in predicting the academic achievement of students in Ibadan city of Oyo State. The participants were 200 senior secondary school (the SS2) students randomly selected from five secondary schools in Ibadan metropolis of Oyo State. Their age ranged between 16 and 21 years with a mean age of 17.04 and standard deviation of 2.01. The participants comprised 110 boys and 90

girls. A validated instrument, namely Academic Performance Five factor Inventory (AP5-FI) was used to collect data. Correlations and multiple regressions were used to analyse the data. The results showed that the five variables compositely predicted academic performance of students. They also revealed that the factor resident in the child uniquely predicted academic performance of the respondent than did other factors.

**Gibb, et.al. (2008)** in his study on gender differences in educational achievement to age 25. Gender differences in educational achievement were examined in a cohort of 14265 individuals studies from birth to age 25. There was a small but pervasive tendency for females to score better than males on standardized tests and to achieve more school and post-school qualifications. The differences could not be explained by differences in cognitive ability as males and females had more prone to inattentive, restless and distractible behaviours and aggressive, antisocial and oppositional behaviours than females. When the association between gender and measures of educational achievement were adjusted for teacher ratings of classroom behaviour the gender differences were reduce substantially. These results suggest that one approach to reducing gender differences in educational achievement lies in improving classroom behaviour.

**Caro (2009)** in his study on socio-economic status and academic achievement trajectories from childhood to adolescence. Although a positive relationship between socio-economic status and academic achievement is well established, how it varies with age is not. This article uses four data points from Canada's National Longitudinal Study of Children and Youth (NLSCY) to examine how the academic achievement gap attributed to SES changes from childhood to adolescence (ages 7 to 15). Estimates of panel data and hierarchical linear models indicate that the gap remains fairly stable from the age of 7 to 11 years and widens at an increasing rate from the age of 11 to the age of 15 years. Theoretical arguments and policy implications surrounding these findings are discussed.

**Joseph (2009)** conducted a study on influence of family size and family birth order on academic performance of adolescents in higher institution. The study sought to find out the influence of family size and family birth order on academic attainment of adolescents in higher institution. The sample comprised of 102 pre-degree students of University of

Ado-Ekiti, Nigeria. The population of pre-degree students was 1000, including males and females. Survey method was used to elicit information from the subjects. Experts in tests and measurement guidance and counseling validated the self constructed questionnaire while, test re-test method was employed in establishing reliability for the instrument. The reliability coefficient was 0.69; this was considered higher enough for the study. The data collected as subjected to statistical tests, specifically Analysis of variance (ANOVA). The analysis of the data showed that family size and birth order have no influence on academic performance of pre-degree students of the Univesity of Ado-Ekiti, Nigeria.

**Sun (2009)** conducted a study on post divorce family stability and changes in adolescents' academic performance a growth –curve model. Three waves of panel data from 7897 adolescents in the National Education Longitudinal Studies have been used to investigate whether a stabilized postdivorce family environment benefits adolescents' academic performance trajectories. The analyses indicate that compared with peers who grow up in stable postdivorce families. Children of divorce who experience additional family transitions during late adolescence make less progress in their math and social studies performance over time. Furthermore, family resource differences before and during late adolescents either partially or completely account for the less positive performance trajectories in two types of divorced families. Finally, daughters in unstable postdivorce families appear to make less academic progress over time than sons. The study illustrates the importance of incorporating both postdivorce family transitions and repeatedly measured child outcomes in the investigation of divorce effects. **Asikhia (2010)** in his study on students and teacher's perception of the causes of poor academic performance in Orgun state secondary schools (Nigeria): implications for Counseling for National Development. The study examined the perception of students and teachers on the causes of poor academic performance among secondary school students in Ogun State, Nigeria. Subjects for the study were one hundred and thirty five (135) students and fifty (50) teachers randomly drawn from five secondary school sin Odogbolu Local Government Area of Ogun State. Questionnaire was used to collect relevant data for the study. Percentages and chi-square were used to analyse the research questions. Responses of teachers showed that teachers qualification and students environment do not influence students' poor performance but teachers methods of teaching influence poor academic

performance. Students response on the other hand showed that while teachers qualification and students environment influence students poor performance, teachers method of teaching and learning materials do not. The implications of these findings for secondary school guidance counselors interested in counseling adolescents for good academic performance were discussed.

**Naderi, et.al. (2010)** conducted a study on relationship between creativity and academic achievement: a study of gender differences. The objective of this research is to examine if a relationship exists between creativity and academic achievement and if the relationship differs between males and females. Two research questions are examined in this paper (1) what is the relationship between different aspects of creativity and academic achievement? (2) is there any significant gender differences regarding the relationship between different aspects of creativity and academic achievement? Participants (N=153; male =105 and females=48) completed creativity test. Cumulative grade point average (CGPA) was used to select the participants. Creativity was measured using the Khatena-Torrance Creative Perception Inventory (KTCPI). Pearson Correlation analysis indicated that aspects of creativity are related to academic achievement for both male sand females.

**Okoh (2010)** conducted a study on Influence of age, financial status and gender on academic performance among undergraduates. This study examines the influence of age, financial status and gender on Academic Performance among undergraduate. To guide this study, one question was asked and three hypotheses were formulated and tested 0.05 level of significance. The design is correlational and simple random sampling was used to select sample size of 175 respondents. The instrument used for this study has face and content validity. Cronbach alpha was used to obtain reliability coefficient of 0.84. In addition to the instrument, the cumulative grade point average (CGPA)of the respondents was collected from the departmental office and marched with the names of the respondents. The findings of the study reveal that gender, age and fiancé are not significant predictors of academic performance. There was no significant difference in academic performance based on age, gender and financial status. It was recommended that counseling centers should open to handle varying problems confronting students irrespective of age, financial status or gender.

**Synder, et.al. (2010)** conducted a study on impact of a social-emotional and character development program on School-level indicators of academic achievement, absenteeism, and disciplinary outcomes: a matched-pair, cluster randomized, controlled trial. This paper reports the effects of a comprehensive elementary school based social emotional and character education program on school-level achievement, absenteeism, and disciplinary outcomes utilizing a matched-pair, cluster randomized, controlled design. The Positive Action Hawaii trial included 20 racially/ethnically diverse schools (mean enrollment=544) and was conducted from the 2002-3 through the 2005-06 academic years. Using school level archival data, analyses comparing change from baseline (2002) to one-year post trial ((2007) revealed that intervention schools scored 9.8% better on the Terra Nova (2nd ed.) test for reading and 8.8% on math; 20.7% better in Hawaii I Content and Performance Standards scores for reading and 51.4% better in math; and that intervention schools reported 15.2% lower absenteeism and fewer suspensions (72.6%) and retentions (72.7%). Overall, effect sizes were moderate to large (range 0.5-1.1) for all of the examined outcomes. Sensitivity analyses using permutation models and random-intercept growth curve models substantiated results. The results provide evidence that a comprehensive school based program, specifically developed to target student behaviour and character, can positively influence school-level achievement, attendance, and disciplinary outcomes concurrently.

**Lacour and Tissington (2011)** shows the effects of poverty on academic achievement. Poverty, which forms a specific culture and way of life, is a growing issue in the United States . The number of Americans living in poverty is continually increasing. Poverty indicates the extent to which an individual does with resources. Resources can include financial, emotional, mental, spiritual, and physical resources as well as support systems, relationships, role models, and knowledge of hidden rules. Poverty directly affects academic achievement due to the lack of resources available for student success. Low achievement is closely correlated with lack of resources, and numerous studies have documented the correlation between low socioeconomic status and low achievement. Several strategies exist to assist teachers in closing the poverty achievement gap for students.

**Busair (2012)** conducted a study on evaluating the relationship between Gender, Age, Depression and academic performances among adolescents. Depression is said to have a relationship with academic performance. Thus, the purpose of the study was to investigate the relationship between age, depression and academic performance among adolescents. The study was carried out among 1200 students (600 male and 600 females) in the age range 15-19 years. The instrument used for data collection was the Beck depression inventory (21 item BDI). The analysis of data used correlation coefficient and t-test. The results showed that 26.5% of the boys and 30.7% of the girls were depressed and that depression and academic performance were significantly correlated ( $r=0.25$ ,  $p<0.000$ ). In addition there was significant difference of academic performance between male and female, ( $t(1)=-5.51$ ,  $p=0.000$ ). It is recommended that along with academic performance, mental health be developed in school settings using support strategies such as educational guidance and counseling, teaching life skill programs and psychotherapy.

#### **2.3.1.2 Studies Conducted in India:**

**Bhatnager (1969)** conducted a study of some EPPS variables as factors of academic achievement relating 6 EPPS personality variables to the academic achievement of 261 high schools after controlling the effects of socio-economic status, intelligence, school differences, and age differences. It was found that the relationship between personality and achievement is tied with age levels, intelligence, and specificity of academic achievement. The research concluded that the EPPS (Hindi) variables do contribute to academic achievement, but differently at different levels of age and intelligence and for different types of academic achievement, e.g. arts and science achievement.

**Jain and Parmar (2010)** conducted a study on impact of parental counseling on students academic outcomes. The present study aims to investigate the impact of parental counseling on academic outcomes of students. Sample included 80 students and 40 parents from Vidya Bhawan Public School, Udaipur. Pre and Post experimental design was used. Analysis of co-variance confirmed the significance of parental counseling in school student's academic outcomes. The study has implication for practice and provides empirical support for creating school structure that would foster parents' continued interest and engagement in their children's education.

**Adsul and Kamble (2011)** conducted a study on geographical disparity among scheduled caste students on academic self concept, academic stress and academic achievement. The purpose of this study is to find out the disparity among the scheduled caste students from Konkan and Western Maharashtra about academic self concept, academic stress and academic achievement. 600 students was selected by quota sampling method from Western Maharashtra (n=300) and Konkan region (n=300). These students were enrolled in B.A., B.Com. and B.Sc. faculty. Data was obtained through Academic Stress Scale and Academic Self Concept scale, as well as academic achievement scores was collected through the result ledgers of college. Data was analyzed through t test. Results show that students from Western Maharashtra and Konkan region are significantly differ on academic self concept, academic stress, and academic achievement.

**Asthana (2011)** conducted a study on self-concept, mental ability and scholastic achievement secondary school students of Varanasi. The present study was conducted on a sample of 300 (150 M, 150 F) students of secondary education from Varanasi, with a view to assess gender difference in scholastic achievement, to find out relation of self-concept and mental ability with scholastic achievement, and to ascertain whether self-concept moderates the relationship of mental ability and scholastic achievement. Obtained data were analyzed with the help of t-test, coefficient of correlation (r) and moderated regression analysis. Findings revealed that there was a significant difference in male and female students regarding their scholastic achievement. Girls were better than boys in academic performance. Mental ability and self-concept were positively and significantly related to scholastic achievement Moderated regression analysis as well as subgroup analysis revealed that relationship between mental ability and scholastic achievement is moderated by self-concept.

**Bala, et .al. (2011)** conducted a study on home variables and academic achievement of adolescents. The present study was planned to study the effect of three of these variables viz. parent-child conflicts, education and economic status of parents on academic achievement of adolescents. The sample of 306 students was selected for this study. Parent-Child conflict scale by Gupta 2003 was used to measure the conflicts. To collect

data related to parents' education and income, background information sheet was used. The result of 8th class was taken as the academic achievement scores. The study revealed that parent child conflict decreases the academic achievement of adolescents but there was no significant difference in academic achievement due to different level of conflict. Further academic achievement of adolescents having parents who have high education and high income is more than that of having low education and low income.

**Chawla; et.al. (2011)** conducted a study on general intelligence, emotional intelligence and scholastic achievement of commerce 10+1 Grade students. An investigation was carried out to find out the correlation among General Intelligence, Emotional Intelligence, and Scholastic Achievement of 180 students of 10+1 grade of commerce in two English medium senior secondary schools of Punjab district. It was observed that there were significant positive correlations between General Intelligence and Scholastic Achievement, Emotional Intelligence and Scholastic Achievement and the high and low score achievers were equally correlated with General Intelligence and Emotional Intelligence; there was significant negative correlation between General Intelligence and Emotional Intelligence.

**Farzana (2011)** in her study about impact of birth order on academic achievement of high school students. The present study attempts to study the impact of birth order on academic achievement of high school students. To meet the objective, required data were collected from 600 Class 10 students drawn from 20 high schools of Chittoor district in Andhra Pradesh. The Birth Order was inquired from the subjects and noted down. The families with three children were taken into account. The marks obtained subject-wise by the students in Class 9 is the dependent variable, that is, Academic Achievement. The obtained data has been treated statistically by using Means, Standard Deviations, ANOVA and t-test. From the results it is concluded that Birth Order does not have significant impact on the performance of students.

**Hemamalini (2011)** conducted a study on anxiety and academic achievement of high school students of Mysore city. In this study an attempt has been made to find the relationship between anxiety and the academic achievement of high School (300 students) students of Mysore city. The sample was selected through stratified random

sampling technique. Data was collected by using standardized Anxiety Scale. A significant negative relationship was found between Anxiety and Academic Achievement of high school students. The study revealed that both very high and very low anxiety levels lead to low academic achievement among high school students.

**Mokashi, Yadav and Khadi (2011)** conducted a research on relationship between anxiety and scholastic achievement of residential school students. The study was conducted on 330 students comprising of 165 boys and 165 girls, from two residential schools, Marks obtained in the previous final examination were considered for assessing scholastic achievement and Cattle's anxiety scale was used to measure anxiety. The results revealed that the students were in their anxiety and also in scholastic achievement. Boys were significantly higher than girls' anxiety while girls were higher in scholastic achievement. Majority of them had development a high level of self-sentiment, ego-weakness, suspiciousness, guilt-proneness and frustration-tension. A significant negative relationship was observed between lack of self-sentiment anxiety with the scholastic achievement.

**Raju and Samiullah (2011)** conducted a study on impact of parental involvement on academic achievement of VII standard students. An attempt was made in the present investigation to study the impact of parental involvement on academic achievement also to establish whether there was any significant difference in the academic achievement of students studying in government and private schools. Parental involvement and type of management were the independent variables and academic achievement is the dependent variable of the study. A simple two group design is employed. 150 students both boys and girls studying in government and private schools constituted the sample of the Study. It was hypothesized that parental involvement and type of management would significantly affect the academic achievement of the pupils. The marks obtained by the students in their annual examinations constituted the dependent variable scores. 'T' test was employed to study the significant difference in the Academic Achievement of students with low parental involvement and high parental involvement and students studying in government and private schools. The result revealed that students with high parental involvement had shown better Academic Achievement compared to students

with low parental involvement. There was no significant difference in the Academic Achievement of the students studying in government and private schools.

**Sadanandam and Lourdusany (2011)** in their study show parental influence on academic achievement of higher secondary students. In this study, the investigators, among other findings, find a significant relationship between scholastic performance of students and parental influence though there was no significant relationship between scholastic performance of students and their parenting, family and school relationship.

**Sharma, et.al. (2011)** conducted a study on prediction of different streams in academic achievement through verbal and non-verbal intelligence tests. The relationship among different educational streams and intelligence test viz. verbal and nonverbal was studied. A sample of 200 boys and girls of +1 class from different schools of Shimla was tested on SPM and GMAT together with their scores on different subjects. SPM was found to be the best correlate of mathematics and science subjects, whereas, GMAT correlated best with language and social sciences subjects, whereas, GMAT correlated best with language and social sciences irrespective of the gender. An interesting observation was the superiority of males on SPM, mathematics and science i.e. the practical mechanical aspect of general ability and female's dominance on GMAT, language and social sciences i.e. the verbal-educational aspect of general ability.

**Shelly (2011)** shows relationship among personality traits approaches to learning, study skills and academic achievement of Pharmacy students. The aim of the present study was to examine the relationship between professional students' personality traits, as measured by Goldberg's international personality item pool and approaches to learning, as measured by Entwistle's approaches and study skills inventory for students (ASSIST-2000) and academic achievement. Subjects were 600 pharmacy students of Punjab. The finding indicates that intellect trait predicted the deep learning approach and the emotional stability trait negatively predicted the surface learning approach. As expected, both deep learning approach and strategic learning approach were positively associated with academic performance whereas the surface learning approach negatively predicted achievement.

**Singh and Misra (2011)** in their study show promoting academic competence in school adolescents: Results of 15 day life style intervention programme. There has been paucity of theory-based life styles intervention to improve academic competence among school adolescents. Therefore present study examined the effect of life style intervention programme (LSIP) introduced through a psycho-educational programme on academic competence in a sample (N=100) of students in a residential school located at Mankapur, Gonda in Uttar Pradesh, India. Academic competence (AC) was evaluated through a self-report measure. The results indicated that adolescents who participated in a 15-day LSIP reported of increased AC. Also some of the aspects significant for academic performance (i.e. self esteem anxiety, depression, optimism) as secondary outcomes were also assessed. The findings have implications for life style education efforts in implications for life style education efforts in school, which could have a major impact on the academic performance of students.

**Singh and Thukral (2011)** conducted a study on emotional maturity and academic achievement of high school students. The present study was designed to investigate the relationship of Emotional Maturity with Academic Achievement of high school students and also to see the sex and regional differences on the basis of their emotional maturity. The study was conducted over a sample of 400 (200 boys and 200 girls) high school students studying in X class in 8 different schools (4 urban and 4 rural) affiliated to Scale was used to measure Emotional Maturity and the aggregate score of the selected students in the board examinations was taken to show their level of academic achievement. The results revealed that there exists no significant relationship between emotional maturity and academic achievement. No significant differences were observed between boys and girls as well as Rural and Urban students on the basis of their emotional maturity.

**Sudhamani (2011)** researched on effectiveness of semester schemes on secondary school students influence on academic performance. The department of public instruction, Government of Karnataka, has introduced the semester scheme for classes I-IX and non-semester scheme for Class X or SSLC since 2004. Accordingly, the schools across the state educate pupil in semester scheme for Classes I-IX and for Class X in non-semester

scheme. The scheme was introduced to lessen the school-related problems like burden of academic stress on pupils, examination fear, failures leading to detriment from mainstream, students' psychological problems like depression, fear psychosis, inferiority complex, and poverty-related problems. The semester scheme of evaluation focused on learner-centered education through remedial teaching programs awarding grades instead of marks and special identification of slow learners and learning gaps amongst them. Pupils would be taught, tutored and trained in this scheme and promoted to non-semester scheme in Class X. A pupils learning attitude from the semester scheme to achievement attainment in SSLC Class X becomes important, as it counts for school effectiveness. The school effectiveness depends on the results of Class-X. In this study, the researchers attempted to reveal the impact of semester scheme and Class X performance in terms of school effectiveness. Results indicated that there was no difference in performance of students from semester and non-semester scheme. It is clear that students required more reasoning ability and retention ability at the secondary level education.

**Azmi and Ansari (2012)** conducted a study on influence of self-concept and psychological well being on academic performance. The present deliberation is aimed to see the influence of self concept and psychological wellbeing on academic performance. For this purpose a sample group of 10th standard of school boys and girls (N=300) were chosen and the tests were administered on these students. A self concept measure developed by Ahluwalia (1986) was used for tapping informance regarding students' perception pertaining to their self concept. For measuring psychological wellbeing, a scale developed by Bhogle and Prakash (1995) was used and the academic performance the results of the students for the last three consecutive years were taken and the average of these were obtained for determining students' performance level. Adopting 2 x 2 factorial designs. Two way ANVOA was run by using SPSS Package. The obtained results have clearly indicated that pattern of influence of self concepts and psychological wellbeing independently as well as in conjunction thereof. Having run this statistics, it was found that both the independent variables have their significant influence on academic performance but intersectional effect of both independent variables was not found statistically significant.

**Jan and Malik (2012)** shows social problems of adolescents students of earthquake affected areas of district Baramulla with reference to academic achievement.” This study was undertaken to study the social problems of adolescent students of earthquake affected areas of District Baramulla with reference to academic achievement in Jammu and Kashmir. The investigator took two hundred (200) adolescent students (100 male and females) reading in 9th and 10th grades as sample for the study. Nadeem and Ahanger’s (2001) Urdu adaptation of California test of personality (CTP) for the measurement of social problems was administered. The analysis of the data revealed that the male adolescents’ students of earthquake affected areas and female adolescents students of earthquake affected areas of Uri (District Baramulla, Jammu and Kashmir) differ from each other on certain dimensions of social adjustment like social standards, family relations, school relations and community relations. It was found that female adolescent students were socially well adjusted than male adolescent students of earthquake affected areas of Uri (District Baramulla). Correlation between various dimensions of social adjustment and academic achievement of male and female adolescents students were found positive and significant.

**Khan and Shrivastava (2012)** conducted a study on significance of metacognition in academic achievement. The study was conducted on a sample of 100, studies purposively draw from Maharaja College, Chhattarpur (M.P.) Metacognition inventory (M.C.I.) constructed by Dr. Punita Govil (2003) was used to assess the metacognitive level of the sample. Sample was divided into two G1 and G2. G1 were the students who were received more than 65% in their senior secondary class and G2 students acquired less than 55%. Results reveal that there is significant effect of metacognition on academic performance. Students’ performance increased with the level of metacognition. Metacognition enables a person not only to plan out administer or regulate a task that it also helps in when, which strategy is to be used for a tusk. On gender wise comparison, it was found that there was no difference between groups on the basis of gender but the scores differ with the performance in academics. Hence, it the students are instructed to increase their metacognitive level with the help of experts; an increase in academics can also be seen.

**Kochargaonkar and Chandak (2012)** shows comparative study of academic performance and personality between students of KFI and Non-KFI residential schools. School plays a very important role in the academic development of children. The impact of school environment is seen in the academic performance as well as the personality of the students. The present study analysis the performance of the residential students of Krishnamurthi Foundation India (KFI) and NON-KFI schools vis-à-vis their personality and academic dimensions. The sample population was selected from IXth and Xth standard students from two KFI schools and two non-FKI schools. The sample size was 155 for each category of schools. The data was analyzed by applying Mean, S.D. and t-test to compare the personality and academic performance of two groups of students. The biographical format and MDAPS were administered in a session of 45 to 50 minutes from each school. The results revealed a significant difference in the personality between the two studied groups. The mean values showed that the KFI school environment assists in the development of the students' personality. It was also concluded that, the KFI School environment and its unique pedagogy are best suited for the development of the students.

**Raju and Raddy (2012)** conducted a study on effect of personal factors on scholastic achievement of class IX students in physical sciences. The study explored the relationship between students personal factors (sex, religion, caste, locality, economic position) with their achievement in physical sciences. A science achievement test was developed by the investigators. The sample for this study was 14 to 15 years old students from four educational divisions of Chittoor district of Andhra Pradesh. The results revealed that sex and caste had significant influence on scholastic achievement of class IX students in physical sciences but religion, locality and economic position had no significant influence.

**Sood (2012)** researched on need for academic achievement and socio-demographic variables of high school students of Kullu and Manali Districts (India). The present study was undertaken to study the need for n-achievement (achievement motivation) among high school students in relation to their academic achievement and certain socio-demographic factors like gender, family type and residential background. A sample of 300 high school students (studying in Class IX) was selected from 15 high senior school

of Kullu and Manali districts of Himachal Pradesh by following systematic random sampling technique. In order to collect the requisite data, Achievement motivation inventory by Prayag Mehta (1969) was administered. Data were analyzed by applying descriptive statistics (Mean, S.D. and Two-way ANOVA (2 x 2) factorial design). The result revealed that n-achievement positively and significantly affected academic achievement of high school students. The students with high n-achievement possessed significantly higher academic achievement as compared to students with average or low n-achievement. Girls were found to be have significantly higher n-achievement in comparison to boys. However, no significant differences in n-achievement were found among rural and urban students as well as students belonging to nuclear and joint type of families. Although, the students residing in urban areas and those belonging to joint type of families have shown higher n-achievement than their counterparts. The respective mean differences were not significant statistically.

### **2.3.2 EMOTIONAL INTELLIGENCE**

Emotional intelligence (EI) is the capability of individuals to recognize their own, and other people's emotions, to discern between different feelings and label them appropriately, to use emotional information to guide thinking and behavior, and to manage and/or adjust emotions to adapt environments or achieve one's goal. Thus, the studies pertaining to some of these factors were reviewed and presented below:

#### **2.3.2.1 Studies Conducted Abroad:**

**George (2000)** suggested if EI is associated with an enhanced ability to use positive emotions by accurately perceiving how subordinates feel and also understanding their needs, then high EI leaders can influence these subordinates to support the goals of the leader and organization.

**Nada Salem, Abisamra, (2000)** in the research study, The Relationship between Emotional Intelligence and Academic Achievement in Eleventh Grade formed a hypothesis- There will be no significant relationship between emotional intelligence and academic achievement in eleventh grader. The sample will be 500 eleventh grader boys and girls from public and private schools. The sample were given the Bar On Emotional

Quotient Inventory. On the basis of eleventh graders' last/second semester marks high and low achievers were selected. It was concluded that there is a relationship between emotional intelligence and academic achievement. Hence the null hypothesis was rejected.

**Van Der Zee et al (2002)** found that Personality was a better Predictor of academic success relative to EI. However they did observe that EI was able to account for a small portion of the variance.

**Barchrd (2003)** conducted a study why does emotional intelligence assist in the prediction of academic success. Some authors have claimed that emotional intelligence predicts success at work, at school, and in relationships. As well as or better than IQ. Little research exists to support or refute this claim at present. In this study, the ability of emotional intelligence to predict academic achievement was examined in a sample of undergraduate psychology students, using year-end grades as the criterion. The predictive validity of emotional intelligence was compared with the predictive validity of traditional cognitive abilities and the Big Five dimensions of personality. In addition, the incremental predictive validity of each of these three domains was assessed. In this setting, only some measures of Emotional Intelligence predicted academic success, and none of these measures showed incremental predictive validity for academic success over and above cognitive and personality variables. It may be that the overlap between many emotional intelligence measures and traditional measures of intelligence and personality limits their incremental predictive validity in this context.

**Mandell and Pherwani (2003)** conducting a small study consisting of 13 male and 19 female managers in mid-to large-size companies, with the goal of examining gender difference in the relationship between EI and transformational leadership. The researchers found that female were significantly higher in EI than males, but there was no gender difference when comparing the relationship between EI and transformational leadership.

**Parker, et.al. (2004)** conducted a study on academic achievement in high school: does Emotional intelligence matter? The relationship between emotional intelligence and

academic achievement in high school was examined. Students (N=67) attending a high school in Huntsville, Alabama completed the emotional quotient inventory (Eqi:YV). At the end of the academic year the Eq-i:YV data was matched with students academic records for the year. When EQ-i:YY variables were compared in groups who had achieved very different levels of academic success (highly successful students, moderately successful, and less successful based on grade-point-average for the year), academic success was strongly associated with several dimensions of emotional intelligence. Results are discussed in the context of the importance of emotional and social competency on academic achievement.

**Petrides (2004)** conducted a study on the role of trait emotional intelligence in academic performance and deviant behavior at school. The aim of this study is to evaluate a series of hypotheses concerning the potential role of trait EI in academic performance and in deviant behavior at school. Method: Questionnaire data were collected from 901 pupils. Completed were available for about 650 of them, although the actual sample size varies depending on the variables involved in the various analyses. Approximately 52% participants were males and 48% females. All participants were year 11 pupils in British secondary education (Mean age approximately 16.5 years). Findings: I Trait EI was differentially associated with the educational subjects considered in this study. Thus, it had no considerable influence on maths or science performance, but it moderated the effect of IQ on English and overall GCSE performance. There are two distinct processes through which trait EI may bear on academic achievement. The present findings suggest that trait EI is relevant to scholastic achievement and deviant behaviour at school especially for disadvantaged and vulnerable adolescents.

**Bastian and Burns (2005)** in their study shows emotional intelligence predicts life skills, but not as well as personality and cognitive abilities. Emotional intelligence (EI) is held to explain how emotions advance life goals. While different theories of EI have been proposed there is still controversy about how EI should be conceptualized and measured. It is agreed, however, that EI's relevance depends on it being able to predict significant outcomes. A study of 246 predominantly first year tertiary students investigated relationship between EI and a number of life skills (academic achievement, life

satisfaction, anxiety, problem-solving and coping). Correlations between EI and academic achievement were small and not statistically significant, although higher EI was correlated with higher life satisfaction, better perceived problem-solving and coping ability and lower anxiety. However, after controlling for the influence of personality and cognitive abilities, shared variance between EI and life skills was 6% or less.

