The Effects of Learning Styles and Socio-economic Status on Learning Achievement of Secondary School Students

By
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ACKNOWLEDGEMENTS

All Glory be to Allah Who enabled me to compete this research work.

It gives me an immense pleasure to pay my special gratitude to those who contributed their sincere efforts in the accomplishment of this research work in one way or the other. Without their contribution and collaboration, perhaps this dream would have not turned into reality.

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Zarina Akhtar
ABSTRACT

Title: The Effects of Learning Styles and Socio-economic Status on Learning Achievement of Secondary School Students

The objectives of the study were to investigate the relationship between different learning styles and learning achievements, socio-economic status of students and their learning achievement and learning styles and Socio-economic status of students studying at secondary schools. Study also assessed the difference in opinion by gender and by region about learning styles.

To investigate the relationship three types of data were collected. Firstly information about students learning styles were collected by using learning style questionnaire, secondly information about socio-economic status of parents were collected through the questionnaire and thirdly information about students’ achievement was taken from their Secondary School Certificate Examination.

The population of the study was all students studying in class 10th at public sector schools of district Attock, Chakwal, Islamabad and Rawalpindi. The sample (1580 students and their parents) was drawn by using multistage sampling technique from four districts. The data were collected by administering the questionnaires to students in their classes. The data were then analyzed by SPSS using Pearson Co-relation. Gender wise and region wise differences in opinion were also computed by t-test.

It was found that A+ grade achievers did not preferred collaborative learning style and A grade achievers did not preferred dependent learning style. None of the students from upper and lower class got A+ grade. The more students who got A+ grade were from the upper middle class and lower middle class. The middle class students prefer independent learning style. The female students prefer dependent learning style in spite of region (rural and urban). No difference in opinion by region was observed.

Students did not preferred collaborative and dependent learning style. They preferred to study at their own this leads that the class room activities were of no use for them. Their concern for the achievement showed their interest for examination. This showed that learning styles may not effect learning achievement but the system of examination effects the achievement. In the light of conclusions it was recommended that the system of examination may be connected with class room activities. It may focus on real classroom learning not to rote memorization.
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CHAPTER 1

INTRODUCTION

1.1 Rationale of the study

Life from its start to end is learning. Learning continues since the start to the end of life. The concept of learning is as old as development. The aim of education is the development of six aspects of the personality. These six aspects of personality development are physical, mental, social, spiritual, esthetic and emotional. Development is associated with achievement so the ultimate goal of learning is achievement. According to Dictionary of Education (2002, p.5) achievement is “successful accomplishment or performance in particular subject or course or area of study”. Many educationist and psychologists tried since long to know the ways and means of learning and to maximize the achievement. These ways of learning were identified as learning styles and means of learning were the opportunities provided by the environment either by school or by parent. These parental factors were distinguished as socio-economic status. So the learning styles and the socio-economic status are two important components which maximize learning achievement.

To maximize learning the efforts of all the concerned persons were remained continued as the life goes on. The contributions of psychologist were remarkable for understanding the process of learning. Their contributions were started from Behaviorists to Humanists and then to Cognitivists; all of them described the learning theories. Everyone was trying to define the concept of learning, the nature of learning. How learning takes place? How individual learns? Which factors influence the learning process? Which
factors effects academic achievement? What physical and mental changes came as the result of learning? Which steps should be followed to be a learned person? Every psychologist perceives the process of learning in a different way. Those different ways of learning were called learning theories. The learning theories gave new and diverse directions to study the process of learning without discarding the previous. According to the Parson, Hinson & Sardo-Brown, (2001, p.207) “the beliefs of all presented learning theories are seeds of their theories. They should be acknowledged for their belief but it should be kept in mind that theories are reasoned explanations for phenomena and not the absolute fact and there is much more beyond theses theories of learning”.

1.2 What Learning Styles are?

The learning theories provide the base for learning styles. Learning styles are relatively stable preference used by each individual to organize and process information for solving a problem in a learning task. According to Feldman (2004, p.35) “learning style reflects our preferred manner of acquiring, using and thinking about knowledge”. When a situation has been faced by a person it is his learning style which leads him to acquire, retain and use knowledge to handle that situation. Every one has different way to handle the situation. Felder (2005, p.58) said that “students are characterized by different learning styles preferentially focusing on different types of information and tending to operate on perceived information in different ways”.

In simplest term a student’s learning style is a particular way with which a student learns the best. Although the researchers have defined learning style in their own perspective but all are agreed that it refers to individual characteristic of learning
behavior which is pervasive and consistent in nature. There are many learning styles based on the individual differences or these individual differences reflect different learning styles in human personality. This shows the diversity in learning styles.

1.3 Learning Styles by Gender

Learning styles are the reflections of individual differences or preferences among learners, which impact learning. Male and female students possess biological, social, psychological and emotional differences. There are variety of responses in students’ perception, thinking, feeling and acting even in one gender. There may be variety of differences in different genders. The research shows the male students possess different learning styles then female students. Verma and Tiku (1989) conducted a study on the learning styles of male and female students. They found male and female students are similar on independent, dependent, avoidant, collaborative and competitive learning styles and different on participant learning style. The female students have strong preference for participant learning style. Verma and Kumari (1988-89) also conducted a study on learning style differences by gender and result showed that female students tend to have relatively more preference of field-independent and environment oriented learning style than male counter part. Similarly some other researchers i.e. Cohen (1986) and Sing (1987) studied the learning styles of male and female students by using different tools. They have also reported gender differences in learning styles.
1.4 **Diversity with in Learning Styles**

Learning Styles appears to be biological and perhaps, social differences that influence the classroom learning in particular and life long learning in general. These styles reflect qualitative differences or preferences. They do not reflect how smart students are or how well the students are developed cognitively. According to Felder and Spurlin (2005) there are many types of learning styles such as psychological styles, physiological styles and cognitive styles.

- **Psychological Styles**

  The student’s inner strength, sense of individuality and personality traits (social and emotional traits) influences their learning. The self perception and self-esteem also affected the learning. All these factors together are called psychological styles. The example of this style is Myers-Briggs Type Indicator. (Houston, 1997; Avitabile, 1998; Wilson, 1998; Parsons & colleagues, 2001).

- **Physiological Styles**

  There are consistent ways to facilitate learning through the use of the senses or environmental stimuli. Hemispheric specializations (right or left brain), auditory, visual, kinesthetic, olfactory preferences, or preferences for environmental conditions, e.g. light, noise are examples of physiological styles. The examples of Physiological style are Holland's Model (1974), Kolb’s Learning Style (1976), Dunn and Dunn's Model (1978), etc.

- **Cognitive Styles**

  There are consistent ways of responding and using stimuli in the environment; how things are perceived and made sense of; which is the most comfortable, expedient,
and pleasurable way to process information. For example students may utilize field-dependent or independent style (Aggarwal Styles (1983)), impulsive or reflective styles (Honey and Mumford Learning Style (1986)) etc.

The more students grow, the more sophisticated they become, but every one has preferred styles or ways of learning. Students’ preferred styles of learning influence their achievement. The environment includes two aspects: the school environment and the home environment. School environment further has two components classroom inner environment and out of class school environment Charles (2002). Classroom environment has curriculum, teacher’s instruction, teaching methodology, students’ teacher and peers’ relationship. The out of class environment provides the opportunity to participate in other co-curricular activities create the sense of participation, co-operation and competition. Learning styles may emerge form school and home environment Slavin (1995). The school environment provides facility to students to interact with teachers’, peers’, learning activities and system, during the process of learning, where as home environment or socio-economic status of parents provides basic needs and different opportunities to promote learning.

1.5 How Socio-economic Status (SES) be perceived?

The home environment has direct focus on parents. Because they are responsible to built and manage it. Home environment influenced by many factors such as parent education, job, attention and income. All these factors together called Socio-economic Status (SES). So the other factor which may affect students learning achievement is the SES of parents.
According to Parson, Hinson and Sardo-Brown (2001, p.193), “Socio-economic Status (SES) is the term used to distinguish between people’s relative position in the society in terms of family income, political power, educational background and occupational prestige”. The SES often described by social classes or groups. Internationally as defined by Socio-economic Classification (2004, p.13) these social classes are distributed into five categories, such as “upper class”, “upper middle class”, “middle class”, “lower middle class” and “lower class”. There are some variations in class structure but most of the time this five class structure is used.

1.6 **Diversity in Socio-economic Status**

SES groups or classes are determined through various aspects all over the world. It varies because of the individual differences no one is similar to any one by any of aspect. Some try hard earn more and some earn less. At any corner of the world people earn at different rate and enjoy different socio-cultural positions. Every country has defined criterion for measuring and valuing the positions of their citizens. These positions further wrapped as SES. The margins between SES groups are settled according to the local situation of the country. Along with it an internationally defined criterion is also available given by Socio-economic Classification (2004, p.13). According to that criterion the SES described via stratified groupings.

The Socio-economic Classification further described by Macionis (1994) quoted by Parson, Hinson and Sardo-Brown (2001, p.193), the families with an income in excess of $100,000, and enjoy broad political power, who possess college and professional degrees, and who has large family business are categorized at the top of the hierarchy or
“upper class”. Families earning between $40,000-100,000/annum, and hold power in state and local politics, with having at least high/higher school education and white collar or skilled labor jobs are a part of the “upper middle class”. The “middle class” families earn between $25,000-40,000/annum.

Parson, Hinson and Sardo-Brown (2001, p.193) further described some families are considered part of working class or “lower middle class”. Lower middle class have income between $12,000-25,000/annum, having limited local power, high school degree and blue collar jobs. The others are categorized as “lower class” they lived below the poverty line. They earn below $12,000/annum and no political voice.

1.7 Learning Achievement

Achievement is what one can do; which added value made a tangible or noticeable difference and contribute toward the advancement of the person. Achievement is measured by performance indicators like percentiles and ranks. Learning achievement means gain in knowledge. It is a successful performance on a specific task. According to the Dictionary of Education (2002, p.5), “achievement is successful accomplishment or performance in particular subjects, areas, or courses, usually by reasons of skill, hard work and interest. Achievement is typically summarized or measured in various types of grades, marks, scores or descriptive commentary”.

The ultimate goal of all the efforts of psychologists and educationists is to maximize learning achievement from the minimum resources. The developed countries focused on achievement for their further developments and advancements whereas the
developing and under developed countries also focuses on it to save their resources from wastage and get maximum from the available resources.

1.8  **Relationship between Learning Styles and Learning Achievement**

The one reason of the failure during academic life is that students cannot apply what they have learned during their academic life to the world in which they live. Many students failed to explain everyday phenomena by using concepts they have learned during their educational training. This is not due to the lack of knowledge, because all the students attend 180-200 school days interacting with lectures and practical activities and they are also evaluated on what they have been taught and what have learned. Bonder (1991) concluded it as “students all too often posses knowledge without understanding”.

According to Ashkenazi (2006), the problem is not just the lack of ability to transfer domain specific knowledge into everyday life. Evidence shows that the individuals acquired knowledge is fragmented and is unreliable. Many students do not tried to concentrate on acquired knowledge so they are unable to understand the basic concepts from the very beginning of their studies. Research of Nakhleh, (1992) shows that students’ constructions of a concept sometime differ from that one the teacher holds and tried to present. Different kinds of misconceptions can be identified when students are asked to explain their own views of established concepts. When explored the students’ cognitive structure these misconceptions interfere with subsequent conceptual learning. But this lack of conceptual understanding does not interfere with the students’ ability to perform well in problem solving situation. In a study conducted by Sawrey (1990) “concept learning versus problem solving” students were asked to answer two
questions that rely on the same concept. The first was a numerical problem solved by using mathematical formula; the second was a conceptual question which has no formula associated with it. Only 31% gave a correct answer to the second (conceptual) question, and 88% solved correctly the first one. This shows that most of the student learn to use formula for solving problems without having an understanding of the underlying concept.

The discussion may be concluded in this way that all the students in a class did not possess and follow the same way of learning. This forced to acknowledge that different students preferred different learning styles. These different learning styles effect their learning achievement. Verma and Sherma (1987) conducted a study on “academic achievement in relation to learning styles of adolescents” The major findings were the group of students have participant learning style has better performance in the total area of the study than the group having avoidant learning style. Another study conducted by Dunn (1989) on “Grouping students for instruction: effect of learning style on achievement and attitude”. The results revealed that the learning style has positive effect on the achievement and attitude as the students preferred learning alone performed significantly better in the learning alone condition and the students preferred learning with peers performed significantly better in the learning with peer condition.

1.9 Relationship between Socio-economic Status and Learning Achievement

Socio-economic status is an important variable which may effect learning achievement. According to Dictionary of Education (2002, p.864), Socio-economic Status (SES) can be defined as “the background or standing of one or more persons in the society on the basis both of social class and financial situation”. The high Socio-
economic Status (SES) families provide more resources for learning experience to their children. The financially and socially stable parents may provide better opportunities for learning experiences.

Mirza in (2001) study the “relationship of socio-economic status with achievement” and found socio-economic status of students has fairly significant effect on their achievement. Some other research studies shows that children from high SES group earn higher achievement test scores, better grades and stay in school longer than the children from low SES group.(Reed & Sautter, 1990; Knapp & Shields, 1990). It was concluded on the bases of the findings of different research studies that there is positive correlation between low SES and lower self-esteem, ability or readiness and school oriented resources; and negative correlations between low SES and learned helplessness, achievement test scores, the dropout rate and discipline problems (Rice, 1993; Dodge, Pettit & Bates, 1994). It was also observed that many students who are academically able to continue their studies fail to do so because of the low income status of their families (Jordan & Plank, 1998).

1.10 Relationship of Socio-economic Status and Learning Styles

Students from different SES groups have different facilities at home and schools. It is universally true that a class has three types of students the high achievers, average and low achievers. Although they learn in same class, but the learning outcomes are different according to their personal experiences.

Verma & Sheikh (1992) conducted a study on “learning styles of advantaged and disadvantaged students”. They used Socio-economic Status questionnaire of Koul for the
classification of advantaged and disadvantaged groups. The result showed that the students from advantaged group have more preference for independent and participant learning styles than the students from disadvantaged group. It provides the base to study the relationship of learning styles and SES.

Pakistani familial setup reflects diverse socio-economic status. This status may effect the learning achievement of students. So far there had been no enough research done to figure out the relationship between learning style, socio-economic status and learning achievement. The relationship between these three factors is the back bone of the education system as the whole system revolves around the input (socio-economic status), process (learning style) and out put (learning achievement). In the light of previous discussion the current study is designed to identify the effects of learning style and its relationship to their socio-economic status and learning achievements.

1.11 Statement of the problem

Learning is the most important component in education system. Learning style is an individual’s characteristic way of responding to certain actions in the instructional environment which leads to learning. The learning styles may have different effects on the student’s academic achievements. Similarly parental socio-economic status may also have some effect on student’s achievement. The study was designed to explore the effects of student’s learning styles and socio-economic status on learning achievement at secondary school level.
1.12 **Objectives of the study**

The main objectives of the study were:

1. To investigate the relationship between different learning styles and learning achievement of students at secondary schools.
2. To find out the relationship between different groups of socio-economic status of parents and learning achievement of their children studying at secondary schools.
3. To explore the relationship between different groups of socio-economic status of parents and learning styles of their children studying at secondary schools.
4. To identify the difference in opinion about learning styles of students by gender.
5. To find out the difference in opinion about learning styles of students by region.
6. To investigate the difference in opinion about learning styles of rural and urban students by gender.

1.13 **Research questions of the study**

The following research questions were addressed in the study:

i. Is there any significant relationship between the different learning styles and academic achievement of the students at secondary school?

ii. Is there any significant relationship between different groups of socio-economic status of parents and academic achievement of their children studying at secondary schools?

iii. Is there any significant relationship between the different socio-economic status groups of parents and learning styles of their children studying at secondary school level?
iv. Is there any significant difference in learning styles of students by gender?

v. Is there any significant difference in learning styles of students by region?

vi. Is there any significant difference in opinion about learning styles of rural students by gender?

vii. Is there any significant difference in opinion about learning styles of urban and students by gender?

1.14 Significance of the Study

Individual differences work everywhere in every situation. Whether it is a personality difference, it is biological or social differences or it is difference in learning and responding to a specific situation. Even the socio-economic status is not same anywhere. Some do hard earn less some do less earns more. There is a need to study which factor affects what. To conduct this research three variables are selected the learning styles of students, the socio-economic status of parents and of students and the learning achievement. The researcher tried to explore the relationship among these three variables. The findings and the conclusion of the study will be helpful for students to identify and differentiate their own learning style. It will also help teachers to adopt teaching methods according to the learning styles of students. The teacher educators can get benefit from this study for training prospective teachers to understand the different learning styles of students and designing classroom learning activities according to the preference of their students. Parents can get information how Socio-economic status effects the learning style and learning achievement of their children which may motivate them to uplift their socio-economic status. The principals and administrators can use the
findings of the study for establishing the system in their institutions which suits to maximize the learning. Policy makers will be benefited by the results of the study for further policy formulations regarding teacher training, designing teaching learning aids and taking measures for the improvement of classroom environment. The non-governmental organizations (NGOs) can also persuaded by the result of the study to work for designing teaching aids, training teachers regarding methodology, assessment etc and developing supplementary reading material according to the learning needs of the students. This study further provides an edifice for further researches in the field of teaching, learning and achievement.

1.15 Delimitations of the study

Keeping the finances and time available to researcher the study was delimited to:

a. Region Pothohar Plateau of Pakistan included four districts i.e. Attock, Chakwal, Islamabad and Rawalpindi.


c. Only public sector schools of four districts (Attock, Chakwal, Islamabad and Rawalpindi) were included in the study.

d. Learning styles defined by Grasha and Riechmann (1974), i.e. independent, dependent, competitive, collaborative, participant and avoidant styles were used as a basic tool for research.
1.16 **Conceptual Framework**

The conceptual framework of the study focused on the relationship of three variables i.e. students learning achievement, their learning styles and parental socio-economic status. In which learning styles and socio-economic status of parents of sampled students were independent and learning achievement was dependent variable.

The design of the study is depicted as below:

![Diagram](image)

*Figure: 1-1 The conceptual framework of the study*

After the identification of independent and dependent variables it was easy to categorize the variables for visible picture of the study. The learning styles model presented by Grasha & Riechmann (1974) which have six styles, the socio-economic status divided into five classes for the clear understanding of the results and the academic achievement of students measured in grades i.e. $A^+$, A, B, C, D, E as per defined policy of Boards of Intermediate and Secondary Education in Pakistan.
CHAPTER 2

REVIEW OF LITERATURE

Education is the process of life long learning. Learning is development. Development means certain changes that occur in human beings with the passage of time throughout their lives. In the process of development the human capabilities are modified and refined up to maximum level that enables people to adjust in society and live a better life. According to Dictionary of Education (2005, p.130), “Education is the process of developing the potentials of man to the optimum level, in order to enable him to lead a productive and happy life in society”. The aim of education is to develop the human personality. The human personality has six aspects so the ultimate aim of education is to develop six aspects of the personality. These six aspects of personality development are physical, mental, social, spiritual, esthetic and emotional. Human development can be divided into four domains physical, personal, social and cognitive. The Physical development, deals with the changes in physical appearance of the body i.e. height, weight etc. Personality development focuses personality of human beings as psychological, emotional and esthetic development. The social development refers to social changes and social relations with others. The last cognitive development refers to changes in cognition and thinking. Since long education was considered as one of the most powerful agent of change. It enable individual to gain a more profound understanding of human development and building relationship among individuals, communities and nations to lead a successful life.

As the child grows the process of development focuses on two major areas, the physical development and mental development. The physical development enables child
to perform physical activities and the cognitive development enables child to think and respond in a specific situation.

The cognitive development is mainly related to brain development. Ausubel (1965) described the human brain as white matter of coconut size. There are several different areas of the brain. These areas are responsible to perform different functions. For example feathery looking cerebellum coordinates with balance and skilled movements. The cerebellum may also play a role in higher cognitive function such as learning. This part of body learns, thinks, remembers and solves problems. So it remains under special interest of educators’ as they want to know how the brain contributes to educational phenomena. Brain regulates two functions memory and emotions. Regarding the memory part of brain called hippocampus processes person’s experience and give meaning to it. New information is stored in memory as long-term knowledge while the amygdale directs emotions. The thalamus is involved in our ability to learn new information, particularly verbal information.

Hippocampus is composed of group of neurons. For a specific experience hippocampus is activated and person can recall facts and information from memory. This process of neuron activation is called neural placity. This process brings structural changes in brain (O’Donnell, Reeve & Smith, 2007, p.35). The process of education changes the function of brain not the structure of brain. Educational programmes provide environment to brain to process, store, remember and use information to solve problems. The educational process develops the brain and it has greater neuronal interconnectivity. A normal human brain has 100 billion neurons and brain forges about 100 trillion
connections that join neurons together and these connections foster learning. (O’Donnell, Reeve & Smith, 2007, p.36).

In the literature Jean Piaget was the first psychologist who describes how humans gather and organize information and process it for development. The work of Jan Piaget is known as “Piaget’s Theory” for cognitive development. Vygotsky and Bruner are also the well known psychologists they worked for cognitive development and how the learning and thinking takes place.

2.1 **Piaget’s Theory for Cognitive Development**

Piaget started to study the child’s cognitive development at the beginning of the 20th century. According to Piaget (1969, p.70) “the main goal of education should be to help children learn how to learn and that education should “form not furnish” the minds of students”. The Piaget’s theory of cognition is based on adaptation and organization of facts according to demand of physical environment. The process of adaptation has four stages schema, assimilation, accommodation and equilibration (Parsons, Hinson & Sardo-Brown, 2001, p.36).

(a) **Schema**

Piaget (1971, p.44)) said scheme is a unit. It is a collection of neurons. It is a chunk of information activated in the result of specific action under a specific situation and it helps to organize the environment. He used schema to represent the cognitive structure. Piaget said that it helps individuals to organize their environment.

He further elaborated the function of schema according to him when a person encounter with new idea the existing structure helps to understand it and make it
meaningful for the person. If that new experience or idea became meaningful or understandable then it assimilates to existing structure that is the next stage in Piaget’s Cognitive Development Theory.

(b) Assimilation

Piaget’s theory was explained by Parson and Colleagues (2001). They said assimilation is the process of making sense of experience and perception by fitting them into previously established cognitive structure. If the new idea or experience did not assimilated and remained unable to make connection with the existing cognitive structure then the brain creates new scheme. This process is called accommodation.

(c) Accommodation

Parson and Colleagues (2001) deeply study the Piaget’s work and explained that in the process of accommodation the new idea get a separate place in the brain as it remain unable to make a connection with existing situation and not assimilated. Now two processes occur at the same time one is assimilation and other is accommodation. This refers to cognitive development. If the process of assimilation occurs only the brain gets a big structure of schema with more information then it become difficult to distinguish the idea. If the continuous process of accommodation occurs then the brain has isolated schemata without any connection and relation in the result generalities can not be formulated. Both the processes occur in the brain simultaneously and Piaget named this stage as “Equilibration”. Equilibration is a stage of balance between assimilation and accommodation.

To motivate individuals Piaget suggested put them in a state of cognitive disequilibrium. It is a discrepancy between what is perceived and what is understood.
Piaget called it cognitive conflict. Cognitive conflict is a state in which one expects something to happen in a certain way but it does not. This situation motivates individual to understand the situation which caused the conflict and in the result assimilation takes place otherwise new schemata created with new experience and adaptation takes place.

Piaget classified the cognitive development parallel to physical development into four stages. According to him at sensory motor stage (birth to 2 years) the child moves from the reflexive activities to more highly organized form of activities. Like as from reaching, grasping and sucking to the object permanence.

The second stage is pre-operational stage (2 years-7 years) at this stage the child lacks logical operations, symbolic function, egocentrism, centration or concentration. Third stage (7 years-13years) is concrete operational stag. At this stage a child is able to think logically but only about concrete objects and problems. The last stage (13years-17years) is operational stage; according to Piaget, at this stage a child is able to solve abstract problems.

Many criticisms came to Piaget’s theory. Piaget focused the individuals. He thought individual can learn at their own when reached to specific stage. He ignored the individual differences as every individual is different. He may reach to a specific developmental stage at different time, then; how learning could be happened at the same rate in same situation at the same time. Further Piaget assumed that cognitive conflict motivates learning but this discrepancy some times produces avoidance behavior which totally stops learning. Piaget also ignored the teacher’s, the environmental and cultural role in learning. Learning is a process which could not be continues in isolation so environment, culture and teacher may affect learning. When Piaget gives his biological
views of cognitive development Vygotsky gave socio-cognitive perspective of learning. Socio-cognitive perspective of learning focus how the cognition develops when others help the learner. When a learner come a cross to a new situation he may be confused in handling new situation. He needs some guidance in the form of instructions or role play. When anyone guides him he may solve the situation comfortably. This is the social aspect of cognitive development.

2.2 Vygotsky Socio-cultural Perspective of Cognitive Development

Vygotsky believed that child is not an isolated character of the world. He lives in society and has some culture. This social and cultural factor has significance affect on cognitive development. Vygotsky (1978, p.57) assumed that “every function in a child’s cultural development appears twice: first on the social level and later on the individual level; first between people (inter-psychological) and then inside the child (intra-psychological)”. Woolfolk (2004, p.79) strengthens the idea of Vygotsky by saying that “the higher mental process appears first between people as they are constructed during shared activities then the process internalized by the child and become part of that child’s cognitive development”.

Vygotsky believed that during the learning process the children may face two situations or stages; either he can solve the problem independently or he can not. When the child can solve the problem independently he named this stage as the “zone of actual development” and when he is unable to do so at their own and may be able to solve it with the help of some other person the Vygotsky named this stage as the “zone of proximal development (ZPD)”. The ZPD is an individual’s potential to learn.
Encyclopedia of Education (2003, p.575) defines zone of proximal development as, “The ZPD is the area between a learner’s level of independent performance (often called developmental level) and the level of assisted performance (when the child can do with support)”. To get support from others to perform a task, language and other signs symbols are the main factors.

Both the Piaget and Vygotsky emphasized the importance of social interaction in cognitive development but in a different perspective. Piaget believes that interaction promote development by creating disequilibrium, he believes that most helpful way is to interact with peers because they are at the same level of development. While Vygotsky believes that cognitive development fosters by interaction with some skilled and experienced person. Students can learn from both adults and peers.

Some other psychologists have also worked for social development. Vygotsky highlighted socio-cognitive aspect of development. He focused the concept of social interaction and assumed that it developed the cognitive activities. The others focused on personality development such as psycho-social development. According to O’Donnel and Colleagues (2007, p.77), “The essence of social development is the students’ progression toward psychological growth, personal adjustment, a sense of competence, emotional maturity, a pro-social orientation towards others, and a capacity for autonomous functioning”. The training institutions for social development are society and school. In which the role of teacher has important place. This function of school and teacher in social development was explained by Erikson.

Erikson (1982) explains it in “life span development framework”. He described eight developmental turning points that all people face during the developmental process
at specific age. Those eight points were: trust versus mistrust, autonomy versus shame, initiative versus guilt, competence versus incompetence, identity versus role confusion, intimacy versus isolation, generality versus stagnation and integrity versus disparity. Each turning point is related to seven others. A positive resolution at one stage increases the individual strength and potential to cope with future turning points whereas negative resolution leaves the person more vulnerable to later maladjustment.

Along with Piaget’s cognitive development theory, Vygotsky’s social development theory Bruner gives learning as discovery theory. All three were constructivists focusing cognitive development by three different aspects.

2.3  Bruner’s Theory of Discovery Learning

In contrast to the Piaget’s age-stage theory Bruner (1966) believed that a person can learn new idea at any age by taking an active role in the learning process. He called it the invariant sequence of stages. He felt that a person’s environment and background knowledge or schema and current knowledge play an important role in person’s cognitive development and understanding of ideas. Bruner believed that learner should participate actively in transforming knowledge, decision making, constructing hypothesis and thinking about what is being taught.

Bruner stands some where between Piaget and Vygotsky. He bridges the concept of both. Bruner like Piaget acknowledge the role of biology in cognitive development, in particular that individuals are born with the biological systems that enable them to make sense of their environment and that these systems mature over time. Bruner was also agreed with Piaget that individuals have to be active in their development as discussed
above. However Bruner have more agreement with Vygotsky. He emphasizes discovery learning or role of language. The language not only reflects experience but it can transform the experience. He was interested in language learning and teaching, and expands the Vygotsky’s concept of scaffolding.

2.3.1 Modes of cognitive development

Bruner presented three modes of cognitive development. He said during the cognitive growth students’ move through these stages.

a) **Enactive Stage**

At this stage students begin to develop understanding with environment through active manipulation. Student learns to control his body and react physically to the environment. This form of memory may be linked with muscle memory. At this stage students should be given opportunity to play with material in order to understand how it works.

b) **Iconic Stage**

At the second stage incoming information is stored in the form of mental images or icons. Students can manipulate these images without having concrete objects. Students are able to take the form of sound and smell images and to visualize concrete information.

c) **Symbolic Stage**

This is the final stage in which students can use abstract ideas to represent the world. Now students have ability to make important shift in cognitive development.
A key difference between Piaget and Bruner is that whilst Piaget thought the application of logic was the ultimate goal of cognitive development, Bruner believed that all these modes of representation were available to the adult engaged in problem solving activities.

The similarity of Bruner and Vygotsky was both believed that if the language form thoughts then the cognitive development can be accelerated. The cognitive processes and the quality of thinking may be enhanced by teaching the appropriate language.

In the above discussion of cognitive development two concepts overlap each other learning and development; a question arises which one comes first? Both strengthen each other, development promotes learning and in the result of learning development takes place.

2.4 **What is learning?**

According to Dictionary of Education (2005, p.521) “learning is the process of acquiring knowledge, skills and belief through experience”. Learning takes place when students interact with others and with environment by observing, talking, listening discussing, writing and relating their own ideas and experiences with others.(Reddy, 2006, p.11). Piaget’s (1964, p.17) describes “learning is subordinated to development and not vice versa”. He explained development as the active construction of knowledge and learning as the passive formation of association. He was interested in knowledge construction and believes that cognitive development came before learning. According to his view child cannot learn a concept before they are cognitively ready. Here by the term
cognitively ready he means development of child. Cognitive development takes place first then they become able to learn where as Vygotsky believed that learning is an active process and it did not wait for readiness. Vygotsky, (1978, p.90) said “properly organized learning results in mental development and sets in motion a variety of developmental process that would be impossible apart from learning”. He saw learning as a tool in development. Learning pulls development up to higher level and social interaction is a key in learning. So in this way learning can be defined as an individual as well as social activity.

Learning takes place as a result of experience. For example a first grade student sings, “twinkle twinkle little star” and second grade student leaves hot spoon immediately. First case is the example of learning while second case is not the example of learning, what’s the difference between the examples of learning and not learning? The difference is the experience. In other words the first grade student’s behavior is the result of his experience. He was not biologically programmed to sing “twinkle twinkle little star” and leaving hot spoon is reflexive activity. According to Parson (2001, p.206) “learning is acquiring knowledge: it’s an enduring change in living beings not dictated by genetic predisposition; it is also a relatively permanent change in behavior resulting from practice or experience”.

This definition has three important elements.

1. Learning is a change in behavior, for better or worse.
2. This change takes place through practice or experience. It means changes due to growth, reflex actions, maturation or injury are not learning.
3. This change must be relatively permanent.
So the changes due to motivation, fatigue, adaptation drug or sensitivity of the organism is not learning because these changes are of a transient nature resulting from genetic forces, or induced artificially. They are not considered to involve in promoting learning.

Different educationist and psychologists perceive learning in a different way.

According to Skinner quoted in Sharma (2005, p.285) “learning is not acquiring knowledge or skill by more mechanical repetitions. It is a process in which the learner organizes different elements and experience to reach a practical goal”.

According to Hilgard quoted by Reddy (2006, p.53) “learning refers to the change in a subject’s behavior to a given situation brought about by his repeated experiences in that situation, provided that the behavior cannot be explained on the basis of native response tendencies, maturation or temporary states of the subject (e.g. fatigue, drugs etc).

Sharma (2005, p.284) describes, “Learning is associated with acquisition of new behavior or modification of old behavior”. This was strengthened by the views of Reddy (2006, p.143) he said, “Learning is the modification of behavior potential as a function of experience”.

All the definitions of learning discussed above emphasizes learning takes place due to experience. A learner gain experience while interacting with society so the learning is a social as well as individual activity. Learning is a social activity started by the interaction with others but ends as an individual’s activity. As teacher design an activity the whole class or a group of some students gone through it but same learning did
not occur, because every individual’s experience could be different. The change in thinking, feeling and action which has taken place in the result of activity is different.

Learning is a complex activity it continues formally or informally intentionally or unintentionally. Some times learner gone through the different activity but learn different thing which may not be the intention of learner. So people learn things that are beneficial and not so beneficial to them. An example might be phobia.

Learning is an abstract concept some time learner become aware of what has been learnt some time not. Learning is not always deliberate and learner may not be conscious of what has he learnt. Some time learning takes place without realizing it. Some time it remains unaware what has learnt, and some time learned what did not set to learn. The results of learning are not always easy to see. Most contemporary theorist agreed that not all learning yields readily observable change like Bandura (1977, 19978) noted that learning can takes place even though no overt behavioral change is witnessed in learners. Besides all this; psychologists agreed that learning varies from simple to complex and mechanistic way to organized way.

From the century ago educationist and psychologist observe the process of learning and describe it in learning theories.

2.5 Learning Theories

All the theories of learning were based on the presenter’s perception about the nature of man. Scientists, Psychologists and educationists proposed theories of learning totally depend on the assumption about knowledge, society and man. A survey of research literature reveals that particular learning theories emphasize particular kind of
learning and learning environment, while they neglected others. Learning theories proposed yet can easily be divided in following categories.

1. Behavioristic learning theory.
2. Humanistic or non-Behaviorist learning theory.
3. Cognitive learning theory.

2.5.1 **Behavioristic Learning Theory**

The major proponents of Behavioristic theory were Thorndike, Watson, Skinner and Guthrie. Behaviorist said that behavior and environment are the most important component of learning. Reeve (2007, p.209) said “Changes in the environment will result in change in behavior”. Individual differences are less important to them, because their goal is to produce desirable behavior or reduce the frequency of undesirable behavior. Same views were presented by Parson (2001, p.208) “learning is a change in the way people act overtly-observable behavior observable change”. They believe that learning occurs through a process of contiguity i.e. learning is the result of events occurring at the same time. Whenever two events occur together over and over again they will become associated. The best contiguity theory is classical conditioning, which involves the pairing of a stimulus and a response. The stimulus leads to the response without any prior learning, for every stimulus there is a natural response as for every action there is a reaction. Pavlov discovered the phenomenon of classical conditioning while conducting research on the digestion system of dogs. He noted dog salivated when food presented to it.
Pavlov begins to ring a bell whenever food presented to dog. Initially no response was observed but gradually through experience dog learned the sound of bell and it become conditioned response. Previously the unconditioned stimulus (food) produced unconditional response (salivation), which was natural now associated with the condition of bell. So the conditioned stimulus (ringing of bell) produce conditioned response (drooling) with out the presentation of food to dog as result of contiguous pairing of the two events.

Association’s theories depend on the principle of contiguity. Guthrie (1935) proposed this theory, which was further explained by Zais (1976, p.251), “a combination of stimuli which has accompanied a movement will on its occurrence tend to be followed by that movement”. Guthrie's theory got attention because of its simplicity. He said, "In any given situation we learn what we do and in similar situations repeat what we have learned. He said all learning takes place in a single contiguous pairing of stimulus and response. The criticism on it was then what was the role of practice? He explains under the presence of stimulus different responses occur and due to practice when the stimulus removed the last response is the learning of the person. Because when ever the situation repeated under the specific stimulus the person repeat the last response learnt in first trail. He further said, the practice improved the total acts of achievement not the learning. Learning takes place at first trail and practice improve the acts of a person and his performance.

An alternative theory of behavioral learning was operant learning. It was presented by Skinner. In operant learning the learner acts in the environment and in the result, learner's repeating behavior increases or decreases. The basic law of operant
conditioning was stated by Skinner (1938, p.21) as "If the occurrence of an operant is followed by presentation of reinforcing stimulus, the strength is increased”. This theory emphasizes two factors the operant and the re-inforcer. His approach was described by O'Donnell, Revee & Smith (2007, p.210) as black box theory, in which information from environment going into the individual who learn and behave. But nothing could be said about what occurred in the black box of the individual. This approach is contrast to cognitive theory as the proponent of that are very interested in what occurred in the individuals as he or she receives and actively process the information from the environment.

2.5.2 Humanistic Learning Theory

Albert Bandura and Allport was the proponent of this theory. Bandura (1978) stated this theory as “the social settings in which individual live, work and play are powerful influences on behavior, attitudes and beliefs about one's self and the world”. The primary point is that individuals learn from observing the behaviors of other and the social consequence of those actions. Allport (1985, p.3) also have the same point of view and said "to understand and explain how the thoughts, feelings and behaviors of individuals are influenced by the actual imagined or implied presence of others”.

