A STUDY OF COGNITIVE SKILLS OF X GRADERS IN
RELATION TO THEIR STRESS, ASPIRATIONS
AND SOCIO-ECONOMIC STATUS

A SUMMARY OF THE THESIS

Submitted to the
Faculty of Education
PANJAB UNIVERSITY, CHANDIGARH
for the degree of

DOCTOR OF PHILOSOPHY

2012

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SUMMARY

In the preceding chapter, introduction of the problem, review of the related literature, objective of the study, hypotheses of the study, development and description of the tools, and analyses and interpretation of the data were discussed. The present chapter has been devoted to present the summary and conclusions. For providing the background of the findings, a brief description of the purpose, design and procedure, along with the educational implications and suggestions for the further research have been given and also the results of statistical analyses reached have been presented.

INTRODUCTION

Every child has unique nature as regards capabilities, attitudes, personality, characteristics, interests, cognitive skills and aspirations etc. Cognitive Skills are any mental skills that are used in the process of acquiring knowledge. These skills include reasoning, perception and intuition. So Cognitive Skills refer to those skills that make it possible for us to know. There is nothing that any human being knows, or can do, that he has not learned. Therefore, all Cognitive Skills must be taught. After independence much emphasis was laid on Mathematics teaching and learning. Thus the Education Commission (1964-66) has rightly recommended Mathematics as a Compulsory subject up to +10 levels. National Policy of Education (1986) has also recognized the importance of Mathematics. Aspirations refer to the ambition or desire of a want, which has yet not been fulfilled and a man still works for it. The word Socio-Economic Status is commonly used to climate social and economic background. It devotes to the entire social environment that is provided to the children. Academic stress, Aspirations and Socio-Economic Status can affect cognitive skills of a student. Academic stress is needed, but within a limit.

COGNITIVE SKILLS

Skill is a well-developed capability of any kind, including intellectual, physical or artistic capabilities. A skill is a rapid, efficient performance, mental or physical, which has been, learned e.g., mental arithmetic, golf and so on (Philip, 1947). A number of studies have examined the long-term retention of every day
cognitive skills, when the skills are no longer being used. Skills that have not been highly practiced appear to be lost fairly rapidly once they are no longer used. Highly practiced skills are retained very well; skill at algebra that is being used in calculus course is retained for life even though the more tenuously learned skill at calculus is rapidly lost with disuse (Bahrick and Hall, 1991). Cognitive development concerns changes with age in relation to the system of what we know and changes in the way in which that system interacts with other facts of behavior (Flavell, 1977; McCall, 1981; Wohlwill, 1973). Characteristics of human intellectual functioning such as thinking, planning, knowing, relating, classifying, creating and problem solving have been traditionally labeled as cognitive processes. Desoete, A. and Roeyers, H. (2006) developed a model for the assessment of nine cognitive skills involved in Mathematical Problem Solving in adolescents. The skills were tested for conceptual accuracy and clinical relevance on a sample of children with average intelligence and Mathematical learning disabilities. In 1956, Benjamin Bloom wrote Taxonomy of Educational Objectives: Cognitive Domain, and his six-level description of thinking has been widely adapted and used in countless contexts ever since. His list of cognitive processes is organized from the most simple, the recall of knowledge, to the most complex, making judgments about the value and worth of an idea. In 1999, Dr. Lorin Anderson, a former student of Bloom’s, and his colleagues published an updated version of Bloom’s Taxonomy that takes into account a broader range of factors that have an impact on teaching and learning. This revised taxonomy attempts to correct some of the problems with the original taxonomy.
Mathematics is a major discipline of study that has its roots in the systematic development of methods to solve practical problems. In recent decades, there has been an immense growth in the use of Mathematics in other areas of study. It is Mathematics which, for example, lies behind the computer technology and medical technology. In view of the growing importance of mathematics in all areas of study, the mathematics teaching at school should prepare the students adequately in knowledge, skills and value of mathematics. For the present study, firstly the research literature related with cognitive development of adolescents between age group of 13+ to 16+ was consulted. Piagetian developmental stages were also consulted and cognitive skills identified by different authors were noted. After having made a list of cognitive skills (at 13+ to 16+ age), objectives of Indian Primary and Secondary levels were consulted. Report of project ‘Minimum Levels of Learning’ (Govt. of India) and Bloom Taxonomy were consulted. Curriculum and Syllabus for X grade under Punjab School Education Board (P.S.E.B.) were consulted and five major competencies (skills) required for learning Mathematics were assessed. These competencies have been identified as:

- KNOWING
- UNDERSTANDING
- ANALYSIS
- SOLVING
- APPLYING

STRESS

In today’s hectic life of materialistic pursuits of cut throat competition at all levels, everyone goes through a life full of stress of different types- physical, emotional and behavioral. Stress is a systematic response induced by the wave of cellular alterations identical to those which initiate inflammation (Eyring and Dougherty, 1955). The term stress, which has become a part of our everyday vocabulary, originated in physical sciences and means a force exerted upon a person, who resists the force/pressure in his effort to maintain his original state and in the process suffers some degree of discomfort (Cofer and Appley, 1964). Lazarus (1969) stated that stress is an internal state at the individual who perceives threats to
physical and psychic well-being. Selye (1976) defined stress as the non-specific response of the body to any demand. According to Lazarus (1984) stress is in harmonious fit between person and the environment, one in which the person’s resources are taxed or exceeded, forcing the person to struggle, usually in complex ways and to cope with. According to Patterson (1985) stress is a condition of felt tension or difficulty. It is usually associated with need or desire to change something. Stress is often described as when individual reaches at, ‘breaking point’, ‘having a weakness’ and ‘breakdown’, ‘reach overload’ and imply to rupture in the individual’s capacity to engage in the world (Bector, 1995). Stress is anything that imposes an extra demand on a child’s ability to cope, often something that is new and different (Furman, 1995). Ellis (1999) defined stress as a feeling of tension that is both emotional and physical. It can occur in specific situations. Different people perceive different situations as stressful, stress management refers to the effort to control and reduce the tension that occurs with a situation that is considered difficult or unmanageable. According to Cambridge Paperback Encyclopaedia (2000), stress may be physical (noise, heat) or psychological (bereavement, unemployment) but their effects depend on their interpretation. The effects of stress arise when certain external circumstances (stressors) lead to a stereotyped non specific response from a person. Response symptoms include intentional selectivity, memory loss and automatic activity (e.g. sweating). Oxford Dictionary of Psychology (2001) described stress as psychological or physical strain or tension generated by physical, emotional, social, economic, or occupational circumstances, events or experiences that are difficult to manage or endure. According to Cambridge Dictionary of American English (2003), stress is the worry caused by a difficult situation or something that causes this condition. Stress has been found to have four components and may affect a person in either these four or on all the four components, i.e.