**Elias (2005)** conducted a study on the connection between academic and socialemotional learning. The study examined the impact of emotional intelligence (EI) on the successful transition from high school to university. The short form of the emotional quotient inventory (EQ-i) was completed by 14726 first-year students attending four different universities within the first week of classes (September). At the end of the academic year (May), the students cumulative GPA was used to identify two groups of students: academically successful (i.e., GPA of 3.0 or better; n=590) and academically unsuccessful (i.e., GPA of less than 2.0; n=289) students. Results revealed that academically successful students had significantly higher levels of several different emotional and social competencies. These findings suggest that emotional intelligence plays an important role in the successful transition from high school to university.

**Parker, et.al. (2005)** researched on academic achievement and emotional intelligence: Predicting the successful transition from high school to university. The study examined the impact of emotional intelligence (EI) on the successful transition from high school to university. The sample consists of 879 students academically successful (590) and academically unsuccessful (289). Findings: Academically successful students had significantly higher levels of several different emotional and social competencies. These findings suggest that emotional intelligence plays an important role in the successful transition from high school to university.

**Marquez, et al. (2006)** conducted a study on relating emotional intelligence to social competence and academic achievement in high school students. The study investigates the discriminant, criterion and incremental validity of an ability measure of emotional intelligence, high school students. Method : Analyses are based on Spanish participants (n=77, 38 females, 39 males). Who were students 4 ESO (last year of the obligatory secondary education) in a semi private high school in Cadiz, Spain. The students between

14 to 17 years old ( $M=15.03$ ,  $S.D.=.70$ ) and most came from middle class families. Findings: The present research provided support for the relationship between EI and prosocial/maladaptive behavior and academic achievement in a sample of high school students in Spain. This study examined relations between EI and important social and academic outcomes for high school students. The results support the incremental validity of EI and provide positive indications of importance of EI in adolescents academic and social development. Students with high EI tended to be more prosocial and perform better in school.

**Qualter and Gardner (2007)** conducted a study on emotional intelligence: Review of research and educational implications. This article provides a critical review of the research field of emotional intelligence (EI) and examines the usefulness of the construct in the debate on educational policy and practice. The authors examine two approaches to the theory and measurement of EI and summarize the evidence linking EI to life success and academic achievement. Also considered is whether or not EI can be changed or developed, and how it might be facilitated in educational practice. In conclusion, while a distinct construct of EI remains debatable; many of the attributes encompassed by this term do predict that life success and programmes of socio-emotional learning in schools may usefully contribute to the development of these attributes.

**Adeyemo (2008)** conducted a study on measured influence of emotional intelligence and some demographic characteristics on academic self-efficacy of distance learners. This study examined the influence of emotional intelligence, gender and age on the academic self-efficacy of distance learners. The participants were 320 distance learners 150 males and 170 females. Two valid and reliable instruments namely, emotional intelligence questionnaire and academic self-efficacy scale were administered on the participants. Pearson product moment correlation, Multiple regression analysis and t-test statistics were used to analyse data. The results show that emotional intelligence, gender and age were vital factors in academic self-efficacy of distance learners. Significant difference was also found between the academic self-efficacy of male and female participants.

**Manley (2009)** shows emotional intelligence and academic achievement: What relevance and implications does this psychological construct called emotional intelligence have for

education in New Zealand? To investigate the current thinking around the development of EI that promotes both social competence and intellectual growth with in students. Methodology: Professional reading concurrent with emotional intelligence interviews with principles and leaders in this field, Collect information and write up finding. Findings: Academic achievement with EI does not indicate future success. EI is important in the world of education and also in society in general. The corporate world is recruiting leaders who display EI. Research shows strong links between EI and social well being. Children who have an understanding of the role that emotions play in their life will have a better foundation on which to build successful futures. The practice of reflective thinking is a powerful tool in bringing about understanding, competency and mastery into one's life. Studies undertaken shows that those who have emotional literacy are better able to handle personal relationship.

**Ogundokun and Adeyemo (2010)** conducted a study on emotional intelligence and Academic achievement: The Moderating Influence of Age, intrinsic and extrinsic motivation. The study examined the moderating influence of emotional intelligence age and academic motivation on academic achievement of secondary school students. The study adopted a survey research dosing. The participants in the study were 1563 (male =826, females 737) secondary school students from Oyo state, Nigeria. Their age ranged between 12 years and 17 years with mean age of 15.96 years. Two valid and reliable instruments were used to assess emotional intelligence and academic motivation while achievement test on English language and Mathematics were used as a measure of academic achievement. Descriptive statistics, Perason's product moment correlation and hierarchical regression were used to analyse the data. The results revealed that Emotional Intelligence, Age and Academic Motivation were potent predictors medley associated to academic achievement. The study has implications for the curriculum developers to integrate emotional intelligence into the school curriculum of secondary school. That teachers, counseling and educational psychologists should encourage the development of a strong achievement motivation in the students through the provision of appropriate counseling intervention programme and enabling environment. By so doing, the academic performance of the students could be improved barring all other teaching-learning obstacles.

### **2.3.2.2 Studies Conducted in India:**

**Dash and Beher (2004)** conduct a study on a conceptual analysis of emotional intelligence and its relevance. Education is as old as the human race. Since the very dawn of civilization, it has been regarded as essential concomitant of all human societies. So, it should be updated according to the need of the society as well as the individual. In this connection the Kothari Commission (1964) reported that yesterday's education system cannot satisfy the present need and even less so, tomorrow's need. To meet the present need, the education of the youth should be changed from the world of school to the world of work and life. Perhaps today's education system badly give any guarantee for a successful life. Education in the contemporary society is not mere acquisition of bookish knowledge, but in fact interaction between the teacher and the pupil, knowledge, understanding and handing the emotions in the right manner, at the right time, in the right way. Our past experiences and experiments clearly delineate that even a person with a high intellect cannot be always successful. But why is it so? This vacuum is realized over the years. Many psychologists and educationists have been trying to bridge the gap between the success and discomfiture caused by head (value) and heart (devalue) not only in India but all over the world. Psychologists Mayer, et. al. (1989) came with an answer by introducing the concept of emotional intelligence, though it was referred by various names-from smartness and personality to soft skills and competence.

**Devi and Rayalu (2005)** conducted a study on relationship between emotional intelligence and intellectual abilities of adolescents. The present study is an attempt to examine the relationship between emotional intelligence and intellectual abilities of adolescents. Two hundred Students studying Junior and Senior intermediate course constituted the sample. Emotional intelligence inventory developed and standardized by Uma Devi (2003) was used to find out emotional intelligence levels of adolescents. An intellectual ability of adolescents was measured by using Raven's standard progressives matrices (1992). Results of the study revealed that the total emotional intelligence and viz. intellectuals abilities were significantly and positively related to each component. It is also interesting to note that intellectual abilities was positively and significantly related to intra personal subscale, one of the five subscales of emotional intelligence. It is

surprising to note that only two out of fifteen dimensions of emotional intelligence- empathy and optimism were positively and significantly related to intellectual abilities.

**Devi and Rayulu (2005)** conducted a study on levels of emotional intelligence of adolescent boys and girls – A comparative study. The present study was taken up to understand the emotional intelligence levels of adolescents of 15+ to 18+ years by using the emotional intelligence inventory developed by the investigator. Sample consisted of 224 adolescents (112 boys and 112 girls) selected from coeducational junior colleges located in Hyderabad city. Results revealed that majority of the boys and girls fell in to an average and above on emotional intelligence levels. Significant difference was noticed in interpersonal skill component of boys and girls favouring girls. Results on dimension wise emotional intelligence showed that girls surpass boys on self awareness, empathy, social responsibility and problem solving. Adolescent boys and girls did show similar scores on other 11 dimensions of emotional intelligence and on total emotional intelligence levels. It is interesting to note that younger adolescents were high on interpersonal skills than older adolescents. It is surprising to note that group of study did not show any relationship on emotional intelligence levels of adolescents.

**Pareek, Mittal, Hingar and Kaur (2005)** conducted a study on enhancing emotional intelligence and enriching meaning in life: An intervention study. The study was conducted to evaluate the effect of “Basic Human Process Laboratory” course in enhancing emotional intelligence and enriching meaning in life. Eight subjects participating in this course, who volunteered themselves for psychological assessment, comprised the sample. Results revealed the significant improvement in post mean scores of overall emotional intelligence and its components like self awareness, self management, internality I optimism and empathy, except motivation and social skills. Pre and post mean scores of purpose in life also differed significantly showing enhanced meaning in life of the subject. Study advocated the view point that the EI is a set of abilities like emotional understanding, regulation and utilization rather than a personality trait. It is claimed as a learned behaviour and thus can be improved upon. Study highlights the importance of intervention programmes in enhancing emotional Intelligence and thereby promoting meaning and quality of life intra and inter personally.

**Uma and Devi (2005)** in their study show relationship between the dimensions of emotional intelligence of adolescents' and selected personal social variables. The present study was taken up to examine the relationship between the dimensions of emotional Intelligence and selected social variables. The sample comprised of 120 parents and their children between the age ranges of 15-17 years from the city of Visakhapatnam. Emotional intelligence inventory developed by Uma Devi (2003) was used to find out the emotional Intelligence levels of the adolescents. Results revealed that the parental (mother's and father's) education, occupation has significant and positive relationship with the dimensions of emotional intelligence like social regard, social responsibility, impulse control and optimism. It is interesting to note that in the child related variables child's education, gender and birth order were significantly related social regard, social responsibility, stress tolerance and happiness dimensions of emotional intelligence.

**Shrivastava and Mukhopadhyay (2009)** conducted a study on alienation and emotional intelligence of adolescents with internalizing symptoms. Present investigation has assessed the levels of alienation and emotional intelligence of adolescents with internalizing symptoms. Multi-dimensional assessment of personality (form-t) test was used as screening tool in the first phase. Total 510 adolescents in the age group of 14-18 years studying in various schools of Varanasi were screened for internalizing symptoms. Those who scored above the cut-off point were identified as the "affected group" having internalizing symptoms showing more than 6 symptoms, the sample showing 4-5 symptoms as "moderate group", sample showing 1-2 symptoms as "mild group" and adolescents without internalizing symptoms were identified as "normal group". Students Alienation Scale and Mangal Emotional Intelligence Inventory were then administered on all the four groups each having 15 subjects for the final study. The result obtained from ANOVA revealed that the affected group is significantly alienated and emotionally immature in awareness and management compared to their comparative normal group.

**Malhotra and Kaur (2011)** show relationship of emotional intelligence with physical and mental health of adolescents. The present study examined the relationship of emotional intelligence (EI), with somatic complaints, anxiety, and depression. The sample comprised of 120 participants (50 boys and 50 girls) aged 12-18 years from

Patiala district. The participants were assessed by emotional intelligence scale (MSEIS) which evaluates optimism/mood regulation, utilization of emotions, appraisal of emotions and social skills. Physical and mental health of adolescents was evaluated by child behavior checklist with focus on somatic complaints, anxiety and depression. It was hypothesized that EI would be negatively associated with physical and mental health functioning. The results showed that EI was negatively and significantly related to somatic complaints and depression. The results provided further support on the claims that there is a relationship between EI and health functioning. The findings are discussed in the context of importance of EI on physical and mental health, while implications for practice and directions for future research are proposed.

**Sood and Anand (2011)** conducted a study on emotional intelligence of senior secondary school students in relation to certain socio-demographic variables. The main aim of the present investigation is to study the emotional intelligence of senior secondary school in relation to certain socio-demographic variables. In addition, the relationship of emotional intelligence with academic achievement has also been explored. For realizing these objectives, a representative sample of 463 senior secondary school students was selected from Mandi, Bilaspur and Hamirpur district of Himachal Pradesh by employing the procedure of multi stage random sampling technique. The emotional intelligence of sampled students was measured by Emotional Intelligence Inventory developed by S.K. Mangal and S. Mangal (2004). Further, the marks of the students in previous class board examination were considered as their academic achievement. The data were analyzed with the help of 'Two Way ANOVA' and 'One Way ANOVA' keeping into view the objectives of the study. The results of the study revealed that girls and students residing in urban areas have significantly higher emotional intelligence than boys and rural students respectively. However, no family-wise difference in emotional intelligence was found to be significant. Similarly, none of the interactional effect between gender, area and family-type with regard to their combined influence on emotional intelligence was significant. Apart from this, emotional intelligence has been found to be positively correlated with academic achievement of the sampled students. In the last, the findings have been discussed and implications have been made.

**Subramanyan (2011)** shows impact of emotional intelligence and study of high school students. An attempt was made in the present investigation to study of effect of emotional intelligence and study skills of high school students. 60 high school students constituted the sample of the study. Emotional intelligence Scale developed by Natankumar Thingujam and Usha Ram (1999) and “Study skills inventory” developed by Prof. P.V. Ramamurthy and Geetha Nath (1977) were administered on the sample to assess their level of emotional intelligence and study skills. Based on the findings of the study it was concluded that there is no significant difference with regard to the impact of gender on emotional intelligence and study skills of high school students.

**Kalara and Nisha (2012)** conducted a study on emotional intelligence and personality among school students. The present study aimed at studying the emotional intelligence and personality’s big five factor among school students of Sirsa, Haryana. For the present studies, Mangal Emotional Intelligence Inventory (S.K. Mangal and Shubhra Mangal, 2004) which deals with four aspects of emotional intelligence namely inter-personal awareness, intra-personal awareness, inter-personal management and intra-personal management had been chosen. And for personality’s big five factor i.e. neuroticism, extraversion, openness, agreeableness and conscientiousness, NEO Personality Inventory Revised (form S) (Paul T. Costa, Jr. and Robert R. McCrae, 1992) had been taken. It includes 100 students from govt. and private schools of Sirsa district. The five factors of personality showed their impact on four aspects of emotional intelligence, extraversion showed a significant impact on the three aspects of emotional intelligence i.e. inter-personal awareness, intra-personal awareness and inter-personal management, whereas inter-personal management had a positive relationship with conscientiousness. On the contrary, agreeableness exhibited negative relationship with intrapersonal management.

**Mallya and Anand (2012)** conducted a study on effect of yoga on the intrapersonal emotional intelligence among adolescents girls. Saami (1999) notes that development of emotional skills is important for an adolescent’s development. Studies have shown that physical exercising helped in the maintenance of emotional wellbeing. Present study aimed to find the effect of Yoga, an ancient Indian form of exercise, on the intrapersonal factor of emotional intelligence as conceptualized by Bar-On (2006). The Youth Version

of Bar-On's emotional quotient inventory (2000) was used as the tool. Sample for the study consisted of two groups of adolescent girls drawn into experimental and control groups respectively. The results showed that practices of Yoga improved the intrapersonal factor of emotional intelligence.

**Neelakantan (2012)** conducted a study on emotional intelligence in relation to self esteem. The present study found significant positive correlation between self esteem and emotional intelligence ( $r=0.793$ ,  $p<01$ ). From the findings, it can be inferred that people's self-esteem enhances their emotional intelligence. The findings of the present study are in consistency with findings of Country & Chester (2005). The study was conducted with a small sample. Differences may exist in other locales. Nevertheless, the findings are notable and supported by past results. An important task for future research is to examine the between self esteem and job productivity, creativity and health.

**Singh and Kaur (2012)** show a comparative study of gifted and non-gifted children on emotional intelligence. The present study would focus on the objective such as (i) to measure and compare the emotional intelligence of the gifted and a average/non gifted children and (ii) To find out significant differences on emotional intelligence on the basis of sex (male and female); location of the schools of the children (rural and urban). The Sample of the study consisted of 1000 school children in the age group of 12-18 years (adolescent period), out of which 200 were identified as gifted children out of the larger sample and 200 were non-gifted and average children. 50% of the whole sample was males and 50% females (100 males gifted and 100 females gifted; 100 male average and 100 female average). Half of them were from rural area and half from urban area. The total sample for the final study consisted of 400 students. The tools which were used to collect the data were (i) Jatola's Intelligence Test and (ii) Ekta Emotional Intelligence Scale. The results of the study show that (i) there were difference between gifted and normal students on the different components of emotional intelligence. Gifted students were high on emotional intelligence as compared to non-gifted students (ii) Sex differences on the different components of emotional intelligence were not found and (iii) Rural urban differences were found in some components of emotional intelligence relationship with the negative measures of mental health.

**Vijayalaxmi; et.al. (2012)** in her study shows influence of an intervention program to nurture adaptability skills on the emotional intelligence of selected adolescents. The present study was taken up to assess the influence of an intervention program to nurture adaptability skills on the emotional intelligence of selected adolescents. The present study carried out in IX phases. A total of 90 adolescents (both boys and girls ) in the age group of 14-16 years were identified for the study after they were administered the Bar-On emotional quotient inventory; youth version. These were further divided into experimental and control groups having 45 participants in each group. The experimental groups were exposed to an intervention programme on adaptability skills. The study concluded that, the intervention program had influenced the adaptability dimensions of the respondents in the experimental group.

## **2.4 STUDY RELATED TO NON-COGNITIVE FACTORS**

### **2.4.1 PERSONALITY TYPE**

Personality type refers to the psychological classification of different types of individuals. Personality types are sometimes distinguished from personality traits , with the latter embodying a smaller grouping of behavioral tendencies. Types are sometimes said to involve *qualitative* differences between people, whereas traits might be construed as *quantitative* differences. Thus, the studies pertaining to some of these factors were reviewed and presented below:

#### **2.4.1.1 Studies Conducted Abroad:-**

**Cattell et al. (1968)** attempted to predict school achievement and creativity from ability, personality and motivation measures and reported that the primary source traits of conscientiousness (G), submissive (E), friendship (A) and dependability (Q) were related to achievement.

**Bachtold (1969)** studied the personality characteristic of 227 over and under-achiever bright 5th grade students' with the help of children's personality questionnaire and found that successful female achievers got higher scores on credibility, self confidence and self

control compared to under achievers; successful male achievers scored higher on emotional stability, seriousness and sensitivity in comparison to under achievers.

**Eysenck et al. (1969)** analysed scores of 4000 boys and girls by using Eysenck Personality Inventory in relation to performance on scholastic ability revealed that extraverted girls were scholastically superior where as extraverted boys were scholastically poorly adjusted; extraverted girls doing unexpectedly poor performance on ability achievement tests.

**Johnson (1970)** studied personality differences between low and high achieving boys using the personality inventory for children. Results showed that low achievers were generally less emotionally adjusted and mature than average achievers.

**Cattell (1971)** studied personality and intelligence quotient measures as predictors of school achievement by administering 'high school personality questionnaire' and the 'culture fair intelligence test' and concluded that factor B (intelligence) and factor G (conscientiousness) follow a developmental sequence in their relationship to achievement. In 6th grade, factors A (warm-hearted participation) is important, but in 7th grade, it was not. In 7th grade, factor C (emotional stability), factor J (desire or group action), factor O (selfassuredness) and factor Q3 (exacting will power) become important, although they were not in 6th grade; some personality factors were specifically related to individual areas. In both 6th and 7th grade, factor H (adventurousness) was related to achievement in mathematics; in science the higher achievers were tough minded (factor I) and it helps in mathematics if their dominance (factor E) scores were high.

**Walaytiram (1974)** studied the effects of personality factor, achievement motivation and achievement of upper and lower intelligence level by taking a sample of 450 students of 12th grade selected through random sampling technique and found that personality had significant correlation with achievement which influenced on all subjects (Math, Science, Hindi, Social Science). In case of lower intelligence group the traits related to the stability of neuroticism, extraversion, introversion were significant with academic achievement.

**Zelniker and Jeffrey (1976)** hypothesized that reflective children differ from impulsive children in their information processing strategies. They reported that the reflective children used a left hemisphere; analytic-thinking style and the impulsive children preferred a right hemispheric, global thinking style.

**Karne and Kirton (1982)** detected significant positive correlations between total Kirton scores and the Myers- Briggs dimensions of intuition, perception and intuition and perception combined. Scores on each of the Kirton subscales also correlated significantly with the Myers- Briggs intuition score, perception score and the combined intuition-perception.

**Huelsman (1983)** undertook a study to investigate the interrelationships of learning styles and some psychological types of personality. The results indicated that learning styles were significantly related to some of the Myers-Briggs Type Indicator (MBTI) variables.

**The study of Pandian (1983)** revealed that personality factors were related to learning styles of college students. Schmeck and Lockhart (1983) found differences in the learning styles of introverts and extroverts. Roberts (1984) reported that there were significant correlations between learning style and introversion/extroversion characteristics.

**Davis (1985)** carried out an investigation of the relationship of personality types and learning style preferences of high school students. Myers-Briggs Type Indicator (MBTI) and Learning Style Inventory (LSI) by Dunn, Dunn and Price were used to measure personality types and learning styles respectively. Results pointed out that eleven learning style elements correlated significantly with the extraversion- introversion index of MBTI; eight LSI elements correlated significantly with the judging-perceiving index of the MBTI; seven LSI elements correlated significantly with the sensing-intuition index of MBTI; five elements correlated significantly with the thinking-feeling index of the MBTI. Thus the 44 significant correlations in the study showed that there was linkage between personality types and learning styles.

**Hinkle (1986)** undertook a study of relationships among learning style preferences and personality types. The results revealed that learning styles and personality types were

significantly related in the following ways: concrete experience to extraversion, reflective observation to introversion, active experimentation to extraversion; active experimentation to perceiving.

**Fratzke (1988)** studied the relationship between learning style and personality type among traditional age college students and adult learners. This pilot study had indicated a high correlation between learning style preference and personality type among adult learners. Dominant personality types preferred converger learning styles, influencer personality types preferred diverger learning styles and compliant personality types preferred assimilator learning styles.

**Jackson (1989)** investigated the relationship between personality and learning styles of achieving gifted and underachieving gifted middle school students. The results indicated that EM, ES, IN and IS grouping provided the most significant relationship between learning styles and achieving gifted and underachieving gifted middle school students.

**Atkinson and Michael (1990)** examined the relationship between career personality types and learning styles in college students. Analysis of data pointed out that there was significant relationship between learning styles and career personality types.

**Joyce (1991)** studied the personality characteristics which differentiate achiever and under-achiever high school students from socio economic environment and concluded that high achievers were characterized by high concept of ability, lack of need for aggression, positive self concept and a tendency to perceive high percentage for achievement in their particular subjects.

**Jacobson (1993)** studied relationship between styles of creative thinking and personality types among United States service sector managers and compared to results found among British management students with work experience. Statistically significant positive correlation was found between Kirton's Innovative Style and the Myers- Briggs intuitive and perceptive dimensions. A statistically significant positive correlation was also found between Kirton's Innovative Style and the Myers- Briggs extraversion and feeling dimensions. Jacobson concluded that there was positive correlation between innovative style and extraversion type of personality.

**Sternberg and Grigorenko (1993)** reported that correlations were computed with MBTI as well as Gregorc measure of mind styles. For the MBTI 30 out of the 128 correlations were found statistically significant whereas for Gregorc, 22 out of 52 were significant.

**Epstein et al. (1996)** reported that there was negative significant relationship between analytical thinking style and depression, anxiety and stress in college life. Moreover, Intuitive style of thinking was negatively related to anxiety, stream and depression but the magnitude was smaller than former.

**Saleh (1997)** explored that majority of participants having right hemispheric style of thinking was intuitive, feeling and perceiving oriented whereas the participants having left hemispheric style of thinking were sensing, thinking and judging oriented.

**Mills (1998)** examined personality traits and cognitive/ learning style differences with a sample of academically talented students when compared a general population of the same age range. On the Myers-Briggs Type Indicator, the academically talented students differed significantly from the comparison group on all four dimensions. Specifically the academically talented group expressed greater preference for introversion, intuition and thinking. Although there were more judging types in this group than in a comparison group. Overall more academically talented students expressed a preference for a perceptive style. In particular, a cognitive style that emphasize a thinking over a feeling mode appears to mediate gender differences in math ability and achievement.

**Busato et al. (1999)** pointed out that extraversion correlated positively with the meaning directed (MD), reproduction directed (RD), application directed (AD) learning style and undirected learning style (UD). Conscientious was associated positively with meaning oriented, reproduction oriented and application oriented and negatively with undirected learning style. Openness to experience correlated positively with the meaning oriented and application directed learning styles and negatively with the undirected learning style. Neuroticism correlated positively with undirected learning style and negatively with reproduction oriented and meaning oriented learning styles. Agreeableness was positively associated with reproduction oriented and application directed learning styles.

**Walfradt (1999)** investigated the association between thinking style (rational and intuitive), schizotypal traits intolerance of ambiguity, self-efficacy and anomalous (inconsistent) experiences. Analysis revealed that the anomalous experience were closely related to schizotypal traits and thinking styles. Intuitive thinkers scored highest on interpersonal aspect of schizotypal and interpersonal intolerance of ambiguity.

**Zhang (2001)** concluded from her study that thinking styles and personality overlap to a degree. As predicted, the more creativity-general and more complex thinking styles were related to extraversion and openness personality dimensions and the more norm favouring and simplistic thinking styles were related to neuroticism. No specific pattern was identified in the relationships of thinking styles to agreeableness and conscientiousness dimensions.

**Golden (2001)** investigated the relationship of learning styles with personality type. The results of the study revealed that two personality Profiler Facet Scales - Talkative and Reflective significantly influenced scores on Reflective Observation Scale of Kolb's Learning Style Inventory. However, no significant relationships were found to exist between the Facet Scale and Active Experimentation Mode.

**Isaksen, S.G. and Lauer, K.J. (2003)** investigated the relationship between personality type and cognitive style using Myers - Biggs Type Indicator and Kirton Adaption - Innovation Inventory. The results of correlations between the measures showed a statistically significant relationship between the MBTI and KAI. Stronger relationships were found between sensing-intuitive and judging -perceiving personality types with innovative cognitive style and KAI total scores.

**Yang Shu Ching (2004)** concluded that external type had significant positive correlation with legislative, judicial, hierarchical, oligarchic, anarchic, global, external and liberal and negative correlation with executive, internal and conservative. Internal types had significant negative correlation with legislative, judicial, hierarchical, oligarchic, anarchic, global, external and liberal and positive correlation with executive, internal and conservative thinking styles.

**Kazmi (2005)** studied the personality profiles and cognitive factors of academic failure among science and arts students at various levels and found that the relationship between different personality factors viz. intelligence, conformity, achievement motivation, study habits, memory span and academic failure were not significant; failures differed in their personality interact characteristics and cognitive make up; gender difference did not interact with any personality characteristics for academic failure; personality characteristics and cognitive factors interacted on the failure's of academic achievement.

**Meneely, J. and Portillo, M. (2005)** examined domain specific relationship between creative personality traits, cognitive styles and creative performance in design. Students completed the Adjective Check List (ACL) and Herrmann Brain Dominance Instrument (HBDI) to gauge personality and cognitive styles respectively. The findings indicated that participants showing flexibility between cerebral right and left modes of thinking had significantly higher mean scores on creative personality than those who exhibited more entrenched cognitive style. Thuds study revealed a strong connection between personality and thinking styles.

#### **2.4.1.2 Studies Conducted in India:-**

**Lohithakshan (1961)** studied the personality traits of educationally backward children and found that educationally backward children were inferior with regard to confidence, persistence, attitude towards school work, sociability, sensitivity to praise and blame and regard for self, tended to be less enterprising in school work, less envious and less cheerful although less adjustable.

**Rushton (1966)** in a study found that school students having trait of emotional stability (C+), relaxed (Q4), perseverance (G+), easy going (A+), dominance (E+), happy go lucky (F+), internally restrained (J+) and self control (Q3+) tend to be higher in scholastic achievement. Ainsworth (1967) studied the personality factors in relation to scholastic achievement and revealed that conscientiousness (G+), self sufficiency (Q3+) along with intelligence (B+) were the most promising factors in the prediction of school attainment.

**Bhatnagar (1967)** found relationship between personality characteristic and academic achievement by relating personality variables to academic achievement after controlling the effects of socio economic status, intelligence, school difference and age difference; academic achievement, act differentiate at different levels of age and intelligence for different types of personality.

**Dhaliwal (1971)** study personality correlates of academic success failure. Three contrasting groups as overachieving, normal achieving and underachieving students were formed. These groups were neutral as regards intelligence but differ significantly in terms of academic achievement. The results revealed that study habits, adjustment in home, school and emotional areas, emotional stability and verbal intelligence had positive relationship with academic achievement; while social adjustment, insecurity feelings and reserved-outgoing, obedient-assertive, placid-apprehensive, sober-happy go lucky and relaxed-tense dimensions of personality had negative associations with academic over-under achievement; anxiety and need for achievement had curvilinear relationship with over-under achievement.

**Aggarwal et al. (1973)** in a psycho social study of academic achievement of over and under achievement at secondary school level and found that under achievers were comparatively less emotionally mature, less calm, less placid, less prone to getting into difficulties less able to face reality and possessed less ego strength than over achiever students.

**Reddy (1973)** studied the relationship between personality factors and academic achievement and revealed that personality factors namely A, C, G, H, F, L, J, K, Q1, Q3 and Q4 were significantly associated with achievement in one or the other subject.