In the result of criticism on behaviorist theory it was criticized that the human beings are not robots they understand the environment in which they live and they are influenced by it. They further said "sometimes there is something in the organism which effect behavior".
This theory was based on Bandura’s "Bobo doll study" (1963 p.3-11). He made a film and showed it to students and observed the student’s behavior. He suggested observational learning strategy for students learning. The factors involved in observational learning were attention, retention, reproduction and motivation. In the light of this theory it was suggested to the teachers by Parson (2001, p.236) that “they must grab the students attention; they must provide for the retention of the learning, they must ensure students have the capability to learn observationally, and they must provide same kind of incentives for learning”.

2.5.3 Cognitive learning theory

All cognitive theories are constructive in nature and emphasize the active role of learner in making meaning out of their experience. Cognitive theory is also known as “Classical Gestalt Theory”. It was generally known as the product of German psychologists. Wertheimer, Koffka & Kohlar were the main persons who perceived this theory. Gestalt was a German word, meaning, "pattern" or "configuration". Later on Piaget, Bruner and Asubel gave their perspective and developed the cognitive learning theory.

Gestaltist pointed out that person perceives or learns in terms of dynamic structured wholes. It could be understood by an example when three dots are presented so \( \cdots \), it tends to look like a triangle rather than three separates dots. Changing the dots in to squares \( \square \square \square \) presents an entirely different set of visual components. Yet the essential character of the Gestalt is not altered.
So the learning under this theory is not the perception of fact or data rather it is the restructuring and reorganization of data to make sense of it. The way a learner restructures the data it is based on previous experience and current state of mind. The gestalt learning or cognitive learning also has been affected by some laws or factors as the previous theories were.

The example described above is the gestalt first law of figure. This law is stated as the tendency of perceiving images in the foreground first, while other images fade into the background. In the previous image when one see three dots they perceive it as triangle and the dots fade into the background.

The laws of learning in gestalt theory are derived from the single general law, the law of good form or law of pragnanz. Which is based on general good form of gestalt as the simple, clear, compact and significant gestalt conveys clear meanings to perceiver or learner which effect learning. The other laws of learning in gestalt theory are developed by Koffka and presented by Zais (1976, p.279).

i. **Law of similarity**

This law states that the good gestalt is composed of similar elements, because it results in interaction which produces a unitary gestalt and so facilitates the learning.

ii. **Law of proximity**

If things are placed together, it is tendency to discern them as belonging together (Farhman – Diggory, 1992). For example see figure below:

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

It is perceived as five pairs of circles first, rather than as 10 separate circles because of the proximity.
iii. **The law of closure**

Perceptually the human beings have tendency to fill the gap (Farhman – Diggory, 1992). In other words we see the above distant circles as closed figure, by joining parallel line.

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  O       O       O       O       O
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It reflects the tendency of human beings to give suitable end to every situation. This closure represents the rewards that come with the successful completion of learning tasks.

iv. **The law of good condition**

It states that perceptions are formed on a pattern that tends to continue the pattern perceived as incomplete gestalt. For example a half circle is perceived as complete figure. These were the four basic laws of gestalt or cognitive learning theory.

Bruner and Asubel were the proponents of this theory. According to the Bruner "learning is an active process in which learners construct new ideas or concepts based upon their current or past experience". The learner selects and transforms information, constructs hypothesis and makes decision based on cognitive structure. Cognitive structure provides the meaning and leads the learner beyond the information given. Bruner concludes that the persons learn best when are motivated to perceive and they are motivated to perceive by insight full experience.

The other theory which was based on the theme was presented by the Gestaltist’s information process model (IPM) like the gestalts IPM theorists behave in the significance of perception of learning. Bombarding stimuli are filtered through these structures and what perceived after filtered thoughts are processed.
All the learning theories discussed above were the perception of different schools of thought of psychologists and educationists. The further advancements on the bases of research disclosed the different ways of perceiving information and processing knowledge. As the behaviorists totally focus the behavior of learner it was perceived a mechanical task. The educationists of this point of view thought that learning takes place by hit and trail method. It is mechanical drill process. They focus on rote memorization. After extensive practice the learner becomes able to perform tasks.

The socialist criticize and gave their own points of view that learner can not live in isolation, and learning is a social activity. When learner interacts with environment or society learning takes place, and society contributes in the process of learning. This school of thought gave social learning theory. After that the cognitivist came and said that learning is the cognitive process it is the process of perceiving information they focus on cognitive map. All the theories over lap each other and concept travel side by side after analyzing critically it was noticed that all new school of thoughts did not deny the previous theory rather they modify it and looked them in different perspective drill and practice, refined the social actions which has always been learned through society. Further learner interacts with society through five senses and the process help in the development of cognitive map. Every theory has its own importance.

It is easy to look in the light of above discussion that learning takes place at three stages the learner’s physical activities (Behaviorists) the learner's social activities (Social learning theories) and learner's cognitive activities (Cognitive or gestalt theory of learning). Learning will be durable when all three aspects contribute. For people to be learned the impact of these components varies and people learn differently. Some people
focus behaviors, some social actions and some cognitive processing for learning. These different perceptions, variations or preferences are called learning styles. This is an important area for a teacher to have awareness about cognitive and learning styles variations mainly in the ways that students perceive in their world and in how they process and reflect upon information. Some of these variations seem to be caused by differences in the brain, others by individual performance and still others by culture. All these variations are due to individual differences.

Educators had noticed that some students learn better than others and prefer certain ways of learning to others. These different ways and preferences were referred as learning styles. Learning style is a consistent pattern of behavior and preference by which an individual approaches. Bennet (1990, p.140) defines educational experience, “It is the composite of cognitive affective and physiological factors that serve as relativity stables indicator of how a Lerner perceive, interacts with and responds to the learning environments.

2.6 Definition of learning styles

Different psychologists and educationists look upon the idea of learning style differently. They define this concept according to their own perspective.

Sigel & Coop (1974, p.23) have viewed learning style as an integral concept that bridges the personality cognitive dimension of the individuals.

Gibson (1976, p.89) argues that learning style and cognitive style are synonymous.
Lay Cock (1978, p.45) describes learning style as an individual characteristic way of responding to certain variables in the instructional environment.

Kalsbeek (1989, p.2) said that learning style can be understood as a person's preferred approach to information processing, idea formation and decision making. The attitude and interest decide how to respond in which learning situation all depends on the compatibility with the personal profiles. So it can be concluded by analyzing all these definitions that the learning style is the preferred way of perceiving and responding to the information in a specific learning situation.

2.7 **General Concept of Learning Style**

By going through the concept and definition of learning style the researcher come to the conclusion that learning style is influenced by the personality trait, working preferences and cognitive perception. The history traced back to ancient Greeks: Hippocrates divide personality into four types i.e. melancholic, sanguine, phlegmatic, and the choleric. Jung divided personality in two type’s extro-version and intro-version. He further divided these two types into four fold classification of thinking, feeling, sensation and intuition. Keefe (1979, p.10) stated that learning styles reflect genetic coding, personality, development, motivation and environmental adaptation. This shows that learning style is the learner's personal way of perceiving and processing information in which the whole personality, environment and cognition of the learners work. The identification and recognition of one’s learning style may help them how life long learners to be. If students remain unable to learn how to learn, they may not be effectively trained to lead a successful life. Actually helping students to understand how they can
naturally take in and process information will go a long way towards making the life long learner. The environment around the person makes sense to him as an individual. This is called perception and perception shape what one thinks. How he makes decision and defines what is important to him. These individual perceptions determine the natural learning strengths or learning style.

James and Blank (1993, p.45) identified three dimensions of learning styles. First is the individual's information processing style, which define learner's typical mode of perceiving, thinking, problem solving and memory. These preferred ways of perceiving, organizing and retaining knowledge are believed to be distinctive and consistent. Second is affective style defined as personality traits relating to attention, emotion and valuing and how the person motivates his/her self and sustains behavior? Third is physiological style, defined as the biological based modes of responses, which depend upon the physical environment, gender differences and the individual's state of nutrition and health. These three areas together offer a holistic view of the learner taking into consideration of one's mind, body and emotion.

Same as the developmental stages person's learning style accompanies personal development and self actualization. Rayner and Riding (1997, p.9) describe three stages in this process. Initially the person is unaware of their learning style; it is hidden. Gradually the person gains awareness of style and its possible implications for learning and behavior of their-self and others. To be aware of learning style paradigms, it is important to examine both definitions of learning styles and the classification of learning styles. According to Reiff, quoted by Kang (1999, p.1), “it is evident that people learn differently and at different paces because of their biological and psychological
differences”. Again, Brown (2000, p.114) states that “It would appear that individuals show general tendencies toward one style or another, but that differing contexts will evoke differing styles in the same individual”. Obviously, people have their own preferences in learning situations and in certain circumstances they can use different learning styles which are appropriate for them.

With the in-depth study, researchers have made efforts to define and categorize learning styles in different ways; for example, learning style is “identifiable individual approaches to learning situations”, learning styles are the “preferred modes for perceiving, organizing, and retaining information”, its “natural, habitual, and preferred way(s) of absorbing, processing, and retaining new information and skills” and as “cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to learning environments” (Keefe, 1979) (all cited in Peacock, 2001, p. 2).

In addition, learning styles have been categorized by researchers in a variety of ways. Brown (2000, p.114-122) introduced learning style variables as “field independence, left-and right-brain functioning, ambiguity tolerance, reflectivity and impulsivity, visual and auditory styles”. Reid divided learning styles into three categories: cognitive, sensory, and affective learning style models (Rausch, 1996). Keefe (2001, p.4), wrote that “learning styles have cognitive, affective, and physiological variables.” He elaborated it by writing “if, a student has good analytic skills (cognitive), information will probably be categorized correctly. If a student does not like mathematics (affective), learning will be impeded. If a student feels ill or tired (physiological), then little learning will occur”.
Thus, there were two situations one defined Learning Styles and other categorized it keeping in view the variables and it is a difficult job. When each researcher classified learning styles based on different variables, there were many different ways to categories and decide which variable should be included in each category. In fact, Rausch (1996) described the complexity of learning styles in his article when he explained Reid’s categorization of learning styles models by saying that elements of each category are not exclusive and independent.

Finally the researcher discovers application of this awareness to many situations in life. Developing awareness can help individuals recognize their strengths and those of others acknowledging their weaker areas and work collaboratively with others more effectively.

2.8 **Difference between Cognitive Style and Learning Style**

In addition to learning style the related concept is cognitive style. Some psychologists perceived it in the same way but it is different. As Riding and Cheema (1991, p.194) describes the distinction between cognitive style and learning style. He viewed cognitive style as underlying learning style and involving theoretical academic description of process involved, while learning style is of immediate interest of trainer and educator.

It was observed by psychologists that people differ in perceiving and processing information; it is their “cognitive style”. Arends (2007, p.50) "Some individuals appear to be ‘field dependent’: They perceive situation as a whole rather than ‘in parts’. They like to see big picture in most problem situation. Some other are ‘field independent’, they tend
to see the separate parts of the whole instead of the whole “it self”. In general field dependent individuals are more people oriented; social relations are important to them and they work well in groups. Field independent individuals have strong analytical ability and they monitor their information processing rather than their relationships with others.

Arends (2007, p.50) labeled learning style as "in-context" and "out of context style". By “in-context” he means learner acquired skills and knowledge at specific point, he need in his real life situation and develop perceptions. By "out of context" learning means that learning is unconnected to a real immediate need, so it is process oriented. Obviously; it is important for teachers to recognize students’ difference in the ways they process information and in their preferred ways of learning.

It can be summarized that cognitive style is absorption of information and learning style is processing of information. Cognitive style is mainly related to function of brain and gestalt devolvement and learning style is a way of responding to a certain situation.

2.9 Theories of Learning Styles

Theories of learning styles were emerged from learning theories. Every individual is different because of heredity, environment and training. These individual differences forced to perceive and process information differently.

Traditional theory of Behaviorism has been superceded by socialists and cognitivists based on social, cultural and cognitive factors. The learning style theories can be easily put under the umbrella of learning theories. As Dun & Dun’s model under
Behavioristic theory, Myers-Briggs Type Indicator under cognitivistic Theory and Grasha & Riechmann under social learning theory.

The learning style theories can be best represented by Curry’s “onion model”. Bentham (2002, p.99) reflected on model. He stated that all learning style may be placed according to the layers of onion. The outer layer of model has root in Behaviorist Theory which may be influenced by learning environment and individual’s expectation. The example of that layer may be Dunn & Dunn's model, John Holld's model and Schmech, Ribich & Ramanaiah model.

The middle layer of the model refers to as information processing style. This learning style reflects the individual’s intellectual approach for integrating or assimilating information, the example of this layer may be Kolb's learning style. The inner layer was referred as cognitive personality style, which defined as the individual's approach to assimilating and adapting information. The example of this layer would be Myres-Briggs type indicator. The onion model gave no comment for social interaction model.

This metaphor was expanded in (1987, p.123) by Charles Claxton and Particia Murrell to four layers. Further Claxton and Murrell explained that the traits described at different levels are not discrete or separate units. Traits at inner most level are most stable and least subject to change. Moving from core level of personality to outer levels, the inner set of traits influence the outer layer traits. Hence personality has impacts on ones information processing abilities, information processing abilities effect person's social interaction and person's social interaction style influence their instructional preferences.
2.10 Learning Style Models

Learning style model can be easily divided into four categories after reviewing the literature, as:

1. Instructional and environmental preferences models.
2. Social interaction model.
3. Information processing model.

2.10.1 Instructional and environmental preferences models

In curry's onion model it represents the outer most layer. It was considered to be the least stable and easily influenced by learning environment.

a. Dunn and Dunn's Model

The Dunn and Dunn Model have a great deal of history and research behind it. It was developed by Dr. Rita Dunn in 1967 and since that time research has been conducted at more than 90 institutions of higher education. The model traces its roots to two distinct learning theories: Cognitive Style Theory and Brain Lateralization Theory.

Cognitive Style Theory was based on the idea that individual process information differently on the basis of either learned or inherent traits. Brain Lateralization Theory is based on the idea that the two hemispheres of the brain have different functions: left brain has verbal-sequential abilities and right brain has emotions-spatial holistic processing.

Rita Dunn and Kenneth Dunn (1978, p.3) proposed the main theory of instructional and environmental preferences. They said that “Learning Style is the way in which each learner begins to concentrate, process, and retain new and difficult
information”. They further elaborated learning styles as “...a biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some students and ineffective for others,...” (Dunn, 1989).

Dunn and Dunn's defines Learning Style Elements as follows

i. **Environmental Stimuli Preferences**
   - Sound Preference
   - Light Preference
   - Temperature Preference
   - Design Preference

   The environment in learning style refers to noise level, light, temperature and seating design. For instance some prefer to learn at night some in day. Some achieve best learning in calm and quite atmosphere whereas some other prefers music around them.

ii. **Emotional Stimuli Preference**
   - Motivation Preference
   - Persistence Preference
   - Responsibility Preference
   - Structure Preference

   By these factors they mean motivation, persistence, responsibility, and need for externally imposed structure verses flexibility. As some people prefer to complete one task before starting other and other people can easily perform multiple tasks, working well at a variety of responsibilities at the same time.
iii. **Sociological Stimuli Preference**

- Self Preference
- Pair Preference
- Peers/Team Preference
- Adult Preference
- Varied Preference

By sociological needs they mean how individual learn when associated with people or peers, with an authoritative person or with colleague. Learning occurs at several ways or follows a persistent pattern. Some like to work alone some impart their best performance working with group.

iv. **Physiological Stimuli Preferences**

- Perceptual Preference
- Intake Preference
- Time Preference
- Mobility Preference

Physical needs are related to physical performance for learning like perceptual modalities as visual, auditory tactical, kinesthetic, time of day as morning, evening, afternoon, night, energy level, need for intake as eating or drinking while studying and mobility (sitting still or moving around at study time).

v. **Psychological Stimuli Preferences**

- Global/Analytic Style
- Hemisphericity Preference
- Impulsive/Reflective Preferences
This group is pertaining to psychological processing as global or analytic processing style, action and hemispheric, impulsivity or reflectivity.

These 21 elements were grouped across five “stimuli” categories, environmental preferences, emotional preferences, sociological preferences, physiological preferences, and psychological preferences. The theory of Dunn and Dunn's model is biologically based upon physical and environment learning preferences. This is well-knitted to emotional and sociological preferences combined to form an individual learning style profile.

The Dunn and Dunn's model is presented conceptually as a gestalt of environmental, emotional, sociological, physical and psychological elements that vary from learner to learner and whenever reference is made to the model the learning style elements are always described and grouped in terms of their related areas.

A primary component of the Dunn and Dunn Learning Styles model is the process of identifying each student's individual learning style. How do teachers come to know what learning styles each student has or prefer? There are many different ways to determine an individual student's learning style. The Learning Styles Inventory (LSI) and the Reading Styles Inventory (Dunn, Dunn & Price; Carbo & Dunn) are the assessment instruments recommended by the model developers. However, the Learning Styles Profile (Keefe & Monk, 1986) is also used extensively with learning style programs that are primarily based on the development work of the Dunns.
b. **Jhon Holand's Model**

Jhon Holand presented his model in 1974. This model is based on the correlation between the personality and vocational preference. He focuses on six personality types: realistic, investigative, artistic, social, enterprising and conventional in relation to six environmental models sharing a common set of constructs (1974, p.2). He believes one can predict when placed in a different environmental setting because environment powerfully influences an individual's opportunity to learn. The descriptions of these settings were taken from the article “Learn to Live, Work: A Comprehensive Developmental Guidance Program”. These settings are as follows:

i. **Realistic**

In realistic surroundings people are motivated to see the world in simple, direct and traditional way while encouraging people to perceive them as an individual unit. It discourages interpersonal relationship. It stimulates people to perform realistically and rewards them for the display of conventional goods and values such as money, power and possession. The typical work activities include fixing, building, repairing, using tools that require fine motor coordination. Generally these people prefer concrete problems over abstract problems. Their hobbies include hunting, fishing, camping, building, reading magazines, operating recreational vehicles, and dangerous activities (skydiving, mountain climbing, auto racing). These people are emotionally stable, reliable, practical, thrifty, persistent, shy, and modest, avoid being the center of attention, maintain traditional values, and slow to accept new ideas.
ii. **Investigative**

This style helps to distinguish the environment by investigation and observation. It encourages people to investigate abstract, complex and original ways. It motivate learner to investigate biological, cultural and physical phenomenon by using scientific methods. The focus of the activities includes performing abstract tasks, solving problems through thinking, working independently, doing scientific work, collecting and organizing data, conducting research, dislike selling, and prefers to rely on their own work rather than working in a group. The typical hobbies include complex activities (skiing, scuba diving, sailing and flying), computers, reading, bird watching, astronomy, and chess. These people are independent, self-motivated, reserved, analytical, original, confident, and creative and having scholarly abilities.

iii. **Artistic**

The artistic environment is characterized by creative, free and ambiguous activities and competencies. It encourages people to see themselves as expressive, original, intuitive and creative and to view the world in flexible and unconventional ways. The typical work activities include composing, writing, creating artwork, working independently, playing musical instruments, comfortable in academic environment, decorating and designing. The typical hobbies include drawing, sketching, painting, photography, going to theater, museum, reading, writing poetry or stories, collecting artwork, dancing, and enjoy being a spectator. These people are independent, non-conforming, impulsive, romantic, free-spirited, intuitive, sensitive, emotional, and drawn to beauty and aesthetic qualities.
iv. **Social**

This environment is described by sociability and dominated by similar types of men and women. Learners are encouraged to participate in social activities and promote cooperation, flexibility and helpfulness. The typical work activities include teaching, explaining, enlightening, helping, selecting, informing, organizing, working with people, often like to be the center of attention, solves problems through the discussion of feelings, and enjoys leading and directing others. The typical hobbies include entertaining others, attending conventions, doing volunteer work, and organizing social events. These people are humanistic, idealistic, ethical, responsible, cooperative, kind, generous, insightful, friendly, cheerful, and concerned about others.

v. **Enterprising**

Enterprising environment forced learners to see themselves as popular, aggressive, self-confident, sociable and possessing leadership qualities. They can design personal goals and in this way dominating others. The typical work activities include selling, purchasing, political maneuvering, entertaining clients, leading committees, managing people, seeks positions of leadership, participates in competitive activities, giving speeches and presentations. The typical hobbies include belonging to clubs, sporting events, political activities, and attending conventions. These people are ambitious, talkative, witty, argumentative, aggressive, risk takers, adventuresome, and attracted to money, power, and material possessions.

vi. **Conventional**

In this environment individuals feels to be bound with values and authorities. It leads person to feel constricted, simple and dependent on others in society. The typical
work activities include conducting a financial analysis, operating office machines, keeping records, writing business reports, making graphs, and often work well in large organization. The typical hobbies include collecting (stamps, coins), home improvement projects, building models, civic and fraternal organizations, and playing games with clear-cut rules. These people are conscientious, practical, self-contained, conservative, orderly, systematic, precise, accurate, careful, controlled, and careful about money.

c. **Schmeck, Ribich and Ramanaiah Model**

Schmeck presented this model in 1977. They used behavior oriented statements to assess the learning process in the dynamic setting. In fact it was developed with in the context of cognitive psychology and derived from laboratory research concerned with information processing and memory. It focuses on four learning processes deep processing, elaborative process, fact retention and methodical study (1977, p.17).

i. **Deep processing**

It assesses the use of dialectical and hierarchical information structuring techniques.

ii. **Elaborative process**

It assesses the use of personal experiences and self-involvement for the purpose of encoding information.

iii. **Fact Retention**

It assesses the focus of attention and memorization of facts for passing examination.
iv. **Methodical study**

It assesses regularity in studies as well as the appropriateness of method used for earning high grades.

d. **Aggarwal Learning Style Inventory**

Aggarwal (1983) has developed and standardized the Learning Style Inventory which has seven aspects.

1. **Flexible and non-flexible**
2. **Individualistic and non-individualistic**
3. **Visual and aural**
4. **Field-dependent and Field independent**
5. **Short attention span and Long attention span**
6. **Motivation centered and non-motivation centered**
7. **Environmental oriented and environment free**

2.10.2. **Social Interaction Model**

The second layer of onion model consists of social interaction model. This model considers how the interpersonal relationship of peers and student-teachers helps to gain, understand and assimilate information. The main presenter came under this category are Grasha & Reichmann and Baxter and Magolda.
**a. Grasha & Reichmann Learning Model**

Anthony Grasha & Sheryl Reichmann developed this model in (1974). This model focuses on student’s attitudes toward learning, classroom activities teachers and peers; Grasha’s original idea was that as compared to participative, collaborative and independent, avoidant, dependent and competitive styles were always functional; but other researchers have not always operated on those assumptions and have sought preferred learning methods for all except the avoidant style. The style or trends he describes are as:

i. **Avoidant Learning style**

The students having this learning style do not participate in the classroom activities and are not interested to take responsibilities. They do not bother about learning content and attending the class. They study enough to pass the examination only. Mostly they remained absent from the class.

**General classroom preference**

- They remain passive rather avoid to participate in classroom activities
- They does not like continuous assessment system in class
- They like pass-fail grading system
- They does not like teachers attention
- They like to sit on back benches

Advantages of this style are students take life easy. They remain happy with what the life is. They are not interested in taking serious steps to change their lives. They have time to enjoy the life. Disadvantages are they do not contribute for the development. They keep themselves away from setting productive goals.
ii. **Participative Learning style**

These students enjoy learning and willing to accept responsibilities for self-learning and try to get knowledge as much as possible. They participate in all activities to enhance their own learning. Their focus is the requirements of the course and their own contribution. They do maximum to fulfill the requirements of the course. They enjoy going to class and participating in classroom activities.

General classroom preference

- They prefer lecture with discussion
- They like to avail all the possibilities to share the information
- They enjoy class reading assignments
- They like those teachers who can conclude the discussion

Advantage of this style is these students have practical experience. Disadvantage is they may give importance to others needs then their own.

iii. **Competitive Learning style**

These students always try to do better than others. They believe in putting maximum efforts to get reward and recognition. They like teacher’s attention for this they follow all the instructional procedures in class. They are anxious about what others are doing. They want to remain at the top.

General classroom preference

- They become a group leader in discussions
- They like teacher-centered teaching
- They want appreciation for doing a good job
- They prefer those activities in which they can perform better then others
Advantage of this style is it motivates students to set targets for their success. Disadvantage of this style is it make difficult for people to appreciate and to learn collaborative skills.

iv. **Collaborative Learning style**

The students prefer this style believe that they can learn by sharing ideas and talents. These students enjoy working and learning by sharing their knowledge and activities with others in a group. They cooperate with teachers and students in conducting classroom activities.

General classroom preference

- They prefer group work
- They like to organize seminars and team activities
- They like students centered activities
- They prefer to work for group projects

Advantage of this style is it develops skills for working for combined activities. Disadvantage of this style is that the students may not work with competitive people. They depend too much on others and not always able to work alone.

v. **Dependent Learning style**

They have less intellectual curiosity and they prefer to learn only what is required. They always look towards teachers and peers for the instructions and guidelines. They are good to follow the instructions. They do everything what teacher asks because they totally depend on others.

General classroom preference

- These students like that the material should be provided by teachers
• They want clear instructions from teachers what to do
• They live happily with teacher-centered classroom method
• They prefer the demands of teacher must be clear in all aspects of course

    Advantage of this style is these students are good followers. Disadvantages are it is difficult to develop skills for independent work. They have no self direction. They cannot set targets for their life. They can not deal or handle new situation.

vi. **Independent Learning style**

    These students can set their goals by themselves. They are confident in their learning abilities. They need less direction from the teacher. They prefer only the content which is important to them. They are target oriented they like to work alone on course projects.

    General classroom preference

    • They prefer independent study
    • They like to follow self-paced instructions
    • They like those assignments that enhance their independent skills
    • They like the projects which can be designed by students
    • They prefer-students centered course designs

    Advantage of this style is it develops self-initiated and self-directed learner. Disadvantage of this style is these students are deficient in collaborative skills. They are failed to consult teachers when they need help.

    Grasha & Reichmann (1974) stated that individuals learn best in the situation that meet their social emotional needs and are attuned to their predominant pattern of
behavior. They also proposed that teacher should develop activities which appropriately match their student’s perceptions and styles for their proper involvement in the learning.

b. **Marcia Baxter-Magolda’s Model**

Marcia Baxter-Magolda’s (1992, p.138) presented her view after re-conceptualizing William Perry’s ideas and declare that for learning: individuals use their age and gender as well as the social expectation. She describes four stages of learner’s in her model.

i. **Absolute Knower**

These students believe that teachers know every thing and it is their responsibility to get it from them. They expect teachers should have friendly behavior, it makes easier for them to know what is expected from them.

ii. **Transitional Knower**

They can take risk. They are willing to perform new experiment with the surety of being correct. They can use different strategies for improving learning in same area. They are able to apply their knowledge and ability in different areas.

iii. **Independent Knower**

They can use and manipulate information and experience according to their need. They appreciate leader’s act of promotion of independent thinking and exchange of opinion.
iv. **Contextual Knower**

They can judge and criticize their own knowledge and skill that may apply to a new or unique environment. They are capable of applying concepts in different situations.

### 2.10.3 **Information Process Model**

This model describes the third layer of onion model. It explains how people perceive and process information for learning. How individuals interact with the world. This layer is considered to be more stable than the outer layers because it works inside human beings and not directly interact with the environment, although it is modified by learning strategies. Main theories fall in to this layer are Kolb (1976), Gregorc (1982), Honey and Mumford learning Styles (1986).

#### a. **Kolb’s Learning Style Inventory**

According to Kolb’s point of view different people prefer different learning styles. Various factors influence a person’s preferred style. In his experiential style model he defines three stages of a person’s development. The four different learning styles improve as we mature through our development stage.

In his experiential learning style model he defines three developmental stages and when a person matures through these developmental stages he may possesses four different learning styles. The developmental stages Kolb defined are as:

i. **Acquisition**-This stage continues through birth to adolescence. At this stage the basic abilities and cognitive structures are developed.
ii. Specialization-This is adulthood stage. In which particular special learning style is shaped by educational and organizational socialization.

iii. Integration-It is about mid career to later life, at this level person exhibits, expression of non-dominant learning style.

Kolb (1976, p.2) further explains learning process. He said students can be divided into four groups.

- Students who can learn only by doing
- Students who can learn by reflecting
- Students who can learn by experiencing
- Students who can learn by thinking

Then he made groups and combined these styles into two components: perception i.e. “how the information is taken in” and the processing i.e. “how the information is assimilated”.

In terms of perception an individual may have a preference for “concrete experience” or “abstract conceptualization”. In concrete experience person participate in specific situation which effect person’s feeling, where as in abstract conceptualization the emphasis is on thinking rather than feeling.

In terms of processing an individual would either have a preference for “active experimentation” or “reflective observation”. In active experimentation person prefers to do and wants to involve in practical work, where as in reflective observation person prefer to watching rather than doing something. Then person of this learning style emphasized on understanding and seeing the situation from different perspective.
These two dimensions of perceiving and processing information results in four type of learners.

Type 1: (concrete experience + reflective observation)
Type 2: (abstract conceptualization + reflective observation)
Type 3: (abstract conceptualization + active experimentation)
Type 4: (concrete experience + active experimentation)

Mostly Kolb’s learning style concept was used to identify the learning styles of distance learning system. It was also used to identify learning styles of Indian Managers: The specialty of Kolb’s experiential learning was defined by Ahmad and Varghese (1991, p.55) that “for most people learning resides in the class room. It is viewed as acquiring concepts and the application of learned concept was neglected. Kolb has taken learning “out of the class rooms” and linked it to the experiences of daily life”.

b. **Honey and Mumford Learning Style**

Honey and Mumford (1986) defined four learning styles which are as:

i. **Activist:**

Activists function in immediate situation. They love challenges and prefer hands on activities. They do not necessarily recognize problems. Activists involve themselves fully in new experience. They enjoy here and now and are happy to be dominated by immediate experiences. They are open-minded, not skeptical and this tends to make them enthusiastic about anything new. Their philosophy is: I'll try anything once'. They tend to act first and consider the consequences afterwards. Their days are filled with activity. They tackle problems by brainstorming. When they finished one task they looked busy in searching new. They tend to
thrive on the challenge of new experiences but are bored with implementation and longer term consolidation. They are gregarious people constantly involving themselves with others but, along with it they want to remain at the center of all activities.

i. **Reflector:**

Reflectors like to stand back. They don’t indulge themselves in new experiences they only observe from different perspectives. They collect data, both first hand and from others, and prefer to think about it thoroughly before coming to any conclusion. They collect data through all aspects before making decision. They postponed the decisions until they reach at definite stage. Their philosophy is to be cautious. They are thoughtful people who like to consider all possible angles and implications before making a move. They prefer to take a back seat in meetings and discussions. They enjoy observing other people in action. They listen to others and get the drift of the discussion before making their own points. They tend to adopt a low profile and have a slightly distant and tolerant view. When they act they have past as well as the present data and others' observations as well as their own.

ii. **Theorist:**

They are rational, logical and analytic. Theorists adapt and integrate observations into complex theories. They tried to solve problem in a logical way. They assimilate disparate facts into coherent theories. They tend to be perfectionists who won't sit until things are tidy and fit into a rational scheme. They like to analyze and synthesize. They are keen thinkers on basic assumptions, principles, theories, models and systems. Their philosophy praise rationality and logic. 'If it's logical it's good'. Questions they frequently ask: "Does it make sense'? .... How does this fit with that? .... What are the basic assumptions'?" They tend
to be detached, analytical and dedicated to rational objectivity rather than anything subjective or ambiguous. Their approach to problems is consistently logical. This is their 'mental set' and they rigidly reject anything that doesn't fit to it. They prefer to maximize certainty and feel uncomfortable with subjective judgments, lateral thinking and anything flippant.

iii. Pragmatist:

Pragmatists are keen on trying out ideas, theories and techniques to see if they work in practice. They positively search out new ideas and take the first opportunity to experiment with applications. They are the sort of people who return from management courses brimming with new ideas that they want to try out in practice. They like to get on with things and act quickly and confidently on ideas that attract them. They tend to be impatient with ruminating and open-ended discussions. They are essentially practical, down to earth people who like making practical decisions and solving problems. They respond to problems and opportunities 'as a challenge'.

Their philosophy is: "There is always a better way' and 'If it works it's good'.

This theory was come after Kolb’s and considered equivalent to Kolb’s experiential learning theory.

c. Anthony Gregorc’s Style Delineator

Gregorc (1982) proposes that people differ in organizing the space and time. Individuals have two significant types of mediation abilities: perception i.e. the way in which information is grasped and second is ordering i.e. the way in which information is arranged; systemized and deposited. Perception has two qualities abstractness and concreteness. Ordering has two dimensions: sequential and random. According to
Gregorc these dimensions combined to provide four learning styles. Concrete sequential, concrete random, abstract sequential and abstract random.

i. **Concrete sequential**

The learners having this style prefer step by step orderly approach to organize information.

**In General:**

- People of this style like clear structure with clear directions and deadlines.
- They prefer to be told what to do and how to do it.
- They are gifted at organizing according to an established or traditional pattern and are good at maintaining that organization.
- They like to collect discrete concrete facts or objects, classify them, chart and report on them.

**In the Classroom:**

- They prefer a world where there is a clear hierarchy,
- Where there is a right answer and a wrong answer, and
- Where tidiness and organization are rewarded.

ii. **Concrete Random**

These learners learn mostly by trail and error. They are also intuitive and independent.

**In General**

- Most famous inventors were probably dominant or strong in this style, which is best known for creative problem solving and solving mysteries.
- Typically, individuals of this style are divergent thinkers who dislike being told
what to do and how to do it. Directions for assembling or purchase are only for reference if they can’t figure it out at their own.

- On the other hand, people with this dominant style may take charge in emergency and lead other people what to do and how to do it.

- Often considered to be “trouble makers” in highly structured environments, individuals with this dominant style will be valued for this ability to rise to the occasion in an emergency.

**In the Classroom**

- People of this dominant style are often very uncomfortable in the highly structured and directive atmosphere that is typical in American education today.

- They in turn can make traditional teachers uncomfortable either by their divergent thinking (there is more than one “right” answer or way to do it.) or by their tendency to ask questions (The most frequent question being, “Why?”).

- According to Kathleen Butler, this style is the most likely to drop out of school (as a way to solve the problem of their discomfort in school.)

- Students with dominant Concrete Random style will thrive in an atmosphere that permits individual problem solving, group brainstorming, simulation games and competitive games.

- They prefer a world where they are not told what to do, but have an opportunity to learn by asking questions, where they can try to figure out things at their own, and where the ability to provide leadership in crisis situations is rewarded.
iii. **Abstract Sequential**

These learners are strongly analytical and logical. They favor verbal form of instructions.

**In General:**

- People with this dominant style are a small proportion of the population, but they are highly respected for their intellectual prowess and vocabulary.
- They tend to organize thoughts around themes, with thematic piles on their desks or shelves.
- Books are a major part of the world of the person who has a high Abstract Sequential style, particularly reference and non-fiction books.

**In the Classroom**

- People of this style are highly independent learners who are gifted at analytical thinking, who like to research independently, to hypothesize, and to debate different sides of the same issue.
- This style tends to like lecture-style instruction with some, but not too much, practice.
- They prefer a learning environment where a high degree of independence is permitted and where academic excellence is rewarded, where the rightness and wrongness of an answer is always open for debate.

iv. **Abstract Random**

These learners prefer unstructured environment and learn holistically. They show strong visual preference toward instructions.
In General:

- People with this dominant style are heavily influenced by the personal pleasure they derive from a situation to satisfy their aesthetic or emotions.
- They tend to be extremely attuned to the people and the emotional environment around them.
- They are often artistic.

In the classroom:

- The most important thing for a teacher to do in order to effectively educate students with this dominant style is to communicate that you like them. If they feel that you like them, they will make enormous efforts to please you. If they feel that you are cool toward them or actually dislike them, it is almost impossible for them to learn in your classroom.
- In general individuals who have a high Abstract Random style are easily discouraged in the highly sequential world of the typical American classroom, both because their dominant style puts them at a learning disadvantage and because they are often criticized for their messiness, lack of attention to detail and failure to follow directions.
- Anxious to please, they do best when they receive emotional support, and are allowed to learn through storytelling, pretending and creating.
- They prefer a world that is warm and beautiful, where others are sensitive to their feelings, and where sensitivity and artistic creativity are valued.
- These students can often function better if taught to use a variety of colors for taking notes and organizing information.
2.10.4. **Cognitive and Personality Model**

Cognitive and personality model described the inner most layer of Curry’s “onion model” This model focuses individual’s deepest personality characteristics and how they view the world. This model describes the level at which the deepest personality trait shaped toward the world. The main theories falls in to this category are under:

a. **The Felder & Silverman Learning Style Model**

According to Felder & Silverman (1988, p.1) learning takes place in the outer and inner environment of learner. It overlaps the middle and inner layer of onion model. They classify students on five spectrums: Sensing/Intuitive, Visual/Verbal, Inductive/Deductive, Active/Reflective and Sequential/Global. Every spectrum can be defined as:

i. **Sensing or Intuitive Learner**

Sensor learners are concrete, practical, oriented toward facts and procedures, where as Intuitive learners are conceptual, innovative oriented towards theories and meanings.

ii. **Visual or Verbal Learner**

In this category visual learners prefer visually presented material, pictures, diagrams and flow charts; where as verbal learners prefer written instruction and spoken explanation.