• Anxiety
• Conflict
• Pressure
• Frustration

**Academic Stress**

Students in school experience academic stress when pressure experienced by them is greater than normal abilities. Academic stress has become a source of
immediate concern as it also contributes to major health hazards, problems both physical and mental. Stress related diseases viz. high blood pressure, peptic ulcers, allergies; headaches seem to have reached an epidemic proportion. In the school situation, this pressure may be accountable for an individual’s success and failure. Hence, this kind of stress i.e. academic stress is an important factor accounting for variation in academic achievement. Walbley (1986) investigated the correlation between the performance and academic stress and found a correlation of 0.63 between performance and academic stress. The factors like writing term papers test-anxiety, poor study skills, excessive academic load, professions and classroom environments were reported be the cause of academic stress which in turn forms a major part of general stress in adolescent students (Edmunds, 1984). Academic stress is a mental distress with respect to some anticipated frustration associated with academic failure or even an awareness of the possibility of such failure (Gupta, 1987). In the context of school, academic stress means a pervasive sense of urgency to learn all those things, which are related or prescribed by the school. Stress makes a significant contribution to the prediction of subsequent school performance and acts as a negative predictor of academic performance in school children (Endler et al., 1994). Life of present day students is quite stressful. According to Bector (1995), a student is caught in a dynamic technological whirlpool and seems to be precariously poised on the brink of disaster. Rao (2005) pointed out that especially at the adolescent age, if the academic stress demands on the body physically or mentally, exceed the person ability to cope and if individuals are not well oriented about coping with stress holistically, they run into risk of mental and physical health problems.

**Social Stress**

Every one experiences social stress at any stage of life. Social stress is a type of stress which deals with social events, behaviors etc. The concept of social stress is insufficient to explain psychological functioning. To be useful, social stress must include enduring social practices characteristic of particular social systems that violate socially generated as well as biological needs. Some of these stressful events are gender role, poverty, and societal practices such as extreme competition, individualism, and materialism. Social situation can cause stress. For example, poverty, financial pressures, racial and sexual discrimination or harassment, unemployment, isolation, and a lack of social support all take a toll on daily quality of life.
The term ‘Aspirations’ is one which is often used synonymously with goals, ambitions, objectives, purposes, dreams, plans, designs, intentions, desires, longings, wishes, yearning, cravings or aims. Aspirations are what drive individuals to do more and be more than they presently are. We may know what we are, but we cannot know for certain what we can be! Hurlock (1964) defines aspirations as longing for what is above one’s achievement level with advancement or as its end. Webster’s Encyclopedic Unbridged Dictionary of English Language (1976) defines aspirations as a strong desire for realization (as of ambition, idea or accomplishment). The Encyclopedia of Educational Research (1982) defines level of educational aspirations as the standards of educational goals realistically in relation to his physical and mental attributes and in accordance with his environment. Educational aspirations set the level of striving and this is highly individual development. Aspirations are strong desires to reach something high or great. Young people's aspirations guide what students learn in school, how they prepare for adult life, and what they eventually do (Walberg, 1989). The concept of level of aspirations was first introduced by Hoppe (1930) as “degree of difficulty of the goals towards which a person is striving”. He concluded that the nature of level of aspirations of an individual might reflect his personality patterns. According to Frank (1935), the level of aspirations is future performance in a familiar tasking which an individual knowing his level of past performance in that task explicitly under takes to achieve. Dembo (1931) said that “One of the important aspects of personality which has aroused considerable interest in recent years is the individual’s level of aspirations.” Drever (1964), in his Dictionary of Psychology, defined the term level of aspirations as a frame of reference involving self esteem or alternatively as a standard with reference to which an individual experiences i.e. has the feeling of success or failure. According to Good (1959), level of aspirations is the level of performance or the good that a person (or a group) desires or helps to reach in a specified activity. Gardner (1940) found that if the performance equals the level of aspirations, the level of aspirations is lately to swing upward conversely, an unattained desire level of performance leads to lowering the level of aspirations.
Educational Aspirations

Educational aspirations, which refers to early impressions of one's own academic abilities and the highest level of education an individual expects to attain (Furlong & Cartmel, 1995), also has been linked to academic achievement (Rojewski & Yang, 1997). Educational aspirations have been well documented in the career development literature, and are seen as "the first step in the pipeline" of career attendance (Berkner & Chavez, 1997). Educational aspirations are developed early in a student's academic career, and are generally theorized to affect academic achievement by enhancing the possibility of participating in and/or pursuing educational opportunities (Arbona, 2000). That is, students who have high academic aspirations are more likely to take advantage of educational opportunities that may lead to academic success. Likewise, students with low academic aspirations are less likely to take advantage of these opportunities, thus limiting their future educational opportunities (Arbona). In this way, students' educational aspirations can influence what they learn in school, how they prepare for their postsecondary lives and their ultimate academic and career attainment (Walberg, 1989). Research indicates that African American males differ very little from White males in their educational aspirations, although African American males experience lower educational attainment than any other gender-race group (Bateman & Kennedy, 1997). This incongruence between African American males' educational aspirations and their ultimate educational attainment may be related to what Mickelson (1990) referred to as the dichotomy between abstract and concrete views of education. In other words, students' aspirations may represent their hopes, but their eventual attainment may be affected by future concrete realities such as lack of resources, prejudice, and other social barriers.

Socio-Economic Status

The word Socio-Economic Status is commonly used to climate social and economic background. It devotes to the entire social environment that is provided to the children. By the term ‘Status’, we mean the recognition given to an individual by his group relation (Kelly, 1951). As a rule of conservation (Cooley, 1956) in terms of the sense of belonging (Park and Burgess, 1921) it is the result of the ranking of a role by the group (Ogburn and Nimcoff, 1960) that determines for its possessions of
a degree of respect, prestige and influence (MacIver and Page, 1937). They are, thus the ancient powers and privileges of the family bestowing prestige, authority and power (Mussen, Conger and Kagan, 1963). ‘Social Status’, therefore, is an indication of one’s position of respect, prestige and influence in the social structure (MacIver and Page, 1937; Cole and Montgomery, 1959; Rogers, 1962) apart from his personal attributes (MacIver and Page, 1937) which may either inhibit or enhance an individual’s access to sources of information and his willingness to deviate from group norms (Rogers, 1962) and may even vary with the groups (Cole and Montgomery, 1959). The word ‘Economic’ is used generally for the motives involving earning a livelihood, the accumulation of wealth and the like (Drever, 1964). The Economic Endeavour entails ‘cherishing of things because of their material value (Spranger, 1928) and the pursuer, by virtue of this activity, carves for himself a place in society recognized as ‘Economic Status’. Economic Status thus stratifies modern population according to the amount and source of income which is usually derived from a set of occupational activities, the ownership of property or both. ‘Socio-Economic Status’ would, therefore, be a ranking of an individual by the society he lives in, in terms of his material belongings and cultural possessions along with the degree of respect, power and influence he wields. Hollingshead et al. (1958) developed a scheme to determine the social status of a person. His index of social position utilizes three factors namely occupation, education and ecological areas of residence. MacIver and Page (1955) also defined socio-economic status as a position on the scale. It determines for its possessor, a part from its personal attributes or special service, a degree of respect and influence. Social status is a position in a society or a group. Good (1959) defines, socio-economic status as the level indicative of both the social and the economic development of an individual or a group.