**Srivastava (1974)** examined the effect of achievement motivation and personality characteristic on academic achievement by taking a sample of 931 male students of class Xth and found that when intelligence was constant, personality trait relaxed-tense was correlated with achievement motivation and it influenced academic achievement when intelligence and socio economic status were held constant.

**Verma (1988)** in a study reported that although extrovert and introvert types of students showed greater preference for field-independent learning style over field-dependent learning style, extrovert type of students seemed to have relatively greater preference for field-dependent learning style as compared to their counterparts.

**Bhatnagar et al. (1991)** aimed to find out the relationship between personality needs and academic achievement on the basis of multimedia package of high school students keeping age and intelligence constant. For predicting academic achievement on the basis of personality needs 1941 male students of XI class (912 of humanities, 476 of commerce and 553 of science group) formed the sample. It was found that need for achievement, autonomy, interaction, succorance, dominance, nurturance, endurance and aggression were positively correlated and need for deference, affiliation and abasement were negatively correlated with academic achievement.

**Dadu (1992)** studied personality, values and religious attitudes of urban and rural males and females in purview of socio economic status and found that between rural male and female students the difference was statistically significant for A, Q1 and Q4 personality factors; rural male and urban male students did not differ in their personality traits; between rural and urban female students significant difference existed in respect of Q1; between urban male and female students significant difference existed in respect of Q1.

**Roy (1992)** studied personality differentials of adolescents with scientific creativity in relation to environment with the objective to study personality differences between low and high scientifically creative adolescents in terms of Cattell's trait theory and found that typical high scientific creative adolescent were more resolved, critical, more abstract thinker, more stable emotionally, more excitable, more independent, serious and prudent, more expedient, more venturesome, more tough minded, more individualistic, more self assured, self sufficient, self disciplined and more relaxed than low scientific creative adolescents

**Dhillon (1993)** studied correlates of under achievement and revealed that academic achievement and extroversion was closely related; under achiever boys and girls were generally extroverts and at the same time they possessed neurotic trait as well; the girls

were more neurotic as compared to boys; higher the achievement motivation, the higher was the level of achievement.

**Kumari Balesh (1995)** carried out a study of the learning styles of socioeconomically advantaged and disadvantaged adolescent students in relation to intelligence and personality types. Significant relationship appeared to exist between introvert/extrovert type personality and individualistic vs. non-individualistic learning style preference and environment oriented vs. environment free learning style preference of socio-economically advantaged group while in socio-economically disadvantaged group, this relationship did not exist. Also, there was significant relationship between stable/neurotic type personality and short attention vs. long attention span learning style preference of socio-economically advantaged and disadvantaged groups.

**Khan (2000)** studied about gifted achievers and underachievers on personality, need achievement and socio economic status with the objective to find out the factor pattern associated with gifted achievers and underachievers with a sample of 128 gifted over achievers and 100 gifted underachievers and found that low achieving gifted children were more likely to show behavioural immaturity, emotional instability, feeling of inadequacy and certain nervous symptoms than gifted high achieving students; high achievers had greater feeling of individual worth, greater ability to persist and cope with their own emotional disturbances.

**Sood (2000)** reported significant differences between extrovert and introvert type of personality and judicial thinking style. Extroverts were found to be higher on judicial thinking style than introvert type students. He further disclosed that students in sensing type of personality were higher than intuitive type of students on executive thinking style and intuitive type of students were higher than sensing type of students on monarchic and oligarchic styles. On rest of the thinking styles (10), no significant differences were found between the two groups. Students possessing thinking type of personality were found to score lower on oligarchic and anarchic styles than students possessing feeling type personality whereas it was reverse in the case for external thinking style. On this style feeling type personality were found to be superior to students having thinking type of personality. Students having perception type of personality were found superior to

students having judgement type personality on judicial style. No significant differences were found to exist on rest of the thinking styles.

**Singh, Renu (2001)** found that extravert boys and girls were similar in their preferences for learning styles. At average extravert level, boys were found to be individualistic whereas girls were non-individualistic in their learning styles. (2) The introvert boys were found to be more individualistic and less environment oriented than the introvert type girls. The introvert boys appeared to have long attention span and introvert girls reflected short attention span learning style. (3) At high neurotic and average neurotic level, the boys were individualistic and girls were non-individualistic. (4) Stable girls were found to have short attention span and stable boys to have long attention span learning style. Stable girls also appeared higher in visual learning style than stable boys.

**Sharma, Rajesh (2002)** explored that neurotic type students were significantly higher on executive thinking style than stable type students. No significant differences were found on rest of the twelve thinking styles.

**Verma, Saroj and Sharma, K.P. (2003)** in their study concluded that there were no significant differences in thinking styles of extrovert and introvert type of students. But neurotic type showed more inclination toward executive thinking style than stable type students.

**Ananthasayanam et al. (2005)** studied personality traits in relation to language skills among engineering college students with the objective to find out the influence of selected personality traits on language skills by taking a sample of 135 students and found that personality traits especially emotional control, courtesy and attitude towards life contributed more to the development of language skills; personality traits of low and moderate groups do not support in developing language skills.

**Asthana (2005)** studied internal and external conditions of control as determinants of performance, in relation to personality characteristics and individuals locus of control and found that internal, warm hearted, emotionally stable and assertive individuals performed better if they worked under intrinsic motivation; those who were reserved in nature performed better under the condition of external reinforcement; those who were relaxed

and were external in their locus of control did not perform well under any conditions of control; those who were warm hearted, assertive, adventurous and tense performed well academically irrespective of conditions of control.

**Ritika (2005)** explored the relationship between thinking style and Big Five Personality Factors. The findings disclosed that: (i) Women students with high level of extraversion showed significantly more preference for synthesist thinking style than their counterparts with average level of extraversion; women students with high level of extraversion showed more preference for idealist style of thinking than their counterparts with low level of extraversion. However, no significant differences were found between women students with average and low level of extraversion on any thinking styles. (ii) Conscientiousness dimension of personality was related with thinking styles. Women students with high level of conscientiousness showed significantly more preference for idealist thinking style than their counterparts with average level of conscientiousness; no significant difference was observed between women students with high and low level of conscientiousness on any thinking styles; women students with low level of conscientiousness showed significantly more preference for synthesist thinking style than their counterparts with average level of conscientiousness.

**Sood (2005)** studied the predictors of academic achievement in some selected professional courses and found that personality factors of shrewdness, social awareness and high intelligence contributed positively but group adherence, praxarnia practical and conservatism of temperament contributed negatively to academic achievement in engineering course; personality factors of high ergic tension, stronger super-ego strength, radicalism, tender minded pretension and high intelligence contributed positively but personality factors of untroubled adequacy and artlessness contribute negatively to academic achievement of medical students.

**Bajwa et al. (2006)** studied academic achievement in relation to personality, stress and well being with the objective to study academic achievement in relation to personality by taking a sample of 180 students of XIth class and found that correlation between academic achievement and psychotocism was negative and insignificant; correlation between academic achievement and neuroticism was positive and insignificant;

correlation between academic achievement and extraversion was negative and insignificant.

**Suresh et al. (2007)** studied the influence of personality on the environmental awareness ability of college students and found that gender did not affect the personality of students whereas subject specialization, residential area, parental income and parents' level of education significantly influence certain dimensions of personality; locality of the students had a significant influence on the extraversion, sensation, intuition and perception dimension of personality.

**Ravi (2008)** studied learning discrepancy in relation to personality factors among primary school students and found that the personality traits of boldness, confidence, verbal ability contributed positively to their scholastic achievement; the over achieving groups of superior and general ability were less extraverted and less maladjusted than under achievers.

**Kusum (2010)** studied the effect of personality of 12th grade students on their achievement with the objective to find out whether high and low achievers differ significantly on extroversion-introversion, neuroticism, psychoticism by taking a sample of 200 students from ten randomly selected secondary schools located in Delhi and found that high achievers were more extrovert than the low achievers; there was significant difference between high and low achievers on neuroticism and high achievers were more neurotic than low achievers; both high and low achievers were psychotic averagely but low achievers were more psychotic than the high achievers.

**Ponraj et al. (2010)** studied computer assisted instruction in Zoology in relation to learners' personality with the objective to study the difference in students' achievement scores in zoology of control and experimental group at pre and post test stage in relation to gender, locality of the student, parental education and occupation by taking a sample of 180 students from XI standard and found difference in the achievement of boys and girls, achievement of students with and without computer knowledge, achievement of days scholar and hostel student was not significant; difference in the achievement of rural and urban area students was significant; difference in the achievement of extroversion and

introversion, thinking and feeling, judging and perceiving personality type student was significant; difference in the achievement of sensing and intuition personality type students was not significant.

## **2.5 NEED AND SIGNIFICANCE OF THE STUDY**

The results of different studies are not directly comparable or supported; therefore, the present study is planned to clarify some of the important contradictions by using such variables. The researcher has not found such study which directly or indirectly linked with all variables and also not directly supported the selected problem. Very few studies were explored regarding learning and thinking styles of pupil-teachers by the researcher. But the importance of these variables is remaining same. For this reason, there is a great necessity to examine the relationship of Academic Achievement, Emotional Intelligence and Personality Type with Learning and Thinking Styles of Pupil-Teachers.

## **CHAPTER - III**

### **METHODOLOGY**

According to **Kerlinger** (1973), “research design is the plan, structure and strategy of investigation conceived so as to obtain answer to research question and to control variance. Therefore research design is the most vital aspect of any scientific study. Without it the research work is just like wandering in the be wilderness”.

The Research design is aimed at the intention to know the place of the research with the purpose of attaining the research objectives and how the problems are to be encountered during the process of research. Actually the nature of the problems under investigation determine the course of the research design. It further suggests the choice of the methodology for investigation for the selection and use of tools for the collection of the data as well as the procedure for collection of the data and also the statistical techniques to be used.

The methodology intends to provide the details of research design followed in the present study.

### **3.0 METHOD OF RESEARCH**

The aim of the present study was to know the thinking and learning styles of pupil-teachers in relation to their scholastic achievement and emotional intelligence and also with the non- cognitive characteristics, like- gender, stream and their personality type. As the nature of the study is concerned it required the descriptive analysis of the learning and thinking styles of the pupil-teachers selected for the study. For this only survey method was found to be suitable for the present investigation. Descriptive survey method describes and gives the interpretation of what exists at present. Hence we are concerned with relationships that exist, the prevailing practices and the attitudes that are hold, the processes and the influences and the developing trends.

**Good (1963)** has pointed out that “Descriptive research method includes presentation of facts or current conditions concerning the nature of a group of persons

number of subjects or class of events and involves the procedure of induction analysis classification enumeration or measurement”.

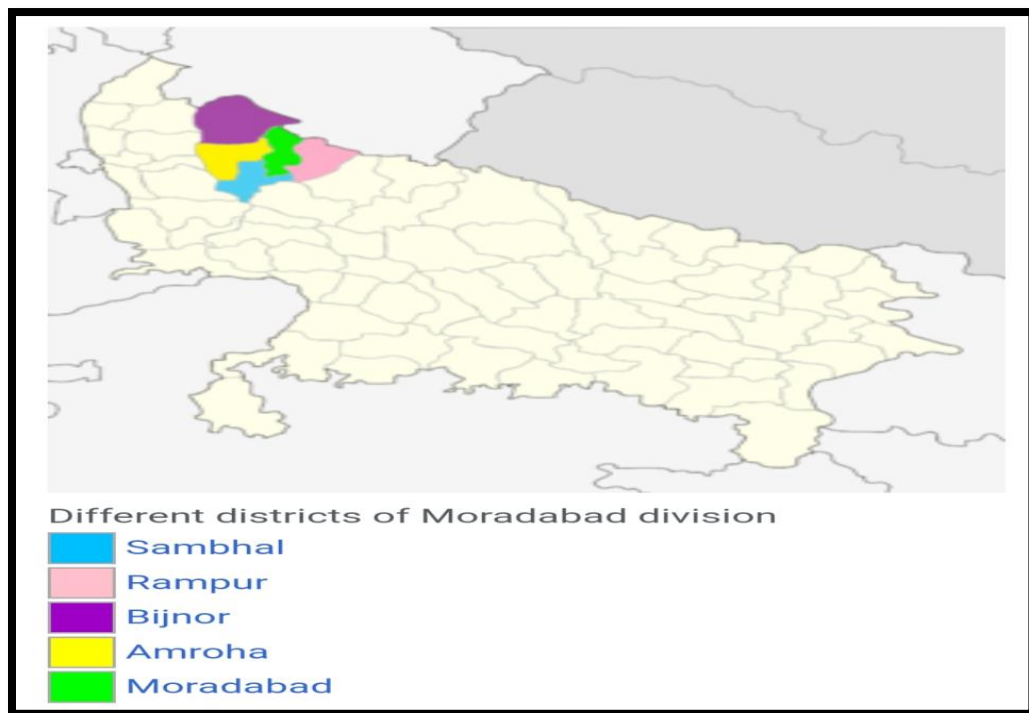
Thus keeping in view the objectives of the study it was decided by the investigator to use the Descriptive Method of the research.

### 3.1 POPULATION OF THE STUDY

According to **Guilford (1965)**, “a population is a well defined group of individuals or of observations”. In the words of **Best and Kahn (1996)**, “a population is any group of individuals that have one or more characteristics in common that are of interest to the researcher. The population may be all the individuals of a particular type or a more restricted part of that group”.

The population of the present study included all the pupil-teachers studying in B.Ed. 1<sup>st</sup> year of arts, science and commerce background in all the colleges of Moradabad division. It included the pupil-teachers of government, govt. aided and the private co-ed colleges in Moradabad Division.

**Fig. No. 3.1 Map of Sample Distribution**



### 3.2 SAMPLE OF THE STUDY

A sample is small proportion selected for observation and analysis is the representative of a large population. By observing the characteristics of the sample one can make certain inferences about the characteristics of the population from which it is drawn.

Samples should not be selected haphazardly but chosen in a systematic random way, so that the operation of probability may be utilized.

The essential requirement of any sample is that it is supposed to be the representative of the vast population. **Miller (1977)** states that, “the scope of generalization of the finding depend on the representativeness of the sample . Infect good sample is one which is unbiased and representative of the whole population”.

In the present study an attempt was made to select a representative and unbiased sample. The random sampling technique was employed forwarding the sample.

First of all, a list of all B.Ed. colleges of Moradabad division was prepared. Then colleges were randomly selected adopting simple lottery method. There after one section of each science, arts and commerce stream was selected randomly from each selected college in the Moradabad Division.

Details of the structure of sample has been given in table 3.2.1

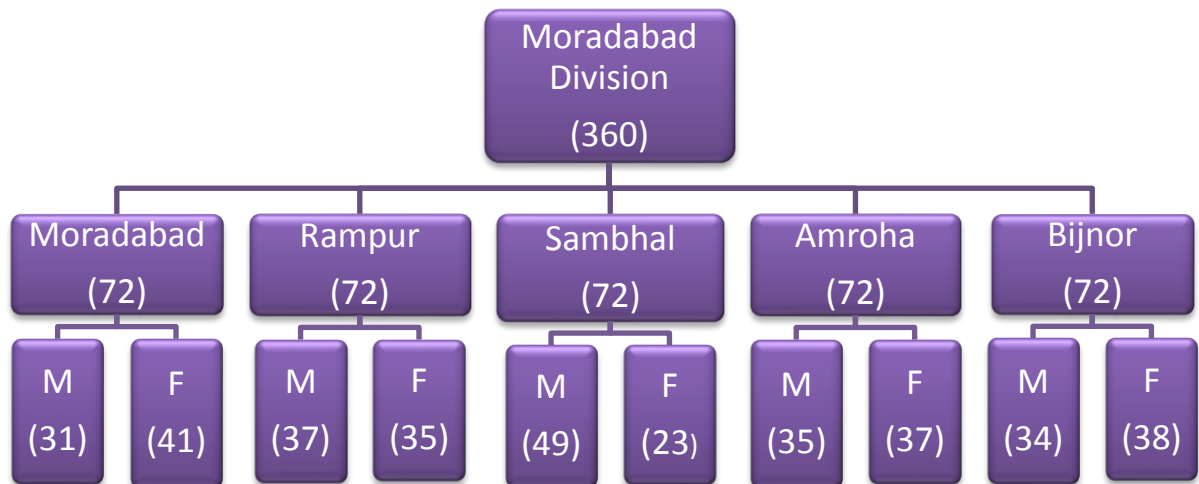
**TABLE 3.2.1**

**Sample of colleges and pupil-teachers from each district**

<b>S.No.</b>	<b>District</b>	<b>No. of Colleges from each District</b>	<b>No. of Pupil-teachers from each Disrtict</b>
<b>1.</b>	Moradabad	02	40
<b>2.</b>	Rampur	02	40
<b>3.</b>	Sambhal	02	40
<b>4.</b>	Amroha	02	40
<b>5.</b>	Bijnor	02	40
<b>Grand Total</b>		<b>10</b>	<b>400</b>

To meet the requirement of study, the random sampling methods were used in selecting sample. Initially collected sample was of 400 respondents in total. As the objectives of the study to SOLAT with Science, Arts and Commerce stream pupil-teachers only, so the investigator on need of the study has reduced all the data from 400 to 360 accordingly. This reduced data provide him base for final analysis of the results as requirement of the objectives of the study. Hence in the study the investigator has used only a data of 360 respondents in analysis and interpretation. The distribution of final data that used in the analysis and interpretation has been presented below on diagram:

**Fig. No. 3.2.2 Distribution of Sample (on final Data)**



From fig no. 3.2.2 that the total sample consisted 360 pupil-teachers. Out of this 193 belonged to science, 105 belonged to arts and 62 belonged to commerce streams. Further 186 pupil-teachers were male and 174 pupil-teachers were female. Thus the sample was large enough and also representative of the population.

### 3.3 VARIABLES OF THE STUDY

In the present study, Academic Achievement and Emotional Intelligence (Cognitive factors) and four non-cognitive factors (Gender, Stream and Personality type) were taken for classifications of the sample.

### **3.3.1 Dependent Variable:**

- Academic Achievement

### **3.3.2 Independent Variables:**

- Emotional Intelligence
- Styles of Learning and Thinking
- Personality Type

### **Demographic Variables:**

- Gender
- Streams

## **3.4 TOOLS USED**

For carrying out the investigation, the data is gathered and the hypotheses are tested. Because each data gathering tools has its own particular weakness or bias it is needed to be evaluated in terms of certain desirable attributes of good tool and finally select the one which seems to be free from major weakness and serves the purpose. Reliability, validity and appropriateness are studied before the selection of a tool for collecting the data. Since selection of suitable tool is of vital importance for successful research.

In the present study the following tools were employed for data collection.

- Style of Learning and Thinking (SOLAT) – by D. Venkataraman
- Moudsley Personality Inventory (MPI) – by Eysenck (An Indian adaptation by Jalota and Kapoor)
- Mangal Emotional Intelligence Inventory (MEII) – by Mangal and Mangal

In following paragraphs, description of each tool in given.

### 3.4.1 STYLE OF LEARNING AND THINKING (SOLAT)

This tool (SOLAT) has been developed by Dr. D. Venkataraman in 1993 published Psy- Com Service, Delhi. This tool is designed for school children from eighth standard and up to college students, and consisted of 100 items based upon accumulated research findings concerning the specialized functions of the left and right hemispheres. Each item provided the respondent with three choices-one representing a specialized function of the left cerebral hemisphere the second representing a parallel specialized function of the right hemisphere and the third is checking of both the items representing the integration of right and left hemisphere functions. Test takers asked to indicate which of the three specific styles of thinking and/or learning best described about their own typical behavior.

- *Dimensions of SOLAT Tool*

The number of items that the each dimension measures in two styles of learning and thinking are the following:

#### A. Learning Styles

- |                        |                |
|------------------------|----------------|
| 1. Verbal              | 1 to 5 items   |
| 2. Content preference  | 6 to 10 items  |
| 3. Class preference    | 11 to 15 items |
| 4. Learning preference | 16 to 20 items |
| 5. Interest            | 20 to 25 items |

1 to 25 items measure learning styles

## **B. Thinking Styles**

- |                         |                |
|-------------------------|----------------|
| 1. Logical/Fractional   | 26 to 30 items |
| 2. Divergent/Convergent | 31 to 35 items |
| 3. Creativity           | 36 to 40 items |
| 4. Problem solving      | 41 to 45 items |
| 5. Imagination          | 46 to 50 items |

26 to 50 items measures thinking style.

- ***The Concepts of SOLAT***

The right and left hemisphere preference for information processing for the concepts selected were identified as indicated in the literature available and in the studies by others in the area and these preference accepted applicable for the study are listed in the table given below:

**Table No. 3.4.1.1  
SOLAT CONCEPTS**

<b>Itam No.</b>	<b>Right Hemisphere</b>	<b>Left Hemisphere</b>
<b>Concept: Verbal</b>		
<b>1.</b>	Understanding movements of action	<b>Getting things quiet while reading or</b>
<b>2.</b>	music, dance and poetry	<b>studying</b>
<b>3.</b>	Learn best by instruction which uses	<b>Learn best of instruction</b>
<b>4.</b>	visual presentation	<b>verbal</b>
<b>5.</b>	Likes to draw more pictures	<b>plain language (or open mindedness)</b>
<b>Concept: Content Preference</b>		
<b>6.</b>	Interest in soft sciences	<b>Interest in Hard sciences (vocational</b>
<b>7.</b>	Open ended lessons	<b>interest in engineering)</b>
<b>8.</b>	Likes to learn through main ideas/Basic concepts	<b>Structured lessons</b>
<b>9.</b>	Writing/likes fiction	<b>Likes to learn through details and</b>
<b>10.</b>	Learning through exploration	<b>specific facts</b>
<b>Concept: Content Preference</b>		
<b>11.</b>	Get clarity while learning experiments	<b>Get clarity though logical reasoning</b>
<b>12.</b>	Learning everything by synthesizing	<b>Understand better while learning</b>
<b>13.</b>	Likes everything by synthesizing	<b>critically and analytically</b>
<b>14.</b>	Slow acquisition of habits	<b>Interested in games and sports</b>
<b>15.</b>	Not well rounded play- fullness	<b>Likes to learn in an abstract way</b>

<b>Concept: Learning Preference</b>		
<b>16.</b>	Divergent	<b>Individuality</b>
<b>17.</b>	Concentrate with several things simultaneously	<b>Social, active</b>
<b>18.</b>	Competitive	<b>No tolerance tendency</b>
<b>19.</b>	Unsocial, Mysterious	<b>Convergent</b>
<b>20.</b>	Greater tolerance and adjustment	<b>Concentrate with one thing at a time</b>
<b>Concept: Content Preference</b>		
<b>21.</b>	Invent something new and imaginative	<b>Improve upon something</b>
<b>22.</b>	Likes to solves complex problems	<b>Likes to solve simple problems</b>
<b>23.</b>	Artistic and aesthetic inters	<b>Temporal interest</b>
<b>24.</b>	More specialize in males	<b>Temporal interest.</b>
<b>25.</b>	Interested in funny things	<b>Not interested</b>
<b>Thinking Style</b>		
	Right Hemisphere	<b>Left Hemisphere</b>
<b>26.</b>	Holistic approach	<b>Fractional Approach</b>
<b>27.</b>	Recall faces	<b>Recall names</b>
<b>28.</b>	Retention and Recalling shapes and	<b>Retention and Recalling and numerical</b>
<b>29.</b>	Figures	<b>Analyzing speech and sounds qualities</b>
<b>30.</b>	A good command over total memory	<b>Sequence of ideas analogical relationship</b>
<b>Concept Divergent\Convergent ”</b>		
<b>31.</b>	Deductive learning	<b>Inductive learning</b>
<b>32.</b>	Independent thinking	<b>Mentally receptive and responsive to what her and say</b>

33.	Deep thinking while lying down	<b>Deep thinking while sitting erect</b>
34.	Easily find directions in strange surroundings	<b>Easily find directions in familiar places.</b>
35.	Likes to make suggests	<b>Not interested in guesses</b>
<b>Concept” Creative</b>		
36.	Creative thinking	<b>Intellectuality</b>
37.	Likes to pre-plan	<b>Likes to day dream</b>
38.	Intuitive	<b>intellectuality</b>
39.	Judgments through feelings and experience	<b>Logical approach in judgments</b>
40.	Playful approach in problem solving	<b>Businesslike approach</b>
<b>Concept: Problem Solving</b>		
41.	Absent mindedness	<b>Never be absentminded</b>
42.	Optimistic view	<b>Pessimistic view</b>
43.	Absence of repression and suppression	<b>suppression</b>
44.	Passive	<b>Aggressive/short tempered</b>
45.	Stronger determination and ambition	<b>General</b>
<b>Concept: Imagination</b>		
46.	A strong memory and remembrance over images	<b>Remembering about languages and pictures</b>
47.	Able to do though experiments	<b>Posses rational learning and analytical</b>
48.	Haptic and tactile perception	<b>Lacks hap tic or tactile perception</b>
49.	Imagine and summarize	<b>Outline</b>
50.	Imaginary	<b>Analysis</b>

- ***Hemisphericity***

Hemisphericity is the cerebral dominance of an individual in retaining and processing modes of information in his own style of learning and thinking. (Vevkataraman, 1989). Researchers conducted during the last two decades have shown that the human left cerebral hemisphere is to be specialized for primarily verbal, analytical, abstract, temporal and digital operations (Bogen, 1969, Gazzaniga, 1970, Ornstein 1972). The same investigations revealed that the right cerebral hemisphere is to be specialized functions of each hemisphere appear well lateralised and established early in life (Kinsbourne, 1975) and barring special intervention or insult, continue essentially unaltered throughout the normal life span (Zelinski and Marsh, 1976). For identifying the hemisphere dominance, the ways in which and the levels at which the information is being processed by the individual are to be studied. Tool is have been developed to study the “Style” of Learning and thinking and hence it would be possible to infer the dominance of an individual.

- ***Reliability of the SOLAT***

The reliability of the tool was measured by test-retest method. One month after the first test, re-test was conducted to 300 students of 150 boys and 150 girls.

The reliability coefficient of correlation for the right hemisphere function was found to be .89. For the left hemisphere function the coefficient of correlation was found to be .65. The coefficient of correlation for the integrated score was .71. These coefficient suggest that the SOLAT possesses reliability to a significant level.

- ***Validity of the SOLAT***

➤**Content Validity:**

A compilation of findings was made from an extensive survey of literature on specialized cerebral functions of the hemisphere (Venkataraman 1989). The items were constructed by attempting to translate research findings on hemisphericity into a multiple choice format, without representing particularly right hemisphere functioning or left hemisphere functioning.

The original inventory consisted of 62 items, and out of them 12 items were deleted on the basis of pilot study (Small group study) and opinion from the experts.

The items were finally selected for inclusion based on the sustained experts opinion, from professors and doctors connected in the field of Psychology, and Neurosurgery respectively.

### ➤ **Construct Validity**

The initial construct validity study was conducted by the author. The SOLAT was tested with 50 students from a variety of academic disciplines. As part of the course, each student took several tests of creativity which provided to construct validity evidence. Creative problem solving and creative thinking call for both left and right- hemisphere functions. Considerable evidence suggests that the essence of creative behavior calls for right-hemisphere functions and judgment, evaluation and elaboration require left-hemisphere functions.

### ➤ **Concurrent Validity**

The SOLAT tool was constructed and validated with the help of standardized SOLAT tool constructed Paul Torrance. To find out the validity of the tool, both the SOLAT tools, (i.e. Tool prepared by Paul Torrance and tool prepared by the investigator) were administered to 300 subjects. The correlation between the two test scores was .842 for the right hemisphere part; .621 for the left hemisphere part and .678 for the integrated part.

- ***Administration of SOLAT***

The style of learning and thinking tool is constructed with simple sentences and can be easily administered in a group. It can be administered from eight standards and up to graduation or post graduation.

The SOLAT Tool can also be administered to the students below 8th standard but it is not recommended since they may check the items vaguely against their preferred style, understanding the partial or different meaning of the items.

Good testing conditions should be arranged and maintained throughout testing. They should be ordered to be quiet, as distractions are possible. The temperature of the room should be comfortable. Make sure that the decision-making process is clear. For each item, there are two statements, and there are four ways to respond.

1. Check the first statement if it describes you.
2. Check the second statements, if it describes you.
3. check both statements, it both are applicable to you.
4. Check neither statement if both are not applicable to you.

Students should record their responses in the blank on the test sheet. They should examine their responses thoroughly to make sure that they have made firm marks which will enable to assess hemisphere dominance correctly.

- ***Scoring Procedure of SOLAT***

In the tool, against serial numbers 1 to 50, checking of the first items indicates right hemisphere; second item indicates left hemisphere and checking of both the items indicates integrated hemisphere (or) whole brained.