All these learning styles which were presented by different Psychologists time to time focus different aspects of student's life. Some focus environment, some personality,
some senses but the majority focus the individual’s ability, individual’s thinking and individual’s way of doing things.

2.11 Comparison of Eleven Major Learning Styles Models

The discussion on learning style is never ending. Many have been discussed in previous section but there are more than that. Some learning styles focus cognitive theories some personality theories; other focuses environment; learning in group or learning alone. The ultimate goal of every one was to trace out which is he most suitable situation to enhance learning. In literature DeBello (1990) compare eleven major learning styles models with respect to variables, populations, instrumentation and the research methodology behind them.

The purpose of review of that portion of literature is not to miss any aspect or component regarding the study. According to DeBello (1990) the pioneers of this field observed individual student differences from varying vantage points. Most of them perceived single or dual variables on a bipolar continuum; others conceived multidimensional approach to the concept. Perhaps the most vital development in education across the world is the concept of individual learners' preferences. Teachers, school boards, and parents across the nation have become cognizant of various aspects of learning styles, and it is incumbent upon those who would be educational leaders to become knowledgeable and have awareness about current research in learning styles.

This part of literature examines the efforts of well known leaders of the field, theorists who have developed and established reputations over the years. Learning style models are reviewed on the basis of: psychometric analyses of Curry (1987), Patricia
Kirby's (1979) and the publications disseminated by the Center for the Study of Learning and Teaching Styles at St. John's University, Jamaica, New York, and the personal experiences and analyses of researcher.

DeBello gives certain reasons for the selection of these models,

(a) These represent a historical perspective;
(b) These have influenced others;
(c) These reflect individual practitioners' attempts to identify style;
(d) These are related to concurrent issues in education;
(e) These are research oriented;
(f) These are widely known in the field presented in Table 2-1.
Table 2-1: The models of learning Styles and elements of those models

<table>
<thead>
<tr>
<th>Summary of Theorists and Models Theorist</th>
<th>Elements of model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunn &amp; Dunn</td>
<td>Environmental, emotional, sociological, physical, psychological</td>
</tr>
<tr>
<td>NASSP</td>
<td>Environmental, emotional, sociological, physical, psychological/cognitive, study skills</td>
</tr>
<tr>
<td>Hill</td>
<td>Qualitative/theoretical symbols, modalities of inference, Cultural</td>
</tr>
<tr>
<td>Letteri</td>
<td>Cognitive style</td>
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<tr>
<td>Ramirez</td>
<td>Bio-cognitive style, bicultural</td>
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<tr>
<td>Reinert</td>
<td>Perceptual modalities</td>
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<td>Schmeck</td>
<td>Cognitive processing, study methods, retention</td>
</tr>
<tr>
<td>Hunt</td>
<td>Need for structure, need for authority dependent/independent</td>
</tr>
<tr>
<td>Kolb</td>
<td>Concrete experience vs. reflective observation/abstract conceptualization vs. active experimentation</td>
</tr>
<tr>
<td>Gregorc</td>
<td>Perception/ordering</td>
</tr>
<tr>
<td>McCarthy</td>
<td>Innovative/analytic/common sense/dynamic hemisphericity</td>
</tr>
</tbody>
</table>

Note. NASSP = National Association of Secondary School Principals
2.11.1 DUNN AND DUNN’s Learning Style Inventory

Kenneth Dunn and Rita Dunn were the earliest research practitioners worked in the field of learning styles. Their model of learning styles can be classified as multidimensional. As discussed in paragraph 2.10.1(a) these dimensions are environmental, emotional, sociological, physiological, and psychological, and contain twenty one subcategories, which the Dunns’ refer to as elements. These elements do not impact equally on all learners. Those that affect individuals strongly are referred to by the Dunns’ as strong preferences; others that are important, but influence less, are called preferences (Dunn and Dunn, 1978).

The environmental stimulus includes the elements of sound, light, temperature, and design (Dunn, 1978). Emotionality includes motivation, persistence, responsibility, and structure. The sociological stimulus includes the elements of learning alone, in a pair, or in a group, or as a part of a team, with an authoritative or collegial teacher, or in varied treatments--in other words, a combination of social patterns. Physical elements include perceptual modalities, the need for intake while learning, time-of-day energy periods; and the need for mobility versus passivity.

The psychological dimension includes global/analytic, hemi-sphericity, and impulsive/reflective characteristics. Although this stimulus is not assessed separately through the Learning Style Inventory (LSI) (Dunn, Dunn, & Price, 1989), research confirmed correlations between being strongly global and needing low light, sound, and periodic breaks when learning, an informal design, and intake, and between being strongly analytic and needing bright light, quiet environment while learning, a formal
design, and no intake and being persistent (Dunn, Bruno, Sklar, & Beaudry, in press; Dunn, Cavanaugh, Eberle, and Zenhausern, 1982).

The Dunns’ model is based on diagnostic/prescriptive approach in which the learners’ styles are identified through a self-report instrument and teaching techniques are designed to respond according to the youngsters' styles. It is of key importance to the theoretical structure of the model is the tenet that individual styles must be assessed and that, if a learner is going to have the best opportunity to learn, instructional techniques must be used that are congruent with each student's style. But it was found that not every theorist agrees with that stance.

Criticism on Dunns’ approach is on his instrument that is used to assess style; which is comprised of 100 items and requires approximately 30 minutes to administering. That instrument was used in different forms for assessing learning style of youngsters in Grades 3 through 12. The LSI Primary Version (Perrin, 1983), is an adaptation essentially for young non-readers. The Productivity Environmental Preference Survey (PEPS) (Dunn, Dunn, & Price, 1982) is a version intended for adults and may have applications outside of the school setting.

The Reading Style Inventory (RSI), developed by Carbo (1984), relies on the theoretical framework of the Dunn model is very much resemble with Gregore’s, McCarthy, and Kolb have certain conceptual similarities heavily steeped in Jungian theory. Carbo’s RSI is an instrument that applies the Dunn and Dunn concept of learning style to reading and is an adaptation of the LSI (Carbo and Hodges, 1989).

Extensive research by using the LSI has made it the most widely documented assessment instrument (Dunn, Beaudry, & Klavas, 1989). Curry's (1987) review of 21
different learning/cognitive style models through psychometric analyses reported that the Dunn and Dunn model had one of the highest reliability and validity ratings. The Ohio State University’s National Center for Research in Vocational Education published the results of a two-year study of instruments. It reported that the LSI had "impressive reliability, and face and construct validity" (Kirby, 1979, p. 72). Since 1979, the LSI has evidenced extremely high predictive validity. The award-winning, experimental, and co-relational research with the LSI conducted at more than 50 universities distinguishes this model's research base. Keefe (1982) identified the Dunns' model as being practitioner oriented and the most widely used assessment in elementary and secondary schools.

2.11.2 NASSP’s Learning Style Profile

National Association for Secondary School Principals and St John’s University started working at University’s Center for the study of learning and teaching styles. This task was carried latter by National Learning Styles Task Force, under the leadership of Keefe, assembled to examine the underlying attributes of each of the better known learning style constructs. They want to create a single learning style instrument that assessed a broad spectrum of research-based learning style characteristics. They adopted the Letteri’s (1980) perspective, related to learning styles and information processing for developing NASSP’s learning style model (Keefe and Monke, 1986).

The developed model encompassed physiological/environmental, cognitive, and affective domains as well as an information-processing perspective. The instrument of Learning Styles Profile (LSP) was a 42-page, 126-item assessment intended for use with
secondary students. Similar to the Dunn and Dunn model, LSP was computer scored and tabulated, and respondents can get a printout of their individual Learning Style Profile.

Both the models have many similar components. Both addresses the study skills which emphasize that student learn through their strongest modality or preference, are reinforced through their secondary or tertiary strength, and are taught finally to apply the new information creatively. (The LSP diverges to that philosophy.)

For LSP cognitive skill items were derived from Witkin’s Group Embedded Figures Test (GEFT) perceptual responses from Reinert's (1976) Edmonds Learning Style Identification Exercise (ELSIE), and environmental, affective, and physiological items from the Dunn and Dunn model. Keefe reported that, while significant correlations were established among the LSP, LSI, and ELSIE, no significant correlation emerged between the LSP and the GEFT. Furthermore, Curry (1987) reported similar findings.

The NASSP’s Learning Style Profile is advancement because it represents the first model to be created out of the diverse and occasionally opposite philosophies of current theorists. Because of its relatively recent arrival, it was suspected that further refinements of the instrument will be forthcoming, for its strongest reliabilities are those of variables adopted from the Dunn and Dunn model. Keefe reported significant correlations between the LSP and Reinert's ELSIE, which purportedly has no reliability or validity (Curry, 1987).
2.11.3 **HILL’s Cognitive Style Profile**

One of the earliest theorists in the field of learning style was Joseph Hill (1976). Hill was president of Oakland Community College in Michigan during the late 1960s and early 1970s. He defined learning style is the process of searches for meaning. According to Hill individual’s learning style is reflected when dealing with theoretical and qualitative symbols; modalities of inference and cultural determinants. Each of those components is discussed briefly in following paragraph.

The category of theoretical symbols is subdivided into auditory and visual categories; each is further subdivided into linguistic and quantitative symbols. There are, in addition, fifteen qualitative elements. Among the fifteen some develop visual perceptions some audio some about six senses. Modalities of inference are the second major category. An individual uses these forms of inferences in the process of obtaining meanings of the situation. Specific elements included in this category are critical thinking, contrasting and comparisons, relationships between measures, and hypothesis development.

The third major element of Hill's model is cultural determinants. Hill’s cognitive style is how individuals interpret symbols, and he believed that the meaning that is assigned to symbols is shaped by one’s culture, and his family and peers influence the culture. This element is one aspect of Hill’s Cognitive Style Profile. However, it gives the base for the identification of cultural patterns in learning styles. Due to this reason it is placed with the Ramirez' model. There is another view which emphasizes the family and peers as perhaps more akin to the Dunns’ sociological stimulus in that both peer’s
orientation and authority orientation may be viewed as aspects of the individual's immediate culture.

In either case, Hill provided the student’s learning styles with a great consideration. Cognitive style mapping is the elaborated process of obtaining a cognitive style profile. It involves a self-report test, which takes about 50 minutes to administer, as well as an interview component.

The Cognitive Style Interest Inventory was revised since Hill’s death; however, it remains rather complex. Although Curry (1987) reported that this instrument showed no reliability or validity, but the Hill's early attempt at a comprehensive diagnostic prescriptive approach to learning style is worthy of study for the principles of learning it presents.

2.11.4 LETTERI’s Cognitive Style Delineators

According to Charles Letteri's (1980) learning is information processing, the storage and retrieval of information. It has six phases starting from perception, reception to long term memory; failure at any phase represent the disability in acquiring cognitive skills. In Letteri's view once a child has acquired these information processing skills and become able to generalize it across the content area. The mastery of learning can be achieved.

Letteri defined the cognitive style of the learner by seven different dimensions like field dependence/independence; scanning/focusing; breadth of categorization; cognitive complexity; reflective/impulsive; leveling/sharpening; and tolerant/intolerant. After defining these dimensions Letteri develop items to assess these dimensions. The
instrument developed represents skills on a bipolar continuum. At one extreme they appear as highly analytic where as at other extreme it appears as being highly global.

After research it was found that those learners who had above average success in academic ask were reflective, analytical, focused, complex categorized narrowly, able to see details sharply and tolerant. Such learner were referred as Type I learners. In contrast the individuals who had below grade level performance in academic areas were impulsive, global, non-focused able to view items only in a simple way, able to categorize broadly, levelers and intolerant. These were the Type 3 learners. Type 2 learners were some where in the middle of two extremes.

In the field of learning styles today, there is debate on it over whether the efforts can be made to change students’ style or not. Dunns’ view is that student should be taught according to their strengths and abilities and the learning style assessment should serve only for diagnostic purpose. Gregorc gives the importance to students’ individuality and in this way presents middle way. Whereas Letteri is at the opposite extreme, not only by suggesting adaptation or flexibility, but also advocating training to actually change the students’ cognitive profiles.

Letteri's approach was clinical; he believes that the schools’ should translate curriculum on the basis of cognitive profile of student needed for school achievement and success.
2.11.5 **RAMIREZ’s Child Rating Form**

Ramirez and Castaneda (1974) defined learning style in terms of the cognitive style dimension of field dependence/independence and cultural differences. He focuses to the behaviors emerged from the bi-cognitive and bicultural dispositions. According to Ramirez the students who are field sensitive are group oriented, they are sensitive to the social environment and positively responsive to adult modeling, but less sensitive to the spatial incursions of others, less comfortable with trial and error, and less interested in the minute detail of tasks and are non-social.

Ramirez focuses minority populations of California for his work. He believes that student-socialization process contributes to their cognitive development. According to Ramirez in the result of socialization practices, the average Mexican American, black and other minority students more field sensitive than the field independent, or more global than the analytic. By understanding students needs the classrooms can be made more responsive to developing field-sensitive learning approaches. He believes that by the encouragement minority students can become bi-cognitive and have ability to function in two extreme settings and become bicultural.

Ramirez was concerned that by ignoring the difference in groups stereotyping increased and in the result diversity with in culture has also been ignored.

The instrument was developed by Ramirez and Alfredo Castaneda was called the Child Rating Form. It was direct observation form showing frequency of behaviors. It could be completed by the teacher or senior student in a self report survey. Ramirez has worked in bilingual education and has developed a primary bilingual program, “Nuevas Fronteras” based on his learning style model.
The Ramirez’s work has been described as primarily in the psychological/cognitive area. However, it is important to repeat that traits associated with field sensitivity also are associated with global dimensions and specific sociological elements of authority and peer orientation, as described by the Dunns.

At a time when groups are beginning to focus on black or Hispanic learning styles, then the Ramirez’ model, directed toward multiethnic concerns, also stresses what learning styles are all about, that is, individual rather than stereotypical group styles.

2.11.6 REINERT’s Edmonds Learning Style Identification Exercise

The Harry Reinert (1976) developed Edmonds Learning Style Identification Exercise based on auditory stimulus. It was used to identify the learning style reactions of his high school students. Its primary focus was the identification of perceptual modality. The activity such as visualization of written words and sounds were the reflection of Dunn, Hill and other instruments. As is discussed in paragraph 2.11.2 the categorization of the ELSIE is incorporated directly into NASSP and LSP.

Reinert described that the main purpose of the ELSIE is to give practical help to the classroom teacher interested in providing more effective counseling for students. The basic pedagogical principle proposed here was that students should have their initial contact with new material by means of their most efficient perception.

Debello described that The ELSIE is composed of fifty one-word items read aloud to students, who are then asked to characterize their reaction to the word according to a forced choice among four alternatives: (a) visualization or creation of a mental picture; (b) alphabetical letters in writing (the word spelled out); (c) sound; or (d) activity, an
emotional or physical feeling about the word. Some examples used are ocean, good, God, and foot.

Keefe reported a significant .002 correlation between the ELSIE and the corresponding subscale elements of the NASSP LSP. However, summative psychometric ratings reported by Curry (1987) showed the ELSIE as having poor reliability and no validity.

2.11.7 SCHMECK: Inventory of Learning Processes

Ronald Schmeck has background in psychology also worked for learning styles. He believes that cognitive and personality studies are useful but not decisive for learning, while the learning styles as a construct would be more useful.

According to Schmeck's learning style is a predisposition on the part of some learners to adopt a particular learning strategy regardless of the specific demands of the learning task. Learning strategies, as defined by Schmeck, are a pattern of information-processing activities that the individual uses to prepare for a test of memory.

Schmeck views this information processing as a continuum; on one extreme, shallow/repetitive and reiterative processor; on the other extreme, deep and elaborative processing. Shallow processors tend to remember the symbols used in communication; as depth of processing increases, the number of conceptual associations increases, giving the material more meaning. Thus, elaborative processors do more than just remember; they classify, compare, contrast, analyze, and synthesize information. (This might well be compared with the higher levels of the Bloom taxonomy.) Thus, shallow processing is not a separate style, but it is one point on a continuum.
Schmeck's original Inventory of Learning Processes (Schmeck, Ribich, and Ramanaiah, 1977) was a self-report instrument comprised of 62 items to assess students' behavioral and conceptual processes. Geared to the college student, as most of Schmeck's research and work are, this true/false format arranged items into four scales: synthesis analysis, study methods, fact retention, and elaborative processing. One example of the relationship among these elements has been posed by Schmeck: It is possible to retain facts whether one processes in depth or shallowly. However, Schmeck's research has determined that those who retain facts by processing deeply and attending to facts were more successful academically than those who processed shallowly and also attended to facts. The latter could be said to be the memorizer, the one who retains information verbatim with little understanding.

Just one further comment on the study methods scale: Those students who studied often by using drill type, classic, how-to-study methods were found by Schmeck in one study to have high achievement motivation but to lack the skill or ability necessary to engage in deep or elaborative processing. In fact, additional research has suggested that students who score high on that scale are "eager to please." Such data increase the dimension of the Schmeck model, and provide insight into the authority orientation of the learner.

In 1984, a later refinement of the instrument developed in conjunction with Entwistle and Ramsden expanded on the initial construct. Schmeck's instrument was designed solely for college students. After the analysis of it, Curry characterized it as having strong reliability and validity.
2.11.8 **HUNT: Paragraph Completion Method**

According to David Hunt learning style is a condition under which students are most likely to learn. The Hunt’s model is the conceptual level based on the description of students need for structure (Hunt, Butler, Noy, & Rosser, 1978). According to Hunt those students who have low conceptual level are concrete and impulsive; they have poor tolerant for frustration. They require a great deal of structure in academic setting. The learners who have average conceptual level are referred as conforming or dependent. They depend on rules and authority and are categorical thinkers. Such learners require structure but should with some choices. Those at the high conceptual level are referred as independent they are described as inquiring, self-assertive, questioning requiring less structure.

The learning style models discussed yet insisted that students’ styles should be changed, some argued that teaching may be changed to the individual’s strength. Hunt promotes both the contemporaneous or developmental perspective. The contemporaneous view indicates that the student with low cognitive-level in the classroom must be given structure if the teacher is to facilitate learning; however, for long-term purposes, at initial stage provide high structure and gradually decrease the amount of structure so that self-initiative can develop.

That perspective is similar to Schmeck's, who agrees that learning styles can, and sometimes should, be modified slowly over time (specifically encouraging shallow processors to become elaborative processors).

Hunt's assessment instrument is called the Paragraph Completion Method. It consists of six lead sentences, which the learner is directed to complete and write more
about. Examples include: "What I think of school... "and "When I am criticized... ". The specific response is important in terms of the complexity of the response, not the opinion stated. Hunt's is a semi-projective assessment that requires specific training to score and interpret. Curry (1987) reported fair reliability and fair validity for this instrument.

Thus, Hunt's approach to learning style takes two dimensions--conceptual complexity and need for structure and relates each in a developmental framework.

2.11.9 **KOLB’s Learning Style Inventory**

David Kolb gives his conceptual framework of learning styles known as experiential learning model. It is based on simple description of the learning cycle of how experience is translated into concepts.

This is a four-stage cycle. It starts from concrete experience which is the basis for observation and reflection. Those observations are assimilated into theory from which new implications for action can be deduced. These implications serve as guide lines in acting to create new experiences. Thus, the cycle has evolved.

To be effective, the learner requires abilities that are polar opposites: concrete experience versus abstract conceptualization and active experimentation versus reflective observation. However, as a result of hereditary equipment, past experiences, and the demands of present environments, most people develop learning styles that emphasize certain learning abilities over others.

Kolb's Learning Style Inventory (1976) is a 9-item assessment form with 4 sub-items. In the result four dominant types of learning styles have emerged. The first type is converger. These person’s dominant learning abilities are abstract conceptualization and
active experimentation. Their strength is practical application of ideas. The second type is diverger. They have opposite learning strength as the converger. They are best at concrete experiences and reflective observation. Their strength lies in their imaginative ability. The third is assimilator. Their dominant learning abilities are abstract conceptualization and reflective observations. Their strength lies in their ability to create theoretical models. The last type is accommodator. Their learning abilities are concrete experience and active experimentation. Their strength lies in carrying out plans and experiments, and involving themselves in new experiences.

Kolb’s model and instrument were designed and used for adults and for management training. Curry (1987) reported strong reliability but only fair validity.

2.11.10 **GREGORC: Gregorc Style Delineator**

Gregorc's model (1982) is based on that learning style which consists of distinctive, observable behavior. It provides the clues about functioning of individual’s mind and the way they relate to the world. It suggests that individuals learn in combinations of dualities, specifically, perception and ordering. Abstract, concrete, random, and sequential proclivities have been found by Gregorc to combine into several styles.

Four distinct learning patterns can be observed in this model. Some exhibits all four patterns to some extent, other show inclination towards one or two. For example concrete sequential acquire knowledge through direct hands on experience. They appreciate order and the direct step by step instructions. Concrete random learners prefer experimental attitudes and behaviors. They like to use trial and error approach, they like
to initiatives. Abstract sequential learners have excellent decoding abilities with written, verbal and image symbols. They prefer to learn in rational and sequential manner they love to learn from authorities rather than active experimentation. Abstract random learners are distinguished by their attention to human behavior and their capacity to interpret vibrations. They prefer to receive information in an unstructured manner and, therefore, prefer discussions and activities that involve multi-sensory experiences.

Gregorc believes that styles emerge from in-born predispositions, and it can be streamlined and modified. Gregorc assesses style with a self-report inventory called Gregorc Style Delineator. It is based on the rank ordering of four words in each of ten sets. It is similar in format and design to the Kolb Learning Style Inventory like the Dunns’ And Hunt, Gregorc emphasis the matching of instructional material and method to meet the needs of individual preference.

2.11.11  **McCARTHY’s 4 MAT SYSTEM**

McCarthy’s was impressed by Kolb’s learning style model. She believes that all people sense and feel observe and think experiment and act. She observes and proposes that all learners move continually between abstract conceptualization and concrete experience while learning.

McCarthy observed learning pattern and identify four learning styles clusters. Those were innovative, analytics, common sense and dynamics. The innovative are curious, aware, and perceptive; analytic’s are critical, fact seeking, and philosophizing; common-sense people are hands-on, practical, and give importance to the present; dynamics are risk taking, adaptive, inventive, and enthusiastic.
McCarthy identifies the left-brain function as being associated with verbal and field-independent activity and the right-brain function as being responsible for visual/spatial, field-dependent activity. McCarthy proposes a spiral process of learning. The learner enters into this process through motivation which comes from the right brain structure. This is the sensing/feeling activity for the innovative learners at the next stage the activity analyzed completely which provide investigative, intellectual exercise. It appeals to analytic learners. Once the concept has been formulated learner’s practice working with the concept the left brain tried to mastery the concept. This relates to common sense hands on practice and personalization. Finally the learner is asked to make right brain choice of alternatives and apply as many as possible to real world situation.

Thus, all four styles are presented with accompanying left/right hemispheric activities in every lesson. This concept provides the concrete experiences to learners, and the cycle is set for another move through the entire spiral.

According to McCarthy’s point of view by using this spiral concept of full-circle training, regardless of the individual’s learning style all the students may be provided an opportunity of being taught through their style strength.

By the very nature of this model’s approach, instrumentation such as the Kolb Learning Style Inventory appears secondary to the instructional plan in that, regardless of students’ learning styles, all receive the same instruction in exactly the same pattern for exactly the same amount of time.
CONCLUSION

The whole discussion leads to general consensus concerning the importance of addressing learning style by all the theorists. After review the chart, there are many areas of overlap among the models. Interest in specific areas such as psychological/cognitive is apparent; however, multidimensional models seem to offer a more thorough, encompassing, and responsive approach to the complexity of diversified differences in how students actually attend to, absorb, and retain new and difficult material.

Clearly, two major issues remain constant. The first is whether to teach to students' strengths or to attempt to expand their style. It may strike some observers as an irrelevant exercise to identify style and then to set about ignoring it. However, a broader problem remains before a firm decision can be made. If psycho-biologist Richard Restak (1979), author of The Brain: The Last Frontier, and Yale psychologist are correct in their point of view then the learning styles are biologically imposed on humans. If someone able to change the style than he/she may be permanently changes the color of eyes, hair, or skin. Research by Kagan (1966) and others appears to confirm that view. However, can it be modified, or to follow the medical analogy further, offer cosmetic surgery in the classroom? The debate continues.

The second issue revolves around whether or not teachers can observe the differences among students' styles or whether valid and reliable instrumentation should be used. While teacher observation checklists can serve a function, even they may require some training and experience on the part of the teacher. In addition, several studies revealed that, although teachers may identify certain learning style characteristics through observation, they often misinterpret many others (Beaty, 1986; Dunn, Dunn, & Price,
1977; Marcus, 1977). As it has been seen, many models of style require not only training in administration but also interpretation of the assessment. The decision by a school or district to take that step should include knowledge of the validity and reliability of the instrument.

Certainly, there is enough room in this newly emerging field for differences and even dissension among theorists. Their differences of opinion forced to pay attention to what they have proposed. Their beliefs are honest and have integrity, but some are based essentially on theory and others on extensive research in schools at every level. One is not necessarily better than the other--they may be mutually complementary--but some have exercised the obligation of providing strong experimentation behind the suggested practices, and others have not as yet been able to do that. However, the decision concerning which model is to be used in schools should rely on the following: First, is it reliable and valid? For that information, Curry's (1987) psychometric review of instrumentation can be consulted, which is available from the Center for the Study of Learning and Teaching Styles, St. John's University, New York. Second, is there widespread practitioner use? For that, it may be referred to the Association for Supervision and Curriculum Development (ASCD) Directory of Practitioners, available from the ASCD in Alexandria, Virginia, the ASCD's Clearinghouse Bulletin and St. John's University's Learning Style Network Newsletter, both of which provide such information in every issue; and Dunn and Griggs' (1988) Learning Styles: Quiet Revolution in American Secondary Schools.

Third, is there extensive research behind the model? For this it is suggested that examine either Dissertation Abstracts International or research journals or examine the
Annotated Bibliography (1990) available through the Center for the Study of Learning and Teaching Styles, St. John's University, New York. Fourth, can the school be visited actually using the model in which you are interested? The ASCD's Directory of Practitioners (1985-1989) is especially helpful, and anyone can make use of it. At the secondary level, Learning Styles: Quiet Revolution in American Schools is the best source. If it works for them, it can work for anyone. When visit made to schools, ask for evidence of how student achievement has increased or whether attitudes or behavior have improved. Ask how they know those things have happened? Finally, can training be designed and provided to teaching staff so that they may be able to know how to use individual styles to obtain increased achievement? Both Wedlund and Gregorc insist that there is a danger in having only a little knowledge about styles and then trying to implement school-wide programs. Identify either well-known practitioners or well-respected theorists and spend the time it takes to really learn to implement a learning styles program. The research is very clear on this point: All children have individual learning styles. While some may disagree as to the treatment of style differences in the classroom; educators today cannot ignore the impact of this revelation.

Treating every child in the classroom the same way is not responding to their styles. Teachers and parents want more for students than the old hit-and-miss strategies of the past. Minimally, both want to help the underachiever and enhance the potential of successful students. Research affirms that learning styles-based programs statistically increase student achievement (Dunn, Beaudry, & Klavas, 1989).
2.12 **Assessment of Learning Styles**

This article was written by Huisun Roh in 2004 due to the relevancy with the current discussion it is included with modification. In order to maximize achievement and study the effect of learning style, teachers need to know how to assess effectively students’ learning styles. Question is whether students can identify their own learning styles or not? Dunn (2002) found that most third through twelfth grade students know not only their strong learning preferences but also weak ones in testing. In addition, to know the subject’s learning preferences, Black (2004) uses a simple question, asking someone for reflection. Subjects are taught either by drawing a map or telling the students directly. Black (2004) described that if subjects are visual learners, they would draw a map; if they are auditory learners, they would prefer telling the person how to go. Therefore, according to Black (2004) and Dunn (2002), people can distinguish their own preferences and also students know not only their learning styles but also strong and weak preferences without assessing their learning styles.

Nevertheless, many researchers have concentrated on how to assess individuals’ learning styles by developing distinct models and assessment instruments. DeBello (1990) wrote that there are as many different methods of assessment of learning styles as there are various definitions of learning styles. DeBello (1990, p. 2) compared and analyzed each model and chose eleven major learning styles models based on historical consideration, mutual influence, and concurrent issues in education, among other styles. The eleven learning styles models he analyzed were Dunn & Dunn’s Learning Style Inventory (LSI), NASSP’s Learning Style Profile (LSP), Hill’s Cognitive Style Profile, Letteri’s Cognitive Style Delineator, Ramirez’s Child Rating Form, Reinert’s Edmonds
Learning Style Identification Exercise (ELSIE), Schmeck’s Inventory of Learning Process, Hunt’s Paragraph Completion Method, Kolb’s Learning Style Inventory, Gregorc’s “Gregorc Style Delineator”, and McCarthy’s 4 Mat System.

First of all, according to DeBello’s (1990, p.4) comparison, the most common type of assessment is self-report. One example is Dunn & Dunn Learning Style Inventory (LSI), based on a diagnostic and prescriptive approach, designed for third to twelfth graders. Their LSI, as reported by Curry (1977), in which students are given thirty minutes to check one hundred items, resulted in “one of the highest reliability and validity ratings”. Also, NASSP’s Learning Style Profile (LSP), similar to the Dunn & Dunn model, intended for secondary students, and includes 42 pages and 126 items. Schmeck’s Inventory of Learning Process, which consists of 62 items arranged into four scales, is another self-report instrument to assess college students’ behavioral and perceptual process. In addition, Kolb’s Learning Style Inventory, which consists of nine items with four sub items, is intended for self-reporting adults.

Second, Reinert and Hunt’s models offer different methods to assess students’ learning styles. For instance, Reinert’s Edmonds Learning Style Identification Exercise (ELSIE), designed for high school students, is composed of 50 one-word items. First, a teacher reads those words to students aloud, and then a teacher characterizes their students’ reaction into one of four categories: “visualization”, “spelling”, “sound”, or “feeling”. Reinert’s model, a primarily perceptual model for identifying learning styles, is intended to help classroom teachers practically counsel students more effectively. Meanwhile, Hunt’s Paragraph Completion Method consists of six lead sentences, which
students are directed to complete. In this model, the complexity of the response is more important than the opinion given by the student (DeBello, 1990).

Third, according to DeBello’ (1990), some models include other methods such as interviews or observation. For example, Gregorc’s Gregorc Style Delineator, similar Kolb’s Learning Style Inventory in form and design, is a self-report assessment. This model, suggests using observation and interviews together to help in classifying learning preferences, in addition to student’s ordering of four words in each of ten items. Also, Hill’s Cognitive Style Profile, including interviews, is a self-report test that takes about fifty minutes. Hill mentioned “culture factor” because he believed people, by interacting with each other, are shaped by their culture, family, and peers. In comparison, Ramirez’s Child Rating Form is a direct observation by the teacher, or if students are old enough, they can do it as a self-report observation. Ramirez emphasized that learning styles are not stereotypical group styles but individual.

In brief, it is common that most students know their preferences of learning, or teachers are sometimes aware of students’ learning styles by asking directly. Moreover, through using learning style assessment instruments such as questionnaires, opinionnaire, observations, interviews or some combination of those, teachers can examine students’ learning styles.

2.13 Teaching styles

There are many teaching styles such as authoritarian teaching style, permissive teaching style, and detached teaching style. The teaching styles are defined by different authors in different ways. According to Galton it is instructional format. Daniel Schneider
thinks that teaching styles refer to the teaching strategies and methods employed plus use of certain kinds of rhetoric. Anthony Grasha (1996) identifies five approaches for classroom teachers. These are as follows:

1. **Expert**

   This is teacher centered approach. Teacher possess this style have knowledge and expertise which students need. He tried to maintain his status as an expert among students by displaying detailed knowledge. They challenged students to enhance their competence. They are concerned with transmitting information and insuring that students are well prepared.

   The advantage of this style is the teacher possesses all type of information, knowledge and skill regarding their field. The disadvantage of the style is that if it is over used the students with less abilities may be less motivated.

2. **Formal Authority**

   The person possess this style achieve status among students because of his knowledge and expertise usually they are faculty members. They are concerned with providing positive and negative feedback without imposing anything. He establishes learning goals, expectations and rules of conduct for students. They are concerned with the correct, acceptable and standard ways to do things keeping in mind the ways students learn. The advantage of this style is they focus on clear expectations and acceptable ways of doing things. The disadvantage of this style is with a long duration the relationship become mechanical. It can lead to rigid, standardize and less flexible ways of managing students and their concerns.
3. **Personal Model**

They believe in teaching by personal examples and develop a prototype for how to think and behave. They direct students by showing how to do things and ask them to observe and respond in the same way as instructors approach. They are less creative. The advantage of this style is its emphasis on direct observation and follows a role model. The disadvantage of this style is that the person possesses this style believe that his approach is the best way to lead students and those students who can not live with this approach feel inadequate.

4. **Facilitator**

The person possesses this style give more regard to the teachers students relationship and the interaction. He guides and direct students by asking questions, exploring options, suggesting alternatives and encouraging them to develop criterion to make informed choices. Their aim of teaching is to develop the capacity for independent action, initiative and responsibility in students. They work with students on projects in a consultative fashion and tries to provide as much support and encouragement as possible.

The advantage of this style is, this person is flexible, the focus is on the needs and goals of students and they have willingness to explore options and alternative course of action. The disadvantage of this style is it is time consuming and is some time employed when a more direct approach is needed. It can make students uncomfortable if not employed in a positive and affirming manner.
5. **Delegator**

It is concerned to develop student’s capacity to work in an autonomous fashion. They give free hand to students to work independently on projects or as part of autonomous team. The teacher is available at the request of students as a resource person. The advantage of this style is it helps students to perceive themselves as an independent learner. The disadvantage is that the opinion about student’s readiness for independent work may be wrong and some students become anxious when given autonomy.

The teaching styles were not addressed during this study there were two reasons. One is there are eight or nine teachers teaching to secondary class students at the moment and there are many who taught them in preceding classes no one can say that the students this specific learning style is due to which teacher. The second reason is the achievement of the students is considered as a whole, no subject-wise description was taken so no body can judge which learning style of students is due to which teacher’s teaching style.

2.14 **Anthony F. Grasha the Author of the Learning Style Questionnaire**

About 30 years ago Anthony F. Grasha wrote a twelve page essay describing the learning styles of students as part of his research. Although at that time author was not engaged in research program but this idea ‘the different ways students used to learn in classes fascinated him. He developed a questionnaire and surveyed students about how they learn. Along with students responses he made informal observation of students in classroom to develop and finalize questionnaire. The essay was accepted by American Psychologists and gets published. This article generates a considerable amount of interest
in author’s view on learning style and he changed his career and associates himself with learning styles.

He started teaching learning issues with other perspectives, like the role of students learning styles and teachers teaching styles in classroom. After going through extensive study and research author give different dimension to the idea and wrote a book in 2002 “Teaching with Style” which was an extension of his previous work. He made serious efforts and conducted hundred workshops and seminars. During his studies he also developed Teaching Style Inventory after conducting extensive interviews on the problems college faculty faced in classroom across different disciplines and presented in his book. He presented an integrated model of teaching and learning style in his book.

This model examines the relationship among learning styles of Competitive, Collaborative, Independent, Dependent and Participant, Avoidant and teaching styles of Expert, Formal Authority, Personal Model, Facilitator and Delegator. According to author teaching styles learning styles and classroom processes are seen as interdependent. Many researches were conducted but with different angle. The researcher got the idea of current research by Grasha’s idea with little difference. Grasha was impressed that teaching styles effects students learning styles but researcher start thinking what else effects learning style whether this theory holds in Pakistani situation or not? Researcher started with the assumption that teacher’s teaching styles are same then what else affects learning styles. The study is the continuity of that idea.
2.15 **The original questionnaire of Grasha & Riechmann**

The original questionnaire of Grasha & Riechmann was developed in 1974. It has ninety statements covering all six learning styles defined by them. These styles were Independent, Dependent, Collaborative, Competitive, Participant and Avoidant. This questionnaire was used by many psychologists for identifying the learning styles of students. After extensive research it was finalized with sixty statements ten for each learning style. These statements were designed on the five point likert scale method for responding. Students respond these statements by number 5 if they are strongly agreed with the stem, by 4 if agreed, similarly by 3, 2 and 1 if uncertain, disagreed and strongly disagreed respectively. This questionnaire was adopted by the researcher after asking for the permission from the author. The permission was applied by e-mail but got no response. This version is available on internet along with the detailed scoring manual.

The statements were placed in a specific sequence while assembling the questionnaire to avoid the influence of the learning styles on students. The statement of each learning style was in sequence of independent, avoidant, collaborative, dependent, competitive and participant. The idea of the author was used and statements were rephrased for the current study. The same scoring procedure was used as described by the author.

2.16 **General Concept of Achievement**

2.16.1 **What is achievement?**

Achievement is a thing you did which added value made a tangible or noticeable difference and contributed to the advancement of the person. Achievement is measured by performance indicators like percentiles and ranks. If a class showed the achievement
of the last student as 80% marks it showed nothing because no one can comment without further information like what was the achievement of student who stood first in class and others. What was the rank or position of a student in a class who got 80% marks? If evaluator found he was the last student it meant lowest achiever in the group. His achievement was very poor as he did not achieve the objectives. Attainment of goals or objectives is called achievement. Achievement is doing what you want to do with in the set criteria. It is recognition of what makes you unique and what you have to offer others. Achievement is difference in prior and later attainment. It is difference between pervious and final stage skill, knowledge and ability. It is the measure of quality and quantity of the success in knowledge skill and ability one have. According to Dictionary of Education (2005) “achievement is a successful accomplishment or performance in particular subjects, areas or courses, usually by reason of skill, hard work and interest”.