**SIGNIFICANCE OF THE STUDY**

The review of related research studies revealed that Cognitive Skills are mental skills that are used for the purpose of acquiring knowledge. These skills include reasoning, perception and intuition. In this competitive world, cognitive skills are the base of the success of a child. Stress, Aspirations and Socio-Economic Status are such major factors which affect Cognitive Skills very much. The present
investigation has put forth a multidimensional representation of Stress, Mathematical Cognitive Skills, Aspirations and Socio Economic-Status.

With the dramatic changes in society over a few decades, Cognitive Skills provide a more powerful tool to fit today’s teachers’ needs. Today’s teachers must make tough decisions about how to spend their classroom time. Clear alignment of educational objectives with local, state and national standards is a necessity. Like pieces of a huge puzzle, everything must fit properly. Cognitive Skills have given rise to educational concepts including terms such as high and low level thinking. It has also been closely linked with multiple intelligences, problem solving skills, creative and critical thinking, and more recently, technology integration. A positive look at the Cognitive Skills, especially related to Mathematics, would add more to the significance of this study.

In today’s hectic life of materialistic pursuits of cut throat competition at all levels, everyone goes through a life full of stress of different types—physical, emotional and behavioral. Stress effects on mental functioning such as concentration, thinking, reasoning and memory. At moderate levels of stress are considered optimal for mental operations such as attention, learning, problem solving and creativity. At lower levels of stress, one fails to be attentive enough and at higher levels, cognition may become highly distorted. Since stress is something every student experiences, it is important to include links to sites addressing this issue.

Aspirations are strong desires to reach something high or great. A research in the concept of student aspirations, suggests that the degree to which students think about and are motivated to achieve their goals predict their level of aspirations. Although research is still needed to clarify further the outcomes of student aspirations, available research suggests that significant educational and psychological benefits are associated with high level of aspirations. Students' educational aspirations can influence what they learn in school, how they prepare for their postsecondary lives and their ultimate academic and career attainment (Walberg, 1989). Educational Aspirations is a psychological construct, which reflects a cognitive type of motivation of the individual.

Another significance of this research is Socio-Economic Status of students. Socio- Economic status is the background or standing of one or more persons in the society on the basis of both social class and financial situation. Families with different socio-economic status often have different sources for information regarding their children’s health, as well as social, emotional and cognitive development.
Although direct or indirect evidence for the links of these dimensions with each other is available in the past literature, but that does not exist in an integrated form. The available results are on one or the other dimensions in different cultural settings. Investigators with regard to Indian socio-cultural settings have not reported much work in this area. The observations of review of literature and the theoretical framework of these issues led to design the present investigation. The statement of the problem was framed as follows:-

**STATEMENT OF THE PROBLEM**

*A Study of Cognitive Skills of X graders in relation to their Stress, Aspirations and Socio-Economic Status.*

**DELIMITATIONS OF THE STUDY**

The present study was delimited as follows:

- The sample was limited to 600 students of Muktsar district of Punjab.
- The study was delimited to only grade X students.
- The study was delimited to Academic stress and Social stress. Each type of stress was studied at three levels- High, Average and Low.
- Effect of all the four dimensions of stress viz. Anxiety, Frustration, Pressure and Conflict were studied separately.
- The study was delimited to Mathematical Cognitive Skills viz. skill of Knowing, skill of Understanding, skill of Analysis, skill of Applying and skill of Solving.
- The study was delimited to Educational Aspirations which was studied at three levels – High, Average and Low.
- Socio-Economic status was studied at three levels – High, Average and Low.

**OBJECTIVES OF THE STUDY**

The study was undertaken with following objectives:

- To plan, design and validate the Cognitive Competency Test on the selected Mathematical cognitive skills.
• To study the effect of Academic Stress on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the effect of Educational Aspirations on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the effect of Socio-Economic Status on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the interaction effect between Academic Stress and Educational Aspirations on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the interaction effect between Educational Aspirations and Socio-Economic Status on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the interaction effect between Socio-Economic Status and Academic stress on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the effect of Social Stress on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the interaction effect between Social Stress and Educational Aspirations on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the interaction effect between Socio-Economic Status and Social stress on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

• To study the interaction effect between Academic Stress, Educational Aspirations and Socio-Economic Status on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.
To study the interaction effect between Social Stress, Educational Aspirations and Socio-Economic Status on Mathematical Cognitive Skills (Total Scores and scores on each of the selected mathematical cognitive skills) for X graders.

Following hypotheses were formulated for the present investigation:

**SECTION I (With Academic Stress)**

- **For Analyses on Mathematical Cognitive Skills (Total Scores) in Relation to Academic Stress × Educational Aspirations × Socio-Economic Status:**
  - **Ho.1:** X graders having High, Average and Low Academic Stress will not be significantly different on total scores of Mathematical Cognitive Skills.
  - **Ho.2:** X graders having High, Average and Low Educational Aspirations will not be significantly different on total scores of Mathematical Cognitive Skills.
  - **Ho.3:** X graders having High, Average and Low Socio-Economic Status will not be significantly different on total scores of Mathematical Cognitive Skills.
  - **Ho.4:** There will be no significant interaction effect of Academic Stress and Educational Aspirations on total scores of Mathematical Cognitive Skills for X graders.
  - **Ho.5:** There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on total scores of Mathematical Cognitive Skills for X graders.
  - **Ho.6:** There will be no significant interaction effect of Socio-Economic Status and Academic Stress on total scores of Mathematical Cognitive Skills for X graders.
  - **Ho.7:** There will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on total scores of Mathematical Cognitive Skills for X graders.

- **For Analyses on Skill of Knowing in Relation to Academic Stress × Educational Aspirations × Socio-Economic Status:**
  - **Ho.8:** X graders having High, Average and Low Academic Stress will not be significantly different on scores of skill of Knowing.
  - **Ho.9:** X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Knowing.
  - **Ho.10:** X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Knowing.
  - **Ho.11:** There will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of skill of Knowing for X graders.
  - **Ho.12:** There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Knowing for X graders.
Ho.13: There will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of skill of Knowing for X graders.

Ho.14: There will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Knowing for X graders.

For Analyses on Skill of Understanding in Relation to 
Academic Stress × Educational Aspirations × Socio-Economic Status:

Ho.15: X graders having High, Average and Low Academic Stress will not be significantly different on scores of skill of Understanding.

Ho.16: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Understanding.

Ho.17: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Understanding.

Ho.18: There will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of skill of Understanding for X graders.

Ho.19: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Understanding for X graders.

Ho.20: There will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of skill of Understanding for X graders.

Ho.21: There will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Understanding for X graders.

For Analyses on Skill of Analysis in Relation to 
Academic Stress × Educational Aspirations × Socio-Economic Status:

Ho.22: X graders having High, Average and Low Academic Stress will not be significantly different on scores of skill of Analysis.

Ho.23: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Analysis.

Ho.24: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Analysis.

Ho.25: There will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of skill of Analysis for X graders.

Ho.26: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Analysis for X graders.

Ho.27: There will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of skill of Analysis for X graders.

Ho.28: There will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Analysis for X graders.

For Analyses on Skill of Applying in Relation to 
Academic Stress × Educational Aspirations × Socio-Economic Status:

Ho.29: X graders having High, Average and Low Academic Stress will not be significantly different on scores of skill of Applying.
Ho.30: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Applying.

Ho.31: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Applying.