- First Count the number of items you checked both boxes for an item, and write that number in box “W”.
- Second Count the number of items you checked only for an item and write that number in box “L”.
- Third Count the number of items you checked only “R” for an item, and write that number in box “R”

The hemisphericity dominance is determined on the basis of the highest score in three categories of dominance, as far as a group testing or score is concerned. For individual scoring and comparison with a reference population kindly read the next section of norms.

- *Norms of SOLAT*

In many research applications, the examiner will have no need to convert the raw scores obtained from the test to sten scores. However, commonly the test users would like to know where an individual stands in relation to a defined population. For this purpose the raw scores are converted into sten scores. The term 'sten' comes from "standard ten". The sten score is distributed over ten equal intervals of standard score points, 1 to 10. The use of sten scores has been found to be very satisfactory, especially, with people inexperienced in statistical techniques involved in psychological testing.

Once the test administrator has decided to use the norm table, the use of norm table is quite straightforward. For example, to convert raw score of Lh, find the raw score of Lh in the column L Score and read the corresponding sten score on the left or right hand column of "Sten' Scores. Do likewise for after two raw scores also. Please note that the values within the table (i.e. in the body of the table) are "raw scores" and the values on the left and right hand side columns are corresponding "sten scores"

A normative group data for various occupation is also available, but is not published here due to the size and complexity involved in the comparison and analysis of the same manually. This normative data is inbuilt in the computer software program available for this scale. These special norms are meant for comparison of the individuals profile with relation to specific job areas. The computer software package also offers a computerized narrative report, consisting of automated interpretations of the SOLAT test results. This report and computer software package is available through the computer Applications Division of M/s Psy-Com Services.

The use norm tables the test user must note that the sten scores derived from these are n- stens or normalized stens, i.e., they do not result from a linear transformation of raw score distribution, but instead, from an area transformation of the raw scores designated to produce a more normal distribution. For test users who wish to convert a group mean raw-scores profile to s-sten (standard-deviation stens), the means and standard deviations of the norm group are given at the bottom of the bottom of the tables.

The sten of 4-7 indicates average score, sten 8-10 indicates high and extremely high score and sten of 1-3 indicates low and extremely low scores.

Norms of SOLAT for converting raw scores to sten score

**Table No. 3.4.1.2**  
**NORMS OF SOLAT**

<b>Sten</b>	<b>W Score</b>	<b>L Score</b>	<b>R Score</b>	<b>STEN</b>
	<b>Raw Scores</b>			
1.	-	0	0-2	1
2.	-	1-4	3-6	2
3.	-	5-8	7-11	3
4.	0-4	9-12	12-15	4
5.	5-9	13-17	16-19	5
6.	10-13	18-21	20-24	6
7.	14-18	22-25	25-28	7
8.	19-22	26-29	29-33	8
9.	23-27	30-34	34-37	9
10.	28-50	35-50	38-50	10
Mean S.D.	9.10 9.23	17.19 8.43	19.99 8.77	Mean S.D.

It is foremost important for the teachers to focus their attention on students favored thinking styles before imparting the subject matter. If they fail to do so, the consequences may be serious, because the teachers may tend to confuse styles of students mind. Since the method of teaching adopted by teachers often reflects their personal thinking style, the students who have the same thinking style of the teachers are only benefited and rewarded. Otherwise the students whose styles are different do not correspond with the teacher styles are labeled as “Slow”, “Dull” or even “Stupid”. IF mismatch exists between the preferred styles of the teacher and that of students, such students are frequently seen to be uninterested in the content, feel bored and reject the learning activity. Since any subject can be taught in any way that is compatible with any style, students will seek learning activities that are compatible with their own preferred styles. Both teachers and students tend to exploit their preferred styles, which may or may

not match. Therefore, it is important for the teachers to know the students preferred styles, so that the teachers can capitalize the opportunities for students learning.

### **3.4.2 MAUDSLEY PERSONALITY INVENTORY (MPI)**

The Maudsley personality inventory is a brief but standard as well as an easily scored inventory. It is designed for assessing Neuroticism- Stability and Introversion – Extroversion dimensions of personality. It is considered for normal and abnormal adults and also for adolescent. The inventory can be used in group or with an individual. The vocabulary required is that of the average newspaper. Although the time limit is enforced in testing, but the short scale takes about 3 to 5 minutes, while the long scale takes about 15 to 20 minutes. The items from serial number 1 to 12 given on the front page of the test booklet make the short scale , while all 48 items of the blkklet constitute the long scale. Each of these items is answerable by making a tick- mark in to one of the three boxes and marked with instruction to answer the question are given of the front cover page of the test booklet.

The reliability – coefficient by comparing the first half with the 2<sup>nd</sup> half, yielded for N= +0.567 and E=+\_0.358. When correct to full length these figures became for N =0.73 and E=0.68. These figures are lower than the English data, but are likely that an odd/ even reliability would be in any case higher figures than would be a comparison of the first half versus second half.

However, it may be mentioned here that original inventory had reliability coefficients for Neuroticism ( ranging between 0.85 and 0.90) and for extroversion ( ranging between 0.75 and 0.85) calculated on many sample by split- half and Kuder Richardson's method.

For estimating validity the full scale was administered on postgraduate male and female pupil-teachers. For the full scales the mean neuroticism score for the male and female groups combined was 232 with a SD of 10.0 this corresponds with English norms of 19.9 and SD 11.0 for Extraversion scale the mean combined score was 27.8 and SD 6.2, this compares with English Norms of 24.9 SD 9.7 . There were no different of any significance between males and females and the data suggest that the Indian group was

slightly more neurotic and extroverted than the English standardization group. Finding with the short scale are similarly showing the comparable viruses of means and SDs.

The test is scored with the help of standard key. Test- retest reliability was also ascertained by the investigator on a sample of 60 pupil-teachers (drawn randomly) with an interval of 2 weeks. The obtained results are shown in table 3.4.

**Table 3.4.2.1**  
**Test- retest reliability of MPI and Indian pupil-teachers**  
**( N=60, interval =2 weeks )**

<b>Dimension</b>	<b>Coefficient of correlation</b>
Extraversion	0.68
Neuroticism	0.73

The obtained coefficients of correlations were found comparable to the coefficients of correlation got by Eysenck. Hence this inventory was considered appropriate to be used in the study.

### **3.4.3 Mangal Emotional Intelligence Inventory (MEII):**

This inventory has been developed and standardized by Mangal and Mangal in 2004 which is published in National Psychological Corporation, Agra. It is available in both Hindi and English language. The Inventory is designed for 16+ years age of school, college & university students for the measurement of their emotional intelligence (total as well as separately) in respect of four areas or aspects of emotional intelligence namely, Intra-personal Awareness (Knowing about one’s own emotions) Inter-personal Awareness (Knowing about others emotions), Intra personal Management (Managing one’s own emotions) and Inter-personal Management (managing others emotions) respectively.

**Table No. 3.4.3.1**  
**Areas or Aspects of MEII**

Sr.No	Area/Aspect	No. of Items
(a)	Intra-personal Awareness (own emotions)	25
(b)	Inter-personal Awareness (others emotions)	25
(c)	Intra-personal Management (Own emotions)	25
(d)	Inter-personal management (other emotions)	25
	<b>Total of Items</b>	<b>100</b>

It has 100 items in total, 25 items contains in each area, where the respondent have to answer in ‘yes’ or ‘no’ option. While constructing items for each of these areas due care was taken by the developers+ to make use of the simple language and provide well- defined purposeful statement to the respondents for the assessment of their emotional intelligence.

In the beginning a list of 180 items was prepared. The list was presented to a group of 5 judges and only those items were retained about which the judges were unanimous on their retention. It leads to the elimination of 30 items out of 180. The remaining 150 items were subjected to item analysis.

- ***Reliability of the MEII:***

Reliability of the MEII estimated through various method has been given below on table, which proving the inventory as highly reliable.

**Table No. 3.4.3.2**  
**Reliability Coefficients of EMII**

Methods Used	N	Reliability coefficient
Split Half	600	<b>.89</b>
K-R formula(20)	600600	<b>.90</b>
Test-retest	<b>200</b>	<b>.92</b>

- *Validity of the MEII*

**Table No. 3.4.3.3**  
**Correlation matrix of the four areas of the EMII**  
**(N=600 300 Males and 300 females)**

	Intra PA	Inter PA	Intra PM	Inter PM
<b>Intra PA</b>	-	.716	.501	.437
<b>Inter PM</b>	-	-	.452	.480
<b>Intra PM</b>	-	-	-	.476
<b>Inter PA</b>	-	-	-	-

Above Table reveals that correlations among the four areas of the inventory vary from .437 to .716 (after testing these correlations at the .01 level -2 tailed, it was found that all were significant).

- *Scoring Procedure of MEII*

Scoring can be done by hand or with the help of stencil. The mode of response to each of the item of the inventory is in the form of a forced choice i.e. either Yes or No, indicating complete agreement or disagreement with the proposed statement respectively. In the present Emotional Intelligence Inventory thus there are item where the response 'yes' is indicative of the presence of emotional intelligence and 'no' for the lack of emotional intelligence. Similarly, there are items where 'no' response provides clue for the presence of emotional intelligence and 'yes' for its absence.

For scoring one mark into be provided for the response indicating presence of emotional intelligence and zero for the absence of emotional intelligence.

**Table No. 3.4.3.4**  
**Scoring Scheme of Emotional Intelligence Inventory**

	<b>Mode of Response</b>	<b>Score</b>
<b>S. No. of items</b> <b>(where ‘Yes’ responses</b> <b>shows presence of</b> <b>intelligence)</b>  <b>6,18,19,20,23 to 25, 27 to</b> <b>29, 31, 41 to 44, 51 to 56,</b> <b>58 to 68, 70,71, 73 to 76, 79</b> <b>to82,84, 88 to 90, 96, 99</b>	<b>Yes</b>  <b>No</b>	<b>1</b>  <b>0</b>
<b>S. No. of Items(where ‘no’</b> <b>Response shows presence</b> <b>of intelligence)</b>  <b>1 to 5, 7 to 17, 21, 22, 26,</b> <b>30,32to 40,45,to</b> <b>50,57,69,72,77, 78, 83, 85 to</b> <b>87, 91 to 95,97 98,100</b>	<b>N0</b>  <b>Yes</b>	<b>1</b>  <b>0</b>

***Administration Guideline of MEII:***

- It is a self-administrating inventory. The cooperation of the students on whom it is to be administered is quite essential. Therefore, the user should try to win over their confidence.
- The user as well as the examinee should read the instructions, given on the front back page of the test booklet, carefully.
- The user as well as the examinee should gen themselves acquainted with the users and purposes of this inventory.
- There is a provision of separate response sheets for writing responses to the items of the inventory. Therefore, examinees should be instructed not to write anything on the test booklet.

- The total adjustment scores as well as the area wise scores are to be computed though the responses given on the response sheets with the help of the scoring scheme provided in the manual.

### **3.5 DATA COLLECTION**

For data collection , first of all class teachers of concerned college were decided. Thereafter, selected following tools were administered.

- Style of Learning and Thinking (SOLAT) – by D. Venkataraman
- Moudsley Personality Inventory (MPI) – by Eysenck (An Indian adaptation by Jalota and Kapoor)
- Mangal Emotional Intelligence Inventory (MEII) – by Mangal and Mangal

However before administration of the tests. Pupil-teachers were told the purpose of the study and importance of their cooperation in data collection. After putting them into proper frame of mind, tests were distributed according to schedule.

### **3.6 STATISTICAL TECHNIQUES USED**

Statistics is a body of mathematical techniques use or processing for gathering organizing analyzing and interpreting numerical data. Because most research yields such quantitative data, statistics is a basic tool of measurement evaluation and research.

As the focus in the present study was to ascertain the significant differences in mean scores of learning and thinking style (s) of pupil-teachers in relation to academic achievement gender, stream, personality type and emotional intelligence two statistical techniques namely one way analysis of variance and T -tests were performed depending upon the comparison of three and two groups. In case of comparison three groups, one way ANOVA was used and in case of comparison of two groups, t test was employed . In case of significant F also t test was used to pin point the exact source of difference in three means.

### 3.6.1 ONE –WAY-Analysis of Variance

In signal classification or one-way-analysis of variance, the relationship between one independent and one dependent variance is examined.

This technique involves three operations mentioned below.

- 1- The variance of the scores for three groups are combined into one composite group known as the total group variance ( $V_t$ )
- 2- The mean value of the variances of each of the three groups, computed separately, is known as the within groups variance ( $V_w$ )
- 3- The difference between the total groups variance and the within groups variance is known as the between groups variance ( $V_t - V_w = V_b$ )
- 4- The F ratio is computed.  $F = V_b / V_w = \text{Between groups variance} / \text{within groups variance}$

#### **The logic of the F – Ratio:**

The logic of F ratio is as follows-

The within groups variance represents the sampling error as the error variance or residual. The between groups variance represents the influence of the variable of interest of the experimental variable. If the between groups variance is not substantially greater than the within groups variance, the research would conclude that the difference between the means is probably only a reflection of sampling error. If the F ratio were substantially greater than one, it would seem that the ratio of the between groups variance was probably too great to attribute to sampling error.

The critical values of the F ratio ( named for Sir Ronald A. Fisher) are found in an F- table which indicates the critical values necessary to test the null hypothesis at selected levels of significance ( in education conventionally 0.05 and 0.01 levels.) the F ratio is seen against the two different degree of freedom one for  $V_b$  ( the numerator) and the one for  $V_w$  ( the denominator).

In the mathematical development of the analysis of variance a number of assumptions have been made. According to Ferguson (1981) the following assumptions may be specially noted.

- 1- The distribution of dependent variable in the population from which samples are drawn is assumed to be normal.
- 2- Another assumption made in its use is that the variances in the population from which the sample are drawn, are equal. This is known as homogeneity of variance.
- 3- The effects of various factors on the total variation are additive, as distinct from, say multiplicative.

Thus the basic model underlying the analysis of variance is that a given may be partitioned into independent and additive bits, each bit resulting an identifiable source. In most situations there are no ground rules to suspect the validity of this model.

Several statisticians held that if the sample is large enough and has been drawn randomly with all care, there is no need to test the basic assumptions of ANOVA before it's applying to the data.

In the present study one way ANOVA was employed without any testing of its assumptions because first of all institutions were selected randomly. Secondly sample sample was drawn by random cluster method. Thirdly the size of the sample was large enough.

Post hoc analysis in case of significant F was done by t test so that exact source of mean differences may be ascertained .

### **3.6.2 The 't' test of independent Samples**

The test of significance of the difference between two means is known as a t test. It involves the computation of the ratio between experiment variance ( observed difference between the two sample means) and error variance ( the sampling error factor).

The obtained value of  $t$  was evaluated at 0.05 and 0.01 level of significance . If the  $t$  value was equal or exceeded the table value of for the particular degree of freedom and level of significant the difference between the two means was considered significant the difference between the two means was considered significance at that level ( 0.05 or 0.01 ). IF the obtained  $t$ -value was not found significant at even 0.05 level of significance, the difference between the two means was treated as false and attributable to chance factor or sampling fluctuations.

In addition to the above mentioned statistics , graphs were also used to depict the difference in means.

## **CHAPTER – IV**

### **DATA ANALYSIS AND INTERPRETAION**

According to Rummel (1958), “Organization, analysis and interpretation of data and formulation of conclusions and generalizations are the next steps after the collection of data to get a meaningful picture out of raw information collected. The analysis and interpretation of data involve the objective reactions and desires to be derived from the data, the inherent meanings in their relation to the problem”.

#### **4.0 INTRODUCTION**

Analysis and interpretation of data is a necessary step in the research process as it aims to find meaning of the raw data. Its basic purpose is to summarize observation and search their broader meaning by linking them to the existing knowledge.

In fact analysis means the categorizing, ordering, manipulating and summarizing of data to obtain answers of research questions. The purpose of analysis is to reduce data to intelligible and interpretable form so that the relation of research problems can be studied and conclusions can be drawn about these relations.

The reason for the analysis was to determine the distinctions in learning and thinking styles pupil-teachers by virtue of their specific psychological and non-intellectual qualities. Scholarly accomplishment and Emotional insight were taken as intellectual qualities. Sex, Stream, and Personality type were taken as non-intellectual attributes. The pertinent information was gathered with the assistance of reasonable devices and authority records. After in consonance with goals and speculations of the investigation.

In the present section, an endeavor has been made to give expand depiction of the analysis and interpretation of the information in an orderly way.

## **4.1 LEARNING AND THINKING STYLES IN RELATION TO ACADEMIC ACHIEVEMENT**

### **TESTING HYPOTHESIS – 1**

**There is no significant differences in Learning and Thinking Styles of pupil-teachers having High, Average and Low levels of Academic Achievement.**

Three type (Right Hemispheric, Left Hemispheric & Integrated) learning and thinking styles of pupil-teachers are to be thought about for various academic achievement category. The hypothesis has been sub-partitioned into three sub-hypothesis. Each sub-hypothesis has been analyzed by ANOVA.

#### **HYPOTHESIS – 1.1**

**There is no significant differences in Left Hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low levels of Academic Achievement.**

One-way analysis of variance has used to test the above null hypothesis and the results have been provided in table 4.1.1.

**TABLE 4.1.1**  
**One-way ANOVA for the scores of Left Hemispheric style in regard to Academic Achievement Groups**

<b>Source of Variance</b>	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F-Ratio</b>
Between Group	2	50.375	25.187	2.462
Within Group	358	3663.057	10.232	NS
Total	360	3913.432		

NS=Not Significant at 0.05 level

It might be noted from table 4.1.1 that the F-proportion was found be 2.462, which is non significant at 0.05 level. It infers that there was no huge contrasts in mean

scores of left hemispheric style of pupil-teachers having different level (High, Average and Low) of academic achievement. Subsequently, the null hypothesis 1.1 was accepted.

**HYPOTHESIS – 1.2**

**There is no significant differences in Right hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low levels of Academic Achievement.**

In this null hypothesis, one-way ANOVA was used and the results have been provided in table 4.1.2.

**TABLE 4.1.2**  
**One-way ANOVA for the scores of Right Hemispheric style in regard to Academic Achievement Groups.**

Source of Variance	df	SS	MS	F-Ratio
Between Group	2	107.579	53.789	3.587*
Within Group	358	5368.569	14.996	
Total	360	5476.148		

\*Significant at 0.05 level

Table 4.1.2 shows that the analyzed F-ratio was gotten as 3.587 at 0.05 level of significance. It implies that pupil-teachers having different levels of academic achievement varied significantly on right hemispheric learning and thinking style. Thus the null hypothesis 1.2 was rejected.

Since the F-ratio gives the general image of the outcomes and does not indicate the accurate wellspring of mean difference t-test was performed. the analyzed outcomes have been appeared in table 4.1.3.

**TABLE 4.1.3**  
**Mean Scores of Right Hemispheric style of Learning and Thinking in regard to**  
**High, Average and Low Achiever pupil-teachers**

S. No.	Achievement Group	N	M	S.D.	Comparison Group	't' valve
1.	High	69	11.70	4.25	1 and 2	1.864 NS
2.	Average	235	12.76	3.81	1 and 3	2.602*
3.	Low	56	13.52	3.57	2 and 3	1.413 NS

NS = Not Significant at 0.05 level

\*Significant at 0.05 level

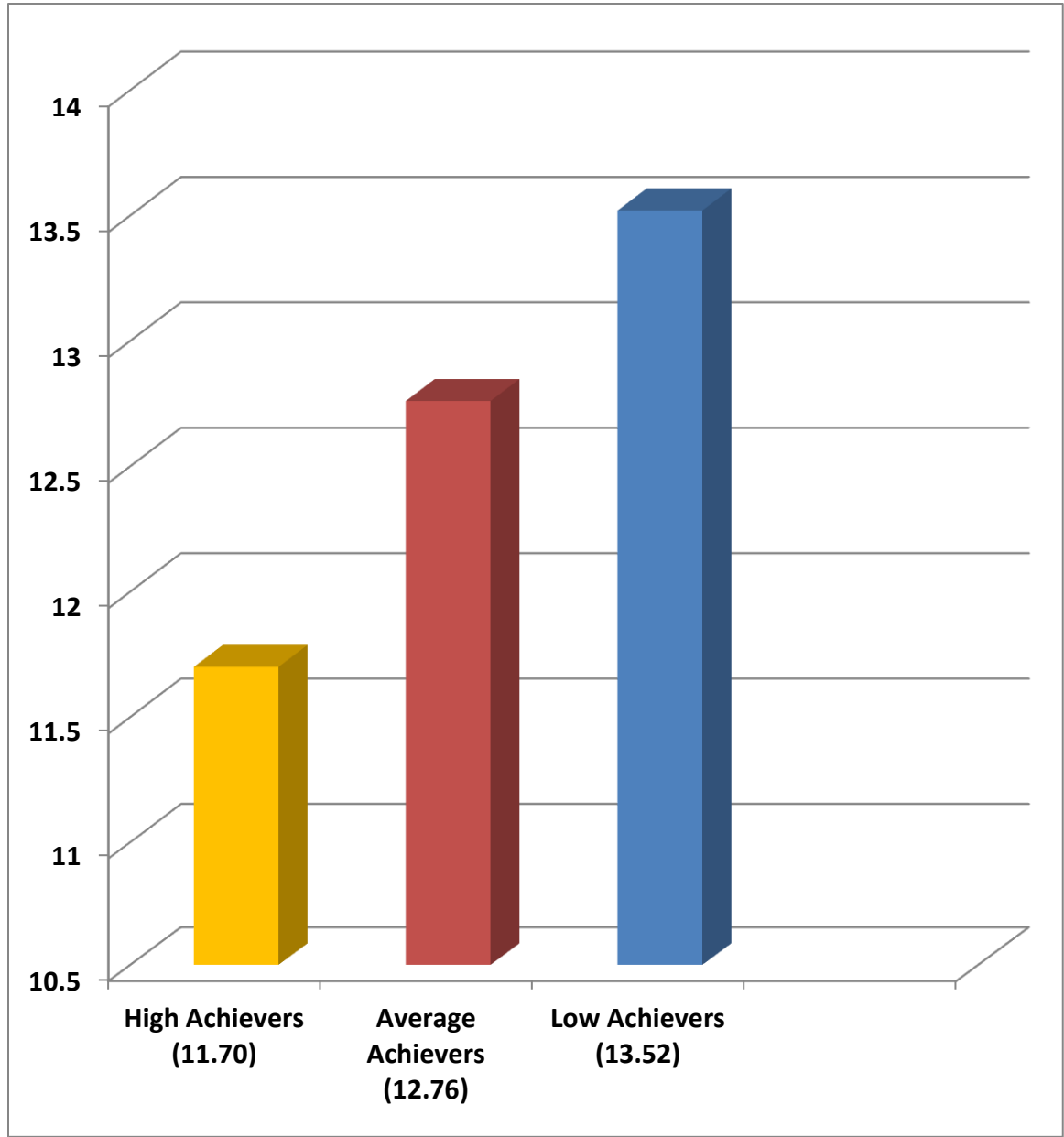
It is clear from table 4.1.3 that t-value has turned out to be 2.602 for comparison of means score of right hemispheric style of high and low achievers. It is significant at 0.05 level of significance. Moreover table 4.1.3 uncovers that mean score of low achievers is more prominent than high achievers. Consequently it might be inferred that low achievers are essentially higher on right hemispheric learning and thinking style than high achiever pupil-teachers.

Table 4.1.3 additionally shows that the t-value 1.864 for the differentiation of high and average achiever pupil-teachers was not discovered significant at 0.05 level. It prompts the end that high and average achievers did not vary fundamentally on right hemispheric style.

It is likewise obvious from the table that the t-value 1.413 got for the differentiation of average and low achievers was irrelevant at 0.05 level of significance, which leads us to the end that there is no factually significant difference between average and low achievers on right style of learning and thinking. At the end, both normal and low achievers are similar on this style of learning and thinking.

**Fig 4.1.1**

**Mean Scores of Right Hemispheric style of Learning and Thinking in regard to High, Average and Low Achiever pupil-teachers**



### **HYPOTHESIS – 1.3**

**There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low Academic Achievement.**

One-way ANOVA was applied to test this null hypothesis and the results have been provided in table 4.1.4.

**TABLE 4.1.4**

**One-way ANOVA for the scores of Integrated style of Learning and Thinking in regard to Academic Achievement Groups**

<b>Source of Variance</b>	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F-Ratio</b>
Between Group	2	1.412	0.706	0.033
Within Group	358	7676.595	21.443	NS
Total	360	7678.007		

NS=Not Significant at 0.05 level

Table 4.1.4 displays that F-value for the integrated style of learning and thinking was gotten to be 0.033, which is not significant at 0.05 level of significance. It infers that there was no significant difference between the pupil-teachers of three bunches (high average and low level) on integrated learning and thinking style. Expressing generally, achievement has no effect on the integrated style of learning and thinking of pupil-teachers. Subsequently the null hypothesis “There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low Academic Achievement” was accepted.

## **4.2 LEARNING AND THINKING STYLES IN RELATION TO GENDER TESTING HYPOTHESIS – 2**

**There is no significant differences in Learning and Thinking Styles of Male and Female pupil-teachers.”.**

There are three styles that have been considered as a parameter for differentiating at male and female pupil-teachers. In this manner, this null hypothesis incorporates three sub-hypothesis. Each sub-hypothesis has been analyzed by utilizing t-test of significance.

### **HYPOTHESIS – 2.1**

**There is no significant difference between Male and Female pupil-teachers with regard to their Hemispheric Style of Learning and Thinking.**

To test this null hypothesis, t-test of significance has been used and the results have been given in table 4.2.1.

**TABLE 4.2.1**  
**Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.**

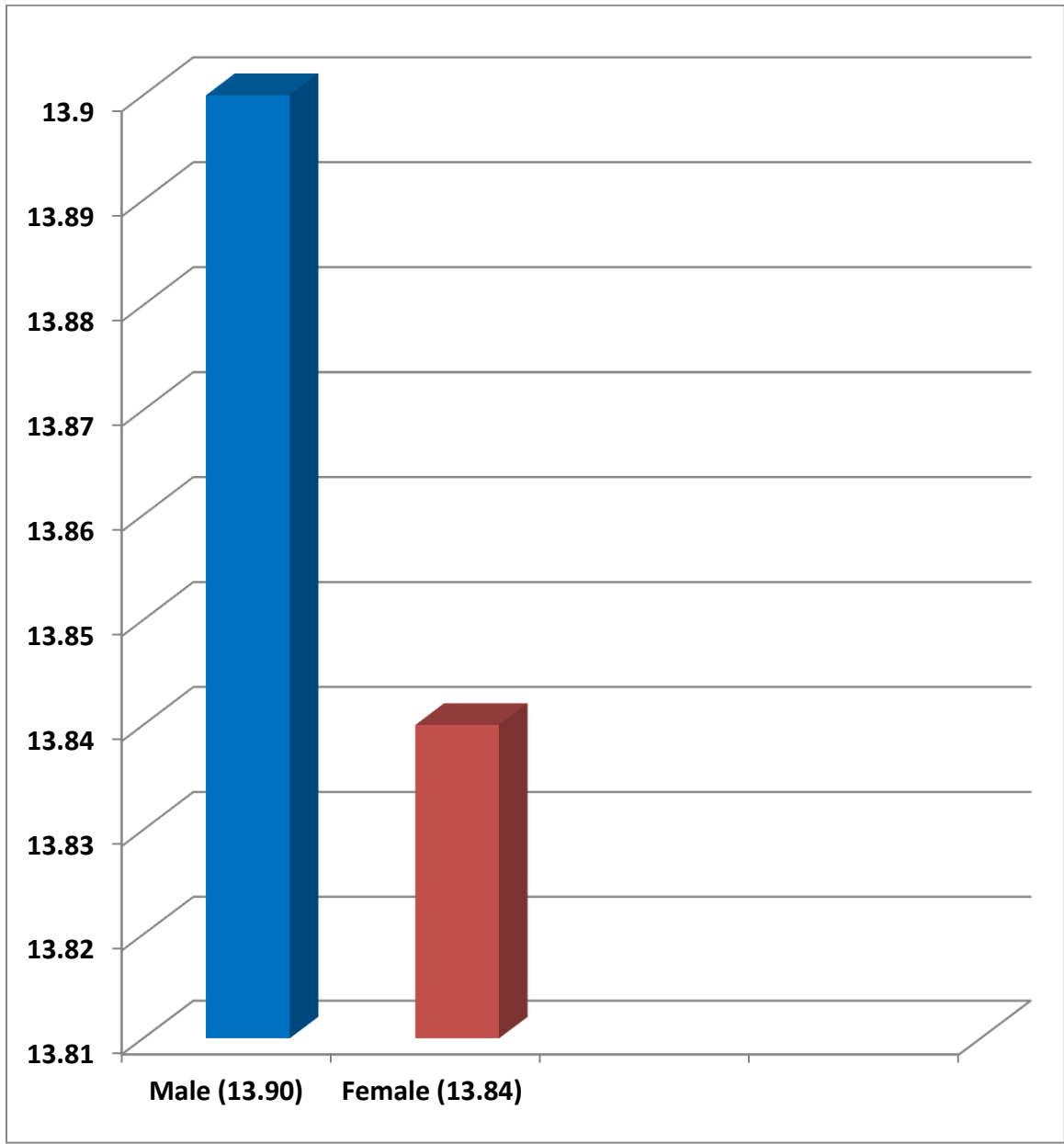
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>‘t’ value</b>	<b>Significance</b>
Male	186	13.90	3.24	358	0.178	NS
Female	174	13.84	3.15			

NS = Not significant at 0.05 level.