For the students achievement is successful accomplishment of learning task. According to web definition “achievement is ability to demonstrate, accomplishment of some outcome for which learning experiences were designed.” Achievement is an abstract concept it could be judged or measured by some criteria. In the Ofsted Hand Book (2002, p.2) achievement is defined as it is judged with reference to the progress made by individuals and groups of students taking in to account their prior attainment and potential”.

2.16.2 Types of achievements

Achievement is of two types materialistic and non-materialistic. In materialistic person get some physical reward in terms of money, grades, gifts etc but in non-materialistic achievement the person cannot get reward physically. It only can be felt in
the form of happiness, kindness helping others etc. The materialistic achievement develop cognitive domain of learning and non-materialistic achievement develop some aspects of affective domain of learning (Bloom’s Taxonomy of Educational Objectives).

The former can be measured by different measuring tools but latter can only be observed and felt, it can not be measured exactly it is pursuit of dream. It is liberty from the chains fear and unbelief. Most of the students are concerned with their learning achievement because learning achievement begins when a child start reading and able to learn. The child’s most important learning challenges and achievement started to acquire at home before entering the school where he learns some of its achievement which further modified in school. When the child enters in school he learns to walk and talk, to be organized and disciplined, he learns thinking and reasoning he further learn to make relation and connection which helps them throughout their lives. This trained them to adjust in the society. If they don’t learn to adjust at this stage it will be difficult for the person later on.

2.16.3 **Measuring learning achievements.**

Learning achievements can be measured by three ways.

a) Oral measurement

b) Written measurement

c) Worked sample measurement.

a) **The oral measurement of achievement**

Learning achievement can be measured by oral test, which is in form of interview, quiz, discussion viva-voice etc.
i. **Interview:**

The interview is an oral questionnaire or test. Instead of writing the response the interviewee responds orally. It is a face to face meeting in which some aspects are discussed regarding the issue. According to Patton (1990, p.278) the purpose of interview is to find out what is in or on someone else’s mind. The interview is often superior to other measuring tools because people are usually more willing to talk rather than to write. During interview the interviewer can get all related information by asking the relevant questions which helps to evaluate and distinguish the person’s organization of thoughts, logical connection, creativity, innovation and novelty which can be missed on written assignment. It also helps to motivate students for responding and hence the interviewer can investigate deeply.

ii. **Quiz**

Quiz is a tool for measuring learning achievement (Linnen, 2003). Some time student is not good at writing. They make spelling mistakes, which can be covered in quizzes. Quiz is the procedure to measure learning achievement of individual as well as group which provide immediate results. Students also feel satisfied by knowing instant feedback. Teacher can also save time of markings papers and compiling the results.

iii. **Viva- Voice**

This test is oral. In which students learning achievement about the process and procedures can be measured (Print, 1993, p.204). This evaluates the consequence and procedure about the specific practical situation in which students have to be very careful. Through this way of measuring learning achievement students learn to follow the steps and instructions about specific situation carefully.
b) **Worked Sample Test.**

Worked sample test is also known as process evaluation test. In this test the actual evidence of student work is frequently under-valued (Print 1993, p.204). It can depict what the student is capable of. In schools, work samples are found commonly in writing, reading, home economic, art, industrial arts, craft, physical education and so forth. Greater use of work samples could probably be made in such subjects as geography, history, social studies, science and mathematics.

c) **Written Test.**

The written tests are paper pencil test, which are specifically used to measure learning achievement of students. There are two ways to use achievement test. One way the performance of whole class is measured by comparing individual student’s performance in the class and the other way students individual mastery level is measured (Kobasa, 1998). In the first situation the test used as a tool is called norm-referenced test and in second it is called criteria-reference test.

The norm-referenced test was defined by Kubiszyn and Borich (2003, p.57) as “A test used to compare students performance to a norm or average of performances by the other similar students is called Norm-Referenced Test (NRT)”. The Criterion referenced test was first purposed by Glaser in 1963 which were closely resembles the concept of mastery approach. According to Riaz (2008, p.3) “The essence of this approach lies in comparing the test performance of examinees to some objectively stated goal or standard of achievement to evaluate their mastery level”. The criterion referenced tests are designed to measure how much of a specified content area has been learned, mastered, or performed by the examinees.
The Criteria-Referenced Test (CRT) is defined as “a test on which student’s performance is compared to a standard of mastery called criteria”. The first type of information tells where students stand when compared with other students. In other words this kind of test data helps to determine a student’s place or rank. Where as second type of information provided by test tells about student’s level of proficiency in or mastery of some skill or set of skills. As it is clear by the definition the CRT must be very specific as it has to provide the information about the individual’s skills. The advantage of this is to be specific about the student’s performance as he has achieved mastery of the skill or failed to master the skill and its disadvantage is; it helps in making decision about the multitude of skills which were typically taught in the average class room.

The Norm-Reference Test in contrast, tends to be general. At one side it measures a variety of specific and general skills at once but on other side it fails to measure them thoroughly and teacher can not say with confidence about the students mastery of concept as he/she can say while using criterion referenced test. So that is teacher: who determines the appropriate uses of test type to measure student’s achievement and mostly it is based or decided on the purpose of testing. There are two types of tools used to measure student’s achievements.

- Teacher made test
- Standardized test

i. Teacher Made Test

This test is prepared by subject teachers who are teaching to students. These tests are designed for specific purpose like formative achievement measurement and for diagnostic purpose. The main purpose of using this test is to measure what and how much
students have learnt as a result of formal or informal instructions. They measure the present level of performance of individuals or groups in academic learning. When it is used for diagnostic purpose it helps to what are strengths and weaknesses of students where he is strong in learning and why failed to achieve other concepts.

ii. **Standardized Test**

Standardized test in contrast to teacher made tests are constructed and administered carefully under certain standard condition so because of these standard conditions these tests are called Standardized Tests (Linn & Miller, 2003)

The standardized achievement test has main distinction features including a fixed set of test items designed to measure clearly defined achievement domain specific directions for administering and scoring the test and norms based on representative groups of individuals like those for whom the test was designed. Standard content and procedures make it possible to give an identical test to individuals in different places. The norms enable us to compare an individual’s test score with those of known groups who also have taken the test. Thus test norms provide a standard frame of reference for determining an individual’s relative level of test performance on a particular test.

There is another advantage of Standardized test as test is set of statements with specific features like to refer to specific content with specific objectives for specific class with specific statements of difficulty level and discrimination Index (Wiersma & Jurse, 1995, p.312). If these are multiple choice items the distracters have specific functions. These test items are made Standardized by applying these conditions on it. Once these were made standardized these can be used again and again. The procedure to make the
test standardized will be discussed in the section of introduction and functioning of Board Intermediate and Secondary Education.

The test used for measuring the learning achievement of sampled students was semi standardized. These tests were administered in four districts at the same time under same standard condition in all districts. These test were basically norm-referenced test constructed from the same content and on same learning standards in all districts and was taught by the teachers with same methodology and same academic and professional qualification. So the effects of student learning styles on achievement can be measured along with the effect of socio-economic status of parents and of students can also be studied because the environment of school in four districts was almost same.

2.17 **Institutions Responsible for Measuring Learning Achievement in Pakistan**

Boards of Intermediate and Secondary Education are the public sector institutions working in Pakistan for measuring learning achievement of the students enrolled at secondary and higher secondary schools. These Boards are working in each Division of each Province of Pakistan and one Federal Board of Intermediate and Secondary Education is working for measuring the achievement of students enrolled at the school under the supervision of Federal Ministry of Education. The achievement of the sampled student was measured by two institutions named as Federal Board of Intermediate and Secondary Education (FBISE) Islamabad and Board of Intermediate and Secondary Education (BISE) Rawalpindi.
a) **Federal Board of Intermediate and Secondary Education Islamabad**

Gazette book of Pakistan (2000) gives information about the Federal Board of Intermediate and Secondary Education (FBISE) Islamabad. It was established under FBISE ACT 1975, is an autonomous body of the Ministry of Education. It is empowered with administrative and financial authority to organize, regulate, develop and control Intermediate and Secondary Education in general and conduct examinations in the institutions affiliated with it.

Jurisdiction of the Federal Board includes:

iv. Islamabad Capital Territory

v. All over Pakistan (Cantonments and Garrisons)

vi. Federally Administered Northern Areas

vii. Overseas

Roles and responsibilities are briefly described below:-

- Affiliate institutions imparting SSC and HSSC education within Pakistan and abroad.
- Prescribe courses of instructions for SSC and HSSC
- Ensure provision of requisite facilities in the affiliated instructions
- Hold exams, appoint examiners and supervisory staff
- Institute measures to promote physical well being of students
- Conduct additional Examinations
  - Allama Iqbal Gold Medal Competitive
  - Primary Teaching Certificate and Certificate of Teaching
  - Diploma in Education
b) **Board of Intermediate and Secondary Education (BISE) Rawalpindi**

Gazette book of Pakistan (2000) gives information about the Board of Intermediate and Secondary Education Rawalpindi. It was established in October, 1977 as a result of bifurcation of BISE Sargodha under Punjab Boards of Intermediate and Secondary Education Act NO. XIII of 197. The BISE Rawalpindi has since been confined to the Districts of Attock, Chakwal, Jhelum and Rawalpindi.

The main objective of the Board is to hold and conduct all examinations pertaining to Secondary School Certificate, Intermediate classical Languages and such other examinations as may be assigned by the controlling Authority/Government of Punjab. Main source of income of the Board is the examination and other fee collected from the candidates. No grant-in-aid from Government or any financial Institution is involved.

The objectives of the Board are as follows:

i. To regulate and supervise the Secondary and Intermediate Education.

ii. To hold and conduct all examinations pertaining to Intermediate and Secondary Education and Classical Language, PTC/CT/DM/OT and such other examinations as may be assigned by the controlling authority/Government.

iii. To compile the result of the students who have appeared candidates and notify the same and issue certificates to successful candidates.

iii. To promote the supports activities among the students.
2.18 The process of Standardization of Instruments Adopted by BISE’s

FBISE Islamabad and BISE Rawalpindi both institutions were responsible to measure and analyze the performance of students at the end of the session of SSC and HSSC. The sampled students were enrolled in SSC program. At the end of the session in March, 2007 the examining bodies decided to evaluate the learning achievement of the secondary school students. For this purpose the external system of evaluation was used as a routine. Normally the FBISE Islamabad and BISE Rawalpindi use paper pencil test to measure learning achievements of the students. No other method of assessment is used for the certification of student’s achievement at SSC level in Pakistan. The institutions hired and trained professional working teachers for the preparation of instruments during June and July, 2006. They were trained by the experts of different countries and then asked to prepare the achievement test. They have adopted the standard procedure for the preparation and finalization of instruments. They have focused on Bloom’s Cognitive educational objectives, knowledge, compression and application. The general weight-age given to all subjects was as given in gazettes of FBISE Islamabad and BISE Rawalpindi 2007.

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The paper pattern includes three types of test item, multiple choice questions, short answer questions and problem solving questions. The test items were processed and
passed through different channels before finalization. The test development experts then assemble the papers, which were standardized; these instruments were used to measure student’s achievement.

2.19 Factors Effecting the Learning Achievement

The student’s achievement remained the major concern of psychologists, educationists and no doubt parents since long. Many research studies were conducted to study the factors affecting learning achievement. People did a lot to maximize the students learning achievement. After reviewing the literature the factors effecting learning achievement can be divided in to two groups the factors from school side and the factors from the student’s home side.

The factors from school side may be the curriculum, school environment, the teaching methodology and relationship with teacher and peers, whereas the factors from the student’s home side were their personal abilities and the environment provided by parents at home or their SES in society. The Trends in International Mathematics and Science Study (TIMSS) is very famous study all over the world, which also analyze the factors effecting learning achievement along with the students’ achievement in Mathematics and Science. The findings of the study in Iran by Kiamanes (2002) were home back ground, student’s attitude towards subject, self concept, teaching and external motivation, are the main factors effecting learning achievement.

A similar study was conducted by Colemanetel; (1966, p.9). It also suggested that schools made no difference; extensive research has been carried out on in and out of school variables affecting student’s achievement. Considerable research has examined the
relationship between students’ characteristics such as self-concept, attitudes toward subject, home back-ground as well as motivation and students subsequent academic performance. Another study was conducted in Pakistan by Saeed and colleague (2005, p.2) They also highlighted the factors effecting the learning achievement of students and according to them these factors are “parent education and their occupation, SES home work school location, facilities at home, availability of helping books. Parents guidance and teacher guidance self-study habit are the major factors effecting student’s achievement.

Along with them Intraprawat and colleagues (2005, p.5) also conducted a study about “Factors effecting Learning Achievements of Suranaree University of Technology Students” they have divided factors into two groups: the factors on the students side and the factors on the university side. The factors on the student’s side were their fundamental knowledge in respective subjects from high schools and their learning behavior in university. And the factors on the university side are the characteristics and teaching factors of the lecturers, and the instructional system of the university. The findings were as: The students who has better performance in high school has performed better in university and the teachers whose knowledge in particular subject is excellent the performance of their students was also better in their subjects.

2.20 Learning Style and Achievement

From the above discussion about learning styles, it is concluded that people adopt different learning styles according to their preferences for perceiving and processing information. These are not quantifiable differences that can be expressed simply as a
higher or lower Intelligent Quotient (IQ). These are qualitative differences in the kinds of perception and judgment that each person prefers to use. Learning depends on many factors. Each of us has a different mix of preferences, we learn in our own, particular and individual way thus we show different degrees of success in school.

Allison & Hayes (1994, p.32) point out that an individual’s learning orientation is possibly the most important determinant of the individual’s educational attainment. For this reason, considerable researches have been conducted in recent years to diagnose learning style preferences. Identifying the characteristics of individual students is seen as a potential way of improving course design and an individual’s learning outcomes.

Significant efforts were made to study the learning styles in education and studies have produced findings indicating significant differences in academic performance by students manifesting different learning styles (Dunn, Deckinger, Withers and Katzenstien., 1990; O’Brien, 1994). Booth & Mladenovic (1999) for example found a significant relationship between learning style preferences and achievement in specific courses in a college pharmaceutical program.

Most educators “agree that learning styles exist and acknowledge the significant effect that learning styles have on the learning process” (Vincet & Ross, 2001). The assertion has been made that tailoring educational environment and materials to students’ learning styles increases overall academic achievement.

A key to getting and keeping students actively involved in learning lies in the understanding of the learning style preferences of the students which can positively or negatively influence a student’s performance. Therefore it would be wise to understand what learning style preferences are, and how to address while preparing instructional
material for students. Studies indicate that the more the student understands about how they learn, the more likely they will become independent, responsible, self-confident learners (Smith & Renzulli, 1984).

Rita Dunn (1983) reviewed several research findings on students learning styles and their achievement at college, secondary and elementary school levels. Her findings indicate that matching students learning styles with teaching styles had a positive effect on achievement scores, attendance towards school, and motivation for additional education.

Most of the early researches about learning styles were related to young population. The learning styles were addressed in reference to student’s achievement. This concept explains the success or failure of the different learning approaches with different tasks, especially as they related to expectations in schools. There is evident that students with specific learning style patterns underachieve in school. Regardless of their cultural background, students who have these dominant learning style patterns have limited opportunities to use their style strengths in classroom.

Many researches in the field of education support the notion that there is difference in the way students approach learning (Biggs, 1976, 1987; Entwistle, 1979). Blackmore (1996) suggested that one of the first thing educators can do to aid the learning process is to simply be aware that there are divers learning styles in the students population. Kourse (2000) established that there are differences in how individual learners acquire and process information.

Kourse as quoted by Imtiaz (2004, p.30) pointed out that although many students can master easy information in the “wrong” style for them, they do it more efficiently and
rapidly when they capitalize on their learning style strengths. He also stated that no one method will be best for all learners and further established that there must be a variety of methods, an appropriate mix of strategies to meet the needs of a variety of individual learners.

Biggs (1987, p. 65) stated that the early works on approaches to learning were restricted to the domain of educational psychology. Essentially, these early theories attempted to predict quality of learning outcomes measured by academic performance by examining factors such as IQ, socio-economic status, prior knowledge and special abilities and so on, in the quest to establish general laws.

2.21 Social Differentiation and Social Stratification: Status and Class

In literature all social groups and societies exhibit social differentiation. The social differentiation is the process by which different statuses in any group, organization, or society develop. For example, the school is a social organization: the principal, teachers, students, administration staff, guard, parents, non-governmental organizations and policies curriculum all have different status within the organization. Together they constitute a whole social system, one that is marked by social differentiation.

Social stratification is a relative fixed, hierarchical arrangement in society by which groups have different access to resources, power and perceived social worth. Social stratification is a system of structured social inequality.

The status was defined by many ways: Ascribed Status, Achieved Status and Master Status.
2.21.1 Ascribed Status

Dictionary of Social Science (2002) defined ascribed status as it is determined at the time of birth like: gender, race, ethnic differences provide basis for ascribed status.

2.21.2 Achieved Status

Achieved status was acquired on the bases of merit skills, abilities by the individual in the society (Dictionary of Sociology, 2003). The example is being a doctor or being a teacher or even being a criminal the status then determines a set of behaviors and expectations for the individuals.

2.21.3 Master Status

According to Academic of Social Science (2002, p.176) “The master status is that status which has exceptional importance for social identity”.

2.21.4 Status Symbols

Status symbols are those items which are used to identify status.

Stockwell, Peter (2002, p.26) defines the status as, “a status is a rank or position in a group or organization”. It was also defined by Sociologists Frederic (1956, p.54), “a status is a position in a social system independent of given factors”. A person’s status or position determines the nature and degree of his responsibilities and obligations as well as his superior, inferior relations to other members of the society.

2.21.5 Estate, Caste and Class System

Stratification system can be broadly categorized into three types: Estate system, Caste system and Class system (Andersen & Taylor, 2003, p.177).
• Estate system

Estate system of stratification is one in which the ownership of property and the exercise of power is monopolized by an elite who have total control over social resources. Historically, such societies were feudal systems where classes were differentiated into three basic groups: the nobles, the priesthood, and the commoners.

• Caste system

In caste system one’s place in the stratification system is an ascribed status. It is a quality given to an individual by circumstances of birth. The hierarchy of classes is rigid in caste systems and is often preserved through formal law and cultural practices that prevent free association and movement between classes.

• Class system

In class system one’s placement in the class system can change according to one’s achievement; that is, class depends to some degree on achieved status, defined as status that is earned by the acquisition of resources and power, regardless of one’s origins. Class systems are more open than caste systems, since position does not depend strictly on birth, and classes are less rigidly defined than castes, because the divisions are blurred by socially mobile individuals moving between one class to the next.

Social Scientists uses concepts and theories to help the people to grasp, order, analyze and understand the nature of the societies, culture and socio-culture formation with which they can confronted. Each society has specific features or attributes that may
resemble or differ from those of others societies, as was said by Nade quoted by Bond (1981).

societies are made up of people; societies have boundaries, people either belongs to them or not; and people belongs to a society in virtue of rules under which they stand and which impose on them regular, determinate ways of acting towards and in regard to one another (p.228).

In simple way it can be said that societies are bounded units whose members are governed by rules. No one can draw a line between these units it could only be observed that if the society organizes these units under some rules then culture provides that set of rules and way of life. This living style determines the status of the person in society.

The status of the person determines the class to which he belongs. Sociologists said with the reference of continuum theory of social stratification that there is no sharp dividing line between social classes. The German Sociologists Max Weber framed three component theory of social stratification in which he defines status class as “a group of people that can be differentiated on the basis of non-economical qualities like honor, prestige and religion. Bedisti (2004, p.4) commented on Weber’s theory and said bureaucracy is the most powerful in all status groups. In fact the difference in power, prestige and status is so numerous and so widespread as to make for almost imperceptible graduations from the lowest to the highest social rank. Almost all social Scientists were agreed with this interpretation, but there is considerable disagreement as to whether categories of classes should be delineated in the first place and what arbitrary points on the power prestige and status continuum best divide the important classes in the second place.
Theories of classes were very old. From the very first “Three class Theory” of social stratification was very popular. According to this theory society is divided into three classes, the “upper class”, “middle class” and the “lower class”. The upper class composed of a relatively few individuals who hold the top most positions in society; a middle class composed of persons of lesser status but of relatively comfortable means; and a lower class is of persons who have a bare existence when measured by the given society standards. The chief criticism of this theory is that it does not draw a sharp dividing line between individuals of different classes in society. The middle class for instance, may run the whole range from semiskilled workers to owners of relatively large business enterprises as well as highly paid professionals. Such criticisms have led to the five and six class theories of social stratification. The six class theory holds that the upper class is divided into an upper-middle and a lower upper class, and the middle class is divided into an upper middle and a lower middle class and that the lower class is divided into an upper lower class and a lower class. The five class theory generally holds only one upper class.

Several other approaches to social class ranking have been used such as the two classes the business class and the working class.

2.22 Social Class Theories

Social class theories revolve around the inequality. All the Social Scientists analyze the situation and give their point of views. The most famous were the theory of Karl Marx, and Max Weber, along with functionalism and conflict theory. These theories were best discussed by Andersen and Taylor (2003, p.176-183).
2.22.1 **Karl Marx: Class and Capitalism**

Karl Mrax (1818-1883) gives a complex and profound analysis of the class system under Capitalism. In Marx’s view two primary classes exists under capitalism. The capitalist class was that who own the production and the working class was that well sell their labor for wages. These two classes were further divided in to two classes: The Petty bourgeoisie small business owners, managers those who can be identified or named as middle class. Those people associated with the interests of the capitalist class but who do not own the means of production. The second was lumpenprole-tariat, they are unnecessary as workers. In these days they are known as underclass homeless, permanently poor people.

Andersen & Taylor (2003, p.179) reflected on Marx thought and said that with the development of capitalism the capitalists and working class would become increasingly antagonistic referred to as class struggle. When class conflicts become more intense the two classes would become more polarized the petty bourgeoisies become deprived of their property and dropping into the working class This analysis is still reflected in the world and the question is when the classes become more polarized then the rich get richer and every one else worse off.

Marx thought that the capitalists are the basis for other social institutions. It is the infrastructure of society with other institutions like law, education, the family etc. Thus according to Marx the law supports the interests of capitalists, the family promotes values that socialize people into appropriate work role and education reflects the interest of the capital class.
The question is why do people support such a system? Here ideology plays a role. Ideology refers to belief system that supports the status quo. According to him the dominant ideas of a society are promoted by the ruling class, because through their control of the communications industries in modern societies the ruling class is able to produce idea that butters their own interests.

At that time when this theory was presented the middle class was small. It was dependent on the capitalists and was exploited by it, because the middle class did not own the means of production. He saw middle class people as identifying with the interest of the capitalists class because of the similarity in their economic interest and dependency on the capitalist system. He thought middle class failed to work in his own interest because of a false believed and they will have to pay for it in future. His analyses was proven true as the tendency of wealth remain long in few hands and majority worked only to make ends meets.

2.22.2 Max Weber: Class, Status and Party

Max Weber (1864-1929) agreed with Marx that classes were formed around economic interests, and also that material forces (economic forces) have a powerful effect on people’s lives. However he disagreed with Marx that economic forces are the primary dimension of stratification. According to Weber three dimensions to stratification are class (the economic dimension), status (prestige, cultural and social dimension), and party (power, the political dimension). Weber gives a multidimensional view of social stratification because he analyzed the connections between economic, cultural and political system. He pointed out that, although the economic, social and political
dimensions of stratification are usually related, they are not always consistent. A person could be high on one or two dimensions, but low on another. Weber as quoted by Andersen & Taylor (2003, p.180) defined class as the economic dimension of stratification i.e. how much access to the material goods of society a group or individual has. According to Weber status is the prestige dimension of the stratification, the social judgment or recognition given to a person or group. Weber understood that class distinctions are linked to status distinctions it means those with the most economic resources tend to have the highest status in society but not always true.

Finally party is the political dimension of stratification. It is the capacity to influence groups and individuals even in the face of opposition. Power is also reflected in the ability of a person or group to negotiate their way through social institutions. Although having power is typically related to also having high economic standing and high social status, this is not always the case. An arrogant man may have money and power, but be held in low esteem by those who worked for him. The point is that stratification does not rest solely on economics; political power and social judgments are also important components of stratification systems. Weber redefined the sociological analyses of stratification to account for the subtleties that can be observed when you look beyond the sheer economic dimension to stratification.

### 2.22.3 Theory of Functionalism

Andersen and Taylor (2003, p.181) commented on Functionalism theory. They viewed society as a system of institutions that are organized to meet society’s needs. The functionalist perspective emphasizes that the parts of society are in basic harmony with
each other. According to different sociologists society is characterized by cohesion, consensus, cooperation, stability and persistence.

According to the functionalist perspective, social inequality serves an important purpose in society: it motivates people to fill the different positions in society that are needed for the survival of the whole. This idea is addressed in an argument by Davis and Moore they argue that some positions in society are more functionally important than others and that inequality is a mechanism to ensure that the most talented people go into the most demanding positions. These positions demand higher training and with it higher rewards are associated so it motivates peoples for achieving these higher positions. In other words, functionalist theorists see inequality as an element of a reward system that motivates people to succeed.

2.22.4 The conflict Theory

Conflict theory also see society as a social system as functionalists theory; but unlike functionalism, conflict theory emphasizes that the system is held together through conflict and coercion. From a conflict-based perspective, society comprises competing interest groups, some of whom have more power than others. Different groups struggles over societal resources and compete for social advantage. Conflict theorist argues that those who control society’s resources also hold power over others. The perspective of conflict theory was largely derived from the Karl Marx theory, social stratification is based on class conflict and blocked opportunity.

Conflict theorists argue that the consequences of inequality are negative. From a conflict theory point of view, the more stratified a society, the less likely that society will
benefit from the talents of its citizens, because inequality limits the life chances of those at the bottom, preventing their talents from being discovered and used.

Implicit in the argument of each perspective is criticism of the other perspective. Functionalism assumes that the most highly rewarded jobs are the most important for society, where as conflict theorists argue that some of the most vital jobs in the society and these sustain life and quality of life, such as farmers, mothers, trash collectors, and a wide range of others laborers are usually the least rewarded. Conflict theorists also criticize functionalist theory for assuming that the most talents get the greatest rewards. They point out that system of stratification tend to devalue the contributions of those left at the bottom and to under use the diverse talents of all the people.

2.23 The measurement of class position in open class societies.

Researchers have attempted to highlight class position in open class societies in many ways. Five approaches were used to measure the class position. Every approach has its advantages and disadvantages. The major approaches are discussed in following section.

2.23.1 The style of life approach

This approach was presented by Weber and quoted by Sims (1970). According to him only the life style grouped people together in different classes. The social intimacy is the one indicator which determines the status of the person and treats others as comparative equal. The second is the member of the different social classes’ posses and use certain items which divide them in to classes. The social intimacy is reported by inter-marriages and having other relationships and mutually shared activities.
The advantage of this approach was found in its comprehensiveness. When interactive relations, symbolic possessions, symbolic activities are tabulated, status indices can be computed for individuals or groups. The shortcoming of this approach is found in the fact that interaction; even marriages do not always follow class line. It is difficult to compute status indices on these indicators.

2.23.2 The reputational approach

According to it the individuals or groups are categories on the basis of their reputation they have in the society. In this approach ask the knowledgeable persons to rank the members of their communities. There are several ways by which the judges may be selected, but the logic is essentially the same in all instances. The assumption is that the members of the community are social system have a first hand knowledge based on personal experience of the social position of the members of their groups. Sociologists who use this approach do not involve in statistical methods of rating and save the time and effort.

No doubt what people say or think about an individual has important implication for his status position. However the criticism that is leveled at this approach is that many people will allow personal approval or disapproval of certain types of behavior color their judgment of individuals. The reputational approach is also criticized because it is impossible for one individual to know every one in a relatively large community. There are also some rather difficult problems to be solved in the random selection of qualified judges.
2.23.3 The subjective approach

The Third approach is the subjective approach. The logic of this approach is based on the assumption that the individual is in the best position to know where he fits into the class system. Warner (1969, p.3) also used this approach, according to him in this approach people of the community made ranking. This method assumed that the members of the community could rank their fellows according to technique such as evaluation of social reputation & institutional membership.

While keeping all the style of life, reputational and subjective approach it could be perceived that subjective approach has an advantage over all approaches. As the reputational approach is limited by the scope of acquaintance of the judges selected and the subjective approach also has advantages of time and simplicity over the style of life approach.

The chief criticism that has been raised against the subjective approach is that the man may have a wrong perception, both of his social class system and his own position in the system. When evaluating themselves such persons for ideological ego or other reasons will indicate that they belong in lower or higher class categories than they actually hold. These shortcomings can be minimized by careful Scholars but do complicate the subjective approach to the study of class position.

2.23.4 The occupational prestige approach

The fourth approach to the study of social class utilizes occupation as an index to class position. This approach is defined in terms of the rationale that occupation has a social reality. It has direct meaning for status position. The status was determined by rating for occupation prepared by the National Opinion Research Centre at the University
of Chicago. The North-Hatt and the Hodge, Siegel and Rossi describe (1964, p.292) occupations on the basis of prestige as determined by the responses of approximately 3000 interviews selected at random. This approach was still in practice in UK in the office of National Statistics to divide social classes by classifying the people/population in socio-economic classification (2004, p.5). They have divided in 8, 5 and 3 classes according to their occupation. In UK Socio-Economic Status of individuals was determined by their occupation class to whom they belong.

The disadvantage of this approach is inherent in all single factor measures of complex entities.

2.22.5 The multiple index approach

All the approaches discussed above or some others for the study of social class position have many weaknesses when used alone. For this reason, Warner (1963, p.273) prefer to use two or more approaches so that they may have multiple indicators of social class positions. Studies which combine the reputational or subjective approach with the style of life or occupational prestige approaches are considered more valid and more reliable if high correlation is attained between the measures used. Various researchers have worked out composite indices that are designed to eliminate the biases of single-factor measures of class position and at the same time eliminate the necessity of double-checking by using multiple approaches.

2.24 Determinants of the social class

What are the major determinants of social class? Different sociologists have different opinion but literature reflects all are agreed on the main determinants namely,
wealth, power and prestige. Educational Sociologists define the meaning of social class and discuss its significance and implications for individuals in society. Class has been described by Weber as multi-dimensional concept that is determined by three major variables wealth, power and prestige.

The philosophy dictionary defines the social class as “A group separating a society in to subsets, defined in-terms of status privilege. It is a place in the processes of economic production, access to power and authority”. The earliest concept of class was of Karl Marx, Who focused on how one class controls and directs the process of production while other classes are the direct producers and the providers of services to the dominant class. Latterly the Max Weber saw people as having different life chances because of difference in skills, education and qualification as was explained by Kerswill (2006, p.4)

Food and Culture Encyclopedia defines social class by “unequal access to desirable resources” such as money, goods and services or the personal gratification such as prestige or respect”.

Giddass (2001) describes social class as difference in styles of life marked by such things as ‘housing’, ‘dress’, ‘manner of speech and occupation’ which are the major determinants. It is also described by Wikipedia encyclopedia. The class is determined largely by: personal or household per capita income or wealth net worth, including the ownership of land, property, means of production etc.

- Occupation
- Education and qualification
- Family background
In the view of Warners (1969) objective approach of class ranking was formalized by “index of status characteristics” four criteria are associated with index: occupation, source of income, house type and dwelling area.

This is the one way to determine the status of the different social classes. There are many other options decided and used for determining the status of a social class in society: as was discussed by Thomas (2007) the status of social classes was determined by the job or occupation they have. The lower class often referred as working class or blue color works.

The blue color workers are those who are employed by some one and they are unable to employ any one. The classes of employees who perform manual or technical labor are referred to the dress codes of workplaces. The distinctive features of this class are generally having low level education unskilled or semiskilled occupation training is often learned on the job and have low income then white collar and higher from pink collar. Fontenot (2006) defines the middle class people generally called white color workers they have more education holding technical or less laborers job. They are not involved in manual labor. They are salaried professional like doctors, lawyers, employers in administrative position managers and they earn average to about average incomes. Upper class people tend to have high education, the highest salaries and prestigious occupational positions. Along with these positions some workers were distinct as pink color workers. In the first half of 20th century in 1950’s women began entering in contrary’s work force in significant number. They entered in workforce at entry level position of pink color workers defined by Dr. Fontenot as when women work for a living in a clean, safe environment, are called pink color workers. Pink color jobs are secondary
labor market jobs like secretaries, nurses, telephone operators, teachers, librarian etc. As according to gender stereotypes pervasive in male dominated societies, these occupations are seen as “ideally and naturally” suited to women as they echo domestic responsibilities and their jobs do not require as much professional training. The status of such jobs is low and pay is also less having limited benefits or chances of advancement.

Since that time different societies fix different determinants and different structures of social classes.

2.25 Class Structure in Various Societies

According to Wikipedia Encyclopedia the social class refers to the hierarchical distinction (or stratification) between individuals or groups in societies or culture. Usually individuals are grouped into classes based on their role in society and economic position (pink, blue or white collar workers) and similar political and economic interests within the stratification system. However class is not a universal phenomenon. Many groups or societies do not have social class and often lack permanent leaders and consciously and actively avoid dividing their members into hierarchical power structure.

No universal factor can determine the class. The class determinants vary from one society to another. Even within a society different people or groups may have very different idea about what makes one “higher” or “lower” in the social hierarchy. Theoretical debate over the definition of class remains important not for old days it is of the much concerned of today. Sociologist Dennis Wrong (Wikipedia) defines class in two ways: realist and nominalist. The realist definition relies on clear class boundaries to which people are divided into social groups. The nominalist’s definition of class focuses
on the characteristics that people share in a given class like education, occupation etc. So the class is determined not by the group in which you place yourself or the people you interact with, but rather has these common characteristics.

Since the period of Karl Max, Max Weber and others sociologists defined different criteria for the distribution of social classes. Some includes occupation, source of income, house type and dwelling area (Bond, 1981) In British the socio-economic status involves combination of factors like occupation, income and education level. This is revised in 2001 by the office for National Statistics it is now called Socio-Economic Classification (SEC) for all official statistics and surveys and determined by “Occupation” alone. Different societies use different social class structures with different determinants and different explanation. As was presented in Encyclopedia Wikipedia (2006, p. 1-49) following societies have specific class structures.

a. **The United Kingdom**

Encyclopedia Wikipedia (2006, p.1-49) described that the social class structured model in the United Kingdom was changed during ‘Thatcher Era’ and it is continuously used in these days. The difference is previously defined the socio-economic status or individual’s social class was governed by mannerisms, education and statuses of one’s parents but no determined by occupational nature of job someone have. They use eight class model described by Encyclopedia Wikipedia (2006) is presented in following pages.

i. **Upper Class**: The people belong to this class have inherited wealth. They got education from most famous British’s schools such as Eton and Winchester.
ii. **Upper Middle Class:** The people of this class are generally professionals with advanced degrees and usually with the public school education. The major portion of their wealth is from inheritance.

iii. **Middle Class:** The people of middle class are also the professionals like upper middle class but with less education and established back ground. They usually have their own home and earn well above the national average.

iv. **Lower Middle Class:** The people of this class may not hold a university degree but work with white color job and earn just above the national average.

v. **Upper Working Class:** The people belong to this class generally does not hold a university degree but they works in skilled or well experienced role such as supervisor, foreman, or skilled trade such as plumber, electrician, joiner, tool-maker, train driver.

vi. **Working Class:** These people usually have low educational achievement and worked in blue color professions as semiskilled or unskilled worker in the field of industry or civil work (construction work). The examples of this class are a drill press operator, car assembler, welding machine operator bus driver truck-lift operator, docker, or production laborer.

vii. **Lower Worker Class:** They usually work in low wage occupation, such as cleaner, shop assistant, bar worker. They are often employed in the personal service industry.

viii. **Under Class:** The people who are unemployed rely on the state benefits for income belongs to this class. They are unemployed.
b. **The United States of America**

According to Encyclopedia Britannica (2006) the social structure in United States of America is defined by several factors. The main determinants are educational attainment, income and occupational prestige. The Americans society is distributed mostly in six or five class systems. The detail according to Encyclopedia Britannica (2006) is as under:

i. **Upper Class**: The upper class is established by those peoples who have great influence, wealth and prestige. The population of this class is only 1% and they own about one third of private wealth. The members of this class tend to act as grand conceptualized and influence the national institution.

ii. **Upper Middle Class**: The upper middle class consists of people with white color professions, comfortable personal income and advanced post secretary Educational degree. The professional’s from this class have enough autonomy at their workplace and therefore enjoy high job satisfaction. They are 15% of the total population in society. They earn round about six figure income and live a comfortable life.

iii. **Lower Middle Class**: They are semi professionals from the professions of non-retail sales people and craftsman who have some college education. They often suffer lack of job security. House holds of this class need two earning members.

iv. **Working Class**: This class consists of the majority of the Americans it includes blue as well as white color workers who have relatively low personal
income and low education many belongs to 45% population of Americans who have never attended colleges.

v. **Lower Class:** They are poor people of this society with very low education and less income they hardly earn to live hand to mouth and it is common for them drift in and out of poverty.

c. **China**

Before Confucian period the feudal system divided the whole population of China into six classes. As described by Encyclopedia Wikipedia (2006) the four noble classes was named as the king, the Dukes then the great men and finally the scholars and below noble class there were commoners and slaves.