Ho.32: There will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of skill of Applying for X graders.

Ho.33: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Applying for X graders.

Ho.34: There will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of skill of Applying for X graders.

Ho.35: There will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Applying for X graders.

• For Analyses on Skill of Solving in Relation to Academic Stress × Educational Aspirations × Socio-Economic Status:

Ho.36: X graders having High, Average and Low Academic Stress will not be significantly different on scores of skill of Solving.

Ho.37: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Solving.

Ho.38: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Solving.

Ho.39: There will be no significant interaction effect of Academic Stress and Educational Aspirations on scores of skill of Solving for X graders.

Ho.40: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Solving for X graders.

Ho.41: There will be no significant interaction effect of Socio-Economic Status and Academic Stress on scores of skill of Solving for X graders.

Ho.42: There will be no significant interaction effect of Academic Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Solving for X graders.

SECTION II (With Social Stress)

• For Analyses on Mathematical Cognitive Skills (Total Scores) in Relation to Social Stress × Educational Aspirations × Socio-Economic Status:

Ho.43: X graders having High, Average and Low Social Stress will not be significantly different on total scores of Mathematical Cognitive Skills.

Ho.44: X graders having High, Average and Low Educational Aspirations will not be significantly different on total scores of Mathematical Cognitive Skills.

Ho.45: X graders having High, Average and Low Socio-Economic Status will not be significantly different on total scores of Mathematical Cognitive Skills.

Ho.46: There will be no significant interaction effect of Social Stress and Educational Aspirations on total scores of Mathematical Cognitive Skills for X graders.

Ho.47: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on total scores of Mathematical Cognitive Skills for X graders.

Ho.48: There will be no significant interaction effect of Socio-Economic Status and Social Stress on total scores of Mathematical Cognitive Skills for X graders.
Ho.49: There will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on total scores of Mathematical Cognitive Skills for X graders.

- For Analyses on Skill of Knowing in Relation to Social Stress × Educational Aspirations × Socio-Economic Status:
  
  Ho.50: X graders having High, Average and Low Social Stress will not be significantly different on scores of skill of Knowing.
  
  Ho.51: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Knowing.
  
  Ho.52: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Knowing.
  
  Ho.53: There will be no significant interaction effect of Social Stress and Educational Aspirations on scores of skill of Knowing for X graders.
  
  Ho.54: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Knowing for X graders.
  
  Ho.55: There will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of skill of Knowing for X graders.
  
  Ho.56: There will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Knowing for X graders.

- For Analyses on Skill of Understanding in Relation to Social Stress × Educational Aspirations × Socio-Economic Status:
  
  Ho.57: X graders having High, Average and Low Social Stress will not be significantly different on scores of skill of Understanding.
  
  Ho.58: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Understanding.
  
  Ho.59: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Understanding.
  
  Ho.60: There will be no significant interaction effect of Social Stress and Educational Aspirations on scores of skill of Understanding for X graders.
  
  Ho.61: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Understanding for X graders.
  
  Ho.62: There will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of skill of Understanding for X graders.
  
  Ho.63: There will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Understanding for X graders.

- For Analyses on Skill of Analysis in Relation to Social Stress × Educational Aspirations × Socio-Economic Status:
  
  Ho.64: X graders having High, Average and Low Social Stress will not be significantly different on scores of skill of Analysis.
  
  Ho.65: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Analysis.
Ho.66: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Analysis.
Ho.67: There will be no significant interaction effect of Social Stress and Educational Aspirations on scores of skill of Analysis for X graders.
Ho.68: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Analysis for X graders.
Ho.69: There will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of skill of Analysis for X graders.
Ho.70: There will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Analysis for X graders.

• For Analyses on Skill of Applying in Relation to Social Stress × Educational Aspirations × Socio-Economic Status:
Ho.71: X graders having High, Average and Low Social Stress will not be significantly different on scores of skill of Applying.
Ho.72: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Applying.
Ho.73: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Applying.
Ho.74: There will be no significant interaction effect of Social Stress and Educational Aspirations on scores of skill of Applying for X graders.
Ho.75: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Applying for X graders.
Ho.76: There will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of skill of Applying for X graders.
Ho.77: There will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Applying for X graders.

• For Analyses on Skill of Solving in Relation to Social Stress × Educational Aspirations × Socio-Economic Status:
Ho.78: X graders having High, Average and Low Social Stress will not be significantly different on scores of skill of Solving.
Ho.79: X graders having High, Average and Low Educational Aspirations will not be significantly different on scores of skill of Solving.
Ho.80: X graders having High, Average and Low Socio-Economic Status will not be significantly different on scores of skill of Solving.
Ho.81: There will be no significant interaction effect of Social Stress and Educational Aspirations on scores of skill of Solving for X graders.
Ho.82: There will be no significant interaction effect of Educational Aspirations and Socio-Economic Status on scores of skill of Solving for X graders.
Ho.83: There will be no significant interaction effect of Socio-Economic Status and Social Stress on scores of skill of Solving for X graders.
Ho.84: There will be no significant interaction effect of Social Stress, Educational Aspirations and Socio-Economic Status on scores of skill of Solving for X graders.
METHODOLOGY OF RESEARCH

DESIGN OF THE STUDY

A research design is the plane, structure and strategy of investigation conceived so as to obtain answer to research questions and control variance (Lindquist, 1956). In the present study, the Descriptive Exploratory Method of research has been employed. This research study was non-experimental because it deals with the relationship between non-manipulated variable in a natural, rather than artificial setting. Method of Descriptive research is particularly appropriate in the behavioural sciences because many of the types of behaviours that interest the researcher cannot be arranged in an artificial setting. Types of behaviours under the natural conditions occur in the school. In fact, the behaviours which were observed and described would have happened even though there had been no observation or analysis. Descriptive Exploratory research also involves events that have already existed and may be related to a present condition. This method was chosen because of these distinctive advantages for the various aspects. In the present investigation, Stress, Aspirations and Socio-Economic Status were three independent variables. Mathematical Cognitive Skills was dependent variable. All the independent variables were studied at three levels each viz: High, Average and Low.

TOOLS USED

- **Cognitive Competence Test**: This test was developed and validated by the investigator herself based on the selected five different Cognitive skills, covering the syllabi of Mathematics of X class under Punjab School Education Board.

- **Scale of Stress**: Scale of Academic Stress and Scale of Social Stress developed and standardized by Bisht, A.R. (1987) (From Bisht Battery of Scales of Stress).

- **Educational Aspiration Scale (E.A.S.)**: It was a student version developed and standardized by Sharma, V.P. and Gupta, A. (1971).

- **Socio-Economic Status Scale**: It was developed, validated and revised by Dev-Mohan (1998).
The sample in the present investigation was drawn at two levels:

- The School Sample
- The Student Sample

**The School Sample**

The school sample was drawn from the schools of District Muktsar in Punjab. A list of schools was procured from the District Education Office. Then by random sampling the schools were selected. For random sampling the name of all the schools were written down on separate sheets of paper of equal size. The papers were folded into six symmetrical slips and put in a carton box. The lid was then sealed and the box was shaken up many times for easy shuffling to take place. The investigator drew out ten slips one by one bearing the names of each school. The draw of school included following schools:

- Govt. High School, Kotbhai.
- Govt. High School, Sahibchand.
- Arya Puttri Pathshalla High School, Giddarbaha.
- Govt. Secondary School (Boys), Giddarbaha.
- Govt. High School, Chottiana.
- Govt. Secondary School, Lambi.
- Govt. Secondary School, Channu.
- Govt. Secondary School, Alam Alla.
- Govt. Secondary School, Bhaliana.