It is clear from the above table 4.2.1 that t-test for Left Hemispheric Style of learning and thinking of male and female pupil-teachers have turned out to be 0.178 which is not significant at 0.05 level, this prompts imply that both male-female pupil-teachers don't vary altogether as to left hemispheric style of learning and thinking. Notwithstanding, the examination of mean scores (Male = 13.90 & Female = 13.84) supports left style for male pupils, it might, subsequently, be reasoned that male and female pupil-teachers are similarly arranged in left style.

**Fig 4.2.1**

**Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.**



## **HYPOTHESIS – 2.2**

**There is no significant difference between male and female pupil-teachers with regard to their Right Hemispheric Style of learning and thinking.**

t-test of significance has been applied to test this null hypothesis and the values have been given in table 4.2.2.

**TABLE 4.2.2**  
**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.**

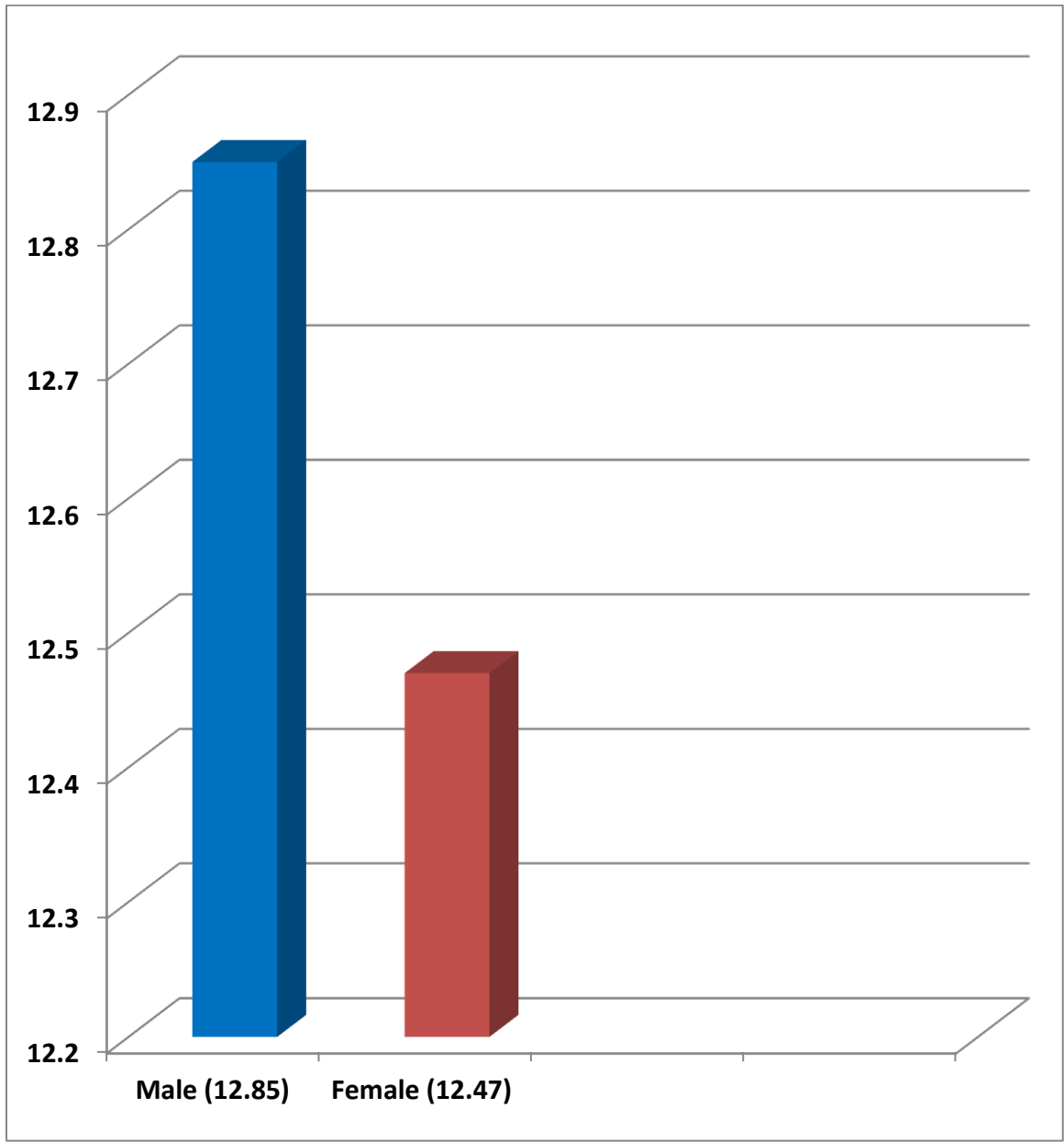
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>'t' value</b>	<b>Significance</b>
Male	186	12.85	3.94	358	0.928	NS
Female	174	12.47	3.83			

NS = Not significant at 0.05 level.

Table 4.2.2 uncovers that t-value for Right Hemispheric Style of learning and thinking of male and female pupil-teachers is 0.928, which is not significant at 0.05 level of significance. It might along these lines be deciphered that no significant difference between male and female pupil-teachers with respect to right hemispheric learning and thinking style. It is likewise delineated by the investigation of mean scores that the mean score is higher for the male. Thusly it might be summed up that both male and female are the similarly situated hemispheric style of learning and thinking.

**Fig 4.2.2**

**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Male and Female pupil-teachers.**



### **HYPOTHESIS – 2.3**

**There is no significant difference between Male and Female pupil-teachers with respect to their Integrated Style of Learning and Thinking.**

Here, t-test of significance has been applied to test this null hypothesis, the values have been shown in table 4.2.3.

**TABLE 4.2.3**  
**Mean scores of Integrated Style of learning and thinking in regard to Male and Female pupil-teachers.**

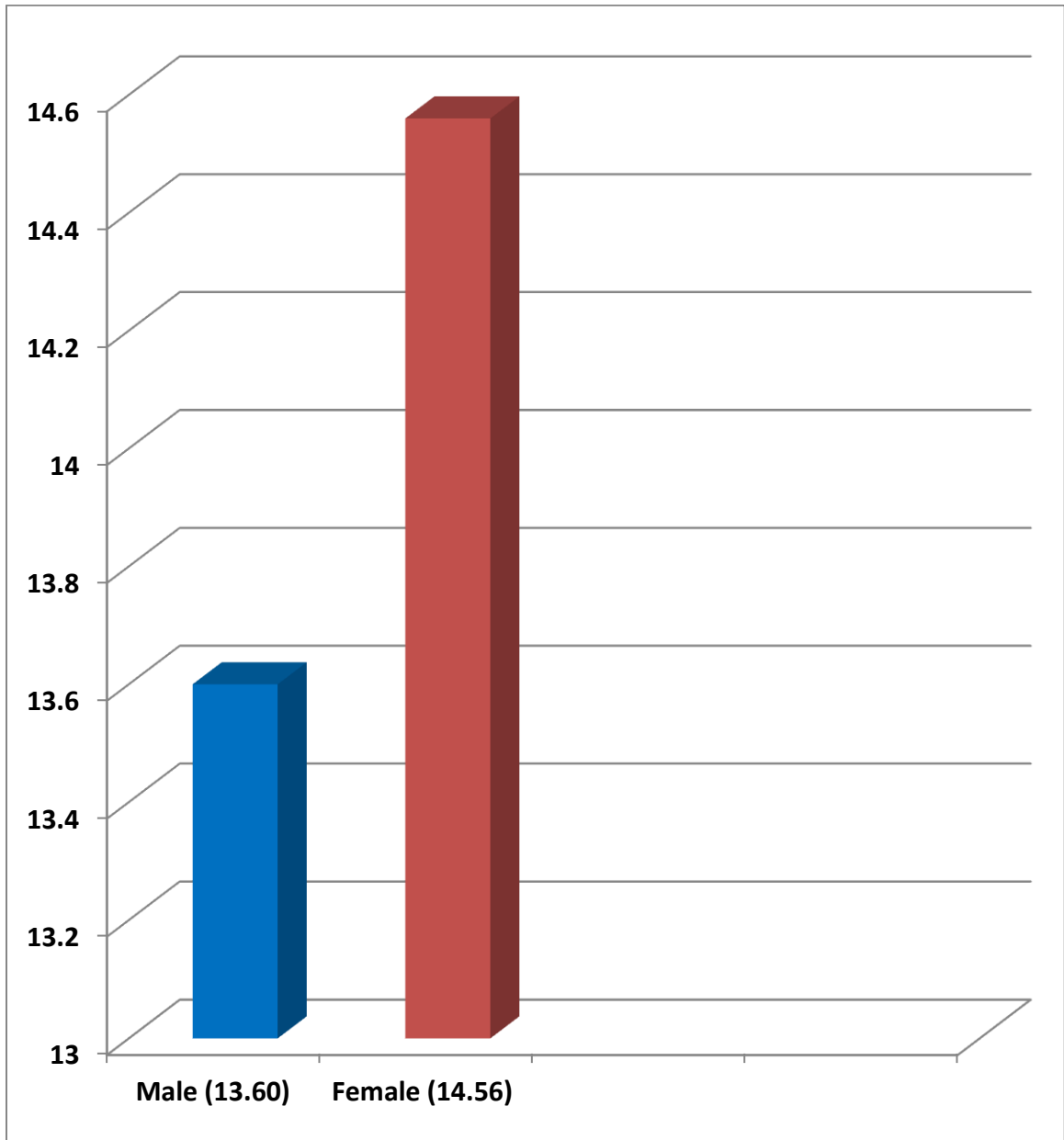
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>‘t’ value</b>	<b>Significance</b>
Male	186	13.60	4.66	358	1.982	*
Female	174	14.56	4.95			

\* = Significant at 0.05 level.

Table 4.2.3 portrays that t-value for Integrated Hemispheric style of learning and thinking of male and female pupil-teachers have turned out to be 1.982 which is significant at 0.05 level of significance, which means accordingly that both male and female pupil-teachers contrasted essentially with respect to integrated hemispheric style of learning and thinking. It might be appeared based on the investigation of mean scores that the mean an incentive for female pupil-teachers is higher than the mean an incentive for male pupil-teachers. This prompts being the end that the null hypothesis 2.3 “There is no significant difference between Male and Female pupil-teachers with respect to their Integrated Style of Learning and Thinking” was rejected.

**Fig 4.2.3**

**Mean scores of Integrated Style of Learning and Thinking in regard to Male and Female pupil-teachers.**



### **4.3 LEARNING AND THINKING STYLES IN RELATION TO STREAM TESTING HYPOTHESIS – 3**

**There is no significant differences in Learning and Thinking Styles of pupil-teachers belonging to Science, Arts and Commerce streams.**

Here, three styles of learning and thinking of pupil-teachers are to be looked at for changed streams, the present hypothesis incorporates three sub-hypothesis. Each sub-hypothesis has been tried by ANOVA. If there should be an occurrence of significant F-ratio, t-tests have additionally been used.

#### **HYPOTHESIS – 3.1**

**There is no significant difference in Left Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.**

To test this null hypothesis, one-way-ANOVA was used and the obtained results have been given in table 4.3.1.

**TABLE 4.3.1**  
**One-way ANOVA for the scores of Left Hemispheric style of Learning and Thinking in regard to Streams.**

<b>Source of Variance</b>	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F-Ratio</b>
Between Group	2	179.000	89.500	9.055 **
Within Group	358	3538.473	9.884	
Total	360	3717.473		

\*\* Significant at 0.01 level

Table 4.3.1 displays that the 'F'-ratio was gotten 9.055, which is exceedingly critical (significant) at 0.01 level. This infers pupil-teachers having a place with different streams (science, Arts and commerce) contrasted significantly on the left hemispheric style of learning and thinking. Consequently, null-hypothesis 3.1 was rejected.

Because the F-ratio gives the whole image of the outcomes and does not indicate precise loci of mean contrast, t-tests were performed. The got outcomes have appeared in table 4.3.2.

**TABLE 4.3.2**  
**Mean Scores of Left Hemispheric Style of Learning and Thinking in regard to Science, Arts and Commerce Streams.**

S. No.	Stream	N	M	S.D.	Comparison Group	't' valve
1.	Science	193	14.54	3.13	1 and 2	3.475**
2.	Arts	105	13.21	3.17	1 and 3	3.273**
3.	Commerce	62	13.07	3.06	2 and 3	0.282 NS

NS = Not Significant at 0.05 level

\*\*Significant at 0.01 level

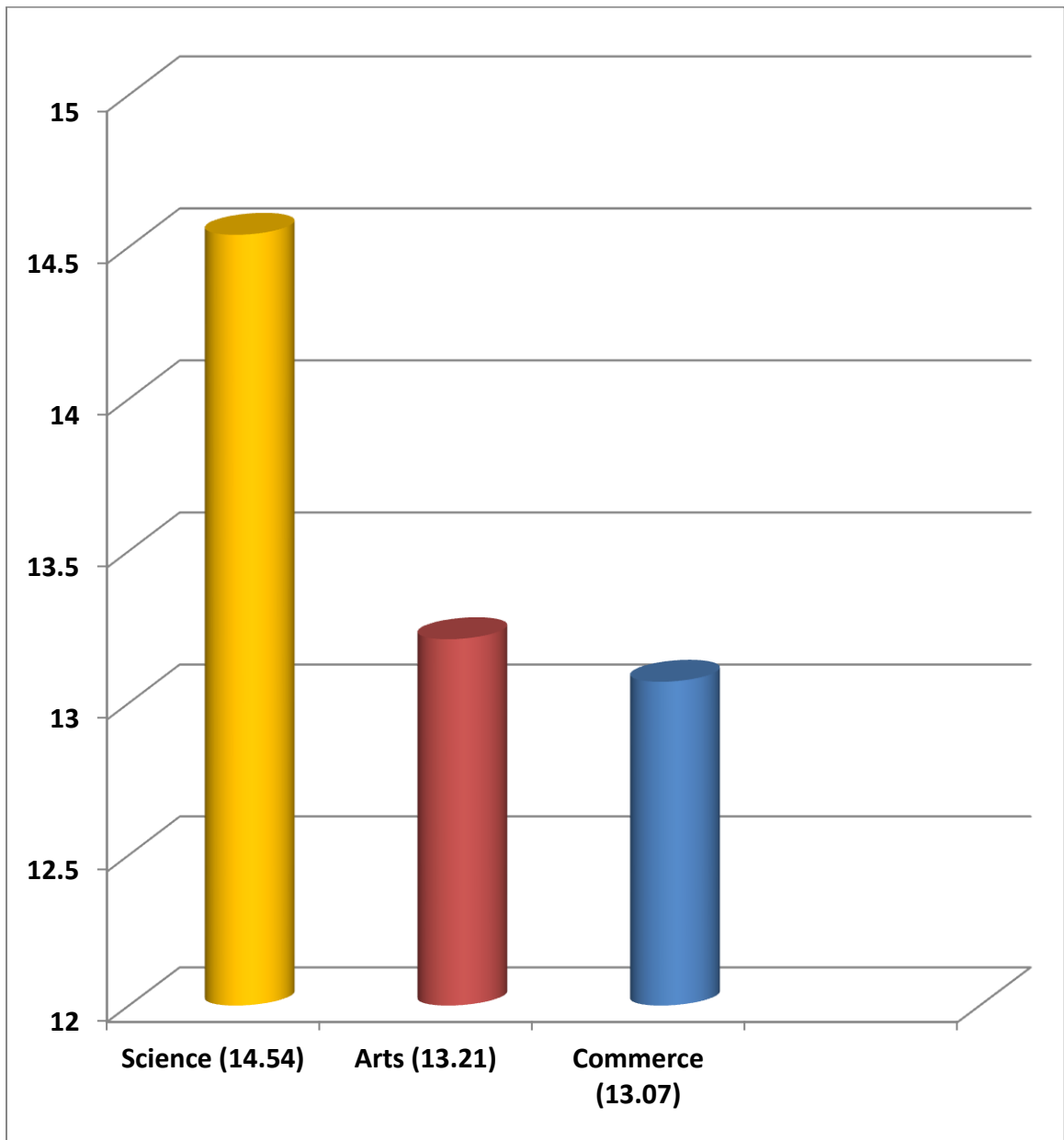
It is obvious from the table 4.3.2 that t-test has turned out to be 3.475 for differentiation of mean scores for left hemispheric style of science and arts pupil-teachers. This t-score is significant at 0.01 level. From the table 4.3.2, mean score for science gathering is higher than arts gathering, from this it might be inferred that science pupil-teachers were fundamentally higher on left hemispheric learning and thinking style than pupil-teachers of arts stream.

Table 4.3.2 shows that 't'-value 3.273 contrasting mean of the left hemispheric style of pupil-teachers belonging to science and commerce streams were observed to be profoundly significant at 0.01 level of significance. This recommends there is a critical significant between science and commerce streams pupil-teachers on left hemispheric style of learning and thinking. Since mean contrast is supportive of science gathering, it might be said that pupil-teachers of science stream were altogether higher on the left hemispheric style of learning and thinking than pupil-teachers of commerce stream.

It might likewise be noticed that t-value 0.282, which looks at arts and commerce bunches on left hemispheric was not discovered significant at 0.05 level. It prompts the derivation that pupil-teachers of arts and commerce streams did not vary essentially on left hemispheric style. It implies that pupil-teachers of arts and commerce were similar on the left hemispheric style of learning and thinking.

**Fig 4.3.1**

**Mean Scores of Left Hemispheric Style of Learning and Thinking in regard to Science, Arts and Commerce Streams.**



### **HYPOTHESIS – 3.2**

**There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.**

To test this null hypothesis, one-way ANOVA was applied and the results of this analysis have been presented in table 4.3.3.

**Table 4.3.3**  
**One-way ANOVA for the scores of Right Hemispheric style of Learning and Thinking in regard to Streams.**

<b>Source of Variance</b>	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F-Ratio</b>
Between Group	2	244.091	122.045	8.329 **
Within Group	358	5245.775	14.653	
Total	360	5489.866		

\*\* Significant at 0.01 level

It is clear from the above table 4.3.3 that 'F' ratio in the event of right hemispheric style has turned out to be 8.329, which is significant at 0.01 level of significance. This implies there was a critical distinction in the right hemispheric style of learning and thinking of pupil-teachers of science, arts and commerce streams. Subsequently, inquire about null hypothesis "There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams" was rejected.

For determining the careful wellspring of distinction in mean scores for right hemispheric style, t-test were applied. The acquired outcomes have appeared in table 4.3.4.

**TABLE 4.3.4**  
**Mean Scores of Right Hemispheric style of Learning and Thinking in regard to**  
**Science, Art and Commerce Streams.**

S. No.	Stream	N	M	S.D.	Comparison Group	't' valve
1.	Science	193	12.08	3.62	1 and 2	4.384**
2.	Arts	105	13.94	3.43	1 and 3	0.472NS
3.	Commerce	62	12.39	4.75	2 and 3	2.247 *

NS = Not Significant at 0.05 level

\*\*Significant at 0.01 level

\*Significant at 0.05 level

Table 4.3.4 uncovers that t-value 4.384 turned out to be significant at 0.01 level of significance. This thinks about the right hemispheric style of pupil-teachers of science and arts. From the acquired outcomes it may be surmised that science and arts varied essentially on right hemispheric style. Since the mean estimation of arts gathering is greater the mean estimation of science gathering, it might be reasoned that pupil-teachers of arts were fundamentally higher on the right hemispheric style of learning and thinking than pupil-teachers of science.

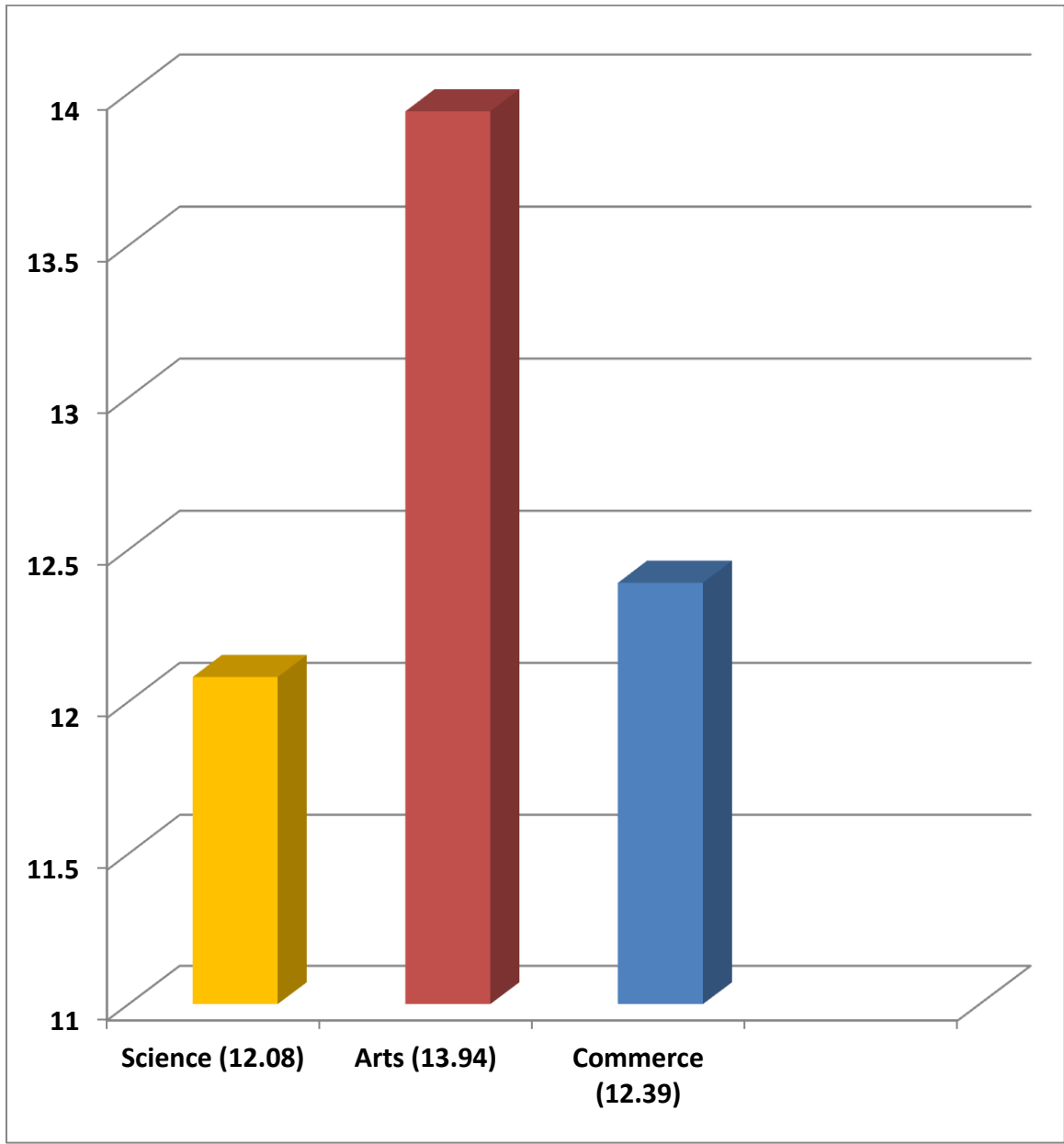
Table 4.3.4 further uncovers that another t-ratio 0.472, which looks at pupil-teachers of science and commerce, were observed to be not significant at 0.05 level. It infers that there was no huge contrast in right hemispheric learning and thinking style of pupil-teachers of science and commerce streams.

The third t-ratio 2.247 differentiating arts and commerce streams pupil-teachers on right hemispheric style turn out to be significant at 0.05 level of significance. Since the mean contrast is agreeable to arts gathering, it might be said that pupil-teachers of arts stream were altogether more right hemispherical style situated than pupil-teachers of commerce gathering.

Subsequently, pupil-teachers of arts gathering were fundamentally higher on right hemispheric learning and thinking style than pupil-teachers of science and commerce gatherings.

**Fig 4.3.2**

**Mean Scores of Right Hemispheric style of Learning and Thinking in regard to Science, Art and Commerce Streams.**



### **HYPOTHESIS – 3.3**

**There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.**

The null hypothesis was tested by one-way ANOVA and the results are shown in table 4.3.5.

**TABLE 4.3.5**  
**One-way ANOVA for the scores of Integrated Hemispheric style of Learning and Thinking in regard to Streams.**

<b>Source of Variance</b>	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F-Ratio</b>
Between Group	2	95.502	26.751	1.262 NS
Within Group	358	7589.959	21.201	
Total	360	7643.461		

NS = Not Significant at 0.05 level

It might be found in table 4.3.5 that F-ratio was gotten as 1.262 which isn't significant at 0.05, it implies that there was no critical contrast. Mean scores of incorporated hemispheric style of pupil-teachers having a place with science, arts and commerce streams are equivalent. Consequently the null hypothesis “There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams” was accepted.

#### 4.4 LEARNING AND THINKING STYLES IN RELATION TO PERSONALITY

##### TESTING HYPOTHESIS – 4(a)

**There is no significant differences in Learning and Thinking Styles of pupil-teachers having Extrovert and Introvert Personality**

There are three style of learning and thinking and each style of learning and thinking was considered independently. In this way, it prompts plan and testing of three sub-hypothesis. In the accompanying passages, the examination by t-test has been applied in regard of three styles of learning and thinking.

##### HYPOTHESIS – 4(a) - 1

**There is no significant difference in Left Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type Personality**

The null hypothesis was tested by t-test and the results have been given in table 4.4.1.

**TABLE 4.4.1**

**Mean scores of Left Hemispheric style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.**

Group	N	Mean	S.D	df	't' value	Significance
Extrovert	95	13.02	3.10	191	4.398	**
Introvert	98	15.04	3.28			

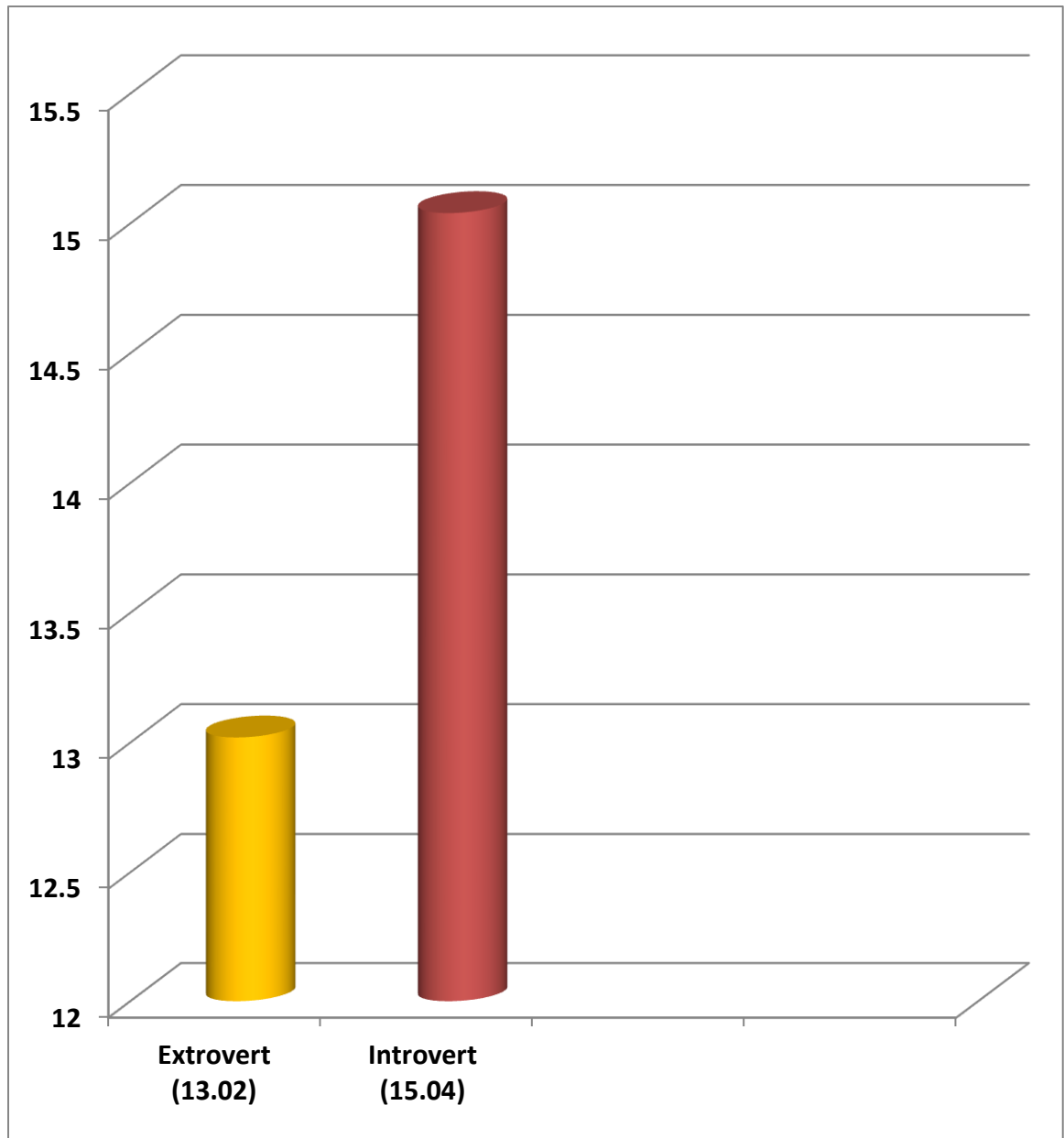
\*\* significant at 0.01 level.