Latter Confucian doctrine minimized the importance of the nobles except the emperor and abolished the status of great men and scholars as noble classes. They divide the society in following groups.

i. **Scholars:** This group is highest in rank because they thought they have ability and opportunity to conceive ideas in state of leisure. It leads them to make wise law. The scholars were mainly belonged to gentry who owned land, and may be educated but had no aristocratic title.

ii. **Farmers:** This class consists of person who produces food and the artisans who produced useful objects.

iii. **Merchants:** They ranked at the bottom because they did not produce any thing.

iv. **Soldiers:** They are ranked even lower then merchants because of there perceived expendability.
The confusion model of social class is different from the model of Europe and America. According to it the merchants can attain great wealth without reaching the social status accorded to a poor farmer. Because merchants can purchase land to reach farmer status or even can buy a good education and they would attain the status of scholar and go to imperial civil service.

d. **France**

France was an absolute monarchy for most of the time, with the king at the Pinnacle of the class structure. However the French State-General was established in 1302 by ranking the people according to hereditary. The detail was taken from Encyclopedia Wikipedia (2006) it described the social class system in France as below:

i. **The First Estate:** The First Estate in France consisted on the high born sons of the great royal families the king and queen. Who had devoted themselves for religion as Brahmins in Indian, Scholars in Confucian (China) and Qajar in Iran.

ii. **The Second Estate:** The second state consisted of all others noble people of the society, who are 2\% in the total population.

iii. **The Third Estate:** Technically all other people belong to this class but in reality this class is of the richest members of the society and peasant has no voice at all in the social system as contrasted with the ideologically high status of farmers in Confucian China.
e. **Japan**

In Japan the class structure was influenced by the China. It was based mostly on feudal system and shifted to coming generations. For details as explained by Encyclopedia Wikipedia (2006), is presented in following section:

i. **The Emperor:** The Emperor was at top (Pinnacle) as a deity and still it continues although now they are not considered as god. In Japan history the emperor was not allowed out side from their palace and their will was interpreted by a shogun or military dictator.

ii. **The Shogun:** The people of this class are military dictators.

iii. **Regional Lords:** This class consists on the people who run the administrative control of the province through their samurai lieutenants.

iv. **Farmers:** As the Japan class structure was influenced by China or perhaps springing from a lack of arable land they ranked farmers above merchants and other bourgeois.

f. **India**

The Indian class system was one of the oldest and rigid systems of social class. Indian society is so rigid they have lack upward or downward mobility between castes. They are totally against the Varna sharme Dharma idea in Hinduism which allowed people born into a certain verna their status was determined by their education and their occupation. The class system of society was divided on the basis of skills and qualification and not the father’s status to their sons. Encyclopedia Wikipedia (2006) described they have four classes:
i. **Brahmin Varna:** The people of this class were idealized as a leisurely priest class devoted to religious ceremonies. They are religious scholars.

ii. **Kshatriya Varna:** They were defined as military princes and they can call as upper middle class. They are distinguished as ruler and warriors.

iii. **Vaishya Varna:** The people of this class were associated to artisan farmers’ herders and merchants. The represent the modern concept of middle class.

iv. **Shudra Varna:** The lower varna were the shudar. They are considered as servants. They do not even have some simple basic right in Indian social system. The Indian Constitution introduces various affirmative action plans to abolish this class system but have very limited successes.

v. Untouchables- an unofficial “5th” class- their jobs involved activities Hindus considered “lowly or dirty” (handling garbage or dead animals, etc.)

vi. Indians were born into a certain caste and they could not change it.

vii. According to karma, the caste system was fair because people’s social class reflected what they had done in past lives.

g. **Iran**

Prior to the revolution 1979 the major determinant for status class was prestige and the influence of one’s in highest decision making, wealth was also important and finally was connected with political power. Education helped to enter in to high jobs which after word provided opportunities for making connection with those who had political power. After revolution some determinants remained at the same position and class system was based on four class systems as described by Hand Book of Iran (2007).
i. **The Upper Class:**

The people of upper class were those who have high position in society like land owners, industrialists, finance and large scale merchants. The merchants remained as part of the upper class by having wealth, but such persons have no political influence and this absence of influence could impede to acquire new wealth. Senior clergy group with great political influence because the element of the upper class religious expertise also has an influence on the government’s key administrator has strong commitments to Shia Islam.

ii. **The Middle Class:**

Prior to revolution middle class was divided in two groups; those who possessed western education who had a secular looked those who were suspicious of western education who valued a role for religious in both public and private life. The people with secular point of view want them self-employed by bureaucracy, the professions and universities, while religious oriented concentrated among bazaar, merchants and the clergy. After revolution 1979 the distribution of middle class remains same. There were several social groups based on different occupations like bazaar merchants, professional managers of private and nationalized concerned the high grade civil servants, teachers, medium scale land owners, military officers, junior ranks of the shia clergy. Some middle groups have more influence to political power. After revolution the people with western education were required to undergo special Islamic indoctrination courses to retain their jobs.
iii. **The Working Class:**

Since twentieth century the working class has been in the process of formation. The working class is a big class divided into various groups of workers; like working in oil industry manufacturing, construction and transportation and those who are mechanics and artisan in the bazaar workshops. Some perform manual labor, some are regular employees and others are not. The illiterate do low ranked jobs. Thousands of people work seasonally or occasionally at one or other jobs.

These are some cases of social class system around us all the societies have same structure parallel to the Plato’s three class system Jalalzai (1992).

i) The Philosophers Kings (rulers)

ii) Guardians (Soldiers)

iii) Workers (Labor, Artisan)

The Plato’s point of view is that the social class is an important factor for most people as it measures the position of person in society. The status of person as well as the structure of social class is defined by two stand parts.

i) Objective

ii) Subjective.

Objective view distinguishes social class on the basis of occupation and subjective view refers the position of a person feels or belongs to a specific group or has influence on the decision making committee (Aragon, Johnson & Shaik, 2004). There are many systems for measuring social class the first is the Registrar General’s Classifications which classify group or classes on the basis of occupation and it is as:

Class I: Class I is based on lawyers, architects and doctors.
Class II: It is consisted of shop-keepers, farmers and teachers.

Class III: It includes shop assistants, clerical staff and electricians.

Class IV: The people assistants with the profession of bus conductors and farm workers came under this class.

Class V: The people of this class are illiterate and mostly are laborers on building and other states.

The Second system of measuring social class by marketing group is as follows:

a) Upper class: It consists of elite group.

b) Upper middle class: The people have high managerial, administrative and professional position consist on this class.

c) Lower Middle class: These people are supervisor or clerical and junior staff in any office.

d) Skilled working class: The people of this class are skilled manual workers.

e) Working Class: They are semi and unskilled manual workers

f) Those having no job and depending on state’s income for survival.

In literature the system of social class distribution of socio-economic status has been defined by both objective and subjective approaches. Some time subjective some time objective. Sociologists use both according to Academic Dictionary of Social Science (2002):

The term socio-economic status often contrasted with that of social class.

Socio-economic Status, largely an American usage has developed as a way to operationalize or measure social class on the assumption that class groupings are not real groups. It is a rather arbitrary category and is
developed by combining the position or score of persons on criteria such as income or amount of education, type of occupation held, or neighborhood of residence the scores can then be arbitrarily divided so as to create division, such as upper class, middle class, lower class. Sociologists are interested in socio-economic status as they are in class, since it is assumed that this status affects life chances in numerous ways (p.178).

2.26 Social Class and Achievement

The study of the relationship between social class and learning achievement is very important. It has been observed that working class children do not have command on the verbal and behavioral skills that are prerequisite to success in the classroom. Lower class children are often regarded as not capable. Many studies have replicated the social class learning achievement relationship and confirm these findings. The relative inability to get an educational achievement has its natural repercussions on the state of discipline once position in the class stratification system implies a certain lifestyle. From an early age we are socialized to be members of a social class and to develop strong loyalties to the values of our class including its attitudes towards education. The general expectation is that we can improve our life position with good education and hard work. All members of society have an equal opportunity to experience upward mobility. Those with higher levels of education have more chances at a better job and salary (Reed & Sautter, 1990).
2.27 Effects of Social Class on Education

Research on the effects of social class upon education and discipline has emphasized the manner in which the social class of a person’s family influences his attitude, values, beliefs, aspirations, performance and discipline in school. While there are still many gaps in this area of knowledge, a great deal is known about the educational consequences to the students. Among boys sixteen and seventeen years of age it was found that the higher the socio-economic standing of the family, the greater the likelihood that the student would remain in the school. The probability of graduate from high school is also related to student’s social class origins. The survey indicated that 41 percent of the age cohort from lower class families did not complete the 12th grade, as compared with 10 to 15 percent of the students from moderate income families.

There is considerable evidence that the academic ability attitude values and social behavior pattern of middle class children are more conducive to academic success than those of lower class children. The life chances of people are, therefore, closely related to their social class background. The sociological studies indicate that school initiated incentives are significantly related to the social class position of the students family in the community.

Macombe emphasizes that social class background can help or hinder students. School has a middle class “bias” are more closely aligned with the values and behavior patterns of middle class children. (Macombe, 2001) A student’s social class is determined by the home environment, and is reflected in schools grade, achievement, intelligence test scores, course failure, truancy, suspension, the high school curriculum pursued and future educational plans. One school district has begun placing students in schools to achieve
socio-economic balance. Class is not the only variable effecting achievement, and within each class there is wide variation, but there is definitely a significant relationship between class on the one hand and achievement on the other hand. Equal opportunity exists when all people, even those without status, wealth or membership in a privileged group, have an equal chance of achieving a high socio-economic status in society, regardless of their gender, minority status or social class. This requires removing obstacles to individual achievements, such as prejudice, ignorance and treatable impairments.

2.28 Demographic Variable of the Sampled Districts

The sample districts were selected from the northern zone called Barani zone of Pakistan. The selected districts were also named as “Pothohar Plateau” on the map of the Pakistan. They are linked by road. These districts were classified as developed and underdeveloped on the basses of literacy rate, services available and facilities provided by government or other non-governmental organizations as was described by Khawaja (2005).

Islamabad and Rawalpindi district were categorized as developed districts and Attock and Chakwal districts were as under developed districts. Islamabad is the capital of Pakistan and Rawalpindi is sister city of it. Both the districts were declared as big cities have literacy rate 72.38 and 70.5 higher in ranking regarding literacy, both the districts have many facilities in terms of education, health, business and trade, embassies and foreign offices etc. Whereas Attock and Chakwal districts have less facilities as compared to developed districts. The literacy rate of Attock and Chakwal is 49.27 and
56.72 respectively. Although both district are neighbors of developed district but there is a waste difference in facilities and services available and living standards of people.

According to Amjad, Arif & Mustafa (2008, p.143), “A second urban corridor has been developed in north Punjab by establishing the capital, Islamabad, alongside Rawalpindi, resulting in an increase in the size of the twin cities that has generated a lot of opportunities for nearby areas. They have integrated their rural population as well as populations from surrounding districts, including Jhelum, Chakwal and Attock, by providing them employment opportunities, mainly in the services sector.

Developed district have almost same educational and health facilities as both have many big hospitals and universities. Chakwal district has one small campus of University of Engineering and Technology Taxila and one District Head Quarter Hospital, whereas Attock has a campus of University of Education Lahore and one government hospital.

2.29 **Formation of Status Classes for the Study**

After going through the literature thoroughly and evaluating the determinants of the social classes, the five class social structure was used. The classes were named as upper class, upper middle class, middle class, lower middle class, and lower class. This structure was previously used by Sabzwari (2004) to study the social structure in Pakistan the major determined were finalized by going through official documents.

Economic Survey of Pakistan 2006-07 was consulted to identify the social and economic indicators. This document is an official document developed by Economic Adviser’s Wing, Finance division, Government of Pakistan. The document defined
economic and social indicators (Appendix-L). The indicators defined by this book were growth rate (constant and current), consumer price index, fiscal policy, money and credit, stock exchange market, balance of payments, commodity sectors, infrastructure, human resources and social development.

The other document consulted were Pakistan Social and Living Standards Measurement Survey (PSLSMS) 2004-05. It was fourteen page official document. It was developed by Federal Bureau of Statistics Government of Pakistan (Appendix-K). It was used to measure the social and living standards of Pakistani people. It has a detailed instrument containing fourteen portions A, B, C, D, E, F, G, H, I, J, K, L, M and N. Each portion required different detail.

The portion A was about introduction. It asked the detail of province, district, city, name of interviewer and interviewee. Portion B was about the detail of family size (male and female members). C part was about the educational levels of the family members. The next part D was about the health facilities available and utilized by the members of the family. The E part of the questionnaire was about the nature of the job of the earning member of the family. F part asked about the property (agriculture land, personal live stock) and facilities (iron, fans, sewing machine refrigerator, and traveling facilities) available to a family. The G portion of the instrument was about the nature of accommodation and utilities. H portion has two parts the first was about the income and expenditure and the second part was about the loan a family has taken and spends on which item. The “I” part asked the safety measure for the children less then age five. The J & K part discussed the condition of married women of the family and services and
facilities availed by the family members respectively. The last part L was about the
detailed expenditure of the family. This questionnaire was used to measure and determine
the social and living standard of a family which was consulted by the researcher to
develop SES questionnaire for the measurement of SES of the parents of the sampled
students.

Along with the two documents discussed above a research study of Sabzwari
(2004, p.50) was also consulted. The indicators taken by him were educational
qualification, occupation, monthly income, supervision/teaching to children, time spend
with children, participation of children for sports and the value system of a family.

After analyzing all the documents and discussing with the experts of the sociology
departments of different university indicators were finalized by the researcher with the
consent and help of supervisor. The main indicators were the parents’ academic and
professional qualifications, parents income level, job, family size, locality and nature of
accommodation, facilities at home, traveling facilities, distance of school from home and
coaching at home. Following variables were used with the consent of supervisor and the
experts of sociology departments of different organizations:

1. Educational Qualification of students mother, father and elders/young siblings
2. Parent’s occupation
3. Monthly income
4. Type of residence
5. Different house hold facilities at home
6. Mode of traveling to school
7. Tuition facility at home.
All the variables were scored and total scores were used to make different classes. The maximum scores obtained on Socio-Economic Status Scale questionnaire by the respondents were 150 and minimum score was 106. According to the obtained scores the classes were made by a fix interval the detail is as:

Table 2-22-1  Breakdown of social classes according to obtained scores

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of respondents</th>
<th>SES Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>42</td>
<td>142 – 150</td>
</tr>
<tr>
<td>Upper Middle class</td>
<td>260</td>
<td>133 – 141</td>
</tr>
<tr>
<td>Middle class</td>
<td>641</td>
<td>124 – 132</td>
</tr>
<tr>
<td>Lower Middle class</td>
<td>575</td>
<td>115 – 123</td>
</tr>
<tr>
<td>Lower class</td>
<td>62</td>
<td>106 –114</td>
</tr>
</tbody>
</table>

Table 2-22-1 indicates that in the selected sample 260 parents were from the upper middle class, 641 parents of the students were from middle class and 575 were from lower middle class. So the very large majority i.e. 1476 students belong to middle class. This also indicates that a majority of children of middle class are studying in public sector educational institutions. This may be due to their economic position and they may be able to afford the expenditure of public sector schools only.

2.30 Related Researches

Many research studies were conducted all over the world to identify student’s learning style and effect of socio-economic status on achievement. Bond (1981, p.253) study the “social economic status and educational achievement” and concluded that the
students from different SES groups did not perform at the same level in school. Performance of students from lower class was poor and it was because of non supportive attitude of teachers towards them. Hopkins (1982, p.351) conducted a study of learning styles of traditional students and non-traditional adult learners enrolled in full time undergraduate study. The findings revealed that non-traditional students preferred the independent, participant and dependent styles while traditional students indicated preferences for the collaborative, competitive and avoidant styles. Females indicated preferences for the dependent, participant and collaborative styles. Male exhibited preference for the avoidant, independent competitive styles.

Pandian (1983) undertook a study to ascertain the learning styles and their preferred teaching strategies as well as the association between learning styles and predictive variables like types of college, gender, subject of the study, personality traits, locus of control and English language ability. The findings revealed that except their subject of study all other variables were found to be related to their learning styles.

Bishop (1985) explored the learning styles of women students in a private liberal arts college. The results showed that the women were collaborative, independent and participative learners. When compared with men and women from other liberal arts college, these women were found significantly more participative and collaborative and significantly less dependent and avoidant. They were significantly less competitive than the men.

Ketchum (1985) undertook a study of student learning styles at Maharishi International University (MIU). Comparisons were conducted with the MIU third and fourth year students and with a sample at another university. The major findings of the
study were (i) the entering MIU first year students’ primary strengths were the ‘Personal’ learning styles of participant, collaborative and dependent, (ii) The first year MIU students were found to score significantly higher on avoidant and lower on participant than the fourth year MIU students, (iii) The MIU first year students did not differ from the students of the other university.

Verma and Sherma (1987) conducted a study on “academic achievement in relation to learning styles of adolescents”. They used Grasha & Riechmann’s learning styles model. They measured the performance of students in five subjects i.e. Hindi, English, Mathematics, General Science and Social Studied with the total area of study. The major findings were the group of students has participant learning style showed better performance in the total area of the study than the group having avoidant learning style. No difference of performance for academic achievement of students having dependent and independent, collaborative and competitive learning style.

Verma (1988) study the “learning style preference in relation to personality types”. He used the learning styles model defined by Agarwal. The results of this study indicated that personality type and learning style preferences of senior secondary students were partly contingent upon each other i.e. the extrovert and introvert students were different in their learning style preference.

Katz (1988) conducted a research on individual learning style Israeli Norms and Cross-Cultural Equivalence of Kolb’s Learning Style Inventory”. He found that the choice of a career or a major field of study is influenced by individual’s learning style.

Verma (1989) conducted another study on “Learning style preference of senior secondary school students in relation to their anxiety”. He used Agarwal’s tool for
learning styles. The major findings of the study suggested that high anxious and low anxious students showed no different preferences for their learning style.

Dunn (1989) conducted a research on “Grouping students for instruction: effect of learning style on achievement and attitude”. The results revealed that the learning style had positive effect on the achievement and attitude as the students preferred learning alone performed significantly better in the learning alone condition and the students preferred learning with peers performed significantly better in the learning with peer condition.

Verma and Tiku (1989) and Verma and Kumari (1988-89) conducted similar studies “a comparative study of learning styles of male and female high school students” and “learning style preferences of senior secondary students in relation to their sex” respectively. In first study researchers used learning styles presented by Grasha & Riechmann and in second study researchers used set of learning styles defined by Agarwal. The major findings of first study indicated male and female students were similar on independent, dependent, avoidant, collaborative and competitive learning style only difference was on participant learning style. The female students showed strong preference for participant learning style whereas the result of second study showed female students tend to have relatively more preference of field-independent and environment oriented learning style than male counter part. Similarly some other researchers i.e. Chohen (1986) and Sing (1987) studied the learning styles of male and female students by using different tools. They have also reported gender differences in learning styles
Verma and Kumari (1989-90) further tried to explore and conducted a research on “students learning styles across the academic streams”. The significant findings of the study showed that Science and Arts students have different preferences than Science and Commerce students. However the students from Arts and Commerce stream showed similar learning styles.

La Pointe (1990) investigated the relationship between cultures, learning styles, classroom environments and teaching procedures. Data analysis highlighted certain differences between groups along with similarities. All had the highest percentage of agreement with collaborative learning style.

Kaeley (1990) conducted a research on “The influence of Socio-economic status, entry style and instructional variables on the learning of Mathematics in a Neo-Literate society”. The result of the study was that SES has influence on student’s mathematics achievement and no significant effect of classroom instruction was found during the study. In another study of Kaeley (1988) it was further concluded that male and female students showed no significant difference in achievement.

Verma and Tiku (1990) found that learning styles of high school students were not appeared to be affected by their socio-economic status. However, when compared with intelligence, students with low intelligence level showed greater preference for avoidance learning style. No interaction between intelligence and socio-economic status was noted with regard to learning styles of high school students.

When the relationship between learning style and achievement motivation was measured by Verma (1991) it was found that learning style preference is independent of
achievement, that there was no significant relationship found between low achievement motivated and high achievement motivated students with any specific learning style.

Stewart, E. Cooper. & Miller (1991) has conducted a study on “MBTI learning style-teaching style dis-congruencies”. The main findings were the teachers and students who were congruent on the concrete abstract (NS) dimension had the highest rating while those congruent on both the concrete-abstract (SN) and reflective-active (IE) dimensions yield the second highest rating. When compared with mean scores for grades it was found that they were not significantly related to level of learning style-teaching style congruency and dis-congruency.

In 1991-92 Verma conducted a research on “relationship between rural-urban residential background and learning style preference”. It was found that rural-urban residential background of the students was not significantly related to their learning styles. But some other researchers as Tappenenden (1983); Clyne (1984); Atchison (1988) and Nah (1989) used different tools for measuring learning style and conducted researches from rural and urban students and found difference in learning styles.

Again Verma conducted research with Sheikh in (1992) on “learning styles of advantaged and disadvantaged students”. They used Socio-economic Status questionnaire of Koul for the classification of advantaged and disadvantaged groups. The result showed that the students from advantaged group have more preference for independent and participant learning styles than the students from disadvantaged group. Whereas in 1990 it was found that no relationship exists between SES and learning styles.

Verma has conducted series of researches in relation to different aspects of life with learning style. Like in 1992 he tried to find-out relationship between “creative
personality and preferred learning styles”. It was found no significant relationship exists between creative personality and preferred learning styles. In 1992 he further explored the relationship of family climate and learning style by a research “an ex-post-facto study of the relationship of family climate and learning style” and found that family climate of adolescent girl students has no significant relation with their preferred learning style.

In 1993 he again tried to investigate “differences in learning styles of adolescent girls students possessing high and low self-concept” and found some difference in learning styles i.e. the girls students possessing high self-concept seem to prefer field-independent and long attention span learning style than the students possessing low self-concept they prefer field-dependent and short attention span learning styles. He focused not only the learning styles of secondary school students but also the learning styles of university students. Verma conducted research in (1993) on “modes and styles of learning of university students as a function of their locus of control”. For this research he used the learning style inventory of David Kolb (976) and in the result non-significant relationship emerged between locus of control and learning styles of university students.

Chi-cling Yen and Seok Lee conducted a research in 1994 on “applicability of the learning style inventory in an Asian context and its predictive value”. It was found that the Singaporean students score was high in abstract conceptualization ability and low in concrete-experience ability and it was proved the learning styles were associated with different educational background.

Gokhale (1995) conducted a research on “Collaborative learning enhances critical thinking”. He also founds that the students with collaborative learning style performed significantly better on the critical thinking test than students who studies individually.
In 1996 Verma conducted research on “modes and styles of learning as functions of personality and motivation”. The study showed that personality (sense of personal identity and locus of control) and motivation (self-actualization and achievement motivation) were not significantly related to the modes and styles of learning of university students.

When all aspects were covered Verma (1996) conducted study on “do different types of schools make a difference in learning style preference of adolescents?” The findings showed that different types of schools lead to difference in learning styles of the adolescents. Again during the same year Verma and Kumar (1996) combined five variables in one study named “study involvement and learning styles of women students as related to residential background, academic stream and type of institution”. The findings of the study indicated that the rural women students with Arts subjects studying at government institutions showed greater study involvement than urban women students with Science subjects studying at private institutions. Further the rural students prefer avoidant learning style; Science students showed preference for other learning styles; the students of private institutions have inclination towards independent and avoidant learning styles.

Verma (1997) conducted a research on “learning style preferences of intellectually gifted adolescents and implications for instruction”. The analysis of data showed that intellectually gifted adolescent students possess different learning styles and these different learning styles has different implications on instructions like preference of individualistic learning style encourage independence in learning, the teacher may
provide opportunity to the students having flexible learning style in the completion of assignments which leads to creativity etc.

Verma (1999) investigated “student’s perceptual style preference and classroom environment in vocational schools”. The findings showed that vocational and non-vocational secondary school students had similar level of preference for visual, aural, and kinesthetic perceptual styles.

Mirza in (2001) study the “relationship of socio-economic status with achievement” and found socio-economic status of students has fairly significant effect on their achievement.

Imtaiz (2004) conducted a research to investigate the learning style preferences of university students. He uses Hanson and Silvir’s Learning Preference Inventory. Four types of learning style i.e. Mastery (ST) Learner, Interpersonal (SF) Learner, Understanding (NT) Learner and Self-Expressive (NF) Learner have been identified among students. The findings were majority of students preferred concrete and specific information, move step by step, learn by practice, emphasis on memory and repeat over and over what has been learned on the other hand a very few students show preferences for imagination, creativity and new possibilities.

Aragon, Johnson, and Shaik (2004) conducted research study on “The Influence of Learning Style Preferences on Student Success in Online versus Face-to-Face Environments”. They used the same learning styles questionnaire of Grasha & Riechmann. The data was collected by using three learning style instruments. The population was the students enrolled in an online instructional design course and students in an equivalent face-to-face course to determine the students’ preferences across the
constructs of motivation maintenance, task engagement, and cognitive controls. Significant differences were found between the learning style preferences of the online students and those of the face-to-face students, these differences were not significant when success factors were controlled. The results of the study suggested that students can learn equally well in either delivery format, regardless of learning style, provided the developed course revolve around adult learning theory and sound instructional design guidelines.

Al-Othman conducted research in 2004 to find out the relationship between gender and learning styles in internet-based teaching at Kuwait. The focus of the study was on students' reactions to online education in TEFL as determined by degree of satisfaction with regards to: classes, degree of mastery of content, degree of applicability of content, and preferences for learning tools; applied to the various online sessions they have taken in a TEFL methodology course. Findings revealed that there were obviously a multitude of factors that influence reactions to online learning and teaching. The study concluded that it was not possible to estimate the weighting of these factors that occur in a student's mind as he/she evaluates an online course.

Anzelmo-Skelton (2006) examine the effects of learning style, strategy use, and personalization of mathematical word problems on the selection of appropriate operations and the execution of correct computational responses by students with learning disabilities (LD). The secondary purpose of the study was to determine if learning style, strategy used, and personalization of mathematical word problems interacted with mathematical word problem achievement levels to effect students with learning disabilities selection of appropriate operations and execution of correct computational
responses. The sample was 144 male students of elementary schools with learning disabilities receiving general and special education services. Results of this study revealed that learning style did affect students with learning disabilities, selection of appropriate operations and execution of correct computational responses of mathematical word problems. The other outcomes of the study indicated no statistically significant results. Further investigations were made regarding the affect of learning style, strategy used, and/or personalization on the mathematical responses of students with learning disabilities.

Uzun and Sentruk conducted a study in (2008) assessing learning styles of students at uludag university faculty of education. The purpose of the study was to determine learning styles of students in order to develop teaching strategies about Computer Literacy Course and to find out the significant difference on learning preferences between students from different departments. Grasha & Riechmann Learning Style Survey was used to assess the learning style preferences of the students. Sample of this study was randomly selected 177 students consisted of 53 students from The Department of Educational Science, 38 students from The Department of Turkish Education, 86 students from The Department of Primary Education. Data were collected from a web page designed for Computer Literacy Course given to these students. Results suggested that students prefer collaborative and competitive style learners. One way ANOVA was used to determine the difference on learning preferences between students from different departments for six sub categories of learning style inventory. Data analysis revealed that there were no department-related differences on students’ learning preferences.
Thomas, Ratcliffe, Woodbury and Jarman (2004) conducted an experimental research study on Learning Styles and Performance in the Introductory Programming Sequence at university of Wales United Kingdom. The objective of the study was to reports on the implication of different preferred learning styles on students' performance in the introductory programming sequence as on work in progress on how to accommodate these different styles. Students were given a learning styles preference test and then their preferred learning styles were compared to their performance on the exam and the practical programming part of the introductory programming module. There were significant differences in performance between groups of students. Research has shown that methods of teaching and learning which combine significant student autonomy, conjecturing and articulation with dynamic scaffolding by the teacher are highly effective.

2.31 **Summary of the whole discussion**

The purpose of education is to develop the individual’s personality. All the efforts of psychologists and educationists revolved around it. They started to define learning. They focused learning by different aspects. At one side they looked down how the brain functions with the growth of an individual on other side they tried to know how the brain develop. How people get, process and retained information. Whatever they understood it was presented in the name of learning theories. The earlier psychologists focus behavior of the person. They described learning as a mechanical task. It is a drill process and promotes rote memorization. They were known as behaviorists. Socialists criticize them and gave their own point of view about learning. They said learner can not live in
isolation and learning is a social activity, when learner interacts with environment learning takes place. The cognitivists said that the learning is the cognitive process. They focus on cognitive map. All the theories overlap each other. The new school of thought did not deny the previous one rather they modify the concept. When these learning theories grow it provided the base for learning styles.

The learning style is the learner’s preferred way of perceiving and responding to the information in a specific learning situation the concept of learning style travel with the learning theories. Every learning theory advocates a learning style. Research on learning styles leads to the different directions some see learning styles in the cover of cognitive style but these are different and some wrap it in personality styles, some focus environment and some psychology of the person. The reason is as there is variation in learning theories so in the learning styles.

Learning style is the way of processing information. When we stand on the feet of behaviorists/environment oriented situation our thinking reflects accordingly and the Dunn and Dunn, Jhon Holand’s and Schmeck, Ribich and Aggarwal’s model of learning style emerges. When it looked by the socialist point of view they consider the interpersonal relationship helps to gain, understand and assimilate information, then Grasha and Riechmann, and Marcia Baxter’s model appears in literature and when the proponents of cognitive learning theory focuses learning styles Kolb’s Gregric and Honey and Mumford learning style model grab the attention of people. The focus of all the above were physical environment, social environment and cognitive abilities for describing learning styles. The Felder and Silverman combine cognitive and personality both and Felder and Silverman learning style model emerges.
Everyone did a god job in their own perspective and tried to highlight their own point of view. In this way various directions appeared. The focus of this research was to study the student’s way of learning in classroom while interacting with peers and teachers; which learning style they prefer during their learning in class and what is the role of socio-economic status (SES) to enhance the learning achievement. For this purpose Grasha’s learning style model was adopted according to Pakistani scenario. This model described six learning styles.

Social status decides the position of a person in the society. To determine the social status in depth study was done. Literature showed like the learning styles many theories and approaches were described by the socialists time to time to determine the status of a person. The prominent social class theories were Karl Marx’s “class and capitalism”, Max Weber’s “class, status and party”, “Theory of functionalism” and “the conflict theory” were found to determine the status of the person in society. Parallel to these theories some approaches were also used to measure class position in open class society. These approaches were “the style of life”, “the reputational”, “the subjective”, “the occupational prestige” and “the multiple index approach. After reviewing the social structure of different neighboring countries five class structure of SES was selected to classify the respondents. The questionnaire for measuring the SES of respondents was developed keeping in view the National documents of Pakistan.

Five classes “upper class”, “upper middle class”, “middle class”, “lower middle class” and “lower class” were used to classify the parents of the students involved in the study.
For this research learning style and SES were used as independent variables and
the learning achievement as dependant variable. In Pakistan Board’s of Intermediate and
Secondary Education are the institutions responsible to assess students’ achievement and
award them certificate of success. The students involved in conducting this study were
enrolled in four districts, three from Punjab province and one from Federation. The
student’s scores obtained on their Secondary School Certificate Examination conducted
by their respective Board’s of Intermediate and Secondary Education was taken as their
learning achievement. These institutions uses written, oral and worked sample test to
assess the students’ achievement.

Other research studies were also reviewed who have similar theme. Some
researches were about the SES and achievement some about the learning styles and
achievement and some focus gender-wise and area-wise preference of learning styles.
Some studies focus learning styles of distance learning other focus learning styles of
formal students. Some researchers used Grasha and Riechmann instrument some uses
other instruments. A long discussion showed the research studies can be categories in
three ways. Some of the studies showed that the socio-economic status affect the
achievement. (Bond, 1981; Kaeley, 1990; Verma & Sheikh, 1992; and Mirza, 2001), one
study showed no effect of SES on achievement. (Verma & Tiku, 1990).

Parallel to this different variables were studied with learning styles. The major
variables were gender, institutions, personality different stream of academic subjects,
creativity, area, family climate, locus of control, choice of career motivation, anxiety etc.
Some variables affected learning styles (Hopkin, 1982; Pardan, 1985; Bishop, 1985;
Ketchum, 1985; Dunn, 1989; Verma & Kumari, 1988-89; Verma & Kumari, 1989-90;

One study Verma & Tiku (1990) showed no relationship between SES and Learning Styles. Some studies showed partial effect of different variables. Al-Otman (2004) showed that it is not possible to estimate the weighting of these factors that occur in a student's mind as he/she evaluates an online course.

So in the light of above discussion researcher feel forced to look through the situation deeply in Pakistani perspective.
CHAPTER 3

METHODOLOGY AND PROCEDURE

The method of studying a problem is conditioned by many factors, such as the nature of the problem, the place where the research is to be conducted and other resources available to the researcher. The procedure of the study includes the following:

- Research design and method,
- Population and sampling,
- Research instruments,
- Data collection and the statistical use for the analysis of data

3.1 Research Design and Method

The research design used was descriptive and the nature of the study was ex-post facto research. The independent variables were learning styles of the students and socio-economic status (SES) of the parents of selected students and the dependent variable was learning achievement of sampled students.

3.2 Demographic Variable of the Sampled Districts

The sample districts were selected from the northern zone called Barani zone of Pakistan. They are linked by road. These districts were classified as developed and underdeveloped on the bases of literacy rate, services available and facilities provided by government or other non-governmental organizations as was described by Khawaja (2005).
Islamabad and Rawalpindi district were categorized as developed districts and Attock and Chakwal districts were as under developed districts. Islamabad is the capital of Pakistan and Rawalpindi is sister city of it. Both the districts were declared as developed cities have literacy rate 72.38 and 70.5 higher in ranking regarding literacy, both the districts have many facilities in terms of education, health, business and trade, embassies and foreign offices etc. Attock and Chakwal districts have fewer facilities when compared with the developed districts. The literacy rate of Attock and Chakwal is 49.27 and 56.72 respectively. Although both district are neighbors of developed district but there is a waste difference in facilities and services available and living standards of people.

Developed district have almost same educational and health facilities as both have many big hospitals and universities. Chakwal district has one small campus of University of Engineering and Technology Taxila and one District Head Quarter Hospital, whereas Attock has a campus of University of Education Lahore and one government hospital.

**Procedure**

Researcher adopted following procedure for the study.

3.3 **Population**

Students enrolled at four districts Attock, Chakwal, Islamabad and Rawalpindi were identified as population. These districts were selected because they presented one region called “Pothohar Plateau” on the map of Pakistan and the socio-economic status of the population living there is almost equal. The main strata’s of population were defined as male, female, rural and urban. Executive District Office (EDO) Attock, Chakwal and
Rawalpindi and Federal Directorate of Education Islamabad provided the list of schools working under their control and supervision and the total number of students enrolled in session 2006-2007 in secondary class called 10th grade. According to the information provided by the respective Executive District Office (EDO) and Federal Directorate of Education Islamabad each district has different number of secondary schools and have different enrollment. Some schools have high enrollment some have low. The detail of the secondary schools and the enrolled students within the target area is presented in table 3-1.

| District       | N   | Enr  | Male School          | Female School         |
|               |     |      | Total | Rural | Urban | Total | Rural | Urban |
| Attock        | 162 | 3875 | 106   | 91    | 15    | 56    | 44    | 12    |
| Chakwal       | 163 | 3125 | 102   | 95    | 07    | 61    | 57    | 04    |
| Islamabad     | 95  | 2004 | 048   | 32    | 16    | 47    | 28    | 19    |
| Rawalpindi    | 266 | 4250 | 167   | 127   | 40    | 99    | 87    | 12    |
| Total         | 686 | 13254| 423   | 345   | 78    | 263   | 216   | 47    |

N= number of schools  
Enr = number of enrolled students

3.4 **Sample Design**

Multi-stage stratified random sampling design was adopted for the current study. At first stage every tenth school from the list provided by respective District Education Offices and Federal Directorate of Education Islamabad was selected randomly keeping in view the four strata’s (male, female, rural and urban)(Appendix-B-C-D-E). At second stage respondents were selected. All students who were present on the data collection day were included in the study. The detail is given in table number 3-2.
Table: 3-2  Sample of the study by schools and students included in the study

<table>
<thead>
<tr>
<th>District</th>
<th>No. of Selected schools</th>
<th>No. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attock</td>
<td>16</td>
<td>775</td>
</tr>
<tr>
<td>Chakwal</td>
<td>16</td>
<td>625</td>
</tr>
<tr>
<td>Islamabad</td>
<td>08</td>
<td>200</td>
</tr>
<tr>
<td>Rawalpindi</td>
<td>26</td>
<td>850</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>2450</td>
</tr>
</tbody>
</table>

Sample Design

Figure-3-1: Sample Design of the study
Distribution of questionnaire and response rate from each district, gender-wise and region-wise is presented in table 3-3, 3-4 and 3-5.