All the schools were equal on the basis of their intake procedures, standard of education; reputation and all were affiliated to Punjab School Education Board.

**The Student Sample**

The principals of these schools were approached. All the ten principals welcomed the idea and promised to co-operate very enthusiastically. It was ensured that none of these schools had done ability grouping and students were randomly
assigned to each section. Hence sections were randomly selected from each of these ten schools. The distribution of initial sample has been presented in the table 6.T.1.

**Table 6.T.1**

**School-wise Distribution of Initial Sample**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the School</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Govt. Girls Secondary School, Giddarbaha</td>
<td>172</td>
</tr>
<tr>
<td>2.</td>
<td>Govt. High School, Kotbhai</td>
<td>48</td>
</tr>
<tr>
<td>3.</td>
<td>Govt. High School, Sahibchand</td>
<td>28</td>
</tr>
<tr>
<td>4.</td>
<td>Arya Puttri Pathshalla High School, Giddarbaha</td>
<td>37</td>
</tr>
<tr>
<td>5.</td>
<td>Govt. Secondary School (Boys), Giddarbaha</td>
<td>149</td>
</tr>
<tr>
<td>6.</td>
<td>Govt. High School, Chottiana</td>
<td>27</td>
</tr>
<tr>
<td>7.</td>
<td>Govt. Secondary School, Lambi</td>
<td>43</td>
</tr>
<tr>
<td>8.</td>
<td>Govt. Secondary School, Channu</td>
<td>40</td>
</tr>
<tr>
<td>9.</td>
<td>Govt. Secondary School, Alam Alla</td>
<td>46</td>
</tr>
<tr>
<td>10.</td>
<td>Govt. Secondary School, Bhaliana</td>
<td>37</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>627</strong></td>
</tr>
</tbody>
</table>

**The Final Sample**

The total process of study lasted about two months. Hence, there were some dropouts in the sample because of absence at one or the other stage. These students were therefore dropped at the time of analysis. The final sample on which the analysis was done have been presented in the Table 6.T.2.

**Table 6.T.2**

**School-wise Distribution of Final Sample**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the School</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Govt. Girls Secondary School, Giddarbaha</td>
<td>166</td>
</tr>
<tr>
<td>2.</td>
<td>Govt. High School, Kotbhai</td>
<td>46</td>
</tr>
<tr>
<td>3.</td>
<td>Govt. High School, Sahibchand</td>
<td>24</td>
</tr>
<tr>
<td>4.</td>
<td>Arya Puttri Pathshalla High School, Giddarbaha</td>
<td>34</td>
</tr>
<tr>
<td>5.</td>
<td>Govt. Secondary School (Boys), Giddarbaha</td>
<td>144</td>
</tr>
<tr>
<td>6.</td>
<td>Govt. High School, Chottiana</td>
<td>23</td>
</tr>
<tr>
<td>7.</td>
<td>Govt. Secondary School, Lambi</td>
<td>41</td>
</tr>
<tr>
<td>8.</td>
<td>Govt. Secondary School, Channu</td>
<td>38</td>
</tr>
<tr>
<td>9.</td>
<td>Govt. Secondary School, Alam Alla</td>
<td>43</td>
</tr>
<tr>
<td>10.</td>
<td>Govt. Secondary School, Bhaliana</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>594</strong></td>
</tr>
</tbody>
</table>

**PROCEDURE OF THE STUDY**

The study was conducted at two stages:

Stage I: Selection of the sample

Stage II: Collection of data
Stage I: Selection of the sample

The procedure adopted for selection of the sample has already been discussed under the heading SAMPLE.

Stage II: Collection of data

The aim of the present investigation was to study Mathematical Cognitive Skills in relation to Stress, Aspirations and Socio-Economic Status of X graders. All the tools employed in this study were administered to 627 students of different schools of District Muktsar (Punjab).

Fixing the schedule

After the selection of the sample, Principals and teachers of the selected schools were contacted with prior appointment. A schedule was fixed to collect information from the students’ of ten schools with the help of the respective class teachers. On the scheduled date informal introduction with the students’ was done through their class teachers to develop rapport. Proper conditions for data collection were ensured before administering of tools.

Administering the Tools

After establishing a proper rapport with the students, scales measuring the above mentioned variables were administered in small groups and in all it took five sittings with every student. The testing conditions for all the students were kept as constant and uniform as possible. Before starting the testing session, it was ensured that the subjects were seated comfortably in a room where there was no outside disturbance. The subjects were told to give their true, free and frank responses and opinions. Instructions for each test were given at the top of each questionnaire and the investigator herself explained the instructions in clear terms and simple language for each test. The subjects were assured that the information revealed by them would be kept confidential, since it was being collected for the purpose of research only. The tools were administered one by one. Each tool was administered on a separate day.

All the tools were scored according to their respective keys. Tabulation of data was done according to the design of the study. The data thus collected was subjected to statistical analysis.

STATISTICAL TECHNIQUES

The following statistical techniques were employed to analyse the data to test the hypotheses:
• Descriptive Statistics like Mean, Standard Deviation, Skewness, and Kurtosis etc. were used to study the nature of data.
• Graphical presentations were also done to analyse data qualitatively, wherever necessary.
• 3x3x3 ANOVA was used for analysis and interpretation of data.
• Each significant F-ratio was followed by t-test.

MAJOR FINDINGS OF THE STUDY

CONCLUSIONS BASED ON ANALYSES OF MATHEMATICAL COGNITIVE SKILLS (TOTAL SCORES) AND SCORES ON EACH OF THE INDIVIDUAL MATHEMATICAL COGNITIVE SKILLS IN RELATION TO ACADEMIC STRESS, EDUCATIONAL ASPIRATIONS AND SOCIO-ECONOMIC STATUS

Major conclusions drawn from the analyses reported in Section I have been summarized below:

Conclusions based on analyses on Total Scores of Mathematical Cognitive Skills

Main Effects:
• X graders having High, Average and Low Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.
• X graders having High, Average and Low Educational Aspirations were significantly different on means of Total scores for Mathematical Cognitive Skills.
  ❖ X graders having High and Average Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills.
  ❖ The mean achievement of X graders with High Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.
The mean achievement of X graders with Average Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.

- X graders having High, Average and Low Socio-Economic Status were significantly different on means of Total scores for Mathematical Cognitive Skills.
  - The mean achievement of X graders with High Socio-Economic Status was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Average Socio-Economic Status.
  - The mean achievement of X graders with High Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.
  - The mean achievement of X graders with Average Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.