Table 4.4.1 shows that t-value for left hemispheric style of learning and thinking was gotten as 4.398, which is significant at 0.01 level of significance. It implies there was a distinction between extrovert type and introvert type pupil-teachers on left hemispheric style of learning and thinking. It is apparent from the table 4.4.1 that the mean estimation of introvert type pupil-teachers is higher than extrovert type pupil-teachers. From this it

might be reasoned that introvert type pupil-teachers would in general be higher than extrovert type pupil-teachers on left hemispheric style of learning and thinking. Hence, the null hypothesis “There is no significant difference in Left Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type Personality” was rejected.

**Fig 4.4.1**

**Mean scores of Left Hemispheric style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.**



#### **HYPOTHESIS – 4(a) -2**

**There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type pupil-teachers.**

The null hypothesis was tested by t-test and the results have been given in table 4.4.2.

**TABLE 4.4.2**  
**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.**

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>'t' value</b>	<b>Significance</b>
Extrovert	95	14.17	3.68	191	3.955	**
Introvert	98	11.93	4.18			

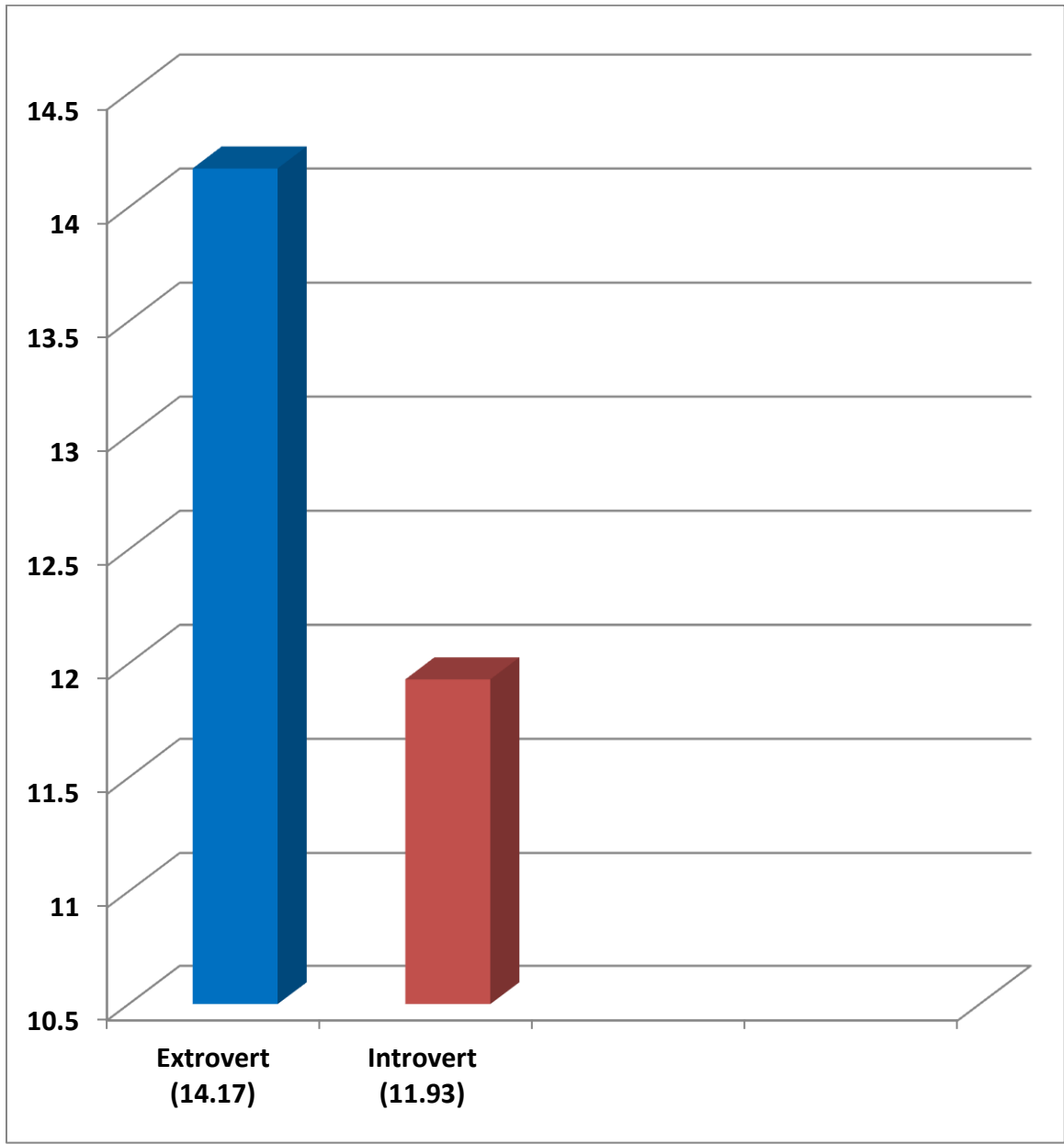
\*\* significant at 0.01 level.

It is evident from table 4.4.2 that t-value for the right hemispheric style of learning and thinking turned out to be 3.955, which is highly significant at 0.01 level of significance. Hence, the null hypothesis 4(a)-2 “There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type pupil-teachers” was rejected. It demonstrates that there is critical contrast between extrovert and introvert type pupil-teachers on the right hemispheric style of learning and thinking.

It is further apparent from the above table that the mean estimation of extrovert gathering is more prominent than introvert gathering. From this, it might be presumed that extrovert pupil-teachers are progressively inclined to right hemispheric learning and thinking style than introvert type pupil-teachers.

**Fig 4.4.2**

**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.**



### **HYPOTHESIS – 4(a) – 3**

**There is no significant difference in Integrated Hemispheric Learning and Thinking style of pupil-teachers having Extrovert and Introvert type Personality.**

The null hypothesis was tested by t-test and the results have been given in table 4.4.3.

**TABLE 4.4.3**  
**Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.**

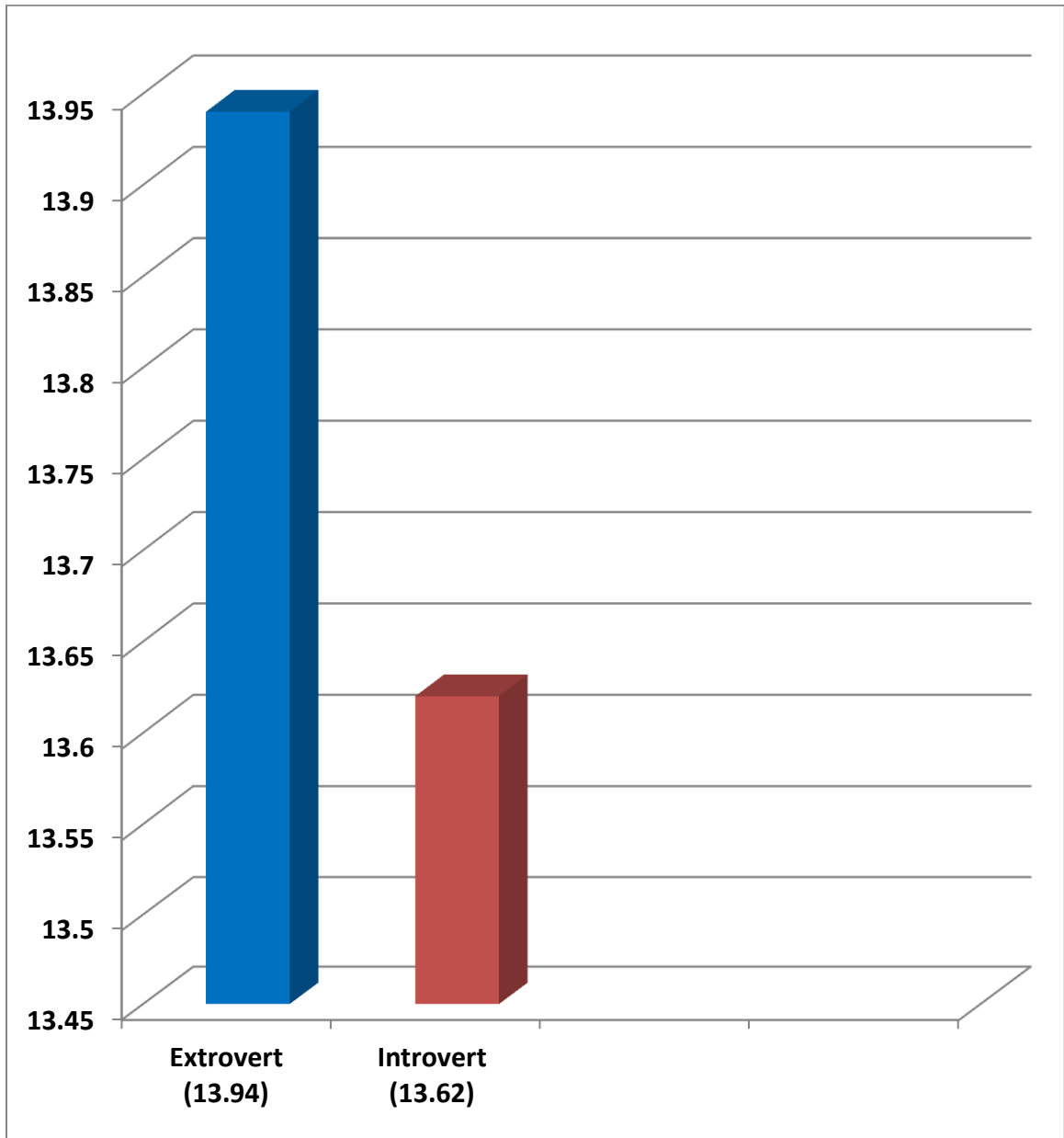
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>'t' value</b>	<b>Significance</b>
Extrovert	95	13.94	5.30	191	0.452	NS
Introvert	98	13.62	4.50			

NS = Not significant at 0.05 level.

It is evident from the table 4.4.3 that t-value turned out to be 0.452, which is not significant at 0.05 level of significance. It prompts acceptance of concerned null hypothesis in perspective on the above it might be expressed that “there is no significant difference between extrovert and introvert type pupil-teachers on integrated hemispheric style of learning and thinking”. Albeit mean contrast is agreeable to extrovert type pupil-teachers. This infers the distinction in the two mean scores was false and might be attributed to risk blunder or examining vacillations.

**Fig 4.4.3**

**Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Extrovert and Introvert type pupil-teachers.**



## 4.5 LEARNING AND THINKING STYLES IN RELATION TO PERSONALITY

### HYPOTHESIS 4(b)

**There is no significant differences in Learning and Thinking Style of pupil-teachers having Neurotic type and Stable type Personality.**

There are three styles of learning and thinking of pupil-teachers and each style is talked about independently. Consequently, it incorporates three sub-hypothesis. In the accompanying sections, the examination by t-test has been given in regard to three styles of learning and thinking.

### HYPOTHESIS – 4(b) - 1

**There is no significant difference in Left Hemispheric Learning and Thinking style of pupil-teachers having Neurotic and Stable type Personality.**

In order to test this null hypothesis, t-test was employed and the obtained results of this analysis have been given in table 4.5.1.

**TABLE 4.5.1**

**Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.**

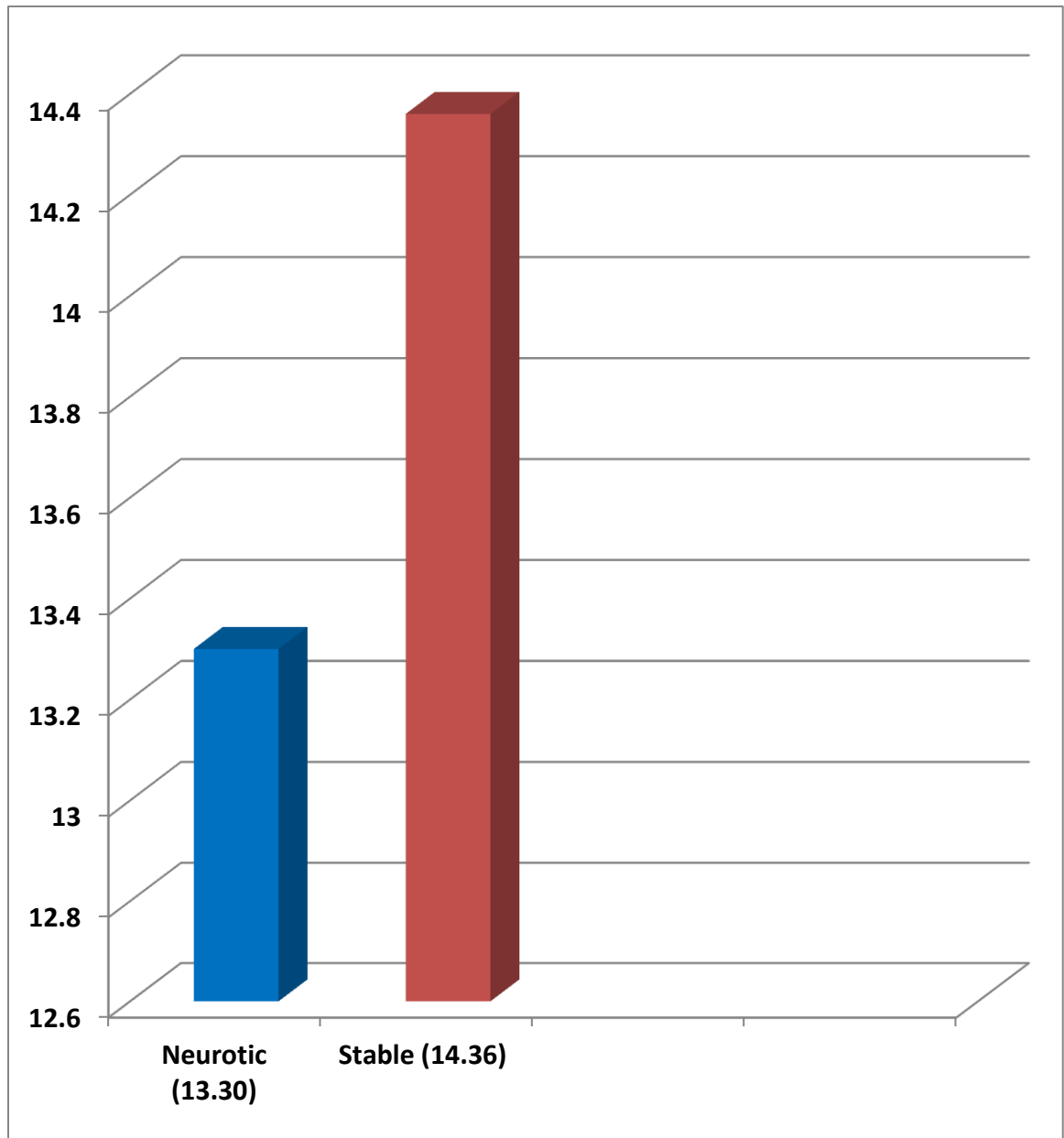
Group	N	Mean	S.D	df	't' value	Significance
Neurotic	91	13.30	3.34	165	2.013	*
Stable	76	14.36	3.43			

\* = Significant at 0.05 level.

From the above table 4.5.1 demonstrates that the t-value was acquired as 2.013, which is significant and this suggests pupil-teachers of a neurotic and stable type contrasted fundamentally on the left hemispheric style of learning and thinking. Thus the null hypothesis " There is no significant difference in Left Hemispheric Learning and Thinking style of pupil-teachers having Neurotic and Stable type Personality " was rejected.

**Fig 4.5.1**

**Mean scores of Left Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.**



#### **HYPOTHESIS – 4(b) - 2**

**There is no significant difference in Right Hemispheric Learning and Thinking Style of pupil-teachers having Neurotic and Stable type Personality.**

To test this null hypothesis, t-test was employed and the obtained results have been provided in table 4.5.2.

**TABLE 4.5.2**  
**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.**

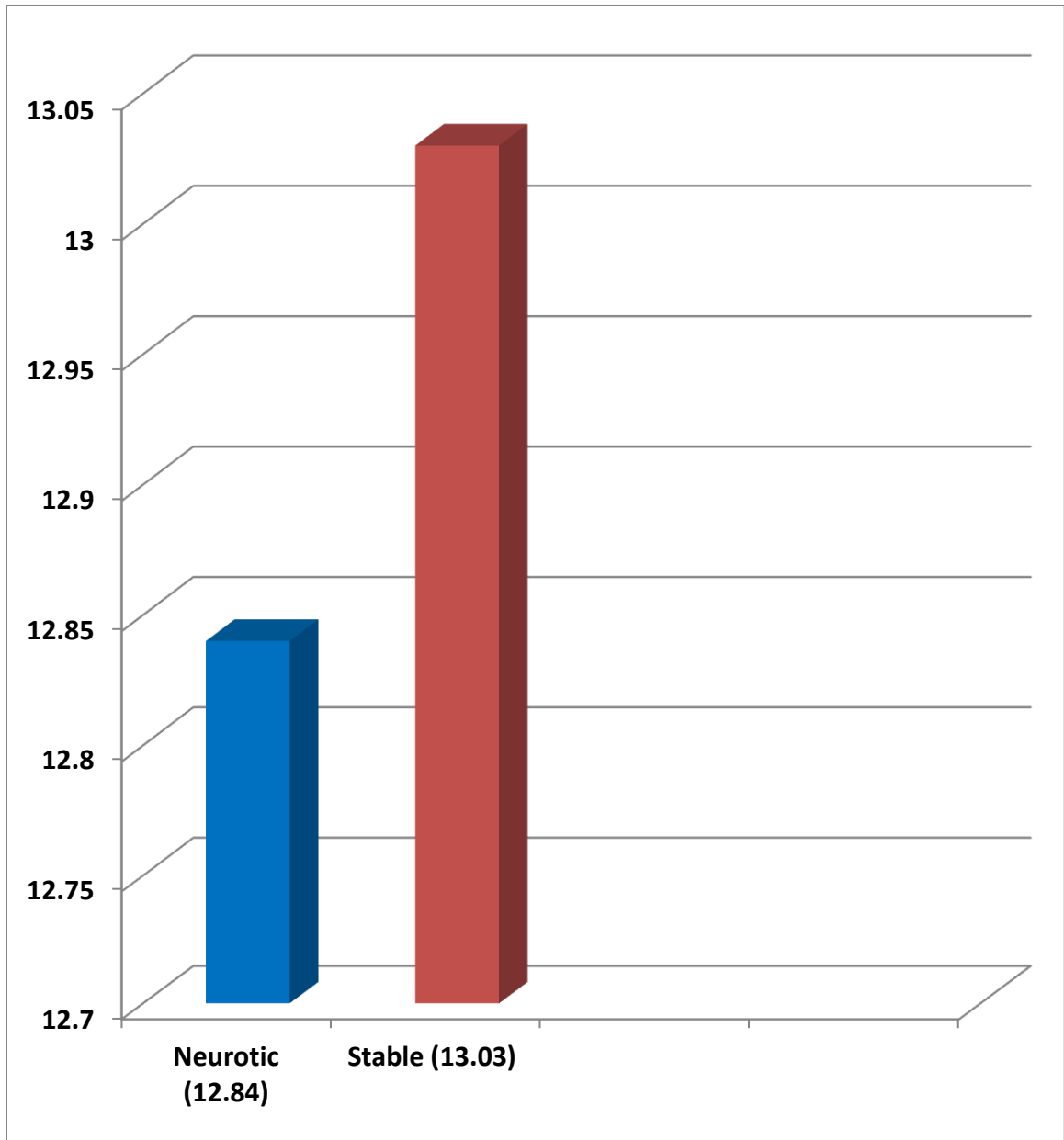
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>'t' value</b>	<b>Significance</b>
Neurotic	91	12.84	3.49	165	0.339	NS
Stable	76	13.03	3.69			

NS = Not significant at 0.05 level.

It is apparent from the above table 4.5.2 the t-value for the right hemispheric style of learning and thinking was gotten to be 0.339. It is not significant at 0.05 level. It in this way drives us to presume that null hypothesis 4(b)-2 expressing that “there is no significant difference in right hemispheric style of learning and thinking” was accepted. In this way, it might be deduced that both neurotic and stable kind of pupil-teachers are similarly right arranged in their style of learning and thinking.

**Fig 4.5.2**

**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.**



### **HYPOTHESIS – 4(b) – 3**

**There is no significant difference in Integrated Hemispheric Learning and Thinking style of pupil-teachers having Neurotic and Stable type Personality.**

In order to test this null hypothesis, t-test was employed and the obtained results of this analysis have been provided in table 4.5.3.

**TABLE 4.5.3**

**Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.**

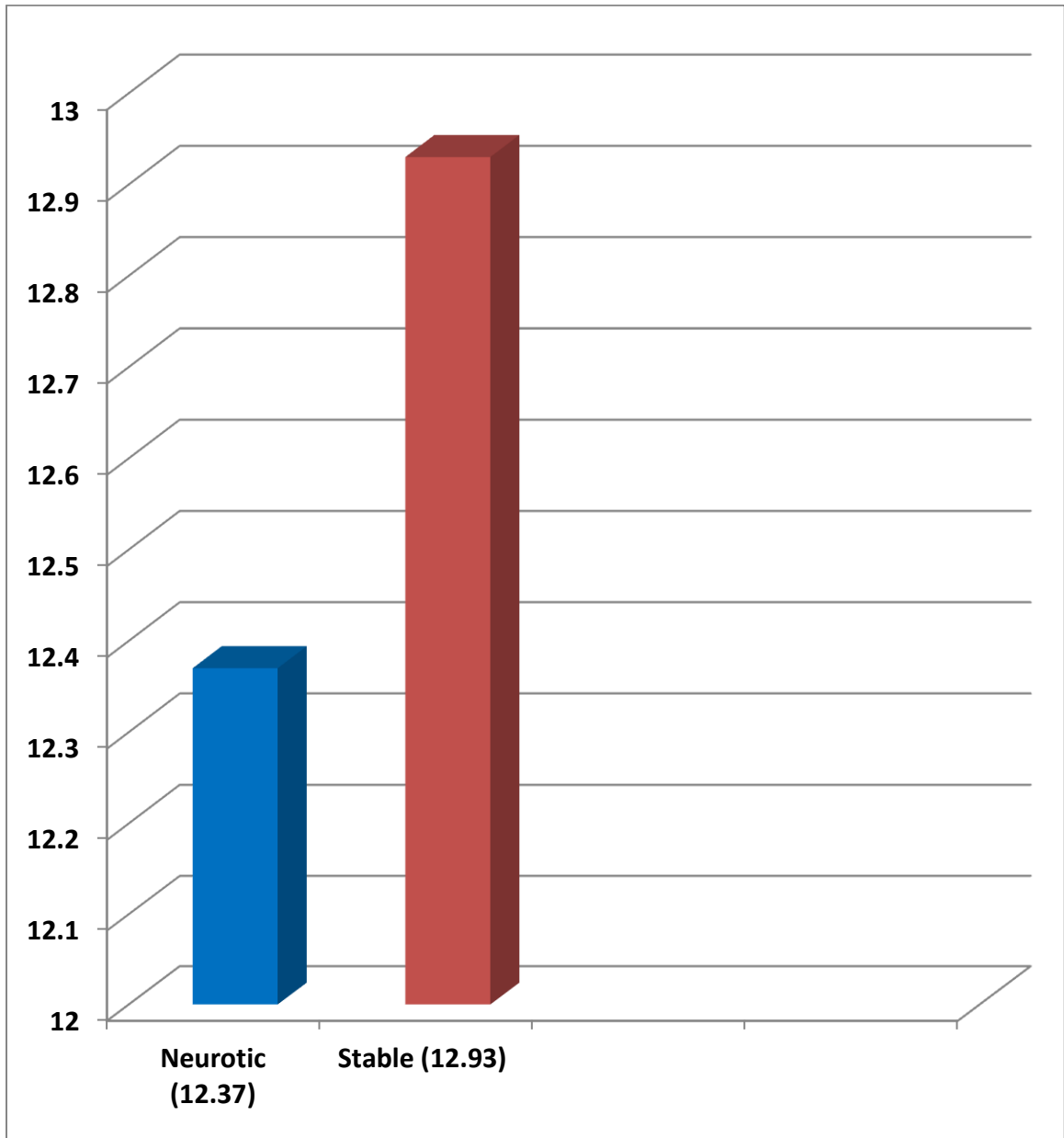
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>'t' value</b>	<b>Significance</b>
Neurotic	91	12.37	3.01	165	1.001	NS
Stable	76	12.93	4.03			

NS = Not significant at 0.05 level.

As obvious from table 4.5.3 the t-value for got as 1.001, which is not significant at 0.05 level. Thus the null-hypothesis 4(b)-3 expressing that “there is no significant difference in integrated hemispheric style of learning and thinking” was accepted. In this way, it might be gathered that both neurotic and stable type pupil-teachers are similarly situated in their learning and thinking style.

**Fig 4.5.3**

**Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to Neurotic and Stable type pupil-teachers.**



## 4.6 LEARNING AND THINKING STYLES IN RELATION TO EMOTIONAL INTELLIGENCE

### TESTING HYPOTHESIS – 5

**There is no significant difference in Learning and Thinking Styles of pupil-teachers having High and Low levels of Emotional Intelligence.**

Here, Three styles of learning and thinking of pupil-teachers are to be looked at for the high and low emotional intelligence, the present null hypothesis have been divided into three sub-hypotheses. Each sub-hypothesis have been tested by t-test.

#### HYPOTHESIS – 5.1

**There is no significant difference in Left Hemispheric learning and thinking style of pupil-teachers having high and low levels of emotional intelligence.**

To test this null hypothesis, t- test was used and the results have been given in table 4.6.1.