Table: 3-3 Response rate from sampled student’s by district

<table>
<thead>
<tr>
<th>District</th>
<th>Delivered</th>
<th>Received</th>
<th>Response Rate(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attock</td>
<td>775</td>
<td>492</td>
<td>63</td>
</tr>
<tr>
<td>Chakwal</td>
<td>625</td>
<td>452</td>
<td>72</td>
</tr>
<tr>
<td>Islamabad</td>
<td>200</td>
<td>126</td>
<td>63</td>
</tr>
<tr>
<td>Rawalpindi</td>
<td>850</td>
<td>510</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>2450</td>
<td>1580</td>
<td>64</td>
</tr>
</tbody>
</table>

Table 3-3 shows the variation in response rate. This was because the student’s questionnaire was filled by themselves in class but the SES Questionnaire was filled by their parents at home. Some students or their parents did not return the questionnaire. So the overall returned response rate of sampled students was 64 percent. The district-wise response rate of Attock, Chakwal, Islamabad and Rawalpindi was 63, 72, 63 and 60 percent respectively.

Table: 3-4 Response rate by gender

<table>
<thead>
<tr>
<th>District</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Delivered</td>
<td>Received</td>
</tr>
<tr>
<td>Attock</td>
<td>500</td>
<td>304</td>
</tr>
<tr>
<td>Chakwal</td>
<td>400</td>
<td>275</td>
</tr>
<tr>
<td>Islamabad</td>
<td>100</td>
<td>58</td>
</tr>
<tr>
<td>Rawalpindi</td>
<td>575</td>
<td>327</td>
</tr>
</tbody>
</table>

Table 3-4 indicates gender-wise response rate of male and female students of each district. The response rate of male and female students from Chakwal district was highest i.e. 69 and 78 percent respectively. The response rate of male and female students from Rawalpindi district was lowest that is 57 and 66 percent respectively.
Table: 3-5  
Response rate by region

<table>
<thead>
<tr>
<th>District</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Delivered</td>
<td>Received</td>
</tr>
<tr>
<td>Attock</td>
<td>325</td>
<td>166</td>
</tr>
<tr>
<td>Chakwal</td>
<td>400</td>
<td>282</td>
</tr>
<tr>
<td>Islamabad</td>
<td>100</td>
<td>63</td>
</tr>
<tr>
<td>Rawalpindi</td>
<td>425</td>
<td>239</td>
</tr>
</tbody>
</table>

Table 3-5 gives the response rate of rural and urban students. Table further shows the response rate of the rural and urban students from Chakwal was highest that is 70 and 75 percent respectively. The response rate of the rural students of Attock district was lowest i.e. 51 percent.

3.5 **Instruments**

For the research three types of data were required: first; information about students Learning Styles, second; information about Socio-economic Status (SES) of the parents of students and indirectly of students and third; student’s achievement scores. For learning styles, Grasha & Riechmann’s (1975) questionnaire “Learning Style Scale Questionnaire” was adopted, for Socio-economic Status “Socio-economic Status (SES) Scale Questionnaire” was developed by researcher and Student’s achievement scores in Secondary School Certificate (SSC) Examination 2007 were used for their academic achievement. For the academic achievement SSC examination scores was used because FBISE Islamabad and BISE Rawalpindi prepared standardized paper for measuring students’ achievement and it was difficult for researcher to prepare standardized paper for all subjects evaluated in the SSC examination.
3.5.1 Learning Style Scale Questionnaire

Grasha and Riechmann (1975) prepared Learning Style Scale Questionnaire for measuring students learning styles. The original version which was developed in 1974 has ninety statements. The modified version 2002 of the questionnaire contains 60 statements; it is available on inter-net (Appendix-F). The questionnaire focuses on six learning styles named as Independent, Dependent, Collaborative, Competitive, Participant and Avoidant. Each style has ten statements. Each statement refers to a specific situation of respective learning style. All the statements were regarding the teaching and learning in classroom environment.

a) Variables of the questionnaire

The questionnaire was assembled in a specific pattern. The statements of each style were placed in the sequence of Independent, Avoidant, Collaborative, Dependent, Competitive and Participant Learning Style respectively. The statements were placed in this way to avoid the influence of style on students. The Statements were designed to respond on five point Likert Scale.

b) Scoring Procedure of the Questionnaire

The scoring manual was also given by the Author of the questionnaire. The obtained score for each style may range between fifty and five; the maximum may be fifty and the minimum may be five. It can be machine as well as manual scored. Machine scoring does it automatically as program was installed with the questionnaire. The manual scoring procedure was as follows:
1. Copy responses from the questionnaire returned by the students with given ratings on the space provided below for each item.

   Learning Style Test Items
   1.____  2.____  3.____  4.____  5.____  6.____
   7.____  8.____  9.____ 10.____ 11.____ 12.____
  13.____ 14.____ 15.____ 16.____ 17.____ 18.____
  19.____ 20.____ 21.____ 22.____ 23.____ 24.____
  25.____ 26.____ 27.____ 28.____ 29.____ 30.____
  31.____ 32.____ 33.____ 34.____ 35.____ 36.____
  37.____ 38.____ 39.____ 40.____ 41.____ 42.____
  43.____ 44.____ 45.____ 46.____ 47.____ 48.____
  49.____ 50.____ 51.____ 52.____ 53.____ 54.____
  55.____ 56.____ 57.____ 58.____ 59.____ 60.____

2. Sum the ratings for each column and place them in the spaces below
   .____  .____  .____  .____  .____  .____  .____

3. Divide total score for each column by 10 and place answer in the spaces below:
   .____  .____  .____  .____  .____  .____  .____

   Independent  Avoidant  Collaborative  Dependent  Competitive  Participant

4. The names for each learning style associated with each column are shown above.

5. Check whether score represents a relatively Low, Moderate, or High score based on the norms for each learning style scale shown below:

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>[1.0-2.7]</td>
<td>[2.8-3.8]</td>
<td>[3.9-5.0]</td>
</tr>
<tr>
<td>Avoidant</td>
<td>[1.0-1.8]</td>
<td>[1.9-3.1]</td>
<td>[3.2-5.0]</td>
</tr>
<tr>
<td>Collaborative</td>
<td>[1.0-2.7]</td>
<td>[2.8-3.4]</td>
<td>[3.5-5.0]</td>
</tr>
<tr>
<td>Dependent</td>
<td>[1.0-2.9]</td>
<td>[3.0-4.0]</td>
<td>[4.1-5.0]</td>
</tr>
<tr>
<td>Competitive</td>
<td>[1.0-1.7]</td>
<td>[1.8-2.8]</td>
<td>[2.9-5.0]</td>
</tr>
<tr>
<td>Participant</td>
<td>[1.0-3.0]</td>
<td>[3.1-4.1]</td>
<td>[4.2-5.0]</td>
</tr>
</tbody>
</table>
3.5.2 Details of the Questionnaire for the study

The Grasha’s Questionnaire was adopted by the researcher. The questionnaire was translated into Urdu and English language with the help of experts of Urdu and English Language departments of different universities. Learning Style Scale Questionnaire was comprised of sixty statements ten for each Learning Style i.e. Independent, Dependent, Collaborative, Competitive, Participant and Avoidant. The statements were distributed in the same order as suggested by the author to avoid the influence of different learning styles on students. Each statement carried five possible responses. The Likert 5 point method of summated rating was used. The scaled values used against each response were Strongly Disagreed (SD) =1, Disagreed (D) =2, Not Decided (ND) =3, Agreed (A) =4 and Strongly Agreed (SA) =5. (English and Urdu Version of Learning Style Questionnaire attached at Appendix-H&J)

The same scoring procedure adopted as was suggested by the author. It was pilot tested in four schools (Appendix-A) other than the schools from where sample was drawn: two from each districts Islamabad and Rawalpindi. On the basis of the result of the pilot testing the highlighted confusions in the statements of the instrument were rectified.

As many learning style inventories’ and questionnaires are available in market as the learning styles are; but the first reason to use this learning style questionnaire was; as the main focus of the study was students learning in classroom i.e. social interaction of students in class. What are the contributions of teachers’ and peers’ to develop a personality? Whether the social relations effects the learning styles and achievements or not? The second reason was; the other learning styles are based on inherited
characteristic. Some are related to personality traits which are psychology based (Jhon Holland's Model) some are cognitive styles (Kolb’s, Honey and Mumford’s) comes from heredity or God giftedness. Aggarwal’s and Dunn & Dunn’s focuses environment some are the combination of two factors personality and cognitive (Felder & Silverman). All focuses individuals; Individual’s personality, individual’s intelligence, individual’s working with physical environment. Grasha & Riechmann has paid attention on the learning style working in the classroom with other students and with teachers. This style has combination of factors as defined by Grasha and Riechmann independent and dependent (no relation with or depend on others), collaborative and Competitive (sharing and working with each other or not sharing but working to compete human’s involved) and participation and avoidant again focus is on students. So the researcher selected this learning style questionnaire for the study. The questionnaire is available on net even then the researcher asked the publisher for the permission to use the questionnaire by e-mail but got no response.

3.5.3 Socio-Economic Status (SES) Scale Questionnaire

“Socio-economic Status (SES) Scale Questionnaire” was used to identify the Socio-economic Status (SES) of the parents of sampled students. The indicators used for defining Socio-economic status were taken from the national documents of Pakistan, like Pakistan Social and Living Standards Measurement Survey 2004-05 by Federal Bureau of Statistics Islamabad and Pakistan Economic Survey for the year 2005-06.
a) **Pakistan Social and Living Standards Measurement Survey (PSLSMS) 2004-05**

Pakistan Social and Living Standards Measurement Survey (PSLSMS) 2004-05 was fourteen page official document. It was developed by Federal Bureau of Statistics Government of Pakistan (Appendix-K). It was the latest version available in the office of Bureau of Statistics. It was used to measure the social and living standards of Pakistani people. It was a detailed instrument containing fourteen portions A, B, C, D, E, F, G, H, I, J, K, L, M and N. Each part required different detail.

The part A was about introduction. It asked the detail of province, district, city, name of interviewer and interviewee. Part B was about the detail of family size (male and female members). C part was about the educational levels of the family members. The next part D was about the health facilities available and utilized by the members of the family. The E part of the questionnaire was about the nature of the job of the earning member of the family. F part asked about the property (agriculture land, personal live stock) and facilities (iron, fans, sewing machine refrigerator, and traveling facilities) available to a family. The G part of the instrument was about the nature of accommodation and utilities. H portion has two parts the first was about the income and expenditure and the second part was about the loan a family has taken and spends on which item. The “I” part asked the safety measure for the children less then age five. The J & K part discussed the condition of married women of the family and services and facilities availed by the family members respectively. The last part L was about the detailed expenditure of the family. This questionnaire was used to measure and determine the social and living standard of a family which was consulted by the researcher to
develop SES questionnaire for the measurement of SES of the parents of the sampled students.

b) **Pakistan Economic Survey 2005-06**

The second document which was consulted for the development of SES questionnaire was Pakistan Economic Survey 2005-06. This document is an official document developed by Economic Adviser’s Wing, Finance division, Government of Pakistan. The document defined economic and social indicators (Appendix-L). The indicators defined by this book were growth rate (constant and current), consumer price index, fiscal policy, money and credit, stock exchange market, balance of payments, commodity sectors, infrastructure, human resources and social development.

Along with the two documents discussed above a research study of Sabzwari (2004, p.50) was also consulted. The indicators taken by him were educational qualification, occupation, monthly income, supervision/teaching to children, time spend with children, participation of children for sports and the value system of a family.

After analyzing all the documents and discussed with the experts of the sociology departments of different university some indicators were finalized by the researcher with the consent and help of supervisor. The main indicators were the parents’ academic and professional qualifications, parents income level, job, family size, locality and nature of accommodation, facilities at home, traveling facilities, distance of school from home and coaching at home. After pilot testing the instruments were finalized in the reflection of the responses of students and by their parents with the expert opinions of experts (Appendix-G&I).
3.6 **Validity and Reliability of Instruments**

Validity is the degree to which an instrument measures what it is supposed to measure and consequently, permits appropriate interpretation of scores. This is the match between the conceptual definition and the operational definition of terms. For the validity both the instruments “Learning Style Scale Questionnaire” and “Socio-economic Status Scale Questionnaire” were delivered to different experts of Psychology, Sociology and Languages, and were received with their comments. In the light of the experts’ opinion the instruments were finalized.

The reliability means dependability, or trustworthiness. According to Gay (1992), “The reliability is the degree to which an instrument consistently measures whatever it measures”. An instrument is reliable if it yields consistent scores when the phenomenon being measured is not changing. It is the degree to which scores are free of “measurement error”. The reliability of an opinionnaire may be measured by inter-item reliability type. The inter-item reliability measures internal consistency of statements. The internal consistency is the association of answers to a set of questions designed to measure the same concept. The stronger the association among individual items and the more items included, the higher the reliability of an index.

- *Cronbach’s alpha* is a statistics commonly used to measure inter-item reliability
- Cronbach’s alpha is based on the average of all the possible correlations of all the split 1/2s of a set of questions on a questionnaire.

The pilot test of Learning Style Questionnaire and Socio-economic Scale Questionnaire was done in four schools; two from Rawalpindi and two from Islamabad
other than the sample schools. The list of pilot test schools is attached at Appendix-A. The learning style questionnaire was filled by students in the class and socio-economic status scale questionnaire was carried by them to home and that was filled by their parents. The statements were clear to the students no one asked any significant question regarding the statements of both the questionnaire. The data were entered in to computer through Statistical Package for Social Sciences SPSS and the reliability of the learning style scale questionnaire was calculated by Cronbach alpha and it was found 0.75.

3.7 **Socio-economic Status Questionnaire Codes**

After a long discussion with the experts of Sociology and Language departments of different universities and with the consent of supervisor the SES Questionnaire were assigned specific codes. The allotted codes were as follows:

- Education of parents = 1 – 8
- Professional education of parents = Certificate =1 Diploma =2 Degree =3
- Income sources = 1 - 3
- Father/mother job = 1 – 3
- Family size = members a family have
- Earning members of the family = number of earning members
- Children enrolled in educational levels = 1-6
- Income group = 1-6
- Nature of accommodation = 1-5
- Facilities at home = 1-9
- Traveling facilities = 1-3
Distance of school from home = number of kilometers

Coaching at home = 1-6

3.8 **Data Collection**

Data was collected, by administering both the instruments “Learning Style Scale Questionnaire” and “Socio-economic Scale Questionnaire” directly to students in their respective classes with the help of their teachers in the month of March, 2007. The Learning Style Scale Questionnaire was responded by students him/her self in class room whereas the Socio-economic Scale Questionnaire was reported by their parents. Some of the students and their parents did not returned the questionnaire so the variation in response rate occurred which is discussed in section 3.3 Table 3-3 of this chapter. The achievement data of the students was collected from the gazette of Board of Intermediate and Secondary Education Rawalpindi and Federal Board of Intermediate and Secondary Education Islamabad of SSC Examination 2007.

3.9 **Data Analysis**

Collected data was entered in computer with the help of data entry operator during June-August, 2007 for the purpose of analysis through software Statistical Package for Social Sciences (SPSS). Descriptive statistics (frequency and percentage) and inferential statistics (Pearson correlation and t-test) were used to analyze the data.
3.10 **Limitations**

During the process of conducting the study some problems were faced by the researcher so the study was restricted at some variables:

1. It was difficult to include the students from all provinces of Pakistan so the study was restricted to the students of four districts, three from Punjab and one from Federation constituting the “Pothohar Plateau”.

2. It was difficult to manipulate all the defined learning styles so the study was restricted to only Garasha & Riechmenn’s Social Interaction Model.

3. It was difficult to manipulate all the indicators of SES however the study was restricted to some basic indicators like education, income, facilities at home and family size.

4. The internal assessment was not given the weight-age. The reason was teachers feel threat against them. The study was restricted to external examination of the students only which were conducted by the Board of Intermediate and Secondary Education.
CHAPTER 4
DATA ANALYSIS AND INTERPRETATION

This chapter deals with the data analysis and its interpretation. For this purpose the whole chapter has been divided into three sections. The first section presents the analysis of the data by using percentages for the distribution of sample in different groups of SES and academic achievement. The second section reflects the relationship of different variables by using Pearson’s Product Moment Correlation and the third section presents the difference in opinion of the sampled students by using t-test.

SECTION 1

4.1 Formation of status class

The five class social structure was used. The classes were named as upper class, upper middle class, middle class, lower middle class, and the lower class. This structure was previously used by Sabzwari (2004) to study the social structure in Pakistan. All the variables were scored and total scores were used to make different classes. The maximum score obtained on Socio-Economic Status Scale Questionnaire by the respondents was 150 and minimum score was 106. According to the obtained scores the classes were made by a fix interval. The detail is as follows:
Table 4-1 Breakdown of social classes according to obtained scores

<table>
<thead>
<tr>
<th>Classes</th>
<th>Number of respondents</th>
<th>Percentage (%)</th>
<th>SES Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>42</td>
<td>02.66</td>
<td>142 – 150</td>
</tr>
<tr>
<td>Upper Middle class</td>
<td>260</td>
<td>16.45</td>
<td>133 – 141</td>
</tr>
<tr>
<td>Middle class</td>
<td>641</td>
<td>40.57</td>
<td>124 – 132</td>
</tr>
<tr>
<td>Lower Middle class</td>
<td>575</td>
<td>36.39</td>
<td>115 – 123</td>
</tr>
<tr>
<td>Lower class</td>
<td>62</td>
<td>03.90</td>
<td>106 – 114</td>
</tr>
</tbody>
</table>

Total Number of Respondents=1580

Table 4-1 indicates that in the selected sample 16.45% parents were from the upper middle class, 40.57% of the parents of the students were from middle class and 36.39% were from lower middle class. So the majority i.e. 93.41 percent students belong to middle class. This also indicates that majority students of middle class are studying in public sector educational institutions. This may be due to their economic position and perhaps they are able to afford the expenditure of public sector schools only.
The achievement of the students’ in respect of their scores was collected by the gazette of Board of Intermediate and Secondary Education (BISE) Rawalpindi and Federal Board of Intermediate and Secondary Education (FBISE) Islamabad. The gazette showed that the total score was 1050. The graphic representation of achievement scores of the students’ is given in following graph.

Graph-1: Achievement of the respondents at secondary level.

Graph-1 showed the obtained scores of the respondents at secondary level. The graph is negatively skewed. It reflects the performance of the students is below the actual mean. The reason may be the for this session the examination pattern focuses on Application level of Cognitive Domain of Baloom’s Taxonomy but the classroom teaching did not equip them for such tasks.
According to gazette of Board of Intermediate and Secondary Education (BISE) Rawalpindi and Federal Board of Intermediate and Secondary Education (FBISE) Islamabad grading policy (Appendix-M) for the year 2007 the sampled students’ achievement scores were categorized by grades given in table 4-2.

Table 4-2 Distribution of students by grades included in the study

<table>
<thead>
<tr>
<th>Grade</th>
<th>No. of students in sample</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>033</td>
<td>02</td>
</tr>
<tr>
<td>A</td>
<td>167</td>
<td>11</td>
</tr>
<tr>
<td>B</td>
<td>444</td>
<td>28</td>
</tr>
<tr>
<td>C</td>
<td>694</td>
<td>44</td>
</tr>
<tr>
<td>D</td>
<td>238</td>
<td>15</td>
</tr>
<tr>
<td>E</td>
<td>004</td>
<td>00</td>
</tr>
</tbody>
</table>

N=1580

Table 4-2 gives the detail of sampled students’ academic achievements according to their respective grades. It shows that only 13% students were declared as pass in A and above grade, 28% students were in B grade and 44% were declared as C grade achievers and only 15% were low achievers. It strengthens the findings of previous graph-1. It is further be clarified by Pie graph.
The graphical representation of students’ achievements by grades is presented by Pie-graph as follows:

Graph-2: Showing achievement of respondents by grades

Graph-2 highlights number of respondents in different grades. The part number 6 of pie graph represents number of respondents who achieved A\(^+\) grade. The part 5 showed respondents in A grade. Part 4 was showing B grade achievers, similarly part 3, 2 and 1 represents number of students in C, D and E grades respectively. E grade achievers were reflected by 1 they were small in number (only 4) so it was not visible by graph. The greater part of the graph is showing the total number of C grade achievers. This indicates that the performance of majority was below average.
Table 4-3   Distribution of respondents of each SES group in respective grades.

<table>
<thead>
<tr>
<th></th>
<th>A*</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Class</td>
<td>0</td>
<td>9</td>
<td>13</td>
<td>15</td>
<td>5</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>Upper Middle Class</td>
<td>12</td>
<td>29</td>
<td>92</td>
<td>98</td>
<td>29</td>
<td>0</td>
<td>260</td>
</tr>
<tr>
<td>Middle Class</td>
<td>10</td>
<td>87</td>
<td>164</td>
<td>292</td>
<td>88</td>
<td>0</td>
<td>641</td>
</tr>
<tr>
<td>Lower Middle Class</td>
<td>11</td>
<td>39</td>
<td>162</td>
<td>265</td>
<td>95</td>
<td>3</td>
<td>575</td>
</tr>
<tr>
<td>Lower Class</td>
<td>0</td>
<td>3</td>
<td>13</td>
<td>24</td>
<td>21</td>
<td>1</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>167</td>
<td>444</td>
<td>694</td>
<td>238</td>
<td>4</td>
<td>1580</td>
</tr>
</tbody>
</table>

Table 4-3 is a two way table showing the number of respondents in the sample and their distribution in each SES group and in respective achievement grades. Table shows that the majority of the respondents were from middle class (641). Similarly the values in table showed that B and C grade achiever were in majority (444, 694 respectively). The E grade achievers belong to lower middle and lower class.
Table 4-4 Distribution of respondents of developed districts in each SES group and respective grades.

<table>
<thead>
<tr>
<th></th>
<th>A+</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Class</td>
<td>0</td>
<td>5</td>
<td>8</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Upper Middle Class</td>
<td>6</td>
<td>13</td>
<td>47</td>
<td>37</td>
<td>20</td>
<td>0</td>
<td>123</td>
</tr>
<tr>
<td>Middle Class</td>
<td>5</td>
<td>37</td>
<td>47</td>
<td>129</td>
<td>46</td>
<td>0</td>
<td>264</td>
</tr>
<tr>
<td>Lower Middle Class</td>
<td>4</td>
<td>9</td>
<td>58</td>
<td>93</td>
<td>41</td>
<td>0</td>
<td>205</td>
</tr>
<tr>
<td>Lower Class</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>12</td>
<td>6</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>64</td>
<td>165</td>
<td>278</td>
<td>114</td>
<td>0</td>
<td>636</td>
</tr>
</tbody>
</table>

Table 4-4 shows total number of respondents of developed districts and their distribution in SES groups and in respective grades. The overall distribution of respondent presented in table 4-3 was also reflected in this table. The majority of the students were from middle class. Similar values were found regarding grades in table 4-3 majority got B and C grade. No one got E grade in the sample from developed districts.
Table 4-5  Distribution of respondents of under-developed districts in each SES group and respective grades.

<table>
<thead>
<tr>
<th>SES Group</th>
<th>A+</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Class</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Upper Middle Class</td>
<td>6</td>
<td>16</td>
<td>45</td>
<td>61</td>
<td>9</td>
<td>0</td>
<td>137</td>
</tr>
<tr>
<td>Middle Class</td>
<td>5</td>
<td>50</td>
<td>117</td>
<td>163</td>
<td>42</td>
<td>0</td>
<td>377</td>
</tr>
<tr>
<td>Lower Middle Class</td>
<td>7</td>
<td>30</td>
<td>104</td>
<td>172</td>
<td>54</td>
<td>3</td>
<td>370</td>
</tr>
<tr>
<td>Lower Class</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>12</td>
<td>15</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18</td>
<td>103</td>
<td>279</td>
<td>416</td>
<td>124</td>
<td>4</td>
<td>944</td>
</tr>
</tbody>
</table>

Table 4-5 reflects the position of respondents of under-developed districts in each SES group along with their grades. Majority of the respondents belongs to middle and lower middle class (377, 370 respectively). The majority of A+ grade achievers belongs to lower middle class and majority of A grade achievers were from middle class. The majority of upper class respondents (8) of these districts got C grade.

The table 4-3, 4-4 and 4-5 shows that the achievement of respondents is tilted towards left as in tables the majority achieve grade B and C. This distribution showed approximate not exact normal curve of the achievement of the sample.
SECTION 2

In this section the relationship between: learning styles and students’ academic achievement, socio-economic status groups and academic achievement and learning styles and socio-economic status of students is discussed. The one thing appeared during the data analyses which effects the results was the responses of students for competitive learning style. The scoring of Learning Style Scale Questionnaire according to given manual in Chapter 3 section 3.4.1 it was found for competitive learning style the scored value was constant. Constant value can not be correlated. So no relationship was found no analyses were made for this learning style when correlation was calculated.

Question 1: Is there any significant relationship between the different learning styles and learning achievement of students at secondary school level

Table 4-6  Relationship between A+ grade achievers and their learning styles

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>0.222</td>
<td>.231</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.086</td>
<td>.636</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.388*</td>
<td>.026</td>
<td>s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.166</td>
<td>.355</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.046</td>
<td>.787</td>
<td>n.s</td>
</tr>
</tbody>
</table>

*Significant at $\alpha=.05$
Number of respondents = 33

Table 4-6 shows the significant negative relationship between the A+ grade achievers and collaborative learning style, where as relationship with other styles was not significant. Only one relationship was positive and it was with Independent learning style ($r = .222$). It gives some indication of the students learning style that A+ grade achievers were not collaborative. They may prefer Independent learning style.
Table 4-7  Relationship between “A” grade achievers and their learning styles

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>-.087</td>
<td>.261</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.155*</td>
<td>.045</td>
<td>s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.082</td>
<td>.290</td>
<td>n.s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.014</td>
<td>.853</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.036</td>
<td>.647</td>
<td>n.s</td>
</tr>
</tbody>
</table>

* Significant at α=.05
Number of respondents = 167

Table 4-7 indicates the relationship among “A” grade achievers and their learning styles. All the defined relationships were negative. Only one relation was negatively significant. It was between A grade achievement and dependent learning style. The relationship with other styles was not significant and was in low range near zero. It means A grade achievers were not dependent. The other relationships were negative and have low value between 0 and the significant relationship -0.155. The value of collaborative and independent style was approximately equal, whereas the value of avoidant and participant styles was near to zero. It was found that the A grade achievers do not prefer any from these styles.
Table 4-8  Relationship between “B” grade achievers and their learning styles

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.048</td>
<td>.309</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.007</td>
<td>.881</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>.066</td>
<td>.164</td>
<td>n.s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>.070</td>
<td>.142</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.036</td>
<td>.445</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 444

Table 4-8 indicates no significant relation between B grade achievers and their learning styles. Although all the relations were on positive side on the defined range of the correlation, but it is not significantly correlated. The higher value in these minimum relations was with participant learning style i.e.0.070. It implies ‘B’ grade achievers have slight preference for participant learning style. If it be linked with the values of previous table 4-7; it was found that A grade achievers showed no relation with participant learning style; but B grade achievers showed positive relation with participant learning style.
Table 4-9  Relationship between “C” grade achievers and their learning styles

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>-.041</td>
<td>.282</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.040</td>
<td>.295</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.023</td>
<td>.550</td>
<td>n.s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.033</td>
<td>.380</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.049</td>
<td>.194</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 694

Table 4-9 point out that no significant relationship exists between “C” grade achievers and learning styles. From the defined relations, one was positive and others were negative. The value of “r” for avoidant learning style was 0.049 and its “p” value is 0.194. This relationship was not significant but its value is meaningful among the other values. Similarly at the other extreme, the value of “r” which may be considered as meaningful was of independent learning style. The value of “r” for this style was -0.041 and its “p” value were 0.282. This may be interpreted in this way that “C” grade achievers do not prefer independent learning style actually they don’t prefer any style but they have some preference for avoidant learning style.
Table 4-10  Relationship between “D” grade achievers and their learning styles

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>-.027</td>
<td>.682</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.053</td>
<td>.415</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.042</td>
<td>.523</td>
<td>n.s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.005</td>
<td>.940</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.002</td>
<td>.974</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 238

Table 4-10 shows that the relationship between D grade achievers and their learning styles was negative and it was not significant. The extreme values were of Avoidant and dependent learning style. The value of “r” for dependent learning style was -0.053 whereas it was -0.002 for avoidant learning style. The existing relationship was not significant but it may give some indication by extreme values that “D” grade achievers do not prefer dependent learning style; along with it they also do not preferred collaborative style.
<table>
<thead>
<tr>
<th>Groups</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>-.367</td>
<td>.633</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.494</td>
<td>.506</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.494</td>
<td>.506</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.494</td>
<td>.506</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 4

Table 4-11 reveals that the relationship of “E” grade achievers with learning styles collaborative and competitive was not defined. The relationship of E grade achievers with other styles was negative. No relationship was significant. The value of “r” for “E” grade achievement and three learning styles i.e. dependant, participant and avoidant learning style was same and it was -0.494 which is almost equal to -0.5. It is a meaningful negative relation showing “E” grade achievers (low achievers) may not have dependent, participant and avoidant learning style. The variation in the correlation for “E” grade achievement and learning style was only for independent learning style. It is interpreted on the basis of the values of the table that no relationship was significant but “E” grade achievers may not prefer dependent, participant and avoidant learning style.
The overall relationship between learning styles and students achievement is presented in the following table.

Table 4-12 Relationship among different Learning styles and Pearson value of students’ achievements by grades

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>A⁺</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.022</td>
<td>-.089</td>
<td>.048</td>
<td>-.041</td>
<td>-.027</td>
<td>-.367</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.086</td>
<td>-.155*</td>
<td>.007</td>
<td>-.040</td>
<td>-.053</td>
<td>-.494</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.388*</td>
<td>-.082</td>
<td>.066</td>
<td>-.023</td>
<td>-.042</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Competitive style</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>-.166</td>
<td>-.014</td>
<td>.070</td>
<td>-.033</td>
<td>-.005</td>
<td>-.494</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.046</td>
<td>-.036</td>
<td>.036</td>
<td>.049</td>
<td>-.002</td>
<td>-.494</td>
</tr>
</tbody>
</table>

* Significant at α=.05
Total number of respondents = 1580

Table 4-12 depicts that only two relationships were negatively significant. Those were between the A⁺ and A grade achievers and collaborative and dependent learning styles respectively. The other students having B, C, D and E grades have no significant relationship with any learning style. Further the results of the table showed that the highest value of \( r = -.494 \) was of “E” grade achievers and dependant, participant and avoidant learning styles. “E” grade achievers have no preference for dependent, participant and avoidant learning style. A⁺ and A grade achievers were studying independently without co-operating with others. These results indicate the preference of high achievers and low achievers. A⁺ grade achievers and E grade achievers both were not dependent. The reason of both may be different. One group (A⁺ grade achievers) was more concerned about their studies but other seems having less concern for studies. Both prefer the same style. Both are studying in same class. This shows classroom environment did not effect both groups’ achievements or both groups have no interest for classroom activities. Both want to study out of classroom environment.
The selected districts may be categorized as developed and under-developed districts on the bases of indicators presented in Chapter-2 section 2.27. The overall relationship between the learning styles and students’ achievements of developed and under developed district is presented in following tables 4-13 and 4-14.

Table 4-13 Relationship among different Learning styles and Pearson value of students’ achievements by grades of respondents of developed districts.

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>A+</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.092</td>
<td>-.049</td>
<td>.001</td>
<td>-.048</td>
<td>-.074</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.419</td>
<td>-.210</td>
<td>-.114</td>
<td>-.112</td>
<td>-.079</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.606*</td>
<td>-.258*</td>
<td>.011</td>
<td>-.034</td>
<td>-.031</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Competitive style</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>-.606*</td>
<td>-.224</td>
<td>.005</td>
<td>-.049</td>
<td>-.131</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.098</td>
<td>-.101</td>
<td>.075</td>
<td>.030</td>
<td>-.061</td>
<td>Not Defined</td>
</tr>
</tbody>
</table>

* Significant at \( \alpha = .05 \)

Number or respondents = 636

The values of the table 4-13 showed that no respondent from the developed districts got E grade so no analysis for this grade can be made. The negative significant relationship exists among collaborative learning style and A+ and A grade achievement (i.e. between high achievers). The value of “r” shows the relation is more meaningful for A+ grade achievement and collaborative learning style rather than A grade achievement. Further the A+ achievers showed significant negative relationship with the participant learning style. This showed that A+ grade achievers did not prefer collaborative and participant learning styles. The relationship between A+ grade achievement and dependant learning style was also negative and is meaningful. Another negative relationship exists between A grade achievement and dependant and participant learning style the value of r is -.210 and -.224 respectively. All other relations lies near zero and showed no relationship exists among the variables.
### Table 4-14 Relationship among different Learning styles and Pearson value of students’ achievements by grades of respondents of under-developed districts

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>A⁺</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.308</td>
<td>-.087</td>
<td>.074</td>
<td>-.045</td>
<td>.035</td>
<td>-.367</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.267</td>
<td>-.121</td>
<td>.071</td>
<td>.007</td>
<td>-.027</td>
<td>-.494</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>Not Defined</td>
<td>.096</td>
<td>.088</td>
<td>-.017</td>
<td>-.068</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Competitive style</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>.182</td>
<td>.081</td>
<td>.086</td>
<td>-.021</td>
<td>.129</td>
<td>-.494</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.059</td>
<td>-.046</td>
<td>.006</td>
<td>.072</td>
<td>.025</td>
<td>-.494</td>
</tr>
</tbody>
</table>

Total number of respondents = 944

The values of the table 4-14 shows no significant relationship exists among achievement and learning styles of the respondents of under-developed districts. The value of “r” shows although not significant but some relationships exist among the achievement of students and their learning styles. The relationship between E grade achievers and dependent, participant and avoidant learning styles has same values i.e. -.494. This is the highest value of “r” in above table. This can be interpret in this way that E grade achievers (low achievers) form the under developed districts do not prefer dependent, participant and avoidant learning styles. On positive side the value of r = .308 and it is for A⁺ grade achievers and independent learning styles. This shows that (although not significant) higher achievers have some preference for independent learning style. All other relationships exist around 0 which may be interpreted as no relationship exists among learning styles and achievement grades of the respondents of under-developed districts.
Question: 2 Is there any significant relationship between socio-economic status (SES) of parents and academic achievement of their children studying at secondary schools.

Table 4-15 Relationship between A+ grade achievers and different SES groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>00</td>
<td>.00</td>
<td>0.00</td>
<td>no relationship</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>12</td>
<td>.036</td>
<td>.912</td>
<td>n.s</td>
</tr>
<tr>
<td>Middle class</td>
<td>10</td>
<td>.323</td>
<td>.363</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>11</td>
<td>.172</td>
<td>.614</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower class</td>
<td>00</td>
<td>.00</td>
<td>0.00</td>
<td>no relationship</td>
</tr>
</tbody>
</table>

Number of respondents = 33

Although 42 and 62 respondents belongs to upper class and lower class respectively but table 4-15 indicates that no student from upper class and lower class got A+ grade; so no relationship has been defined between these two SES groups and A+ grade achievement. The value of “r” for middle class and A+ grade achievement was 0.323; it was not significant but the relationship exists. Relationship was not significant the reason may be the less number of students (10) in this class. But the middle class has positive relation with A+ grade achievement. The other value of r = 0.172 was for lower middle class it also showed positive relation. It was also not significant but relation exists. Relationship with upper middle class of SES groups and A+ grade was also positive but not significant.
The graphic representation of table 4-15 is as follows:

Graph-3: A+ grade achievement by the respondents in each SES group

Graph-3 showed the frequency of respondents who got A+ grade. According to the information given in graph the students from upper middle class, middle class and lower middle class got A+ grade. None of the students’ from the upper and lower classes got A+ grade.
Table 4-16
Relationship between “A” grade achievers and different SES groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>09</td>
<td>.456</td>
<td>.218</td>
<td>n.s</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>29</td>
<td>-.044</td>
<td>.819</td>
<td>n.s</td>
</tr>
<tr>
<td>Middle class</td>
<td>87</td>
<td>-.134</td>
<td>.217</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>39</td>
<td>.058</td>
<td>.724</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower class</td>
<td>03</td>
<td>-1.000*</td>
<td>.003</td>
<td>s</td>
</tr>
</tbody>
</table>

* Significant at $\alpha=.05$
Number of respondents = 167

Table 4-16 shows relationship between different SES groups of parents and A grade achievement. Table shows a perfect negative significant relationship between A grade achievers and lower class. Table further showed positive relationship between upper class and A grade achievement i.e. $r = .456$. Again two extreme groups showed meaningful inverse relations. This may be interpreted in this way that there is a chance for upper class to get A grade and there may not be a chance for lower class to get A grade from sampled students if the study may revised.
The graphic representation of table 4-16 is given in following graph.