Two Order Interactions:

- Academic Stress and Educational Aspirations did not yield different means on Total scores of Mathematical Cognitive Skills for X graders.
- The interaction effect of Educational Aspirations and Socio-Economic Status yielded significantly different means on Total Scores of Mathematical Cognitive Skills for X graders.
  - Mean of Total scores on Mathematical Cognitive Skills of X graders with High Educational Aspirations (B1) and that of those in Average Educational Aspirations (B2) were not different.
  - High Educational Aspirations Group (B1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts (Group B3) of Low Educational Aspirations group.
  - High Socio-Economic Status Group (C1) performed higher on means of Total scores of Mathematical Cognitive Skills as compared to High Educational Aspirations Group (B1).
  - High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- High Educational Aspirations Group (B1) achieved higher means on Total scores of Cognitive Skills in Mathematics as compared to their counterparts in Group of X graders with Low Socio-Economic Status (C3).
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Educational Aspirations (B2).
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).
- Low Educational Aspirations group (B3) of X graders and that of Average Socio-Economic Status (C2) achieved equal means of Total scores on Mathematical Cognitive Skills.
- Low Educational Aspirations Group (B3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).
- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

The interaction effect of Socio-Economic Status and Academic Stress yielded significantly different means of Total Scores on Mathematical Cognitive Skills for X graders.

High Socio-Economic Status Group (C1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts (Group C2) of Average Socio-Economic Status group.

High Socio-Economic Status Group (C1) performed higher means on Total scores of Mathematical Cognitive Skills as compared to Low Socio-Economic Status Group (C3).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in High Academic Stress Group (A1).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Cognitive Skills in Mathematics as compared to their counterparts in Group of X graders with Average Academic Stress (A2).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Academic Stress Group (A3).

Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

Mean of Total scores on Mathematical Cognitive Skills of X graders with Average Socio-Economic Status (C2) and that of those in High Academic Stress (A1) were not different.

Average Socio-Economic Status group (C2) of X graders and that of Average Academic Stress (A2) achieved equal means of Total scores on Mathematical Cognitive Skills.
Low Academic Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

High Academic Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

Average Academic Stress Group (A2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

Low Academic Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

X graders having High (A1) and Average (A2) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.

X graders having High (A1) and Low (A3) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.

X graders having Average (A2) and Low (A3) Academic Stress achieved equal means of Total scores on Mathematical Cognitive Skills.

Three Order Interaction:
- The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different means of Total scores on Mathematical Cognitive Skills for X graders.

Conclusions based on analyses on Skill of Knowing

Main Effects:
- X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Knowing.
- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores of Skill of Knowing.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Knowing.
The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.

The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.

- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores of Skill of Knowing.

- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Average Socio-Economic Status.

- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.

- The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.

**Two Order Interactions:**

- Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Knowing for X graders.

- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Knowing for X graders.

- Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Knowing for X graders.

**Three Order Interaction:**

- The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Knowing for X graders.

**Conclusions based on analyses on Skill of Understanding**

**Main Effects:**

- X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Understanding.
• X graders having High, Average and Low Educational Aspirations were significantly different on mean scores for Skill of Understanding.
  ❖ X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Understanding.
  ❖ The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Understanding than their counterparts with Low Educational Aspirations.
  ❖ The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill for Understanding than their counterparts with Low Educational Aspirations.

• X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores for Skill of Understanding.
  ❖ The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Average Socio-Economic Status.
  ❖ The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Low Socio-Economic Status.
  ❖ X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Understanding.

Two Order Interactions:
• Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Understanding for X graders.
• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Understanding for X graders.
• Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Understanding for X graders.

Three Order Interaction:
• The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Understanding for X graders.
Main Effects:

- X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Analysis.
- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores for Skill of Analysis.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Analysis.
  - The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Analysis than their counterparts with Low Educational Aspirations.
  - X graders having Average and Low Educational Aspirations achieved equal mean scores on Skill of Analysis.
- X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores for Skill of Analysis.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Average Socio-Economic Status.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Low Socio-Economic Status.
  - X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Analysis.

Two Order Interactions:

- Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Analysis for X graders.
- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Analysis for X graders.
- Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Analysis for X graders.
Three Order Interaction:
  • The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Analysis for X graders.

Conclusions based on analyses on Skill of Applying

Main Effects:
  • X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Applying.
  • X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Applying.
  • X graders having High, Average and Low Socio-Economic Status achieved equal mean scores on Skill of Applying.

Two Order Interactions:
  • Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Applying for X graders.
  • Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Applying for X graders.
  • Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Applying for X graders.

Three Order Interaction:
  • The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Applying for X graders.

Conclusions based on analyses on Skill of Solving

Main Effects:
  • X graders having High, Average and Low Academic Stress achieved equal mean scores on Skill of Solving.
X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Solving.

X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores on Skill of Solving.

- X graders having High and Average Socio-Economic Status achieved equal mean scores on Skill of Solving.
- The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.
- The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.

**Two Order Interactions:**

- Academic Stress and Educational Aspirations did not yield different mean scores on Skill of Solving for X graders.
- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Solving for X graders.
- Socio-Economic Status and Academic Stress did not yield different mean scores on Skill of Solving for X graders.

**Three Order Interaction:**

- The three variables i.e. Academic Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Solving for X graders.

**CONCLUSIONS BASED ON ANALYSES OF MATHEMATICAL COGNITIVE SKILLS (TOTAL SCORES) AND SCORES ON EACH OF THE INDIVIDUAL MATHEMATICAL COGNITIVE SKILLS IN RELATION TO SOCIAL STRESS, EDUCATIONAL ASPIRATIONS AND SOCIO-ECONOMIC STATUS**

Major conclusions drawn from the analyses reported in Section II have been summarized below:
Main Effects:

- X graders having High, Average and Low Social Stress were significantly different on means of Total scores for Mathematical Cognitive Skills.
  - The mean achievement of X graders with High Social Stress was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Social Stress.
  - X graders having High and Low Social Stress achieved equal means of Total Scores on Mathematical Cognitive Skills.
  - The mean achievement of X graders with Low Social Stress \( (M=44.81) \) was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Average Social Stress \( (M=40.80) \).

- X graders having High, Average and Low Educational Aspirations were significantly different on means of Total scores on Mathematical Cognitive Skills.
  - X graders having High and Average Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills.
  - The mean achievement of X graders with High Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.
  - The mean achievement of X graders with Average Educational Aspirations was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Low Educational Aspirations.

- X graders having High, Average and Low Socio-Economic Status were significantly different on means of Total scores of Mathematical Cognitive Skills.
  - The mean achievement of X graders with High Socio-Economic Status was higher on Total Scores of Mathematical Cognitive Skills than their counterparts with Average Socio-Economic Status.
The mean achievement of X graders with High Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.

The mean achievement of X graders with Average Socio-Economic Status was higher on Total scores of Mathematical Cognitive Skills than their counterparts with Low Socio-Economic Status.

Two Order Interactions:

- The interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Total Scores of Mathematical Cognitive Skills for X graders.

- High Social Stress Group (A1) was higher on means of Total scores on Cognitive Skills in Mathematics as compared to their counterparts Group (A2) of Average Social Stress group.

- Mean of Total scores on Mathematical Cognitive Skills of X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different.

- High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal means of Total scores on Mathematical Cognitive Skills.

- High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal means of Total scores on Mathematical Cognitive Skills.

- High Social Stress Group (A1) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

- Low Social Stress Group (A3) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).