**TABLE 4.6.1**

**Mean scores of Left Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional Intelligence.**

Group	N	Mean	S.D	df	't'	Significance
High Emotional Intelligence	206	14.08	3.44	358	2.748	**
Low Emotional Intelligence	154	13.14	3.03			

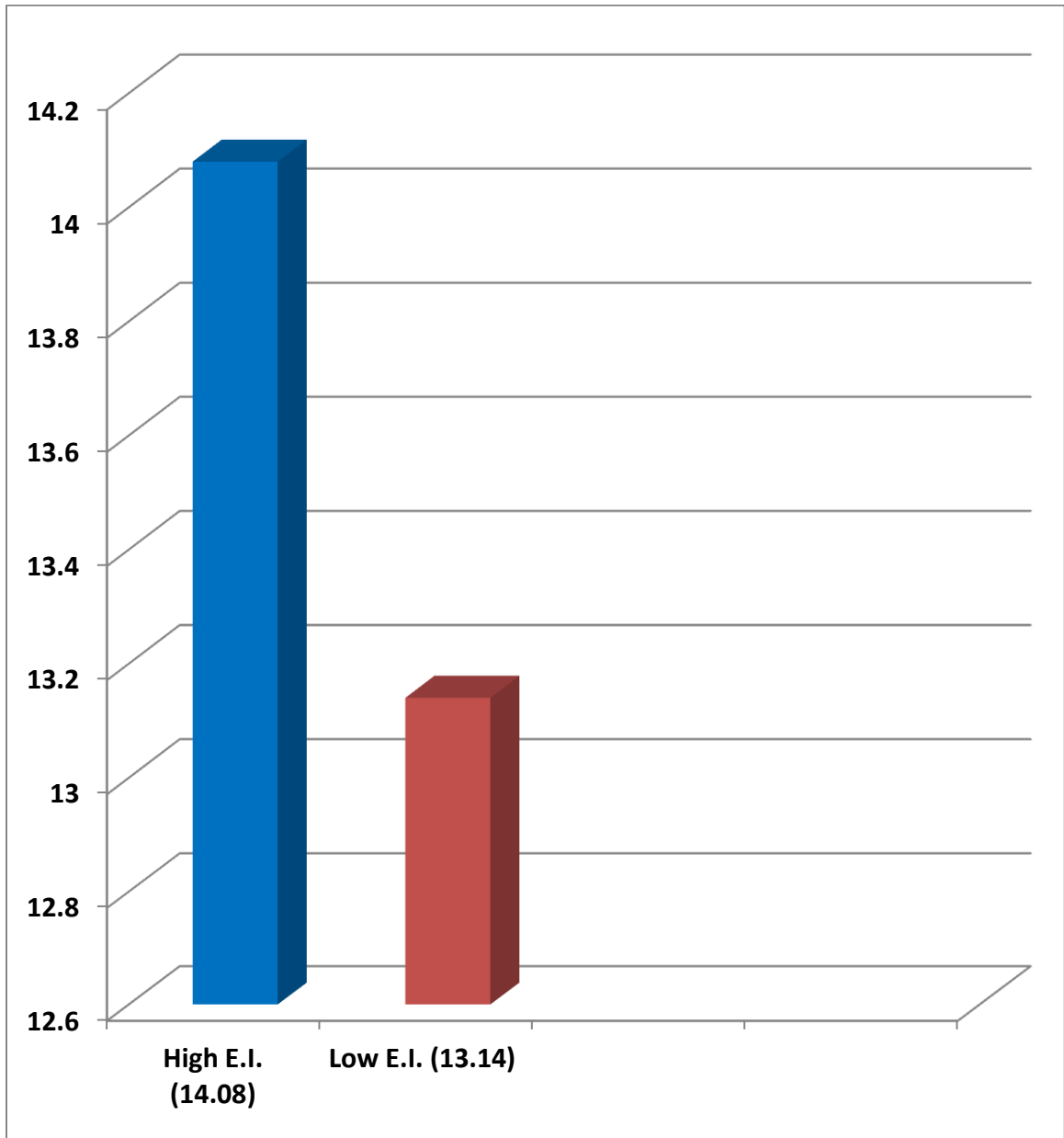
\*\* Significant at 0.01 level

It is clear from table 4.6.1 that the t-value has been determined as 2.748 for the examination of the mean value of the left hemispheric style of pupil-teachers with high and low level emotional intelligence. This t-value is critical at 0.01 level of significance. The table anyway uncovers that the mean score was higher for high emotional intelligence bunch than the mean score of low level emotional intelligence gathering, It shows that there is critical contrast between high and low level emotional intelligence of pupil-teachers on the left hemispheric style of learning and thinking. Subsequently, the

null hypothesis 5.1 “There is no significant difference in Left Hemispheric learning and thinking style of pupil-teachers having high and low levels of emotional intelligence” was rejected.

**Fig 4.6.1**

**Mean scores of Left Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional Intelligence.**



## **HYPOTHESIS – 5.2**

**There is no significant difference in Right Hemispheric Learning and Thinking Style of pupil-teachers having High and Low levels of Emotional Intelligence.**

The null hypothesis tested by t-test and the results of t-test have been shown in table 4.6.2.

**TABLE 4.6.2**

**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional Intelligence and Low Emotional Intelligence**

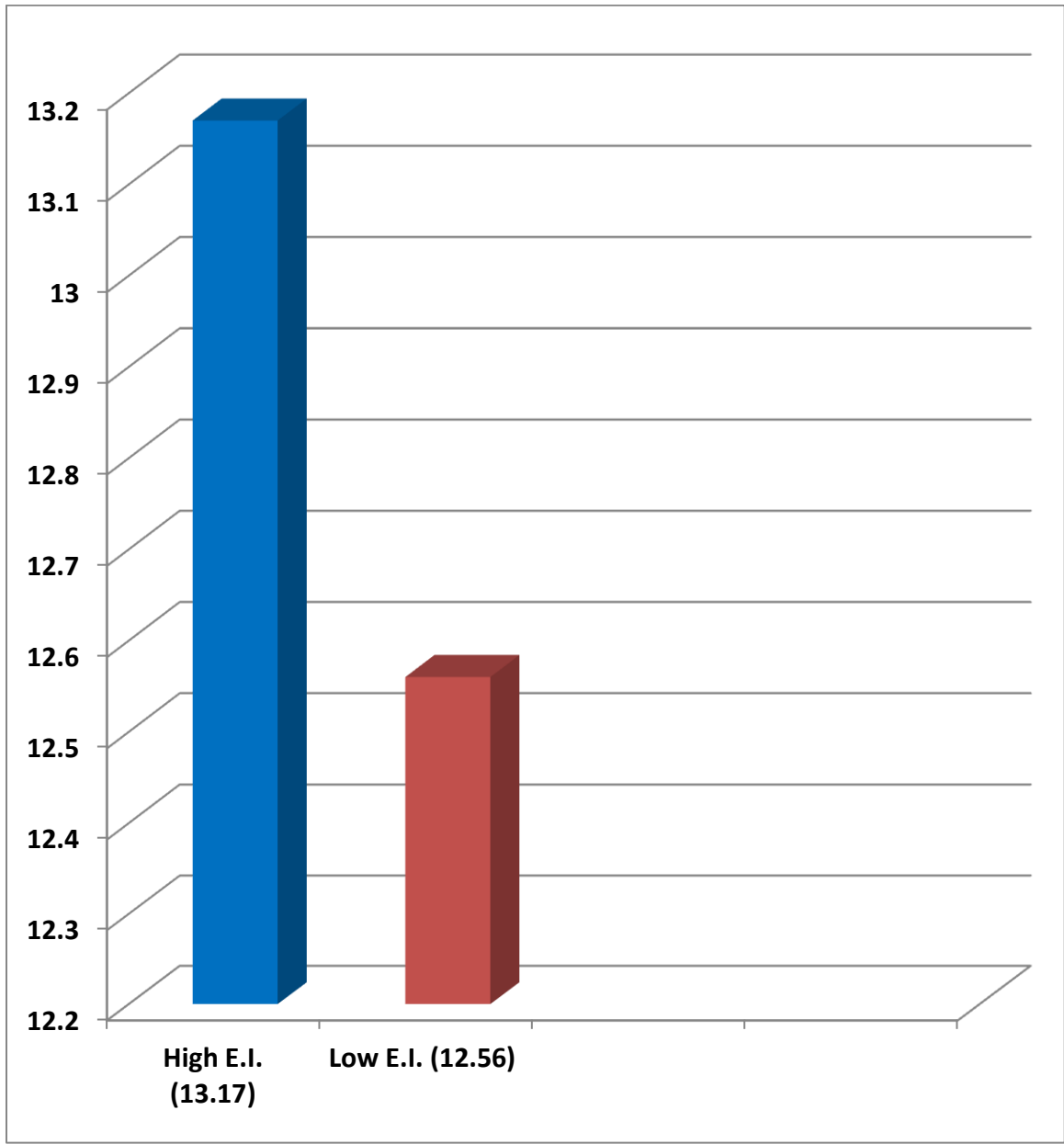
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>‘t’</b>	<b>Significance</b>
High Emotional intelligence	206	13.17	4.11	358	1.353	NS
Low Emotional intelligence	154	12.56	4.32			

NS = Not significant at 0.05 level.

It is evident from table 4.6.2 that the t-value for the right hemispheric style of learning and thinking turned out to be 1.353, which is insignificant at 0.05 level of significance. It prompts the acknowledgment of concerned null hypothesis. In perspective on the above mentioned and it might be expressed that there was no huge contrast between pupil-teachers with high and low emotional intelligence. It might be induced that both high emotional intelligence gathering and low emotional intelligence gathering of pupil-teachers are statistically equivalent in the right hemispheric style of learning and thinking.

**Fig 4.6.2**

**Mean scores of Right Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional Intelligence and Low Emotional Intelligence**



### **HYPOTHESIS – 5.3**

**There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers having High and Low levels of Emotional Intelligence.**

The results of t-test have been presented in table 4.6.3.

**TABLE 4.6.3**

**Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional intelligence**

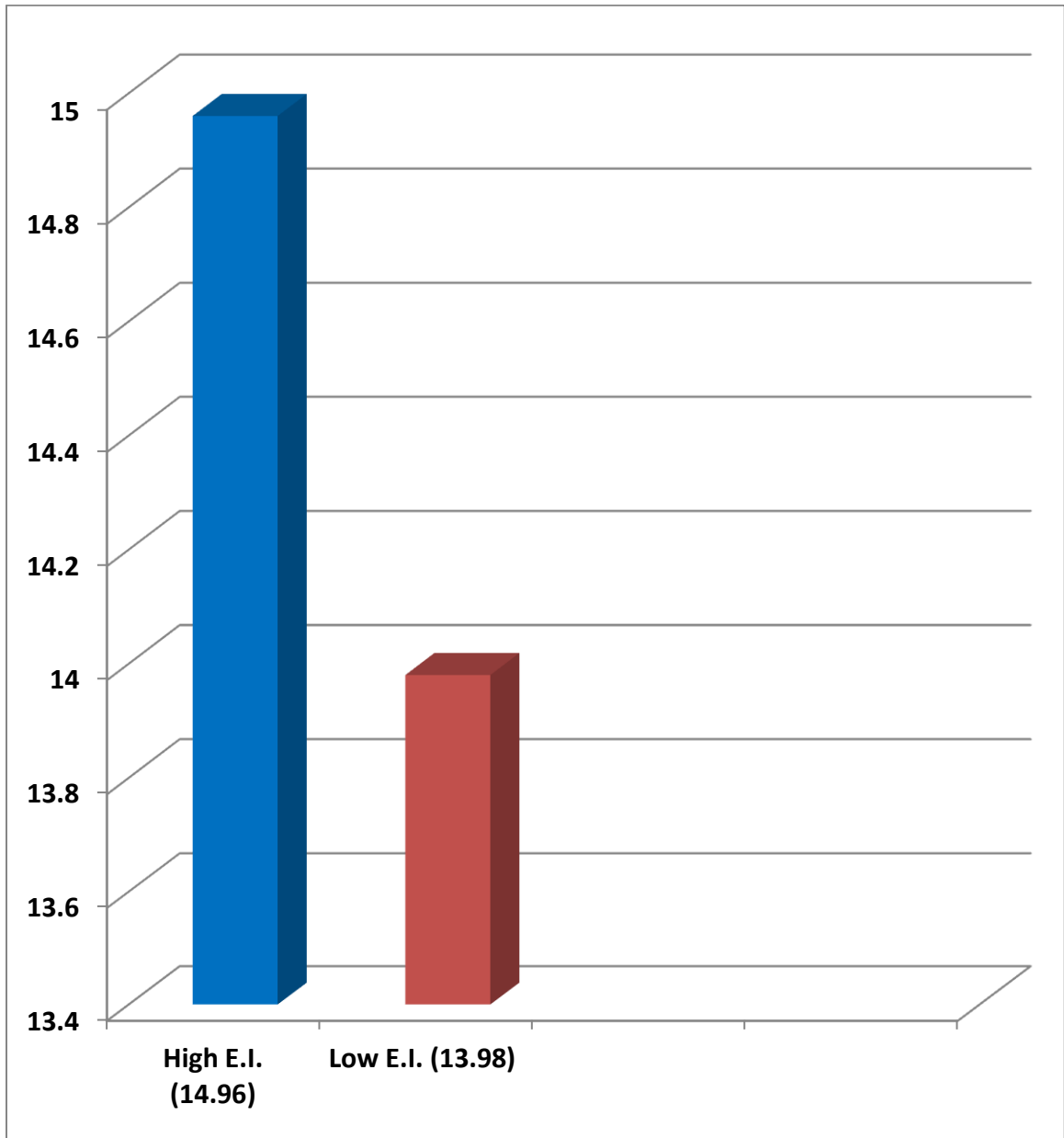
<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>	<b>df</b>	<b>'t'</b>	<b>Significance</b>
High Emotional intelligence	206	14.96	5.27	358	1.949	NS
Low Emotional intelligence	154	13.98	4.26			

NS = Not significant at 0.05 level.

Table 4.6.3 demonstrates that the t-value for the integrated hemispheric style of learning and thinking was observed to be 1.949, which is insignificant at 0.5 level. In this manner, the null hypothesis 5.3 was accepted. It implies that pupil-teachers with high emotional intelligence did not vary the pupil-teachers with low level emotional intelligence altogether in the integrated style of learning and thinking. At the end, both the gatherings of pupil-teachers were similar regarding the integrated style of learning and thinking.

**Fig 4.6.3**

**Mean scores of Integrated Hemispheric Style of Learning and Thinking in regard to pupil-teachers with High Emotional intelligence and Low Emotional intelligence**



## CHAPTER - V

### FINDINGS, CONCLUSIONS AND SUGGESTIONS

This chapter deals with the conclusions implications of findings and suggestions for further research in the area of study.

#### 5.1. MAIN FINDINGS

After analysis and interpretation of the data the next assignment is presentation of the main findings. In the light of the interpretation of the results of the present investigation, the following are the main findings.

**O1-** To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Academic Achievement.

**H<sub>0</sub>1-** There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High, Average and Low levels of Academic Achievement.

**H<sub>0</sub>1.1-** There is no significant differences in Left Hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low levels of Academic Achievement.

**F1.1-** Hypothesis accepted.

**H<sub>0</sub>1.2-** There is no significant differences in Right hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low levels of Academic Achievement.

**F1.2-** Hypothesis rejected.

**H<sub>0</sub>1.3-** There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low Academic Achievement.

**F1.3-** Hypothesis accepted.

**O2-** To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Gender.

**H<sub>0</sub>2-** There is no significant difference in Learning and Thinking Styles of Male and Female Pupil-Teachers.

**H<sub>0</sub>2.1-** There is no significant difference between Male and Female pupil-teachers with regard to their Hemispheric Style of Learning and Thinking.

**F2.1-** Hypothesis accepted.

**H<sub>0</sub>2.2-** There is no significant difference between male and female pupil-teachers with regard to their Right Hemispheric Style of learning and thinking.

**F2.2-** Hypothesis accepted.

**H<sub>0</sub>2.3-** There is no significant difference between Male and Female pupil-teachers with respect to their Integrated Style of Learning and Thinking.

**F2.3-** Hypothesis rejected.

**O3-** To Study the difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.

**H<sub>0</sub>3-** There is no significant difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.

**H<sub>0</sub>3.1-** There is no significant difference in Left Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.

**F3.1-** Hypothesis rejected.

**H<sub>0</sub>3.2-** There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.

**F3.2-** Hypothesis rejected.

**H<sub>0</sub>3.3-** There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.

**F3.3-** Hypothesis accepted.

**O4-** To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Personality Type.

**H<sub>0</sub>4-** There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having Extrovert Type, Introvert Type, Neurotic Type and Stable Type Personality.

**H<sub>0</sub>4(a)-** There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having Extrovert Type and Introvert Type Personality

**H<sub>0</sub>4.1(a)-** There is no significant difference in Left Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type Personality

**F4.1(a)-** Hypothesis rejected.

**H<sub>0</sub>4.2(a)-** There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type pupil-teachers.

**F4.2(a)-** Hypothesis rejected.

**H<sub>0</sub>4.3(a)-** There is no significant difference in Integrated Hemispheric Learning and Thinking style of pupil-teachers having Extrovert and Introvert type Personality.

**F4.3(a)-** Hypothesis accepted.

**H<sub>0</sub>4(b)-** There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having Neurotic Type and Stable Type Personality.

**H<sub>0</sub>4.1(b)-** There is no significant difference in Left Hemispheric Learning and Thinking style of pupil-teachers having Neurotic and Stable type Personality.

**F4.1(b)-** Hypothesis rejected.

**H<sub>0</sub>4.2(b)**- There is no significant difference in Right Hemispheric Learning and Thinking Style of pupil-teachers having Neurotic and Stable type Personality.

**F4.2(b)**- Hypothesis accepted.

**H<sub>0</sub>4.3(b)**- There is no significant difference in Integrated Hemispheric Learning and Thinking style of pupil-teachers having Neurotic and Stable type Personality.

**F4.3(b)**- Hypothesis accepted.

**O5**- To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Emotional Intelligence.

**H<sub>0</sub>5**- There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High and Low levels of Emotional Intelligence.

**H<sub>0</sub>5.1**- There is no significant difference in Left Hemispheric learning and thinking style of pupil-teachers having high and low levels of emotional intelligenc.

**F5.1**- Hypothesis rejected.

**H<sub>0</sub>5.2**- There is no significant difference in Right Hemispheric Learning and Thinking Style of pupil-teachers having High and Low levels of Emotional Intelligence.

**F5.2**- Hypothesis accepted.

**H<sub>0</sub>5.3**- There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers having High and Low levels of Emotional Intelligence.

**F5.3**- Hypothesis accepted.

## **5.2 CONCLUSIONS**

The ultimate goal of any scientific research is to arrive at a final answer to the research question with which the investigation was conducted. Conclusions flow from the analysis and interpretation of data. In the words of pander (1983) conclusions is a kind of 'summing up' of a 'final pronouncement' on the fate of hypotheses tested by the research.

The following conclusions were drawn on the basis of preceding chapter.

### **5.2.1 LEARNING AND THINKING STYLES IN RELATION TO ACADEMIC ACHIEVEMENT**

Pupil-teachers differed significantly only on one learning and thinking style (Right Hemispheric style ) in relation to their academic achievement. Low achievers were significantly more right hemispheric oriented than high achievers.

On rest of the learning and thinking styles viz, left hemispheric and integrated hemispheric style no significant differences were found.

### **5.2.2 LEARNING AND THINKING STYLES IN RELATION TO GENDER**

Male and Female pupil-teachers differed significantly in one learning and thinking style only i.e. Integrated hemispheric style. Female pupil-teachers tended to be more Integrated than Male pupil-teachers in their style of learning and thinking.

On remaining learning and thinking styles, No significant differences between male and female pupil-teachers were observed. These styles were – left hemispheric and right hemispheric style.

### **5.2.3 LEARNING AND THINKING STYLES IN RELATION TO STREAMS**

Pupil-teachers belonging to science, arts and commerce streams differed significantly in styles of learning and thinking. Science pupil-teachers were more left hemispheric dominated than pupil-teachers belonging to arts and commerce streams. Arts pupil-teachers were more right hemispheric oriented as compared to science and commerce pupil-teachers.

On rest of learning and thinking styles viz, integrated, no significant differences were found among pupil-teachers of science, arts and commerce streams.

#### **5.2.4(a) LEARNING AND THINKING STYLES IN RELATION TO PERSONALITY TYPE (INTROVERT AND EXTROVERT)**

Extrovert and introvert type of pupil-teachers did exhibit significant differences in their two learning and thinking styles only viz, left hemispheric and right hemispheric learning and thinking style. Introvert pupil-teachers were more left hemispheric in their learning and thinking style than extrovert type of pupil-teachers. While extrovert pupil-teachers were more right hemispheric in their learning and thinking styles than introvert pupil-teachers.

On rest of the learning and thinking styles namely-integrated, no significant differences were observed between pupil-teachers having extrovert and introvert type of personality.

#### **5.2.5(b) LEARNING AND THINKING STYLES IN RELATION TO PERSONALITY TYPE (NEUROTIC AND STABLE)**

The neurotic and stable type of pupil-teachers differed significantly in one learning and thinking style i.e. left hemispheric style. Stable left hemispheric type pupil-teachers were found to be higher than neurotic type of pupil-teachers.

In learning and thinking styles viz, right hemispheric and integrated hemispheric style, no significant differences were found between neurotic and stable type of pupil-teachers.

#### **5.2.6 LEARNING AND THINKING STYLES IN RELATION TO EMOTIONAL INTELLIGENCE**

Pupil-teachers exhibited significant difference in left hemispheric learning and thinking style in relation to emotional intelligence. High emotional intelligence group of pupil-teachers obtained significantly higher mean scores on left hemispheric style of learning and thinking in comparison to the low emotional intelligence group of pupil-teachers.

On the remaining learning and thinking styles i.e. right hemispheric and integrated hemispheric style, no differences were found between high and low level of emotional intelligence pupil-teachers.

### **5.3 EDUCATIONAL IMPLICATIONS OF FINDINGS**

On the basis of findings of the present study the following implications were drawn for higher education and teacher education.

The findings show that the academic achievement of pupil-teachers is linked with their learning and thinking styles. Low achieving pupil-teachers were more prone to right hemispheric style of learning and thinking. This suggests that administrators in the field of education should use new strategies to improve the pupil's academic achievement by properly diagnosing the factors hindering the achievement of pupil-teachers.

Female pupil-teachers were found more Integrated than their male counterparts in their learning and thinking style. Hence educational planners may keep this in mind for various developments.

Stream is found to have vital links with learning and thinking styles of pupil-teachers. Pupil-teachers of science stream were found more left hemispheric style oriented than arts and commerce pupil-teachers. This underlying fact should be kept in mind by educational counselors and teacher educators for guiding the pupil-teachers in various fields for the proper development of their talent.

Learning and thinking styles also affect the extrovert and introvert type of personalities of the pupil-teachers. This fact must be considered by the teacher educators inside and outside classroom situations for grooming the pupil-teacher's personality.

Learning and thinking styles have found to be having a close relationship with neurotic and stable type of pupil-teachers. Stable pupil-teachers are found more left hemispheric than neurotic type of pupil-teachers. Psychologists may thus consider this fact for helping the pupil-teachers to groom their personalities for their personal development.

Learning and thinking style is found to have a vital link with both levels of emotional intelligence viz, high emotional intelligence and low emotional intelligence. Pupil-teachers with high emotional intelligence were found to be more left hemispheric learning and thinking style than pupil-teachers with low emotional intelligence. While pupil-teachers having low emotional intelligence and high emotional intelligence were found equally oriented in their right hemispheric learning and thinking style.

It may thus be inferred that, intervention strategies may be employed in order to enhance the development of desired learning and thinking styles of pupil-teachers.

Moreover, classroom business, curriculum framing, assignment designing should be based on learning and thinking styles of pupil-teachers so that diversity in learning and thinking styles of pupil-teachers may be property exploited for their development.

According to West, MIT prof. (1978), The right hemisphere appears to have been able to outcome the most difficult, logical and systematic problems which we would hypothesized relaxing the right standard of thought of the left hemisphere. The right hemisphere was perhaps able to design through the experiments which the left hemisphere could not, because of its rigidity. The right hemisphere is thus able to hit upon solutions which could then of course, be recast into strictly logical terms by the left hemisphere.

The right hemisphere processing mode is also hypothesized to be prevalent according to the findings of Hadamard (1945) and Hebb (1966), when artistic judgement is required in task. It is evident that the right cerebral hemisphere makes significant contribution to human performance. It takes in fragmentary sensory information and from it construct a coherent outside world..

Schools are structured environments that run according to time schedules, Favour facts and rules over patterns, and offer predominantly verbal instruction, especially at the secondary level with which right hemisphere learners are not comfortable with. The stronger the right hemisphere, the more hostile the learning environment seems.(Sousa, 2006).

Traditional teaching methods tend to favour strong sequential learners. Concepts are usually presented step by step, practiced with drill and repetition, reviewed, and then tested under timed conditions. Consequently, gifted visual-spatial learners may have greater difficulty in traditional classrooms and their talents may not be fully recognized (Sousa,2003).A left brained curriculum tends to downplay right brain's superior capabilities.(Staley, 1980).

Researches done by Reynolds and Torrance (1978), Bracken and Torrance (1979) and Venkatraman (1989) are indicative that it is possible that a person's preferred style of learning and thinking over relatively brief period (6 to 10 weeks may be modified). It is also possible to control the changes in the style of learning and thinking with the Knowledge concerning their mechanism. It may also be possible to train individuals to modify their information processing procedures as per their demands and the cognitive tasks.

### **5.3.1 Some of the procedures that can be undertaken in institutions to activate the right hemisphere are as following:**

- Maps, Films, charts, diagrams, graphs and cartoons etc. may be used as teaching learning on a trial displayed. Based on the pictures shown students can be instructed to construct stories or incomplete stories can be given for completion in exercises.
- Learning by doing should be encouraged at all levels of education. All students may be given opportunity to work on simple projects and should be assisted in carrying them out. Use of Metaphors and analogies in subjects can be made, to enhance analytical thinking in students.
- Role playing technique in the teaching of history, language and also in science subject is important and should be given due importance. Divergent questions may be asked to enable students to think and answer in various ways.

- Specific issues should be given to students for solution. Students must be encouraged to record their ideas and write stories, essays, plays, dialogues and talks.
- Abilities of students in sports, music and arts should be recognized and cultivated. Children may be encouraged to play with words and interest should be created in preparing models and construction of buildings using cubes, blocks and clay.
- Training in drawing visual patterns and geometric designs will be encouraging with the help of pictures. Students should be asked to identify the figures of famous personalities, locations, buildings and streets.
- Excursion and field trips must be arranged to encourage and satisfy pupil's curiosity and sense of observation.

No doubt, right hemisphericity is more important in cognitive process but to complete a full task both hemisphericity play important role.

### **5.3.2 Procedures to Activate Left Hemisphere in institutions:**

- New concepts should be introduced in an analytical manner with verbal emphasis and importance can be given to the expression of the language in the classrooms.
- Students should be asked to clarify abstract speeches aired in the radios, televisions, public meetings and symposium.
- They should be given training in analyzing and identifying different speech sounds and encouraged to give logical reasoning and examples for unknown activities or functions without experimenting.
- Discussions should be arranged on general problems, world affairs published in daily newspapers and magazines. They should be encouraged to write non-fiction essays and scientific explanations in simple language.
- Games based on verbal materials, numerical, events and meditation should be encouraged after studies.

The right hemisphere is especially important in regulating attention functions of both sides of the brain. Unless the right hemisphere is activated and engaged, attention is low and learning is poor. **(Levy, in Silverman, 2002)**. People who approach learning with a left mode processing preference have beautiful gifts. People who approach learning with a right mode processing preference have beautiful gifts. People who access their whole brain flex and flow, they have both sets of beautiful gifts. **(McCarthy, 1993)**.

#### **5.4 SUGGESTIONS FOR FURTHER RESEARCH**

After conducting the present study, it was feel that researches may undertaken by the investigators on the following lines:

1. Studies should be designed to investigate their gender differences in learning and thinking styles of university and college pupil-teachers by using some inventories of learning and thinking styles.
2. An investigation to explore the relationship of learning and thinking styles of pupil-teachers by using Cattell's personality questionnaire should be undertaken.
3. Learning and thinking styles of pupil-teachers can be studied with their personality enhancement requirements.
4. To compare the learning and thinking styles of pupil-teachers belonging to professional courses a study should be designed.
5. Learning and thinking styles of students should be studied at different levels of academic career.
6. A cross-cultural study may be designed on learning and thinking styles of pupil-teachers.
7. Learning and thinking styles of pupil-teachers as a function of intelligence and creativity should be investigated.

8. A study should be carried on to find out the differences in learning and thinking styles of pupil-teachers in relation to self confidence, self-concept and anxiety levels.
9. A comparative study regarding learning and thinking styles of pupil-teachers coming from disadvantaged sections of the society should be made.
10. With a view to find out the differences in learning and thinking styles of intellectually, creativity and academically talented pupil-teachers a study will be useful.
11. A comparative study should be done on learning and thinking styles of well-adjusted and mal-adjusted pupil-teachers.
12. Learning and thinking styles of pupil-teachers may be investigated in relations to their background factors.
13. The relationship between learning and thinking styles of pupil-teachers and college teachers may be undertaken.
14. The interaction between learning and thinking styles of pupil-teachers and teaching strategies used at college level is suggested.
15. A study exploring the relationship between learning and thinking styles of pupil-teachers and quality of intellectual performance may be fruitful.
16. Learning and thinking styles of pupil-teachers in relation to dogmatism may be done.
17. Role of Socio-economic status in learning and thinking styles based on gender, culture and inhabitation of pupil-teachers should be done.
18. Learning and thinking styles of students relation to different types of creativity viz. musical, artistic, linguistic and mathematical should be explored.