The information of the table 4-16 is further been clarified by the graph-4. The graph-4 represents the respondents of each SES class who got A grade. Graph shows the upper class respondents were at the maximum of A grade and the respondents from lower class were remained at the minimum of A grade.
Table 4-17 Relationship between “B” grade achievers and different SES groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>013</td>
<td>-.134</td>
<td>.663</td>
<td>n.s</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>092</td>
<td>-.071</td>
<td>.499</td>
<td>n.s</td>
</tr>
<tr>
<td>Middle class</td>
<td>164</td>
<td>-.012</td>
<td>.882</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>162</td>
<td>.093</td>
<td>.241</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower class</td>
<td>013</td>
<td>-.279</td>
<td>.357</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents =444

Table 4-17 depicts the relationship between different SES groups and B grade achievers. The value of “r” shows no significant relationship exists between different SES groups and B grade achievers. The detailed investigation shows low negative relations between lower and upper class and B grade achievement. Only one positive relation exists between lower middle class and B grade achievement. The value of r showed no relationship exists with other SES groups and B grade achievement.
The graphic representation of the table 4-17

![Graph-5: B grade achievement by the respondents in each SES group](image)

Graph-5 indicates the number of respondents from each SES group who got B grade along with their marks. Graph showed respondents from lower class and upper class remained at the minimum of B grade whereas the respondents from upper middle class were at the maximum of the B grade. So the performance of upper middle class was better than all other SES groups.
Table 4-18  Relationship between “C” grade achievers and different SES groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>015</td>
<td>-.165</td>
<td>.557</td>
<td>n.s</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>098</td>
<td>.172</td>
<td>.090</td>
<td>n.s</td>
</tr>
<tr>
<td>Middle class</td>
<td>292</td>
<td>.035</td>
<td>.554</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>265</td>
<td>.054</td>
<td>.383</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower class</td>
<td>024</td>
<td>-.265</td>
<td>.211</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 694

Table 4-18 highlights that no significant relationship exists between “C” grade achievers and different SES groups. Two relations between lower class and upper class were negative. The value of r = -0.265 was the value which shows some relationship among other relations. This value was of lower class and C grade achievement the other negative relation was between upper class and C grade. Only one positive relationship between upper middle class and C grade achievement exists. For this relation the value of p = .090 with corresponding to the value of r = .172 was slightly better then others. This relation will become significant if the value of p be less then 0.05.
The graphic representation of table 4-18

Graph-6: C grade achievement by the respondents in each SES group

Graph-6 shows the achievement of the respondents from lower and lower middle class is almost same. They remained near the lower limit of this grade. Whereas the performance of the respondents from the upper class who got C grade was better as compare to lower and lower middle class.
Table 4-19 Relationship between “D” grade achievers and different SES groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>005</td>
<td>-.560</td>
<td>.326</td>
<td>n.s</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>029</td>
<td>.317</td>
<td>.094</td>
<td>n.s</td>
</tr>
<tr>
<td>Middle class</td>
<td>088</td>
<td>.212*</td>
<td>.047</td>
<td>s</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>095</td>
<td>-.021</td>
<td>.837</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower class</td>
<td>021</td>
<td>.168</td>
<td>.466</td>
<td>n.s</td>
</tr>
</tbody>
</table>

* Significant at α=0.05
Number of respondents = 238

Table 4-19 shows that only middle class have significant relationship with D grade. The other classes have no significant relationship with D grade achievement. The relationship between middle class and D grade achievement, although it was significant but the value of r = 0.317 for upper middle class which was higher then the existing value of significant relation (r = 0.212). It implies that there was a strong positive relationship between upper middle class and D grade achievement then the significant relation. The value of r = -.0560 which shows the relation between upper class and D grade achievement. This value is higher then all other relations even from significant relation. This result can not be ignored which indicate the upper class students may not got D grade.

This showed the students from middle class and upper middle class were average students. The reason for this low achievement may be that their parents may not be able to afford expenditure on extra coaching or tuition for their children.
The graphical representation of table 4-19.

![Graph-7: D grade achievement by the respondents in each SES group](image)

This graph reflects the performance of SES groups on D grade. The graph shows that the middle class students remained at the maximum range of D grade. The next to middle class were lower class and lower middle class students. Graph further highlighted that the students from upper middle class and upper class were very few and they remain at the lower end or at minimum of the D grade.
Table 4-20  Relationship between “E” grade achievers and different SES groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>00</td>
<td>not defined</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Upper middle class</td>
<td>00</td>
<td>not defined</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Middle class</td>
<td>00</td>
<td>not defined</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Lower middle class</td>
<td>03</td>
<td>.101</td>
<td>.936</td>
<td>n.s</td>
</tr>
<tr>
<td>Lower class</td>
<td>01</td>
<td>not defined</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Number of respondents = 4

Table 4-20 shows that only 4 students got E grade and they belong to lower middle and lower class. However, no significant relationship was found between these SES groups and E grade.
The graphical representation of table 4-20

Graph-8: E grade achievement by the respondents in each SES group

The graph-8 highlights that only respondents from lower and lower middle classes got E grade. No respondent from any other class got E grade.
The overall relationship between different SES groups of parents and students' achievement is presented in the following table.

Table 4-21  Relationship among different SES groups and Pearson value of students’ achievements by grades

<table>
<thead>
<tr>
<th>SES groups</th>
<th>A⁺</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>.00</td>
<td>.456</td>
<td>-.134</td>
<td>-.165</td>
<td>-.560</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>.036</td>
<td>-.044</td>
<td>-.071</td>
<td>.172</td>
<td>.317</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Middle class</td>
<td>.323</td>
<td>-.134</td>
<td>-.012</td>
<td>.035</td>
<td>.212⁺</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>.172</td>
<td>.058</td>
<td>.093</td>
<td>.054</td>
<td>-.021</td>
<td>.101</td>
</tr>
<tr>
<td>Lower class</td>
<td>.00</td>
<td>-1.00⁺</td>
<td>-.279</td>
<td>-.265</td>
<td>.168</td>
<td>Not Defined</td>
</tr>
</tbody>
</table>

- Significant at α= .05N
- Number of respondents = 1580

Table 4-21 gives the overview of all the results from table 4-15 to 4-20. It indicates the relationship among different SES groups and Pearson value of students’ grades. According to the table there exists a positive significant relationship between middle class and “D” grade, similarly a perfect significant negative relationship exists between lower class and “A” grade of students. Other then significant relation one relation was better that was between upper class and A grade achievement. For this class a negative as well as positive relationship exists. The value of r = .456 was between the upper class and A grade at the same time the value of r = -.560 was for D grade; both the values were inverse to each others but showed an understandable result. Similarly another quotable relationship emerged after analysis between middle class and A⁺ and D grade achievement the value of r was .323 and .212 respectively. This may be interpreted in this way that middle class students has got D grade but there is a chance of some students who may got A⁺ grade. Both the relations were positive. The result for D grade was significant but the value of “r” showing the intensity of relation was higher for A grade achievement.
Table 4-22  Relationship among different SES groups and Pearson value of students’ achievements by grades of the respondents of developed districts.

<table>
<thead>
<tr>
<th>SES groups</th>
<th>A⁺</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>.00</td>
<td>.540</td>
<td>-.245</td>
<td>.082</td>
<td>.00</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>.0172</td>
<td>.206</td>
<td>-.126</td>
<td>.237</td>
<td>.261</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Middle class</td>
<td>.574</td>
<td>-.072</td>
<td>.056</td>
<td>.034</td>
<td>.196</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>-.738</td>
<td>.456</td>
<td>.012</td>
<td>.033</td>
<td>-.006</td>
<td>.101</td>
</tr>
<tr>
<td>Lower class</td>
<td>.00</td>
<td>.00</td>
<td>-.677</td>
<td>-.095</td>
<td>.267</td>
<td>Not Defined</td>
</tr>
</tbody>
</table>

Total number of respondents = 636

Table 4-22 indicates the relationship among different SES groups and achievement grades of the respondents from developed districts. No respondents from this group got E grade no analysis can be done. Table values further highlights that no relationship is significant. The highest positive Pearson value of r in this table is of middle class and A⁺ grade i.e. .574. This shows that the majority of the respondents from middle class got A⁺ grade; whereas the highest negative value of “r” is -0.738 which is inverse value showed the majority of the respondents from lower middle class may not got A⁺ grade. The positive value of “r” indicates a relationship between A grade achievement and Upper class and lower middle class. The value of these two relationships is near to .5 which shows some relationship exists between these two groups.

When relationship is considered with respect to SES groups, it was found that upper class achieve A grade and not B grade the upper middle class remain with B, C and D grade, the middle class with A⁺ and D grade, the lower middle class got A but Not A⁺ grade, and lower class got D not B and C grade in developed districts.
Table 4-23 Relationship among different SES groups and Pearson value of students’ achievements by grades of the respondents of under-developed districts.

<table>
<thead>
<tr>
<th>SES groups</th>
<th>A</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class</td>
<td>.00</td>
<td>.535</td>
<td>.018</td>
<td>.323</td>
<td>-.405</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>-.208</td>
<td>-.140</td>
<td>-.017</td>
<td>.132</td>
<td>.765*</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Middle class</td>
<td>-.455</td>
<td>-.168</td>
<td>-.041</td>
<td>.039</td>
<td>.225</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>.447</td>
<td>-.042</td>
<td>.150</td>
<td>.062</td>
<td>-.040</td>
<td>.101</td>
</tr>
<tr>
<td>Lower class</td>
<td>.00</td>
<td>-1.00*</td>
<td>.363</td>
<td>-.419</td>
<td>.219</td>
<td>Not Defined</td>
</tr>
</tbody>
</table>

* Significant at $\alpha=.05$
Total number of respondents = 944

Table 4-23 depicts the relationship between SES groups and the achievement grades of the respondents of under-developed districts. Table highlight two significant relationships one is positive and other is negative. The positive significant relationship is between the respondents of upper middle class and D grade. The value of $r = .765$ which shows a strong positive relationship. The other significant relationship is also very important; it is perfect negative relation between the respondents of lower class and A grade achievement. Both the relationships may be interpreted in this way that in the sample the respondents from upper middle class got D grade and of lower middle class may not have achieved A grade.
Question: 3  Is there any significant relationship between the different socio-economic status groups of parents and learning styles of their children studying at secondary school level?

Table 4-24  Relationship between “upper class” and learning styles

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.015</td>
<td>.924</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.244</td>
<td>.120</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.320*</td>
<td>.039</td>
<td>s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>.100</td>
<td>.529</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.022</td>
<td>.889</td>
<td>n.s</td>
</tr>
</tbody>
</table>

* Significant at $\alpha=.05$
Number of respondents = 42

Table 4-24 shows that the significant negative relationship exists between upper class and collaborative style. The value of table further shows no significant relationship exists with other styles. All other relationships were positive except the significant relation. In these positive relations the relationship between dependent learning style and upper class was one relation which can be discussed. When assessed between the ranges of correlation i.e. -1 to 1 the only relationship of dependent learning style and upper class has positive “r” value (0.244) which indicates some relationship exists. It can be interpret that upper class students may not collaborate they may depend on others.
Table 4-25  Relationship between “upper middle class” and learning styles

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>-.025</td>
<td>.689</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>-.082</td>
<td>.186</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.080</td>
<td>.199</td>
<td>n.s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.057</td>
<td>.360</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.101</td>
<td>.103</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 260

Table 4-25 indicates no significant relationship exists between the upper middle class and the learning styles. The relationship of different learning styles and upper middle class fall around both the sides of zero, approximately in equal range, which shows no relationship exists. At negative side the value of $r = -0.082$ and at positive side it was .101, but the “p” value shows the relation above zero has some value then the value at negative side. So the upper middle class may prefer avoidant learning style.
<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.118*</td>
<td>.003</td>
<td>s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.055</td>
<td>.165</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.041</td>
<td>.302</td>
<td>n.s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>.020</td>
<td>.609</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.072</td>
<td>.068</td>
<td>n.s</td>
</tr>
</tbody>
</table>

* Significant at $\alpha=.05$

Number of respondents = 641

Table 4-26 reflects the relationship between different learning styles and middle class respondents. Table shows the significant positive relationship exists between independent style and middle class. One relationship was negative and others were positive, but no value of “r” is between the range which may be interpreted. It means no relationship exist between middle class and other learning styles.
Table 4-27 Relationship between “lower middle class” and learning styles

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.059</td>
<td>.157</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.009</td>
<td>.834</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.006</td>
<td>.895</td>
<td>n.s</td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.030</td>
<td>.468</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.002</td>
<td>.957</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 575

Table 4-27 indicates no significant relationship exists between the lower middle class and learning styles. All above relations exists around zero, some on positive side and others on negative side. The main result table shows that no relationship exists among different learning styles and lower middle class.

Table 4-28 Relationship between “lower class” and learning styles

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Pearson Correlation(r)</th>
<th>p value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>-.082</td>
<td>.528</td>
<td>n.s</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.007</td>
<td>.955</td>
<td>n.s</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive style</td>
<td>not defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant style</td>
<td>-.207</td>
<td>.106</td>
<td>n.s</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>-.120</td>
<td>.352</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Number of respondents = 62

Table 4-28 shows no significant relationship exists between lower class and learning styles. One relation is positive i.e. of dependent learning style. The others relationships were negative. No relationship exists among different learning styles and lower class.
The overall relationship between different learning styles and SES groups of parents is presented in the following table.

### Table 4-29 Relationship among different Learning Styles and Pearson value of different SES groups.

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Upper Class</th>
<th>Upper middle class</th>
<th>Middle class</th>
<th>Lower middle class</th>
<th>Lower class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.015</td>
<td>-.025</td>
<td>.118*</td>
<td>.059</td>
<td>-.082</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.244</td>
<td>-.082</td>
<td>.055</td>
<td>.009</td>
<td>-.007</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.320*</td>
<td>-.080</td>
<td>-.041</td>
<td>-.006</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Competitive style</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>.100</td>
<td>-.057</td>
<td>.020</td>
<td>-.030</td>
<td>-.207</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.022</td>
<td>-.101</td>
<td>.072</td>
<td>.002</td>
<td>-.120</td>
</tr>
</tbody>
</table>

* Significant at $\alpha=.05$

The information of table 4-29 indicates that the positive significant relationship exists between the Independent style and middle class. This means the students from middle class possess Independent learning style. Table further shows that negative significant relationship exists between upper class and collaborative learning style. No relationship exists between other learning styles and SES groups. Findings of this table support the findings of table 4-6 and 4-12 that A grade achievers were not collaborative.
Table 4-30  Relationship among different Learning Styles and Pearson value of different SES groups of respondents of developed districts

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Upper Class</th>
<th>Upper middle class</th>
<th>Middle class</th>
<th>Lower middle class</th>
<th>Lower class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.039</td>
<td>-.149</td>
<td>.131*</td>
<td>.176*</td>
<td>-.086</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.164</td>
<td>-.101</td>
<td>.051</td>
<td>-.033</td>
<td>.236</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>Not Defined</td>
<td>-.051</td>
<td>-.072</td>
<td>-.070</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Competitive style</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>.035</td>
<td>-.115</td>
<td>-.014</td>
<td>-.112</td>
<td>-.053</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.260</td>
<td>-.202</td>
<td>.094</td>
<td>.150*</td>
<td>.067</td>
</tr>
</tbody>
</table>

Significant at $\alpha=.05$

Table 4-30 showed the significant relationship between independent learning style and middle, lower middle class students of developed districts. It means the students of middle class and lower middle class preferred independent learning style. The other significant relationship exists between avoidant learning style and lower middle class of developed district. This shows lower class students prefer avoidant and independent learning style. The other value of $r = .260$ was positive but not significant it was of avoidant learning style and upper class this value is higher then the significant values. This shows relative high preference of upper class students for avoidant learning style. Similarly the value of $r = .236$ was on second number which was greater then the significant values it is for the dependent learning style and lower class. This means the upper class students prefer avoidant style and lower class students prefer dependent style. No other relationship between other SES groups and learning styles was found significant.
Table 4-31 Relationship among different Learning Styles and Pearson value of different SES groups of respondents of under-developed districts

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>Upper Class</th>
<th>Upper middle class</th>
<th>Middle class</th>
<th>Lower middle class</th>
<th>Lower class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>.000</td>
<td>.153</td>
<td>.120*</td>
<td>.004</td>
<td>-.067</td>
</tr>
<tr>
<td>Dependent style</td>
<td>.318</td>
<td>-.011</td>
<td>.059</td>
<td>.030</td>
<td>-.185</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>-.289</td>
<td>-.099</td>
<td>.003</td>
<td>.022</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Competitive style</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
<td>Not Defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>.276</td>
<td>-.005</td>
<td>.040</td>
<td>-.008</td>
<td>-.270</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>.293</td>
<td>.153</td>
<td>.055</td>
<td>-.072</td>
<td>-.186</td>
</tr>
</tbody>
</table>

- Significant at $\alpha=.05$

Table 4-31 shows the relationship between learning styles and SES groups of under-developed districts. Only one relationship was significant and that was between independent learning style and middle class. The value of $r = .318$ was between the dependent learning style and upper class which shows the relation high preference of upper class students for dependent learning style. No other relationship between learning styles and SES groups was significant.

The students of middle class from both the developed and under-developed district preferred independent style.
SECTION 3

This Section deals with the opinion about learning styles by gender and locality of students studying at Secondary Schools within the target area.

Question: 4 Is there any significant difference in learning styles of students by gender?

Table 4-32 Opinion about Independent learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>964</td>
<td>2.71</td>
<td>1.802</td>
<td>1578</td>
<td>.072</td>
<td>n.s</td>
</tr>
<tr>
<td>Female</td>
<td>616</td>
<td>2.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-32 shows that the value of t-test at $\alpha=.050$ is not significant for the independent style of male and female respondents. This means there is no significant difference in opinion between male and female respondents about independent learning style. The mean of both the groups is almost same. It also supports the findings that there is no significant difference between the opinion of male and female students for independent learning style.
Table 4-33  Opinion about dependent learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>964</td>
<td>2.79</td>
<td>6.142*</td>
<td>1578</td>
<td>.000</td>
<td>s</td>
</tr>
<tr>
<td>Female</td>
<td>616</td>
<td>2.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at α=.05

According to the table 4-33 the t-value (6.142) is significant at 0.05 level of alpha. It can be concluded that there is significant difference in opinion between male and female respondents regarding dependent learning style. The mean value of female respondents is higher then the mean of male respondents so they showed high preference for dependent learning style.

Table 4-34  Opinion about collaborative learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>964</td>
<td>2.96</td>
<td>1.069</td>
<td>1578</td>
<td>.285</td>
<td>n.s</td>
</tr>
<tr>
<td>Female</td>
<td>616</td>
<td>2.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-34 reveals that the t value (1.069) is not significant at .05 level of significance; it means there is no significant difference in opinion between male and female students on collaborative style. It is further confirmed by the mean values of both the groups (male and female) that both posses the same opinion.
Table 4-35  
**Opinion about competitive learning style by gender**

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>964</td>
<td>2.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>616</td>
<td>2.97</td>
<td></td>
<td></td>
<td></td>
<td>Not defined</td>
</tr>
</tbody>
</table>

Table 4-35 shows opinion of male and female students about competitive was not defined. The mean value of both female and male students is almost the same. This result support that there is no difference between male and female students regarding the competitive learning style.

Table 4-36  
**Opinion about avoidant learning style by gender**

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>964</td>
<td>2.74</td>
<td>4.917*</td>
<td>1578</td>
<td>.000</td>
<td>s</td>
</tr>
<tr>
<td>Female</td>
<td>616</td>
<td>2.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at α=.05

Table 4-36 points out that the t value (4.917) is significant at .05 alpha level. This shows there is a significant difference in opinion between male and female respondents. This is further confirmed as the mean of female respondents (2.84) is higher then the mean of male respondents (2.74). Female respondents have more preference for avoidant style.
Table 4-37  Opinion about participant learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>964</td>
<td>2.81</td>
<td>4.475*</td>
<td>1578</td>
<td>.000</td>
<td>s</td>
</tr>
<tr>
<td>Female</td>
<td>616</td>
<td>2.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at α=.05

Table 4-37 indicates that the t value (4.475) is significant at .05 alpha level. The mean value of female respondents is high (2.89) than the male respondents (2.81) and this confirms that there is significant difference in opinion between male and female respondents. Female respondents have participant learning style.

From the interpretation of tables from 4-32 to 4-37 it can be highlighted that female respondents have dependent, avoidant and participant learning styles as compared to male respondents.
Question 5: Is there any significant difference in learning styles of students by region?

Table 4-38 Opinion about Independent learning style by region

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>750</td>
<td>2.73</td>
<td></td>
<td></td>
<td>0.619</td>
<td>1578 0.536</td>
</tr>
<tr>
<td>Urban</td>
<td>830</td>
<td>2.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-38 highlights that t value (0.619) at $\alpha = .05$ is not significant which is further confirmed by the mean value of male and female respondents which is equal. This showed that there is no significant difference in opinion between rural and urban respondents on independent style.

Table 4-39 Opinion about dependent learning style by region

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>750</td>
<td>2.83</td>
<td></td>
<td></td>
<td>0.043</td>
<td>1578 0.966</td>
</tr>
<tr>
<td>Urban</td>
<td>830</td>
<td>2.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As table 4-39 showed the t value (0.043) is not significant. This is prove is further strengthened by the mean value (2.83) of both the (rural and urban) respondents which is same so it can be concluded that there is no significant difference in opinion between rural and urban respondents on dependent learning style.
Table 4-40  Opinion about competitive learning style by region style

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>750</td>
<td>3</td>
<td></td>
<td></td>
<td>Not defined</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>830</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-40 shows that the mean value of students from urban and rural areas is same i.e. 3.

Table 4-41  Opinion about collaborative learning style by region

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>750</td>
<td>2.96</td>
<td>0.114</td>
<td>1578</td>
<td>.910</td>
<td>n.s</td>
</tr>
<tr>
<td>Urban</td>
<td>830</td>
<td>2.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-41 indicates the value of $t = 0.114$ which is not significant at $\alpha = .05$ and mean value of both the groups is nearly equal. It helps to conclude that there is no significant difference in opinion between rural and urban respondents on collaborative learning style.
Table 4-42 Opinion about participant learning style by region

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>750</td>
<td>2.85</td>
<td>0.563</td>
<td>1578</td>
<td>.574</td>
<td>n.s</td>
</tr>
<tr>
<td>Urban</td>
<td>830</td>
<td>2.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-42 shows the t-value is not significant although the mean value of male respondents (2.85) is higher than female (2.83) but this is very negligible. It means that there is no significant difference between rural and urban respondents on participant style.

Table 4-43 Opinion about avoidant learning style by region

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>750</td>
<td>2.76</td>
<td>1.918</td>
<td>1578</td>
<td>.055</td>
<td>n.s</td>
</tr>
<tr>
<td>Urban</td>
<td>830</td>
<td>2.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-43 highlights that value of $t = 1.918$, which is not significant at $\alpha=.05$, it means that there is no significant difference of opinion between rural and urban respondents on avoidant style.

The interpretation of tables from 4-38 to 4-43 help to concludes that there is no significant difference of opinion between rural and urban respondents on different learning styles. The further analysis was done to find-out the difference in opinion about learning styles of rural and urban students by region.
Question 6: Is there any significant difference in opinion about learning styles of rural students by gender?

Table 4-44 Opinion of rural students about independent learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>472</td>
<td>2.72</td>
<td></td>
<td></td>
<td>1.29</td>
<td>.195 ns</td>
</tr>
<tr>
<td>Female</td>
<td>278</td>
<td>2.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-44 indicates that the mean value of female students (2.76) is greater than the male students (2.72) for independent learning style even then the value of \( t = 1.29 \) is not significant at \( \alpha = .05 \), it means that there is no significant difference in opinion of rural students about independent learning style.

Table 4-45 Opinion of rural students about dependent learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>472</td>
<td>2.78</td>
<td>5.29*</td>
<td>735</td>
<td>.000</td>
<td>s</td>
</tr>
<tr>
<td>Female</td>
<td>278</td>
<td>2.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at \( \alpha = .05 \)

Table 4-45 highlights that

Table 4-45 shows that the \( t = 5.29 \) is significant at \( \alpha = .05 \). It means there is significant difference in opinion of rural male and female students about dependent learning style. Females’ are more inclined towards dependent learning style, because the mean value of rural female students (2.92) is greater than the rural male students (2.78).
Table 4-46  Opinion of rural students about collaborative learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>472</td>
<td>2.96</td>
<td></td>
<td>1.301</td>
<td>692</td>
<td>.194</td>
</tr>
<tr>
<td>Female</td>
<td>278</td>
<td>2.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-46 reflects that the $t = 1.301$ is not significant at $\alpha = .05$. It means that there is no significant difference in opinion of rural male and female students about collaborative learning style. It is further strengthened by the mean value of male and female students which is almost same.

Table 4-47  Opinion of rural students about competitive learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>472</td>
<td>3.00</td>
<td>Not defined</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>278</td>
<td>3.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at $\alpha=.05$

Table 4-47 shows there is no difference in mean so the $t$ value is not defined.

Table 4-48  Opinion of rural students about avoidant learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>472</td>
<td>2.73</td>
<td>2.06</td>
<td>631</td>
<td>.059</td>
<td>ns</td>
</tr>
<tr>
<td>Female</td>
<td>278</td>
<td>2.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-48 depicts the difference in mean value of rural male (2.73) and female (2.80) students about avoidant learning style but the value of “$t$” is not significant at $\alpha = .05$. It helps to conclude that there is no significant difference in opinion of rural male and female students about the said style.
Table 4-49 Opinion of rural students about participant learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>472</td>
<td>2.81</td>
<td>3.85*</td>
<td>709</td>
<td>.000</td>
<td>s</td>
</tr>
<tr>
<td>Female</td>
<td>278</td>
<td>2.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at \( \alpha = .05 \)

Table 4-49 highlights the value of \( t = 3.85 \) which is significant at \( \alpha = .05 \). It is further obvious from the mean value of rural male (2.81) and female (2.91) students that there is significant difference in opinion about participant learning style. The rural female students are more inclined towards the participant learning style than the rural male students.
Question 7: Is there any significant difference in opinion about learning styles of urban students by gender?

Table 4-50 Opinion of urban students about independent learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>492</td>
<td>2.70</td>
<td>1.31</td>
<td>745</td>
<td>.190</td>
<td>ns</td>
</tr>
<tr>
<td>Female</td>
<td>338</td>
<td>2.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-50 indicates that the value of “t” is not significant at $\alpha = .05$. The mean value of urban female (2.74) students is greater then the mean of urban male (2.70) but this difference in mean is not significant. It can be concluded that there is no significant difference in opinion of urban male and female students about independent learning style.

Table 4-51 Opinion of urban students about dependent learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>492</td>
<td>2.79</td>
<td>4.13*</td>
<td>819</td>
<td>.000</td>
<td>s</td>
</tr>
<tr>
<td>Female</td>
<td>338</td>
<td>2.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*$^*$ Significant at $\alpha=.05$

Table 4-51 shows the difference in opinion about dependent learning style. The value of $t = 4.13$ is significant at $\alpha=.05$. The difference in mean value strengthens these results. The mean value of urban female students is greater it means that female students have more preference for dependent learning style.
Table 4-52 shows the opinion of urban students about collaborative learning style by gender.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>492</td>
<td>2.96</td>
<td></td>
<td>0.314</td>
<td>828</td>
<td>.756 ns</td>
</tr>
<tr>
<td>Female</td>
<td>338</td>
<td>2.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-52 reflects the difference in opinion of urban male and female students about collaborative learning style. The “t” value is not significant and the reason may be the difference in mean of urban male and female students is negligible. So there is no significant difference in opinion of urban male and female students about collaborative learning style.

Table 4-53 shows the opinion of urban students about competitive learning style by gender.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>492</td>
<td>3.00</td>
<td></td>
<td></td>
<td>Not defined</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>338</td>
<td>3.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-53 highlights the results of the difference in opinion of urban male and female students about competitive learning style. The mean is same so the “t” value is not defined.
Table 4-54 Opinion of urban students about avoidant learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>492</td>
<td>2.74</td>
<td>5.15*</td>
<td>822</td>
<td>.000</td>
<td>s</td>
</tr>
<tr>
<td>Female</td>
<td>338</td>
<td>2.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at $\alpha=.05$

Table 4-54 depicts there is significant difference in opinion of urban male and female students about avoidant learning style. The “t” value (5.15) is significant. The mean of urban female (2.88) students is higher than the mean of urban male (2.74) so it helps to conclude that the female students have more preference for avoidant learning style than the male students.

Table 4-55 Opinion of urban students about participant learning style by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>492</td>
<td>2.80</td>
<td>2.92</td>
<td>801</td>
<td>.054</td>
<td>ns</td>
</tr>
<tr>
<td>Female</td>
<td>338</td>
<td>2.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-55 showed the value of $t = 2.92$ is not significant at $\alpha = .05$. This helps to conclude that there is no significant difference in opinion of urban male and female students about participant learning style.

The results of the question six and seven shows that rural female students prefer dependent and participant learning style whereas urban female students prefer dependent and avoidant learning style. To clear this situation Cohen’s d effect size of learning style was also calculated to investigate which learning style has strong effect. The detail is given in following table 4-56.
Table 4-56 The effect size of the learning style of rural students measured by Chon’s D formula

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>The value of D</th>
<th>Description of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>0.091</td>
<td>weak effect</td>
</tr>
<tr>
<td>Dependent style</td>
<td>0.402</td>
<td>moderate effect</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>0.050</td>
<td>weak effect</td>
</tr>
<tr>
<td>Competitive style</td>
<td></td>
<td>not defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>0.288</td>
<td>modest effect</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>0.160</td>
<td>weak effect</td>
</tr>
</tbody>
</table>

Table 4-56 indicates that the effect of three learning styles is weak effect. The effect of participant learning style is modest and the effect of dependent learning style is moderate, which shows the rural female students have strong effect of dependent learning style then the participant learning style.

Table 4-57 The effect size of the learning style of urban students measured by Chon’s D formula

<table>
<thead>
<tr>
<th>Learning styles</th>
<th>The value of D</th>
<th>Description of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent style</td>
<td>0.089</td>
<td>weak effect</td>
</tr>
<tr>
<td>Dependent style</td>
<td>0.546</td>
<td>moderate effect</td>
</tr>
<tr>
<td>Collaborative style</td>
<td>0.054</td>
<td>weak effect</td>
</tr>
<tr>
<td>Competitive style</td>
<td></td>
<td>not defined</td>
</tr>
<tr>
<td>Participant style</td>
<td>0.220</td>
<td>modest effect</td>
</tr>
<tr>
<td>Avoidant style</td>
<td>0.366</td>
<td>modest effect</td>
</tr>
</tbody>
</table>

Table 4-57 indicates some different results as table 5-56 showed. Here two learning style i.e. independent, collaborative have weak effect, two showed modest effect i.e. participant and avoidant learning style and one dependent learning style showed moderate effect. The value of D for avoidant style and dependent style when compared it
can be concluded that the urban female students have more preference for dependent learning style and less for avoidant learning style.

In this way the contradiction will be removed and it is interpreted that all rural and urban female students prefer dependent learning style; further rural female students prefer participant learning style whereas urban female students prefer avoidant learning style.
CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS, DISCUSSION

AND RECOMMENDATIONS

5.1 Summary

Education at secondary school level is a terminating stage of learning in Pakistan. The completion of secondary education gives the diversified direction to students. Students may develop their learning and working habits by completing the secondary level of education. To lead them till this stage, the teacher’s continuous efforts play a very important role. This is important for teachers to understand how the in-built features of learners affect the way they process information to perform a task.

Several theoretical perspectives contribute to understand how learning happened such as Behaviorist Theory, Gestalt Theory, and Personality Theory. Some theories have direct influence on pedagogic strategies like Piaget’s Cognitive Development Theory, Vygotsky’s Socio-Culture Theory, The Information Processing Approach, Social Constructivist Theory, Meta-cognition and the Learning Style Theories.

The Learning Styles Models are based on Learning Styles Theories. The Social Interaction Model is one of them, which was concerned about ‘the student’s learning in social environment’. Grasha & Riechmann gives a model for students learning styles. This research was designed to study the effects and relationship of different variables with students’ achievement. The objective was to investigate the effects of Learning Styles and Socio-economic Status (SES) on students’ learning achievement.

For this purpose the researcher adopted the questionnaire developed by Grasha & Riechmann for learning styles. The parents were divided into five classes according to
their socio-economic status. The classes were named as upper class, upper middle class, middle class, lower middle class and lower class. The students were also categorized in the respective classes to whom their parent belongs. The learning achievement was interpreted by scores of students’ obtained during their Secondary School Certificate Examination conducted by respective Board of Intermediate and Secondary Education in 2007. Students enrolled at four districts Attock, Chakwal, Islamabad and Rawalpindi were identified as population. Multistage stratified random sampling technique was used to select sample. First schools were selected randomly then respondents were selected. The sample of the study was all those students who were present on data collection day at selected schools. The total number of students was 1580. Collected data was analyzed through percentages, Pearson’s correlation and t-test and interpreted through graphs and tables.

5.2 Findings

After organizing, tabulating, analyzing and interpreting the data, the following findings were obtained. The findings were classified into six broad categories namely; the findings based on the descriptive statistics, relationship between students learning styles and their academic achievement, relationship between socio-economic status and their achievement, the relationship between learning styles and socio-economic status groups, and the difference in opinion about learning styles by gender and by region.
5.2.1 Findings based on the descriptive statistics

The data obtained from the students regarding their socio-economic status and their achievement was analyzed by the percentage. The major findings were as follows:

i. On the base of obtained scores from the Socio-economic Status (SES) questionnaire the SES groups were formed. The distribution of respondents in each group was 2.6% respondents were from upper class, 16.45% were from upper middle class, 40.57% from middle class, 36.39% from lower middle class and 3.90% were from lower class. (Table 4-1)

ii. 13% respondents got A and above grade, 28% achieved B grade, and 44% had C grade and 15% achieved lower than C grade. (Table 4-2)

iii. From developed districts 12% respondents got A and above grade, 26% got B, 44% got C grade and 18% achieved lower then C grade. (Table 4-4)

iv. From under-developed districts 13% respondents got A and above grade, 30% got B grade 44% got C and 13% remained below C. (Table 4-5)

5.2.2 Findings based on the analysis of relationship between learning styles and achievement

This section presents the findings about the relationship of learning styles and learning achievement. The main findings were:

i. The high achievers (A+ and A grade achievers) do not prefer collaborative and dependent learning style. There is a significantly negative relationship between collaborative and dependent learning styles and high achievers. (Table 4-6 & Table 4-7)
ii. Some relations although not significant yet exist among A+, B, C, D and E grade achievers and learning styles. (Table 4-12)
   - There is a positive relation between A+ grade achievers and independent learning style. (Table 4-6)
   - There is a positive relation between B grade achievers and participant learning style. (Table 4-8)
   - There is a positive relation between C grade achievement and avoidant learning style. (Table 4-9)
   - There is a negative relation between D grade achievement and dependent and collaborative learning style. (Table 4-10)

iii. There is a significant negative relationship between the respondents from developed districts who got A+ grade and collaborative and participant learning style. (Table 4-13)

iv. There is no significant relationship among learning styles and the achievement grades of the respondents from under-developed district; however A+ grade achievers prefer independent style and E grade achievers do not prefer dependent, participant and avoidant styles. (Table 4-14)
5.2.3 **Findings based on the analysis of relationship between Socio-economic Status (SES) and students’ achievement**

On the basis of scores obtained through Socio-economic Status questionnaire the whole sample was divided into five classes named as upper class, upper middle class, middle class, lower middle class and lower class and students grades were classified as A+, A, B, C, D, and E (Table 4-1 & 4-2). In this section findings were based on the results of correlation between SES groups and academic achievement grades of the students. The main findings were:

i. No student from upper class and lower class got A+ grade. This ultimately shows no relationship exists between the achievement grades of the students from upper class and lower class. (Table 4-15)

ii. A perfect significant negative relationship exists between A grade achievers and lower class. (Table 4-16)

iii. A significant positive relationship exists between D grade achievers and middle class. (Table 4-19)

iv. Finding about the relationship between SES groups and achievement grades which were not significant.

- There is a positive relationship between the A grade achievement and the upper class students. (Table 4-16)

- There is a positive relationship between lower middle class and B grade achievement \((r = .093)\) and a negative relationship between lower class and B grade achievement. (Table 4-17)
• The respondents of upper middle class showed positive relation and respondents from lower middle class showed negative relationship with C grade achievement. (Table 4-18)

• Respondents from upper class showed negative relation and upper middle class showed positive relationship with D grade achievement. (Table 4-19)

• E grade achievers belong to lower class. (Table 4-20)

v. There is no significant relationship between different SES groups and achievement grades of the respondents from developed districts. (Table 4-22)

• There is positive relationship between upper class and A grade achievement.

• There is positive relationship between middle class and \( A^+ \) grade achievement.

• There is strong relationship between lower middle class and \( A^+ \) grade achievement.

• There is no relationship between the upper and lower class with \( A^+ \) grade achievement.