- High Educational Aspirations Group (B1) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).

- Average Educational Aspirations Group (B2) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).
Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal means of Total scores on Mathematical Cognitive Skills.

Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal means of Total scores on Mathematical Cognitive Skills.

Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal means of Total scores on Mathematical Cognitive Skills.

Low Social Stress Group (A3) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

X graders having High (B1) and Average (B2) Educational Aspirations achieved equal means of Total scores on Mathematical Cognitive Skills.

High Educational Aspirations Group (B1) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

Average Educational Aspirations Group (B2) achieved higher means on total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

The interaction effect of Educational Aspirations and Socio-Economic Status yielded significantly different means on Total Scores of Mathematical Cognitive Skills for X graders.

Mean of Total scores on Mathematical Cognitive Skills of X graders with High Educational Aspirations (B1) and that of those in Average Educational Aspirations (B2) were not different.

High Educational Aspirations Group (B1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts (Group B3) of Low Educational Aspirations group.

High Socio-Economic Status Group (C1) performed higher on means of Total scores of Mathematical Cognitive Skills as compared to High Educational Aspirations Group (B1).
High Educational Aspirations Group (B1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

High Educational Aspirations Group (B1) achieved higher means on Total scores of Cognitive Skills in Mathematics as compared to their counterparts in Group of X graders with Low Socio-Economic Status (C3).

Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Educational Aspirations Group (B3).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Educational Aspirations (B2).

Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

Average Educational Aspirations Group (B2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

Low Educational Aspirations group (B3) of X graders and that of Average Socio-Economic Status (C2) achieved equal on Mathematical Cognitive Skills.

Low Educational Aspirations Group (B3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).
Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

- The interaction effect of Socio-Economic Status and Academic Stress yielded significantly different means on Total Scores of Mathematical Cognitive Skills of X graders.

- High Socio-Economic Status Group (C1) was higher on means of Total scores of Cognitive Skills in Mathematics as compared to their counterparts Group (C2) of Average Socio-Economic Status group.

- High Socio-Economic Status Group (C1) performed higher on means of Total scores of Mathematical Cognitive Skills as compared to Low Socio-Economic Status Group (C3).

- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in High Social Stress Group (A1).

- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Cognitive Skills in Mathematics as compared to their counterparts in Group of X graders with Average Social Stress (A2).

- High Socio-Economic Status Group (C1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Social Stress Group (A3).

- Average Socio-Economic Status Group (C2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

- High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

- Average Socio-Economic Status group (C2) of X graders and that of Average Social Stress (A2) achieved equal means of Total scores on Mathematical Cognitive Skills.
Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C2).

High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

Average Social Stress Group (A2) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Low Socio-Economic Status Group (C3).

Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Socio-Economic Status Group (C3).

High Social Stress Group (A1) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).

X graders having High (A1) and Low (A3) Social Stress achieved equal means on Total scores of Mathematical Cognitive Skills.

Low Social Stress Group (A3) achieved higher means on Total scores of Mathematical Cognitive Skills than their counterparts in Average Social Stress Group (A2).

Three Order Interaction:

- The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different means of Total scores on Mathematical Cognitive Skills for X graders.

Conclusions based on analyses on Skill of Knowing

Main Effects:

- X graders having High, Average and Low Social Stress were significantly different on mean scores of Skill of Knowing.

- The mean achievement of X graders with High Social Stress was higher on scores of Skill of Knowing than their counterparts with Average Social Stress.
• X graders having High and Low Social Stress achieved equal mean scores on Skill of Knowing.
• The mean achievement of X graders with Low Social Stress was higher on scores of Skill of Knowing than their counterparts with Average Social Stress.

X graders having High, Average and Low Educational Aspirations were significantly different on mean scores of Skill of Knowing.

• X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Knowing.
• The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.
• The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill of Knowing than their counterparts with Low Educational Aspirations.

X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores of Skill of Knowing.

• The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Average Socio-Economic Status.
• The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.
• The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Knowing than their counterparts with Low Socio-Economic Status.

**Two Order Interactions:**
• The interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Scores of Skill of Knowing for X graders.
  • High Social Stress Group (A1) was higher on mean scores of Skill of Knowing as compared to their counterparts Group (A2) of Average Social Stress group.
Mean on scores of Skill of Knowing of X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different.

High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Knowing.

High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Knowing.

High Social Stress Group (A1) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).

Low Social Stress Group (A3) achieved higher means on scores of Skill of Knowing than their counterparts in Average Social Stress Group (A2).

High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Knowing than their counterparts in Average Social Stress Group (A2).

Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Knowing than their counterparts in Average Social Stress Group (A2).

Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Knowing.

Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Knowing.

Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal means scores on Skill of Knowing.

Low Social Stress Group (A3) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).
X graders having High (B1) and Average (B2) Educational Aspirations achieved equal mean scores on Skill of Knowing.

High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).

Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Knowing than their counterparts in Low Educational Aspirations Group (B3).

- Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Knowing for X graders.
- Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Knowing for X graders.

**Three Order Interaction:**
- The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Knowing for X graders.

### Conclusions based on analyses on Skill of Understanding

**Main Effects:**
- X graders having High, Average and Low Social Stress were significantly different on mean scores of Skill of Understanding.
  - X graders having High and Average Social Stress achieved equal mean scores on Skill of Understanding.
  - X graders having High and Low Social Stress achieved equal mean scores on Skill of Understanding.
  - The mean achievement of X graders with Low Social Stress was higher on scores of Skill of Understanding than their counterparts with Average Social Stress.
- X graders having High, Average and Low Educational Aspirations were significantly different on mean scores of Skill of Understanding.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Understanding.
The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Understanding than their counterparts with Low Educational Aspirations.

The mean achievement of X graders with Average Educational Aspirations was higher on scores for Skill of Understanding than their counterparts with Low Educational Aspirations.

X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores of Skill of Understanding.

The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Average Socio-Economic Status.

The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Understanding than their counterparts with Low Socio-Economic Status.

X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Understanding.

Two Order Interactions:

The interaction effect of Social Stress and Educational Aspirations yielded significantly different means on Scores of Skill of Understanding for X graders.

Mean scores on Skill of Understanding of X graders with High Social Stress (A1) and that of those in Average Social Stress (A2) were not different.

Mean scores on Skill of Understanding of X graders with High Social Stress (A1) and that of those in Low Social Stress (A3) were not different.

High Social Stress group (A1) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Understanding.

High Social Stress group (A1) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Understanding.
High Social Stress group (A1) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Understanding.

Low Social Stress Group (A3) achieved higher means on scores of Skill of Understanding than their counterparts in Average Social Stress Group (A2).

High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Understanding than their counterparts in Average Social Stress Group (A2).

Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Understanding than their counterparts in Average Social Stress Group (A2).

Average Social Stress group (A2) of X graders and that of Low Educational Aspirations (B3) achieved equal mean scores on Skill of Understanding.

Low Social Stress group (A3) of X graders and that of High Educational Aspirations (B1) achieved equal mean scores on Skill of Understanding.

Low Social Stress group (A3) of X graders and that of Average Educational Aspirations (B2) achieved equal mean scores on Skill of Understanding.