## BIBLIOGRAPHY

- **Adeniyi, A.H. (2008).** “Five variables as predictor of Academic Achievement among School-going Adolescents.” *Perspectives in Education* Vol. 24 (2), 113-120.
- **Adeyemo, D.A. (2008).** “Measured influence of emotional intelligence and some demographic characteristics on academic self-efficacy of distance learners.” *Perspectives in Education*, Vol. 24 (2), 105-112.
- **Adsul, R.K. and Kamble, V.S. (2011).** “Geographical disparity among scheduled caste students on academic self concept, academic stress and academic achievement.” *Indian Journal of Psychology and Mental Health*, Vol. 5 (Special Issue), 42-47.
- **Aggarwal, J.C. (1972).** *Education Research, an Introduction*. New Delhi: Arya Book Depot.
- **Albaili, M.A. (1993).** “Inferred Hemispheric Thinking styles, gender, and academic major among united Arab Emirates college students.” *Perceptual and Motor Skills*. Vol. 76, 971-977.
- **Ali, R.M. (2007).** “Association between Brain Hemisphericity, learning styles and confidence in using graphics calculator for mathematics.” *Eurasia Journal of Mathematics, Science and Technology Education*. Vol. 3 (2), 127-131.
- **Alves, N.T., Fukusima, S.S. and Casanova, J.A.A. (2008).** “Models of brain asymmetry in emotional processing”. *Psychology & Neuroscience*, Vol. 1 (1), 63-66.
- **Arambula, G.T. (1984).** “Cerebral hemisphericity and its relationship to academic achievement, sex and career preference of high school and mathematics students.” <http://commons.lib.niu.edu/handle/10843/9070>.
- **Aripin, R. et.al. (2008).** “Students Learning Styles and Academic Performance,” 22nd Annual SAS Malaysia forum, Kuala Lumpur Convention Center.

- **Asikhia, O.A. (2010).** “Students and Teacher’s Perception of the Causes of Poor Academic Performance in Orgun State Secondary Schools (Nigeria): Implications for Counseling for National Development.” *European Journal of Social Sciences*, Vol. 13 (2), 229-242.
- **Asthana, M. (2011).** “Self-Concept, Mental Ability and Scholastic Achievement Secondary School Students of Varanasi.” *Journal of Community Guidance & Research*, Vol. 28 (1), 82-88.
- **Aunola, K. et.al. (2000).** “Parenting styles and adolescents achievement strategies.” *Journal of Adolescents*. Vol. 23 (2) 205-222.
- **Azmi, S. and Ansari, S.A. (2012).** “Influence of self-concept and psychological well being on academic performance.” *Indian Journal of Health and Wellbeing* 2012, 3(1), 36-38.
- **Bala, I, Sharma, T. and Singh, M. (2011).** “Home Variables and academic achievement of adolescents.” *Indian Journal of Psychology and Mental Health*, Vol. 5(1) 78-81.
- **Barchrd, K.A. (2003).** “Does emotional Intelligence Assist in the Prediction of Academic Success?” *Educational and Psychological Measurement*. Vol. 63 (5) 840858.
- **Barker, R.G.,and Gump, P.V. (1964).** “Big school, small school: High school size and student behavior.” Stanford, CA: Stanford University Press.
- **Barriga, A.Q. et.al. (2002).** “Relationship Between Problem Behaviours and Academic Achievement in Adolescents : The Unique Role of Attention Problems.” *Journal of Emotional and Behavioural Disorders*, Vol. 10 (4), 233-240.
- **Bastian, V.A. and Burns, N.R. (2005).** “Emotional intelligence Predicts life skills, but not as well as personality and cognitive abilities.” *Personality and Individual Differences*, Vol 39 (6), 1135-1145.
- **Bempechat, J. (1992).** “The Role of Parent Involvement in Children’s Academic Achievement.” *The School Community Journal*, Vol. 2 (2) 31-41.

- **Bhatnager, R.P. (1969).** “A study of some EPPS variables as factors of academic achievement.” *Journal of Applied Psychology*. Vol. 53 (2), 107-111.
- **Busair, A.O. (2012).** “Evaluating the Relationship between Gender, Age, Depression and Academic Performances among Adolescents.” *Scholarly Journal of Education*, Vol. 1 (1), 6-12.
- **Carnegie Council on Adolescents Development (1989).** *Turning points: Preparing American youth for the 21st century*. New York: Carnegie Corporation of New York.
- **Caro, D.H. (2009).** “Socio-economic Status and Academic Achievement Trajectories from Childhood to Adolescence.” *Canadian Journal of Education*, Vol. 32 (3), 558-590.
- **Carter, V.G. (1956).** *Foundation in Education: Dictionary of Education*, New York: Mc Grawhill Book Co.
- **Chawla, H. et.al. (2011).** “General Intelligence, Emotional Intelligence and Scholastic Achievement of Commerce 10+1 Grade students.” *Journal of Community Guidance & Research*, Vol. 28 (3), 476-482.
- **Dash, D.N. and Behera, N.P. (2004).** “A Conceptual Analysis of Emotional Intelligence and its Relevance.” *University News*. Vol. 42 (14), 1-5.
- **Devi, L.U. and Rayalu, T.R. (2005).** “Relationship between emotional intelligence and intellectual abilities of adolescents.” *Journal of Indian Psychology*, Vol. 23 (2) 22-27.
- **Devi, L.U. and Rayulu, T.R. (2005).** “Levels of Emotional Intelligence of Adolescent boys and girls – A comparative Study.” *Journal of Indian Psychology*, Vol. 23 (2), 6-11.
- **Dianne, B.R. (1983).** “Hemispheric dominance patterns and reading achievement.” *Dissertation Abstracts International*. Vol, 44 (3), 0654.
- **Dornbusch, S.M. and Ritter, P.L.(1991).** “Family decision-making and authoritative parenting.” *Presentation on Society for Research on Child Development*, Seattle, WA.

- **Ekstrom, R. B. et.al. (1986).** “Who drops out of high school and why?” Findings from a national study. *Teachers college Records*, vol.87,356-373.
- **Fabbri, M. et.al. (2007).** “Circadian typology and style of thinking differences.” *Learning and Individual Differences*, Vol. 17 (1), 175-180.
- **Farmer, T.W. et.al. (2006).** “School Adjustment and the Academic Success of Rural African American Early Adolescents in the Deep South. *Journal of Research in Rural Education*, Vol. 21 (3), 1-14.
- **Farzana (2011).** “Impact of Birth order on Academic Achievement of High School Students.” *Edu. Tracts* , Vol. 11 (2), 39-40.
- **Feldman, C.F.,Stone, A., and Renderer, B. (1990).** “Stage, transfer, and academic achievement in dialect- speaking Hawaiian adolescents.” *Child Development*,vol.61,472-484.
- **Fordham, S. and Ogbu, J. (1986).** “Black students’ school success: Coping with the burden of acting white. *Urban Review*, vol. 18,176-206.
- **Gadwa, k. and Griggs,S.A. (1985).** “The school dropout: implications for the school counselor, vol.33,9-17.
- **Gadzella, B.M. (1999).** “Differences among cognitive processing styles groups on personality traits.” *Journal of Instructional Psychology*, Vol. 26 (3), 3-7.
- **Gafoor, K.A. (2010).** “Relationship of thinking style with physics achievement among higher secondary students of Kerala”. *Indian Educational Review*, Vol. 46 (1), 50-63.
- **Garg, M. and Gakhar, S. (2009).** “Explaining Academic Achievement in Secondary Teacher Training Programme Thought Distance Mode.” *Turkish Online Journal of Distance Education*. TOJDE, ISSN 1302-6488 Vol. 10(2), Article 8.
- **Gazzaniga (1977).** “Review of the split brain” In *the human brain*, (Ed.) by M.C. Witrock and others, Englewood cliffs, N.J. : prentice-Hall.

- **George, J.M.(2000)** Emotions and Leadership : The Role of Emotional Intelligence. Human Relations 53, P.P. 1027-1055.
- **Ghosh, P. (2003).** “Emotionality of intelligence.” Every Man’s Science, vol.xxxviii (2).
- **Gibb, S.J. et.al. (2008).** “Gender differences in educational achievement to age 25.” Australian Journal of Education, Vol. 52 (1), 63-80.
- **Gibb, S.T.; Fergusson, D.M. and Horwood, L.J. (2008).** Australian Journal of Education, Vol. 52, No.(1) 63-80.
- **Gill, V. (2003).** “Emotional quotient more than IQ.” The Tribune,13 May,P-13.
- **Golmen, D. (1995).** “Emotional Intelligence: Why it can matter more than IQ.” New York: Bantam Books.
- **Gonzales, N.A. et.al. (1996).** “Family, Peer and Neighborhood Influences on Academic Achievement among African--American Adolescents: One Year Prospective Effects.” American Journal of Psychology. Vol. 24 (2), 365387.
- **Griffin, V.L. (1985).** “Right brain study” UNF Theses and Dissertations, Paper 24 <http://digitalcommons.unf.edu./edt/24>.
- **Gupta, S.P. and Gupta, U. (1992).** Statistical Method, New Delhi: Sultan Chand and Sons Publication 9th Ed.
- **Harre, R. and Lamb, R. (1993).** The Encyclopedia Dictionary of Psychology.
- **Hemamalini, H.C. (2011).** “Anxiety and Academic Achievement of high School students of Mysore city.” Journal of Community Guidance & Research, Vol. 28 (1), 94-98.
- **Hinshaw, S.P. (1992).** “Externalizing behavior problems and academic underachievement in childhood and adolescence: Causal relationships and underlying mechanisms.” Psychological Bulletin, Vol. 111 (1) 127-155.

- **Howell, F.M., and Frese, W. (1982).** “Early transition into adult roles: Some antecedents and outcomes.” *American Educational Research Journal*, vol. 19, 51-73.
- **India, Government of India, Planning Commission (2001).** Report of the working group on adolescents for Tenth Five-Year plan, New Delhi.
- **Jain, K. and Parmar, K (2010).** “Impact of Parental counseling on students academic outcomes.” *Indian Psychological Review*, Vol. 74 (4), 205-210.
- **Jan, T. and Malik, M.H. (2012).** “Social problems of adolescents students of earthquake affected areas of district Baramulla with reference to academic achievement.” *Prime Journal of Microbiology Research*, Vol. 1 (2), 73-76.
- **Johnson, G.M. (2005).** “Students Alienation, Academic Achievement , and Web CT use.” *Educational Technology and Society* Vol. 8(2), 179-189.
- **Joseph, T.D. (2009).** “Influence of Family size and family birth order on Academic Performance of Adolescents in Higher Institution.” *Pakistan Journal of Social Sciences*, Vol. 6 (3) 110-114.
- **K. Jain and K. Parmar (2010).** “Impact of parental counselling on students Academic outcomes. *Indian Psychological Review*, 2010, Vol. 14 (4), 205-210.
- **Kalara, D. and Nisha (2012).** “Emotional Intelligence and Personality among School Students.” *Indian Journal of Psychology and Mental Health*, Vol. 6 (1), 1420.
- **Kalpana, V. and Mridula, K. (2007).** “Styles of Learning and Thinking.” *Journal of the Indian Academic of Applied Psychology*. Vol. 33 (1), 111-118.
- **Kaplan, D. Liu, R.X. and Kaplan, H.R. (2005).** “School related stress in early adolescence and academic performance three years later: the conditional influence of self expression.” *Social Psychology of Education*. Vol. 8 (3) 17-20.
- **Khan, R. and Shrivastava, V. (2012).** “Significance of Metacognition in Academic Achievement”. *Indian Journal of Community Psychology*. Vol. 8(1), 113117  
Kochargaonkar,

- **Kumar, Mukesh (2012).** “Academic Achievement of Adolescents in relation to their Emotional Intelligence, Style of Learning and Thinking”. Thesis. MDU, Rohtak.
- **S.H. and Chandak, P.M. (2012).** “Comparative study of academic performance and personality between students of KFI and Non-KFI residential schools”. Indian Journal of Health and Wellbeing 2012(3(1), 175-178.
- **Koul. L. (2007).** Methodology of Educational Research. New Delhi, Vikas Publishing House Pvt. Ltd.
- **Kumar, S. (2011).** “To study the relationship between socio-emotional climate and academic achievement of the tribal and non-tribal secondary students.” Indian Journal of Psychology and Mental Health. Vol. 5 (2), 142-152.
- **Lacour, M. and Tissington, L.D. (2011).** “The effects of poverty on academic achievement.” Educational Research and Reviews, Vol. 6 (7), 522-527.
- **Lambert, N.M. (1988).** “Adolescents outcomes for hyperactive children: Perspectives on general and specific patterns of childhood risk for adolescent educational, social and mental health problems.” American Psychologist, vol.43, 786799.
- **Larson, K.A. (1989).** “Task-related and interpersonal problem-solving training for increasing school success in high-risk young adolescents.” Remedial and special Education, vol. 10,32-42.
- **Lazaratou, H. et.al. (2005).** “Sleep problem in adolescence A study of senior high school students in Greece” European Child and Adolescent Psychiatry, Vol. 14 (4) 237-243.
- **Leng, Y.L. and Tin, L.G (2002).** “Singapore Adolescents also Govt style.” Centre for Development of Teaching and Learning. Vol. 5 (6). 8-10.
- **Leng, Y.L., Hoo, C.T., Chong, J. and Tin, L.G. (1998).** “Different brain functioning profiles among adolescents mathematics achievers.” The mathematics Educator, Vol. 3 (1), 113-128.

- **Madhvi,G. and Ramnathkishan, N. (2010).** “Hemisphericity dominance among children and their academic performance.” *Edutracks*, Vol. 9 (8), 44-45.
- **Mahan, G. and Johason, C. (1983).** “Portrait of a dropout: Dealing with academic, social, and emotional problems.” *NASSP Bulletin*, vol.6, 80-83.
- **Malathi, S. and Malini. E. (2006).** Learning Style in Higher Secondary Students of Tamil Nadu.” *Educational Tracks*. Vol. 5 (10), 27-29.
- **Malhotra, N. and Kaur, A.P. (2011).** “Relationship of Emotional Intelligence with Physical and Mental Health of Adolescents.” *Indian Journal of Psychology and Mental Health*, Vol. 5 (1), 21-25.
- **Mallya, D. and Anand, V.P. (2012).** “Effect of yoga on the intrapersonal emotional intelligence among adolescents girls” *Indian Journal of Positive Psychology*, Vol. 3 (1), 27-29.
- **Mandell, B. & Pherwani, S.(2003)** Relationship between Emotional Intelligence and Transformational Leadership Style : A Gender Comparison. *Journal of Business and Psychology* 17, P.P. 387-404
- **Mangal, S.K. and Mangal, S. (2004).** Mangal emotional intelligence inventory administrator’s manual, National Psychological Corporation, Agra282004.
- **Manley, G. (2009).** “Emotional intelligence and academic achievement: What relevance and implications does this psychological construct called emotional intelligence have for education in New Zealand?” *Royal Oak Primary School Sabbatical Report Term 1, 2009*.
- **Maqsud, M. et.al. (1991).** “Relationships Between Socioeconomic Status, Locus of Control, Self-Concept, and Academic Achievement of Batswana Adolescents. *Journal of Youth and Adolescence*, Vol. 20 (1), 107-119.
- **Marquer, P.G.O. et.al. (2006).** “Relating emotional intelligence to social competence and academic achievement in high school students.” *Psicothema*, Vol. 18(spl), 118-123.

- **Martin, G. (2005).** “Perceived academic performance, self-esteem and locus of control of indicators of need for assessment of adolescent suicide risk: implications for teachers.” *Journal of Adolescence*, Vol. 28, 75-87.
- **Mathur, M. et.al. (2005).** “Gender Differences of Emotional Intelligence and Scholastic Achievement in School going Adolescents.” *Indian Psychological Review*, Vol. 64 (3), 133-136.
- **Mayer, I.D. and Salovey, P. (1997).** “Emotional Development and Emotional Intelligence.” New York: Basic Books.
- **Mayer, J.D., Caruso, D. and Salovey, P. (1989).** “Emotional intelligence meets for traditional standards for intelligence.” *Intelligence*, vol.37(4) 267-298.
- **MC Carthy, B. (1996).** “The 4mat system research: review of literature on the differences and hemispheric specialization and their influence on learning.” Barrington, IL: Excel, Inc.
- **McPherson, M.E. (2004).** “Parenting Behaviour, adolescent depression, alcohol use, tobacco use, and academic performance: a path model.” M.Sc. thesis in Human Development, Falls Church, Virginia Polytechnic, Institute and State University.
- **Mishra, B.C. (2000).** “Students learning styles across the academic streams.” *Journal of Psychological Researches*, Vol. 44 (2), 101-105.
- **Mohanasundaram, K. and Kumar, J. (2000).** “Hemisphericity and Achievement of Class XI Students Studying History in Higher Secondary School.” *The Educational Review*, Vol. 106 (1), 4-7.
- **Mohanasundaram, K. and Kumaran, D. (2011).** “Cognitive Progress, Hemisphericity and Personality of Teacher Trainees of B.Ed. Course.” *Staff and Educational Development International*. Vol. 5 (2), 229-235.
- **Mokashi, M.V., Yadav, V.S. and Khadi, P.B. (2011).** “Impact of Parental counseling on students’ academic outcomes”. *Indian Psychological Review*. 2011, Vol. 76 (3), 187-192.

- **Naderi, H. et.al. (2010).** “Relationship between creativity and academic achievement: A study of gender differences.” *Journal of American Science*, Vol. 6 (1), 181-190.
- **Neelakantan, M.S. (2012).** “Emotional Intelligence in Relation to Self Esteem.” *Journal of Indian Health Psychology*, Vol. 6 (2), 131-132.
- **Ogundokun, M.O, Adeyemo, D.A. (2010).** “Emotional Intelligence and Academic achievement : The Moderating Influence of Age, intrinsic and extrinsic motivation.” *The African Symposium*. ISSN # TX6-342-323.
- **Okoh, E.E.E. (2010).** “Influence of age, financial status and gender on academic performance among undergraduates.” *J. Psychology*, Vol. 1 (2), 99-103.
- **Pandey, R.C. (2008).** “Academic achievement as related to achievement motivation and parental background. *Indian Psycho. Review*. Vol.70(4),213-216.
- **Pareek, S., Mittal, U., Hingar, A. and Kaur, K. (2005).** “Enhancing Emotional Intelligence and Enriching meaning in life: An intervention study.” *Psycho-lingua*, Vol. 35 (2), 97-105.
- **Park, H.S. and Bauer, S. (2002).** “Parenting Practices, Ethnicity, socioeconomic Status and Academic Achievement in Adolescents.” *School Psychology International*, Vol 23 (4), 386-396.
- **Parker, D.A., Creque, R.E. and David, L.B. (2004).** “ Academic achievement in high school: does Emotional intelligence matter?” *Personality and Individual Differences* Vol. 37, 1321-1330.
- **Parker, J.D.A. et.al. (2005).** “Academic achievement and emotional intelligence: Predicting the successful transition from high school to university”. *Journal of the First Year Experience and Students in Transition*, Vol. 17, 67-68.
- **Parke, et al. (2004).** Academic achievement in high school: does emotional intelligence matter?” *Personality and individual differences*. Vol. 34, 1321-1330.

- **Petrides, K.V. (2004).** ‘The role of trait emotional intelligence in academic performance and deviant behavior at school.’ *Personality and Individual Differences*. Vol. 36, 277-293.
- **Qualter, P. and Gardner, K.J. (2007).** “Emotional Intelligence: Review of research and Educational Implications.” NAPCE. Published by Blackwell Publishing Ltd., 9600 Garsington Road, Oxford OX42DQ, UK and 350 Main Street, Malden MA 02148, U.S.A.
- **Raju, M.A. and Samiullah, S. (2011).** “Impact of Parental Involvement on Academic Achievement of VII standard students. *Journal of Community Guidance & Research*, Vol. 28 (2), 224-228.
- **Raju, S.S. and Raddy, B.R. (2012).** “Effect of Personal Factors on scholastic achievement of class IX students in Physical Sciences.” *Journal of Community Guidance and Research*, Vol. 29 (1), 86-92.
- **Reynolds, C.R. and Torrance, E.P. (1978).** “Perceived changes in styles of learning and thinking (hemisphericity) through direct and indirect training”. *Journal of creative behavior*, Vol. 12, 245-52.
- **Rivkin, S.G. et.al. (2005).** “Teachers, schools, and academic achievement.” *Econometrica* Vol. 73 (2) 417-458.
- **Rob, M., Reynolds, I., and Finlayson, P. F. (1990).** “Adolescent marijuana use: Risk factors and implications.” *Australian and New Zealand Journal of Psychiatry*, vol.24, 47-56.
- **Roeser, R.W. et.al. (1998).** Academic and emotional functioning in early adolescence: Longitudinal relations, patters, and prediction by experience in middle school.” *Development and Psychopathology*. Vol 10, 321-352.
- **Sadanandam, M. and Lourdusany, V. (2011).** “Parental Influence on Academic Achievement of Higher Secondary Students.” *Edu. Tracks*, Vol. 11 (1), 33-39.

- **Sapp, M. (1990).** “Psycho educational correlates of junior high at-risk students.” *The High School Journal*, vol. 73, 232-234.
- **Sewell, T. E., Palmo, A.J.,and Manni, J.L. (1981).** “High school dropout: Psychological, academic, and vocational factors.” *Urban Education*, vol. 16, 65-76.
- **Sharma, A. et.al. (2011).** “Prediction of different streams in academic achievement through verbal and non-verbal intelligence tests.” *Journal of Community Guidance & Research*, Vol. 28 (1) 48-55.
- **Shelly, (2011).** “Relationship Among personality traits, approaches to learning, study skills and academic achievement of Pharmacy Students.” *Journal of Community Guidance & Research*, Vol. 28 (2), 229-239.
- **Shock, R. (1981).** “The two brains and the education process” (Report No. TM-820-464). ERIC Documents Reproduction Services, ED 218 360).
- **Shrivastava, A and Mukhopadhyay, A. (2009).** “Alienation and Emotional Intelligence of Adolescents with Internalizing Symptoms.” *Journal of the Indian Academy of Applied Psychology*, Vol. 35 (1), 99-105.
- **Sidtis, D.V. (2004).** “When only the right hemisphere is left: Studies in Language and Communication.” *Brian and Language*. Vol. 91, 199-211.
- **Silverman, L. K. (2002).** *Upside-Down Brilliance: The Visual-Spatial Learner*. Denver: DeLeon Publishing.
- **Singh, Anup (2008).** “A Study of Thinking Styles of College Students in relation to selected Cognitive and Non-Cognitive factors”. Thesis, BU, Jhansi.
- **Singh, A. and Kaur. S. (2012).** “A Comparative study of gifted and non-gifted children on emotional intelligence. *Indian Journal of Positive Psychology*, Vol. 3 (1), 14-19.
- **Singh, A. P. and Misra, G. (2011).** “Promoting academic competence in school adolescents: Results of 15 day life style intervention programme.” *Indian Educational Review*. Vol. 48 (1), 5-17.

- **Singh, R. (2005).** “Learning styles of high school students in relation to their self concept.” *Indian Journal of Psychometry and Education*, Vol. 36 (1), 7783.
- **Singh, S. and Thukral, P. (2011).** “Emotional Maturity and Academic Achievement of High School Students.” *Journal of Community Guidance & Research*, Vol. 28 (1), 89-93.
- **Sood, V. (2012).** “Need for Academic Achievement and Socio-Demographic Variables of high school students of Kullu and Manali Districts (India).” *Journal of Community Guidance and Research* 2012, Vol. 29(1), 111-126.
- **Sood, V. and Anand, A. (2011).** “Emotional Intelligence of senior secondary school students in relation to certain socio-demographic variables.” *Indian Journal of Psychology and Mental Health*, Vol. 5 (Special Issue), 12-19.
- **Sperry, R. W. (1998).** “Left brain-right brain.” *Saturday Review*, Feb. pp. 18-20.
- **Stahl- Gemake. (1982).** “The right brain: An active partner in written literacy.” (Report No. CS-007-059). Boston, MA: Paper presented at the annual meeting of eastern regional conference of the International Reading Association. (ERIC Document Reproduction Service, No. Ed. 228 610).
- **Staley, F. (1980).** “Hemisphere brain research: A break through for outdoor education.” *Journal of physical education and recreation*, Vol. 51(4)28-30.
- **Steinberg, L. (1989).** *Adolescence* (2nd ed.). New York: Knopf.
- **Steinberg, L., Blinde, P.L., Chan, S.K. (1984).** “Dropping out among language minority youth.” *Review of Educational Research*, vol.54,113-132.
- **Stellern, J. et. al. (1986).** “Hemispheric dominance of native American Indian students.” *Journal of American Indian Education*, Vol. 25 (2), 8-15.
- **Subramanyan, K. (2011).** Impact of Emotional Intelligence and Study of High school students.” *Edu Tracks* Vol. 10 (6), 36-38.

- **Sudhamani, P.S.R. (2011).** “Effectiveness of Semester schemes on Secondary School Students Influence on Academic Performance.” *Edu. Track*, Vol. 11 (4) 33-36.
- **Sun, Y. (2009).** “Postdivorce Family Stability and Changes in Adolescents’ Academic Performance A growth –curve model.” *Journal of family Issues*, Vol. 30 (11), 1527-1555.
- **Sundius, M.J., Entwisle, D.R., and Alexander, K.L. (1991).** “The development of academic self-concept in children: Social context and performance feedback.” Paper presented at the Society for Research on Child Development, Seattle, WA.
- **Synder, F.J. et.al. (2010).** Impact of a Social-Emotional and Character Development Program on School-Level Indicators of Academic Achievement, Absenteeism, and Disciplinary Outcomes: A matched-Pair, Cluster Randomized, Controlled Trial.” *Journal of Research on Educational Effectiveness*, Vol. 3(1), 26-55.
- **Torrance, E.P. (1982).** “Hemisphericity and creativity”. *Journal of research and development in Education*, 15(3), 29-37.
- **Uma, M. and Devi, L.U. (2005).** “Relationship between the dimensions of emotional intelligence of adolescents’ and selected personal social variables.” *Indian Psychological Review*, Vol. 64 (1), No 11-20.
- **Van der Jagt, J.W. et.al. (2003).** “Hemisphericity modes, learning styles, and environmental preferences of students in an introduction to special education course.” *International Journal of Special Education*, Vol. 18 (1), 24-35.
- **Venkataraman, D. (1989).** “The effect of synectics Training on creativity and hemisphericity of Higher Secondary Students, unpublished Doctoral thesis, University of Madras.
- **Venkataraman, D. (1993).** *Styles of learning and thinking administrator’s manual psychological services*, Safdarjung enclave, New Delhi, 29.
- **Venkataraman, D. (2012).** “Judgement of students’ emotional actions in relation to their brain dominance.” *Edutracks*, Vol. 11(10), 31-34.

- **Verma, B.P. (1997).** “Learning style preference of intellectually gifted adolescents and implications for instruction.” *Journal of Education and psychology*. Vol. 55 (2) 28-38.
- **Verma, S. (2001).** “Learning styles, study-habits and study involvement across academic streams.” *Praachi Journal of Psycho-cultural Dimensions*, Vol. 17 (2), 113-118.
- **Vijayalaxmi, A.H.M. et.al. (2012).** “Influence of an intervention program to nurture adaptability skills on the emotional intelligence of selected adolescents.” *Indian Journal of Positive Psychology*, Vol. 3 (1), 23-26.
- **Vitale (1982).** “Unicorns are real a right-brained approach to learning” 1st Ed. California: Jalmar Press.
- **Warn, T.S. (2009).** “Students’ Learning Style and their Academic Achievement For Taxation Course-A.” *Proceedings of the 2nd International Conference of Teaching and Learning INTI University College, Malaysia*.
- **Ximyin, C. et.al. (1997).** “Relation between academic achievement and social adjustment: Evidence from Chinese Children.” *Developmental Psychology*, Vol. 33 (3), 518-525.
- **Yeung, A, Read, R. and Schmid, S. (2005).** “Students learning styles and academic performance in first year chemistry.” [Science.uniserve.edu.au/pubs/procs/wshop10/2005yeung.pdf](http://Science.uniserve.edu.au/pubs/procs/wshop10/2005yeung.pdf).
- **Zhang, L.F. (2000).** “Are Thinking styles and Personality Types Related.” *Educational Psychology*, Vol. 20 (3) 271-283.
- **Zhang, L.F. (2001).** “Thinking styles, Self-esteem, and extracurricular experiences.” *International Journal of Psychology*, Vol. 36 (2), 100-107.
- **Zhang, Li-Fang (2002).** “Thinking styles: Their relationship with modes of thinking and academic performance.” *Educational Psychology: An International Journal of Experimental Educational Psychology*, Vol. 22 (3), 331-348.