• There is positive relationship between the upper middle class and lower class with D grade achievement.

vi. There is significant positive relationship between upper middle class and D grade achievement of the respondents from the under-developed districts. (Table 4-23)

vii. There is perfect negative significant relationship between lower class and A grade achievement. (Table 4-23)
viii. There is positive relationship between upper class and A grade and lower middle class and A+ grade achievement of the under-developed districts. (Table 4-23)

5.2.4 **Findings about the relationship between Learning Styles and Socio-economic (SES) groups**

The major findings regarding this section were as:

i. There is significant negative relationship between the collaborative learning style and upper class. (Table 4-24)

ii. There is a significant positive relationship between independent learning style and middle class. (Table 4-26)

iii. There is a positive relationship between dependent learning style and upper class respondents. (Table 4-24)

iv. There is negative relationship between participant learning style and lower class. (Table 4-29)

v. There is significant positive relationship between independent learning style and respondents of middle class from developed districts.

vi. There is significant relationship between independent and avoidant learning style and respondents of lower middle class from developed districts. (Table 4-30)

vii. There is positive relationship between avoidant learning style and respondents of upper class from developed district. (Table 4-30)

viii. There is a significant positive relationship between independent learning style and respondents of middle class from under-developed districts. (Table 4-31)

ix. There is positive relationship between dependent learning style and respondents of upper class from under-developed districts. (Table 4-31)
5.2.5 **Findings regarding the opinion about Learning Styles by gender**

The main finding of this section was:

- There is significant difference in opinion between male and female students about dependent, avoidant and participant learning styles.
  
  (Table 4-33, 4-36 and 4-37)

5.2.6 **Findings about the learning style by Region**

This section has three parts one is for the difference in opinion about learning styles by region. Second is the difference in opinion of rural and urban students about the learning style by gender. The third is the effect size of learning style.

i. The finding of first part was:

- There is no significant difference in opinion between rural and urban students regarding the learning styles of students. (Table 4-38 to 4-43)

ii. The findings of second part is further divided into two as follows

a. The findings regarding the rural students about learning styles by gender

- There is significant difference in opinion of rural male and female students about dependent and participant learning style. (Table 4-45 & 4-49)

b. The findings regarding the urban students about learning styles by gender

- There is significant difference in opinion between urban male and female students about dependent and avoidant learning style. (Table 4-51 & 4-54)
iii. The Chon’s D test result showed the effect of dependent learning style is stronger than the participant and avoidant learning style. (Table 5-56 & 5-57)

5.3 Conclusions

The conclusions drawn from the findings of the study are as follows:

i. The performance regarding the learning achievement of the respondents of under-developed districts is better than the respondents of developed districts.

ii. The A+, A and D grade achievers do not prefer collaborative and dependent learning styles.

iii. B grade achievers prefer participant learning style.

iv. C grade achievers prefer avoidant learning style.

v. The A+ grade achievers of developed districts do not prefer collaborative and participant learning style.

vi. A+ and E grade achievers of under-developed districts do not prefer dependent, participant and avoidant learning style.

vii. A+ grade achievers of developed and under-developed districts do not prefer participant learning style.

viii. None of the students from upper and lower class got A+ grade in their final examination. All E grade achievers belong to lower class.

ix. Lower class respondents are not A grade achievers.

x. Middle class respondents are D grade achievers.

xi. Upper class respondents are A grade but not D grade achievers.

xii. Upper middle class respondents are C and D grade achievers.
xiii. The socio-economic status of the respondents of developed districts affects the achievement.
  • Upper class respondents show relationship with A grade.
  • Upper middle class respondents are D grade achievers.
  • Middle class respondents are A+ grade achievers.
  • Lower middle and lower class respondents are not A+ grade achievers.

xiv. The socio-economic status of the respondents of under-developed districts also affects the achievement.

xv. Upper class respondents do not prefer collaborative learning style.

xvi. Middle class respondents prefer independent learning style.

xvii. Lower class respondents do not prefer participant learning style.

xviii. Lower middle class respondents from developed districts prefer independent and avoidant learning style.

xix. The upper class respondents from developed districts prefer avoidant learning style.

xx. The middle class respondents from under-developed districts prefer independent learning style.

xxi. The upper class respondents of under-developed districts prefer dependent learning style.

xxii. Female students prefer participant, dependent and avoidant style.

xxiii. There is no difference in learning styles of students from urban and rural areas.

xxiv. Urban and rural female students prefer dependent learning style.
5.4 **Discussions**

Achievement is the key component in the teaching and learning process. Many research studies have been conducted to find-out and highlight the variables affecting student’s achievement. The current study is aimed to investigate the effects of students learning styles and socio-economic status on their learning achievement. The learning style is an individual’s way of responding to learning situation and home environment provides an opportunity and experience to handle that learning situation.

Most of the findings are logical and in accordance with the literature review but some of them are different and few are debatable. The findings indicate that A+ and D grade achievers do not prefer collaborative learning style and A grade achievers do not prefer dependent learning style. B grade achievers show some preference for participant style and C grade achievers for avoidant learning style. If A+ and A grade achievers are considered as high achievers and B and C grade achievers as average ability students and D and E grade achievers as low ability students then it can be stated that high achievers and low achievers do not prefer collaborative and dependent learning style. The average ability students (i.e. B and C grade achievers) have opposite preference some prefer participant and some prefer avoidant learning style.

It is evident from the findings of relationship between learning style and learning achievement of developed and under-developed districts. The high achievers of developed districts do not prefer collaborative and participant learning style. Similarly the high achievers of under-developed prefer independent learning style. The low achievers of the under-developed districts also show preference for dependent, participant and avoidant learning style. These results support the findings of the study conducted by
Verma and Sherma (1987) by using same instrument the major finding was that “individual differences in learning styles affect the academic performance of the students. The students prefer dependent and participant learning style are better in their studies than the students who prefer independent and avoidant learning style. Dunn (1989) also has conducted research on “grouping students for instructions: effect of learning style on achievement and attitude” and reported positive effect of learning style on achievement and attitude. These results are supported by some other studies conducted by Chi-Ching, Yuen & Noi, Lee Seok. (1994) and this was against the study of Verma (1991). Verma (1991) conducted this study to investigate the relationship between learning style and achievement motivation. The sample was 95 respondents of intermediate college and all was selected from urban area. Then he uses the responses of 28 high and 23 low achievement motivated respondents and left the 44 average motivated students. He analyzed the data by using chi square. The findings showed that there is no significant relation between learning styles and achievement motivation. The reason for contradictory result was the instrument he uses Aggarwal’s learning styles, small sample size urban environment of institutions. It is so concluded that a teacher needs to consider variations in learning styles of the students during planning, conducting and evaluating teaching learning process.

The findings regarding the relationship between socio-economic status (SES) and learning achievement has showed that upper class students are not A+ grade achievers because no one from them got A+ grade. It means they are not concerned with the top position. They are not low achievers as they showed negative relation with C and D grade.
The students from upper middle class are low achievers as they showed positive relation with C and D grades and negative relation with A and B grades. The middle class students are also low achievers as they have significant relation with D grade and negative with A and B grades. The performance of lower middle class students is good. They show positive relation with $A^+$ and B grades and negative relation with D grade. No one from lower class got $A^+$ rather they showed perfect negative relation with A grade. Lower class also has negative relation with B and C grades. Similarly the upper class students of developed districts and under-developed districts are high achievers whereas lower class students are low achievers. It can be concluded that SES affects the learning achievement of the students. This is also reflected in the literature review chapter 2. These findings verify the results of the study of Bond (1981); Kaeley (1990); Mirza (2001); Barry (2005) and Ewijk and Sleegers (2010) but do not support the findings of the study of Verma and Tiku (1990). Verma and Tiku (1990) conducted a research and study the effect of SES and general intelligence and found that SES and intelligence in combined form do not have any differential effect. The reason for this finding may be the small sample size and urban institutional environment of Verma and Tiku’s research. He selected the sample form Shimla city schools. There is no other study available which opposes these findings.

The findings regarding socio-economic status and learning styles has showed that upper class students are not collaborative, middle class students prefer independent and lower class students do not prefer participant learning styles. The same has appeared in the findings of developed districts; the middle class students of developed districts prefer independent and lower middle class students prefer independent and avoidant learning
style. It means the middle and lower middle class students prefer independent learning style. The upper class students of developed district prefer avoidant learning style. This is linked with the findings that upper class students are not A+ grade achievers as no one from this class in sample achieved A+ grade and they prefer avoidant learning style. The middle class students from under-developed districts also prefer independent learning style but the upper class students of these districts prefer dependent learning style. These findings support the findings of the study of Kirk (1986), Singh (1987) and Verma and Sheikh (1992). It is against the study of Verma and Tiku (1990) where he concluded that the effect of SES was not found significant even at .05 level of confidence with any of the learning styles presented by Grasha and Riechmann. The reason may be the sample size and the institutional environment being urban in nature might have minimized the differences in the learning styles of high school students belonging to high and low SES. From the above discussion it is clear that the SES affects the learning styles of students.

The findings regarding the difference in opinion about learning styles by gender showed that female students are more inclined towards the dependent, participant and avoidant learning styles. Martin (2000) studied the social interaction learning style of Irish adults. The findings showed that the older learners prefer participant learning style whereas the younger learners prefer avoidant learning style. Although the Martin’s study little bit supports the findings even then there is a need to investigate the female students learning styles; because they prefer two opposite learning styles i.e. participant and avoidant. To clarify the situation appeared in the above findings region-wise difference in learning styles by gender has analyzed. It has been found that the rural female students prefer dependent and participant learning styles whereas urban female students prefer
dependent and avoidant learning styles. The first part of the findings support to the findings of the study conducted by Verma (1989), “the female students are more dependent and participant than the male students”. This result was also supported by Hopkin’s (1982) research. He uses the same tool of Grasha and Riechmann and found that female students’ indicated their preference for participant, collaborative and dependent learning styles while male student’s exhibit more preference for avoidant, independent and competitive learning styles. The second part of the finding highlighted that the urban female students prefer dependent and avoidant learning style. This is supported by research conducted by Verma and Kumar (1996), in which the major findings were that the urban female students had avoidant learning style as compared to rural women. Further the effect size of learning styles has also been measured to determine which learning style has strong or moderate effect. Chon’s D formula is used. It has found for both rural and urban students the effect of dependent learning style was moderate as compared to the participant and avoidant learning style the effect of these styles is modest. Finally it was concluded that female students prefer dependent learning style in-spite of region (rural and urban). However, some studies had used different tools and showed difference in learning styles among rural and urban students (Pandian (1983), Tappenden 1983; Clyne 1984; Bishop (1985), Cohen (1986), Sing (1987), Atchison 1988; Nah 1989; and Verma 1992).

Generally the prevailing conditions of our institutions are not satisfactory. Most of the institutions are facing lack of teaching staff, in sufficient physical facilities. The teaching staff at institutions is not fully equipped to handle the situation. Majority teachers have theoretical training. The majority of the sampled students belong to middle
class. The middle class students showed their preference for independent style. The students preferring independent style like independent study. They like to follow self-paced instructions. They feel comfortable with the assignments that gave them a chance to think independently. They like those projects that can be designed by students. They prefer-students centered rather than teacher-centered course activities. Along with these characteristics they have a significant relationship with D grade achievement. This result is also reflected in chapter IV graph-1. The normal curve showing academic achievement is not bell shape it’s negatively skewed. It means the performance of the students is below average. It indirectly showed that the classroom activities are not satisfying their needs so they are low achievers. This showed that the classroom activities do not fulfill their demand. They have no interest in classrooms activities; or the existing classroom situation may over-burden them and not providing them the real learning environment which affect their learning. They prefer to work alone and require little directions from the teachers (Barry, Jennifer, 2005).

The high achievers and low achievers do not prefer the collaborative and dependent learning styles. The students who prefer collaborative learning style like lectures with small group discussions. They like small seminars. They like students-designed aspects of courses. They prefer to work for group projects; similarly they did not prefer dependent learning style. The students who prefer dependent learning style like outlines or notes available on board. They want clear deadlines and instructions for assignments. They live happily with teacher-centered classroom method. They prefer no ambiguity in all aspects of course. Both styles have not been preferred by high and low
achievers. This indicates that high achievers and low achievers have no attention in classroom activities. Their locus of control is some where else.

There may be many reasons for these results; the classroom environment is not favorable, text books are of poor quality, content is heavily loaded with theories, due to over crowded classes teacher can not pay attention to every one, lack of physical facilities may made school environment unattractive, in-service teacher training may not be effective, pre-service teacher training do not fully equipped teachers to make classroom environment attractive for students, students teachers relationship is weak and the demand of the examination in annual system may not focus the classroom learning of students etc (Hamidah, Jaafar Sidek, 2009).

There may be another factor which may be the reason for these results and that is the style of measuring students academic achievement i.e. examination system. The examination is one of the key component of education system which is responsible measure academic achievement and it is linked with classroom activities rather it leads classroom activities. If examination requires concept clarification, skill acquiring then the students may prefer classroom learning but the results of the study showed that the students do not prefer classroom activities as their focus is some where else. Although for the session 2006-2007 the examining bodies changed the pattern of examination as discussed in paragraph 2.17 of chapter 2. The main focus turned on the cognitive domains of Bloom’s (1956) Taxonomy of Educational Objectives but the students results showed that teacher’s teaching do not equip them for such pattern.
Some research studies findings showed that teachers teaching and delivery system do not affects students learning styles. The findings of the Aragon, Johnson, and Shaik (2004) study reflect that the students can learn equally well in either delivery format, regardless of learning style, provided the course is developed around adult learning theory and sound instructional design guidelines. It further supports the study of Uzun and Sentruk (2008) that there were no department-related differences on students’ learning preferences.

In reference to the research questions of the study the first question was “is there any significant relationship between the different learning styles and academic achievement of the students at secondary school?” It is concluded that there is a relationship between Learning styles and achievement.

The second question was “Is there any significant relationship between different groups of socio-economic status of parents and academic achievement of their children studying at secondary schools?” It can be addressed as there is a relationship between the different socio-economic status groups of students and their academic achievement at secondary school.

The third question was “Is there any significant relationship between the different socio-economic status groups of parents and learning styles of their children studying at secondary school level?” It can be answered in this way that SES affects the learning styles of secondary school students.

The fourth question was “Is there any significant difference in learning styles of students by gender?” The findings showed that the female students have different learning styles then male students.
The findings regarding the six and seven questions showed the rural and urban female students prefer different learning style.

Results of the previous and the present studies refer that the classroom activities may be designed in the way which is more practical and attractive and according to the requirement of the students need so that they may stay in class and focus the classroom activities for their life long, durable and real learning.

5.5 Recommendations

The following recommendations were made in the light of findings and conclusion of the study:

1. The high and low achievers have no interest for classroom activities as they do not prefer collaborative and dependent learning style. The average ability student’s preferred independent learning style, means they like out of class learning. All the groups have no interest with classroom activities. This is an alarming situation for Pakistani Educationists. There is a need to bring the students back in to the classroom. This may be possible only when the students feel that the classroom activities are interesting and beneficial for their studies. This can be made by making teaching and learning attractive for the student. It is therefore recommended that the teaching may be made student-centered. The practical activities are recommended rather then the theoretical explanation of concepts. This can be done in two phases: one by motivating working teaching staff during refresher courses, second by renovating the activities of prospective teachers at professional training institutions.
2. For the working teachers practical activities may be designed on the pattern of Children’s Global Network Pakistan (CGNP) working in all provinces of Pakistan. The main focus of this is learner-centered teaching. It can be done in all provinces at professional training institutions. The professional teacher training institutions are fully equipped in all provinces of Pakistan. They may take this responsibility to refresh the knowledge and methodology of the working teachers. Further the administration: the principal of the school may make committees of different subject teachers teaching to different classes at their schools. These committees may meet once a week or once after two weeks to discuss the problems and weaknesses of the students reflected during teaching and faced by teachers and cover those problems at earlier stage of learning after discussion and recommendations of the committee. This will help all teachers to identify, diagnose and highlight the problems of the students appeared during their teaching and they are unable to cope them. The committee will discuss it and give the acceptable solution to all those problems. This will also refresh the knowledge and experience of the working teachers and help to maintain their confidence and healthy environment.

3. The prospective teachers may be trained for this situation during their professional training courses. The research institutions and professional training institution can tackle this situation in such a way by shifting the curriculum of prospective teachers to activity based methodology from the theoretical perspective. It is easy to train new teachers rather than changing the old one. If this situation will not be taken by
responsible persons the students will lose motivation and the country will face the situation as in Sawat and tribal areas today.

4. The study was restricted to public sector institutions. A majority of the respondents were from middle class. Research showed significant effect of SES on learning style and learning achievement. Therefore, it is recommended that a campaign for family literacy along with the vocational training programs with the help of National Commission for Human Development, Basic and Non-formal Literacy Programs and Family Literacy Education may be organized. It may be launched at existing public sector institutions in evening for the motivation of parents to acquire skill and maintain the socio-economic status. As this will provide opportunity to their children for new experience and promote durable and real learning. The home environment contributes a lot in the learning of students.

5. The classroom teaching can be made effective by linking it with internal assessment system. For the sampled students of this research only external examination marks were used which was made by FBISE Islamabad and BISE Rawalpindi. The internal assessment provides a link between the teachers teaching and students learning. This provides a binding force to students and teacher’s and binds them together to improve the teaching learning situation. The findings of the research showed teachers were teaching in an alien environment and students were focusing the examination style no link exists between them every one going on their own way. There was no activity to bridge their teaching and learning. Both were working in different directions and this is not a healthy situation for the developing
country like Pakistan. It is therefore recommended that internal assessment may be
given weight-age along with the final evaluation.

6. It is further recommended that classroom-based assessment program may be
launched at schools. Classroom-based assessment is used to make decisions to
improve instructions for learning. It is designed to assist students learning. This
assessment is subjective, informal, immediate and ongoing and is based on
students’ performance in the situation where students actually demonstrate
proficiently. But the teachers’ practices regarding class assessment may be flawed
with poorly focused questions, predominance of questions that require short
answers, repetition than reflection and they may be influenced by the requirements
of external examination. For the improvement and development of teachers’
competencies regarding assessment techniques and its uses some activities are
suggested at cluster schools; after each terminal examination. In such activities
teachers can highlight the practices used by them for the assessment of students and
its advantages. They may also discuss which were difficult to use and how to
remove these difficulties.

7. Majority of middle class students are enrolled at public sector institution. The upper
class SES group enrolled their children at private institution for better facilities. For
further investigation of the effect of SES on learning styles and learning
achievement it is recommended that include private institutions and select equal
number of students to make SES class and then study the effect of learning styles
and specific SES group on achievement.
8. The female students preferred dependent learning styles so the teachers teaching female students may keep in mind this variation in gender learning style preference.

9. It is recommended that the pattern of examination may be shifted from rote memorization to skill acquirement. There may be some activities conducted in schools affiliated with BISE and FBISE in which the boards reflect those competencies which are required during the evaluation of students and its pattern so that the teachers’ become aware of those styles and patterns.

10. The public and private partnership can be welcomed to design and construct teaching learning material for students and teachers and its availability at learning institutions so that institution may provide the learning experience to the students belong to low SES group which their parents are unable to provide.

5.6 Replications (Suggestion for further researches)

The following suggestions were made for the replication of study:

i. The relationship of learning styles, socio-economic status and academic achievement of the students studying at private institutions may be studied.

ii. The learning styles of students studying at private and public sector institutions may be compared.

iii. Learning styles of students studying at co-education institutions may be studied.

iv. The evaluation of academic achievement of students may be made by their teachers. This may help to clarify the preferred learning styles of students.

v. The socio-economic status classes can be made with equal respondents in each class then their learning style be studied and learning achievement may be
compared. The variation in classes may affect the learning styles and learning achievements.
BIBLIOGRAPHY


Carbo, M. (1984). Reading Style Inventory. Available from Learning Styles Network, St. John's University, Grand Central and Utopia Parkway: Jamaica, NY 11439


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www.everythingsl.net/inservices/learningstyle.php - 10k - 27 May 2006 “Teach to students larning styles”


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smiller@dvc.edu

G:\ERIC - Education Resources Information Center.htm Comparison of Eleven Major Learning Styles Models: Variables; Appropriate Populations; Validity of Instrumentation; and the Research Behind Them.
List of Schools included in Pilot Testing

1. Federal Government Girls High School Pind Malkan Sehala Islamabad
2. Federal government Boys high School Bhimbar Tarr Sehala Islamabad
3. Government Girls High School No. 2 Rawalpindi
## List of Schools of Districts Attock

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<tr>
<td>98.</td>
<td>Government Girls Higher Secondary School No 1</td>
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</table>
Grasha-Reichmann Student Learning Style Scales

(Original Questionnaire)

The following questionnaire has been designed to help you clarify your attitudes and feelings toward learning in college. There is no right or wrong answers to each question. However, as you answer each question, form your answers with regard to your general attitudes and feelings toward all of your courses.

Respond to the items listed below by using the following scale.

Use a rating of 1 if you strongly disagree with the statement.
Use a rating of 2 if you moderately disagree with the statement.
Use a rating of 3 if you are undecided.
Use a rating of 4 if you moderately agree with the statement.
Use a rating of 5 if you strongly agree with the statement.

1. I prefer to work by myself on assignments in my courses.
2. I often daydream during class.
3. Working with other students on class activities is something I enjoy doing.
4. I like it whenever teachers clearly state what is required and expected.
5. To do well, it is necessary to compete with other students for the teacher’s attention.
6. I do whatever is asked of me to learn the content in my classes.

7. My ideas about the content are often as good as those in the textbook.

8. Classroom activities are usually boring.

9. I enjoy discussing my ideas about the course content with other students.

10. I rely on my teachers to tell me what is important for me to learn.

11. It is necessary to compete with other students to get a good grade.

12. Class sessions typically are worth attending.

13. I study what is important to me and not always what the instructor says is important.

14. I very seldom am excited about material covered in a course.

15. I enjoy hearing what other students think about issues raised in class.

16. I only do what I am absolutely required to do in my courses.

17. In class, I must compete with other students to get my ideas across.

18. I get more out of going to class than staying at home.

19. I learn a lot of the content in my classes on my own.

20. I don’t want to attend most of my classes.

21. Students should be encouraged to share more of their ideas with each other.

22. I complete assignments exactly the way my teachers tell me to do them.

23. Students have to be aggressive to do well in courses.

24. It is my responsibility to get as much as I can out of a course.

25. I feel very confident in my ability to learn on my own.

26. Paying attention during class sessions is very difficult for me to do.

27. I like to study for tests with other students.

28. I do not like making choices about what to study or how to do assignments.
29. I like to solve problems or answer questions before anyone else can.

30. Classroom activities are interesting.

31. I like to develop my own ideas about course content.

32. I have given up trying to learn anything by going to class.

33. Class sessions make me feel like a part of a team where people help each other learn.

34. Students should be more closely supervised by teachers on course projects.

35. To get ahead in class, it is necessary to step on the toes of other students.

36. I try to participate as much as I can in all aspects of a course.

37. I have my own ideas about how classes should be run.

38. I study just hard enough to get by.

39. An important part of taking courses is learning to get along with other people.

40. My notes contain almost everything the teacher said in class.

41. Being one of the best students in my classes is very important to me.

42. I do all course assignments well whether or not I think they are interesting.

43. If I like a topic, I try to find out more about it on my own.

44. I typically cram for exams.

45. Learning the material is a cooperative effort between students and teachers.

46. I prefer class sessions that is highly organized.

47. To stand out in my classes, I complete the assignments better than other students.

48. I typically complete course assignments before their deadlines.

49. I like classes where I can work at my own pace.

50. I would prefer that teachers ignore me in class.

51. I am willing to help out other students when they do not understand something.
52. Students should be told exactly what material is to be covered on the exams.

53. I like to know how well other students are doing on exams and course assignments.

54. I complete required assignments as well as those that are optional.

55. When I don’t understand something, I try to figure it out for myself.

56. During class sessions, I tend to socialize with people sitting next to me.

57. I enjoy participating in small group activities during class.

58. I like it when teachers are well organized for a session.

59. I want my teachers to give me more recognition for the good work I do.

60. In my classes, I often sit toward the front of the room.

**Scoring Key**

| Independent | Avoidant | Collaborative | Dependent | Competitive | Participant |
Manual Scoring

If you have any problems with the automatic scoring, use the manual scoring table below:

1) Copy your responses from the sheet of paper with your ratings on it to the space provided below for each item.

Learning Style Test Items

1. __  2. __  3. __  4. __  5. __  6. __
25. __  26. __  27. __  28. __  29. __  30. __
31. __  32. __  33. __  34. __  35. __  36. __
37. __  38. __  39. __  40. __  41. __  42. __
43. __  44. __  45. __  46. __  47. __  48. __
49. __  50. __  51. __  52. __  53. __  54. __
55. __  56. __  57. __  58. __  59. __  60. __

2) Sum your ratings for each column and place them in the spaces below
   __  __  __  __  __  __

3) Divide your total score for each column by 10 and place your answer in the spaces below
   __  __  __  __  __  __

3) Divide your total score for each column by 10 and place your answer in the spaces below

Independent  Avoidant  Collaborative  Dependent  Competitive  Participant

4) The names for each learning style associated with each column are shown above.
5) Check whether your score represents a relatively Low, Moderate, or High score based on the norms for each learning style scale shown below.

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>[1.0-2.7]</td>
<td>[2.8-3.8]</td>
<td>[3.9-5.0]</td>
</tr>
<tr>
<td>Avoidant</td>
<td>[1.0-1.8]</td>
<td>[1.9-3.1]</td>
<td>[3.2-5.0]</td>
</tr>
<tr>
<td>Collaborative</td>
<td>[1.0-2.7]</td>
<td>[2.8-3.4]</td>
<td>[3.5-5.0]</td>
</tr>
<tr>
<td>Dependent</td>
<td>[1.0-2.9]</td>
<td>[3.0-4.0]</td>
<td>[4.1-5.0]</td>
</tr>
<tr>
<td>Competitive</td>
<td>[1.0-1.7]</td>
<td>[1.8-2.8]</td>
<td>[2.9-5.0]</td>
</tr>
<tr>
<td>Participant</td>
<td>[1.0-3.0]</td>
<td>[3.1-4.1]</td>
<td>[4.2-5.0]</td>
</tr>
</tbody>
</table>
QUESTIONNAIRE FOR SOCIO-ECONOMIC STATUS OF PARENTS

1. Name: _________________________  2. Child’s Name: _________________________

3. Child’s School Name: ______________________________  4. District: ___________


7. Wife’s Qualification: _______________

8. Your job: Govt. Service: ☐ Semi Govt.: ☐
Non Govt. Organization ☐ Private: ☐ Any other (pl. specify):_____________

9. Nature of Job:
Self Employed: ☐ Business man: ☐ Land Lord: ☐ Any other(pl. specify):_____

9. Wife’s job:
Govt. Service: ☐ Private: ☐ House wife: ☐ Any other:_____________

10. Number of Family Members: ☐ 11. Number of earning members of Family: ☐

12. Number of Children you have? Son: ☐ Daughter: ☐
13. Age group of your children’s: 1 to 5 years: ☐ 6 to 10 Years: ☐
11 to 15 years: ☐ 16 to 20 years: ☐ Above 20 years: ☐

14. Level of education in which your children’s are studying:
Primary ☐ Middle ☐ SSC ☐ HSC ☐ BA ☐ MA ☐

15. Your Monthly Income from all sources:
(a) Below Rs. 5000/- ☐ (b) Rs. 5000/- to Rs. 10000/- ☐
(c) Rs. 10000/- to Rs. 15000/- ☐ (d) Rs. 15000/- to Rs. 20000/- ☐
(e) Rs. 20000/- to Rs. 25000/- ☐ (f) Above 25000/- ☐
16. In which area do you live? Rural: [ ] Urban: [ ]

17. Your Accommodation is? Own: [ ] Rented: [ ]
   Official Residence: [ ] Living with relatives: [ ] Any other: [ ]

18. Do you have any vehicle? Yes [ ] No [ ]

19. If yes, which one? Car [ ] Suzuki Van [ ]
   Motor cycle [ ] Bicycle [ ]

20. Which appliances do you have at your home?
   Iron [ ] TV [ ] Refrigerator [ ] Washing Machine [ ]
   Greasier [ ] Heater [ ] Computer [ ]

21. Do you have toilet at your Home? Yes [ ] No [ ]

22. If yes, which one?
   Flash (sewerage) [ ] Flash (tank) [ ] Flash (open passage) [ ]

22. Which source your child use for coming to school?
   By foot [ ] Cycle [ ] Motor cycle [ ] Personal car [ ]
   Privately arranged vehicle [ ] Public connivance [ ]

23. Distance of your child’s School from home? _____ Km _____ Meter

24. Who coach your children after School?
Student Learning Style Scales

The following questionnaire has been designed for the purpose of identifying your style of learning in classroom at secondary school. There is no right or wrong answers to each question. However, as you answer each question, it helps researcher to identify your learning style. Your opinion will only be used for research purpose.

Respond to the items listed below by using the following scale.

SD=Strongly disagree    D= Disagree    UD= Undecided
A= Agree               SA= Strongly agree

<table>
<thead>
<tr>
<th>S. No</th>
<th>Statements</th>
<th>SA</th>
<th>A</th>
<th>U</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I prefer to work by myself on assignments in my courses.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>I often daydream during class.</td>
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<tr>
<td>3</td>
<td>Working with other students on class activities is something I enjoy doing.</td>
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<td></td>
<td></td>
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<tr>
<td>4</td>
<td>I like it whenever teachers clearly state what is required and expected.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>To do well, it is necessary to compete with other students for the teacher’s attention.</td>
<td></td>
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<tr>
<td>6</td>
<td>I do whatever content is asked from me to learn in my classes.</td>
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<tr>
<td>7</td>
<td>My ideas about the content are often as good as those in the textbook.</td>
<td></td>
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<tr>
<td>8</td>
<td>Classroom activities are usually boring.</td>
<td></td>
<td></td>
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<tr>
<td>9</td>
<td>I enjoy discussing my ideas about the course content with other students.</td>
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<td></td>
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<tr>
<td>10</td>
<td>I rely on my teachers to tell me what is important for me to learn.</td>
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<tr>
<td>12</td>
<td>Class sessions typically are worth attending.</td>
<td></td>
<td></td>
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|   | I am very seldom excited about material covered in a course.  
|---|---
| 14 | I enjoy hearing what other students think about issues raised in class.  
| 15 | I only do what I am absolutely required to do in my courses.  
| 16 | In class, I must compete with other students to get my ideas across.  
| 17 | I get more out of going to class than staying at home.  
| 18 | I learn a lot of the content in my classes on my own.  
| 19 | I don’t want to attend most of my classes.  
| 20 | Students should be encouraged to share more of their ideas with each other.  
| 21 | I complete assignments exactly the way my teachers tell me to do them.  
| 22 | Students have to be aggressive to do well in courses.  
| 23 | It is my responsibility to get as much as I can out of a course.  
| 24 | I feel very confident in my ability to learn on my own.  
| 25 | Paying attention during class sessions is very difficult for me to do.  
| 26 | I like to study for tests with other students.  
| 27 | I do not like making choices about what to study or how to do assignments.  
| 28 | I like to solve problems or answer questions before anyone else can.  
| 29 | Classroom activities are interesting.  
| 30 | I like to develop my own ideas about course content.  
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<p>| 38 |</p>
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<td>In my classes, I often sit toward the front of the room.</td>
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</table>
ECONOMIC AND SOCIAL INDICATORS
## ECONOMIC AND SO

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<tr>
<td><strong>GROWTH RATE (%) (Constant 1ic)</strong></td>
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<td>4.8</td>
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<td>- Agriculture</td>
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<td>2.4</td>
<td>5.4</td>
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<td>6.7</td>
<td>4.6</td>
<td>6.6</td>
<td>8.2</td>
<td>3.2</td>
<td>4.8</td>
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<tr>
<td><strong>GROWTH RATES (%) (Current MP)</strong></td>
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<tr>
<td>Total Investment</td>
<td>21.8</td>
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<td>8.1</td>
<td>9.8</td>
<td>12.8</td>
<td>19.4</td>
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<tr>
<td>- Fixed Investment</td>
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<td>26.5</td>
<td>3.7</td>
<td>7.8</td>
<td>4.8</td>
<td>12.6</td>
<td>20.9</td>
<td>13.3</td>
<td>16.9</td>
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<td>25.3</td>
<td>2.6</td>
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<td>14.1</td>
<td>19.2</td>
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<tr>
<td>As % of Total Investment</td>
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<td>- National Savings</td>
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<td>22.6</td>
<td>37.6</td>
<td>80.6</td>
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<td>74.8</td>
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<td>61.9</td>
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<td>- Foreign Savings</td>
<td>-32.5</td>
<td>7.4</td>
<td>20.1</td>
<td>19.4</td>
<td>20.4</td>
<td>25.2</td>
<td>22.1</td>
<td>38.1</td>
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<td>As % of GDP (Current MP)</td>
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<tr>
<td>Total Investment</td>
<td>-17.1</td>
<td>10.7</td>
<td>13.3</td>
<td>15.6</td>
<td>16.8</td>
<td>18.3</td>
<td>18.9</td>
<td>16.4</td>
<td>18.5</td>
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<td>- Fixed Investment</td>
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<td>- Public Investment</td>
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<td>- Private Investment</td>
<td>-5.6</td>
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<td>9.1</td>
<td>7.8</td>
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<td>9.3</td>
<td>9.7</td>
<td>9.0</td>
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<td>National Savings</td>
<td>-11.2</td>
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<td>15.1</td>
<td>12.0</td>
<td>14.2</td>
<td>14.3</td>
<td>11.6</td>
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<tr>
<td>Foreign Savings</td>
<td>-5.8</td>
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<td>3.6</td>
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<td>4.8</td>
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<td>7.2</td>
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<tr>
<td>Domestic Savings</td>
<td>-7.4</td>
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<td>7.0</td>
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<td>9.9</td>
<td>13.6</td>
<td>12.0</td>
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<tr>
<td><strong>GDP DEFlator (GROWTH %)</strong></td>
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<tr>
<td><strong>CONSUMER PRICE INDEX (CPI)</strong></td>
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- This indicates...

- From 1968-95 onward also include self-listing in SEEs.
## ECONOMIC AND

### BALANCE OF PAYMENTS (Growth rates %)

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### COMMODITY SECTORS

#### Agriculture

- Total Cropped Area
  - Min. Hectares: 20.3 22.4 19.3 19.9 21.8 22.1
- Wheat Production
  - Min. Tonnage: 12.5 17.0 11.5 11.7 14.0 17.0
- Rice
  - ": 3.3 3.9 3.1 3.3 3.3 3.4
- Sugarcane
  - ": 33.1 44.6 32.4 32.1 36.0 47.2
- Cotton
  - Min. Bales: 6.3 9.7 4.2 5.9 6.8 8.7
- Fertilizer Use
  - Min. N/Tonne: 1.4 2.3 1.1 1.3 1.9 2.2
- Credit Disbursed
  - Bls. Rs: 11.2 23.8 4.0 16.3 14.9 22.4

#### Manufacturing

- Cotton Yarn
  - Min. Kg: 5.6 3.4 10.0 1884.4 373.0 432.0 1641.0 1402.7
- Cotton Cloth
  - Min. Sq.Mtr: 3.1 .52 .11 487.8 380.0 272.0 293.0 321.8
- Fertilizer
  - Min. Tonne: 27.5 13.2 10.7 4.9 1.6 2.7 3.0 3.8
- Sugar
  - ": 34.3 2.2 14.4 3.6 6.0 1.3 1.9 3.9
- Cement
  - ": 10.7 2.5 8.6 11.2 3.6 4.7 7.5 6.9
- Soda Ash
  - Min. Tonne: 12.0 2.5 6.7 293.0 96.0 122.0 147.0 105.9
- Cement Soda
  - Min. Tonne: 24.4 5.0 6.6 147.2 39.0 46.0 75.0 92.7
- Cigarettes
  - Bls. Nos: 10.7 4.3 0.4 55.4 36.0 39.0 30.0 30.7
- Jute Goods
  - Min. Tonne: 3.4 3.5 101.1 60.0 78.0 87.0 67.3

### INFRASTRUCTURE

#### Energy

- Crude Oil Extraction
  - Min. Barrels: 2.9 10.9 26.1 3.6 9.5 22.5 19.9
- Gas Supply
  - Bls. CF: 165.4 305.2 900.0 299.0 361.9 516.5 526.3
- Electricity (Installed)
  - 000 MW: 1.3 3.1 12.9 4.1 5.6 8.7 12.1

#### Transport & Communications

- Roads
  - 000 Km: 70.5 74.1 123.8 279.3 94.0 118.5 178.5 267.7
- Motor Vehicles on Road
  - Min. Nos: 0.4 1.4 4.6 8.6 1.3 2.1 5.0
- Post Offices
  - 000 Nos: 7.1 9.9 11.8 15.8 11.2 11.9 13.4 13.3
- Telephones
  - Min. Nos: 0.1 0.2 0.6 3.0 0.4 0.6 1.2 2.1
- Mobile Phones
  - Min. Nos: - - - - - - - -

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| 214.0   | 247.0   | 253.3   | 239.4   | 248.9   | 218.0   | 213.2   | 208.3   | 286.3   | 297.3   | 316.7   | 319.6   |
| 199.0   | 118.2   | 115.7   | 128.4   | 141.3   | 145.0   | 158.3   | 164.4   | 187.5   | 266.7   | 219.3   | 242.2   |
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Not available | Year as of 1st January | Estimated Year as of 1st January | Progressive Total in 2004 | The latest available data as of January 2005-05

Note: Population have been estimated as on 30th June of the year.
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GENERAL RULES FOR EXAMINATION

1.18 Placement in Grades

A candidate, who has qualified for the grant of Secondary/Higher Secondary School Certificate, shall be placed in one of the following grades:

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<th>S. No.</th>
<th>Percentage of Marks</th>
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