Low Social Stress Group (A3) achieved higher means on scores of Skill of Understanding than their counterparts in Low Educational Aspirations Group (B3).

X graders having High (B1) and Average (B2) Educational Aspirations achieved equal mean scores on Skill of Understanding.

High Educational Aspirations Group (B1) achieved higher means on scores of Skill of Understanding than their counterparts in Low Educational Aspirations Group (B3).

Average Educational Aspirations Group (B2) achieved higher means on scores of Skill of Understanding than their counterparts in Low Educational Aspirations Group (B3).

Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Understanding for X graders.
• Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Understanding for X graders.

**Three Order Interaction:**
• The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Understanding for X graders.

### Conclusions based on analyses on Skill of Analysis

**Main Effects:**
• X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Analysis.

• X graders having High, Average and Low Educational Aspirations were significantly different on mean scores for Skill of Analysis.
  - X graders having High and Average Educational Aspirations achieved equal mean scores on Skill of Analysis.
  - The mean achievement of X graders with High Educational Aspirations was higher on scores for Skill of Analysis than their counterparts with Low Educational Aspirations.
  - X graders having Average and Low Educational Aspirations achieved equal mean scores on Skill of Analysis.

• X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores for Skill of Analysis.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Average Socio-Economic Status.
  - The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Analysis than their counterparts with Low Socio-Economic Status.
  - X graders having Average and Low Socio-Economic Status achieved equal mean scores on Skill of Analysis.

**Two Order Interactions:**
• Social Stress and Educational Aspirations did not yield different mean scores on Skill of Analysis for X graders.
• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Analysis for X graders.
• Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Analysis for X graders.

Three Order Interaction:
• The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Analysis for X graders.

Conclusions based on analyses on Skill of Applying

Main Effects:
• X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Applying.
• X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Applying.
• X graders having High, Average and Low Socio-Economic Status achieved equal mean scores on Skill of Applying.

Two Order Interactions:
• Social Stress and Educational Aspirations did not yield different mean scores on Skill of Applying for X graders.
• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Applying for X graders.
• Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Applying for X graders.

Three Order Interaction:
• The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Applying for X graders.

Conclusions based on analyses on Skill of Solving

Main Effects:
• X graders having High, Average and Low Social Stress achieved equal mean scores on Skill of Solving.
• X graders having High, Average and Low Educational Aspirations achieved equal mean scores on Skill of Solving.
• X graders having High, Average and Low Socio-Economic Status were significantly different on mean scores on Skill of Solving.
  ❖ X graders having High and Average Socio-Economic Status achieved equal mean scores on Skill of Solving.
  ❖ The mean achievement of X graders with High Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.
  ❖ The mean achievement of X graders with Average Socio-Economic Status was higher on scores for Skill of Solving than their counterparts with Low Socio-Economic Status.

**Two Order Interactions:**
• Social Stress and Educational Aspirations did not yield different mean scores on Skill of Solving for X graders.
• Educational Aspirations and Socio-Economic Status did not yield different mean scores on Skill of Solving for X graders.
• Socio-Economic Status and Social Stress did not yield different mean scores on Skill of Solving for X graders.

**Three Order Interaction:**
• The three variables i.e. Social Stress, Educational Aspirations and Socio-Economic Status were independent of each other and did not yield different mean scores on Skill of Solving for X graders.

**EDUCATIONAL IMPLICATIONS OF THE FINDINGS**

All research studies lead to some conclusions which help various sections of educational system to understand various issues. There are always some limitations of research investigation, yet there are some issues which are resolved and may be used by various educators. The results of present investigation have following implications:

Educational Planners may construct a flexible curriculum for Mathematics to decrease the Academic Stress of Students. They may revise the syllabus of Mathematics time to time for increasing Educational Aspirations of students. They may effort to remove the defects of educational system for improving different Mathematical Cognitive Skills. They may incorporate such activities which may involve parental participation.
Educational Administrators should establish good environment to learn different Mathematical Cognitive Skills. They should provide well qualified teachers, co-curricular activities and different mediums of study in the school. General awareness programmes should be organized weekly or monthly as possible for parents and students. Both ends should be motivated to participate. The results of the present study also revealed that the Socio-Economic Status, Stress and Educational Aspirations lead to the differences in performance of various skills of Mathematics. The teacher and the school can make use of this result to enhance the Mathematical Cognitive Skills of the students.

The teacher may assess different Mathematical Cognitive Skill of the students. Proper guidance to the students may be provided. He may create the interest of the students in Mathematics. He must identify the students who score high on Academic Stress and Social Stress in the class. Awareness and guidance to the parents may be provided. The teacher may assess the Educational Aspirations of the students. Proper guidance for further study may be provided to the students. Socio-Economic Status of the students may be assessed to study different learning problems. Methods of teaching may be improved.

Parents should be made aware of the results of present investigation and may be encouraged to improve their interaction with children by devoting more time to children, by taking personal interests in their studies and by answering their questions with patience and having more of verbal communication with them by emotional and varied experiences and by conversing with them regarding different things around them. Positive reinforcement to children may also help in enhancing their achievements. As Mathematics is a subject of reasoning and students need guidance even after school hours. Thus parents must be guided not to force their children to just remember basics of Mathematics i.e. rules, formulas, theorems etc. but to concentrate on solving various questions covering many areas of Mathematics and use it in daily life situation. Parents should attend Teacher-parent meetings for discussing various problems of their children.

Students may build a balance between their Educational Aspirations and Occupational Aspirations. The feeling of a healthy competition with siblings and peers in the hope of showing better than others may be built. They should be familiar to coping strategies of Stress. They should know their weaknesses in Mathematics and a healthy interest may be created in Mathematics.
Today’s students are the future of the society. With the help of the results of present study, a rapport may be built between teacher & student, teacher & parents and parents & their children. Each one may understand the aspirations of others. Academic and Social Stress may be reduced with co-operation of each other.

Mathematicians should be made aware of the results of present investigation and they may develop new teaching methods for reducing the stress of students and creating their interests in Mathematics. They may construct special puzzles of Mathematical recreations.

SUGGESTIONS FOR FURTHER RESEARCH

The investigator is quite aware of the limitations under which the present research was conducted and therefore accepted that no sweeping generalization could be made. These findings are only indicative of trends. The researcher, by virtue of her experience in the field of the study, humbly offers the following suggestions for further research that could be undertaken by the prospective researchers.

• The present study was conducted on X graders. A study may be replicated on lower or higher levels e.g. Primary, Upper Primary, Secondary and Higher Secondary levels.

• The study may be replicated on a large sample to authenticate the findings of the present investigation.

• The study may be conducted on the students studying in the schools affiliated to C.B.S.E. or any other school boards.

• The study may be extended to special group children.

• The present study was conducted on the Mathematical Cognitive Skills. A study may be replicated on the Cognitive Skills of Science and languages.

• More research needs to be conducted in order to better understand the classification of different Mathematical Cognitive Skills.

• The independent and dependent variables together only explained a small portion of the variances in learning outcomes and engagement activities. This relationship suggests that there might be other variables e.g. Attitude towards Mathematics, School Environment, Family Environment, Parent-Child interactions, Teacher-Taught relationships etc. that have significant effects on learning and engagement that were not included in the study.