Chapter 1

Introduction
CHAPTER-I
INTRODUCTION

In this fast paced time, with the pressure of international economic competition and an increased focus on technology, parents, educators, local communities, states and National Governments are all struggling to encourage improvement in education to help our children prosper. Children are the supreme asserts of the nation. Today, the index of success and work of a child in a particular class is his academic achievement, which he acquires during his various experiences in the classroom. That is why, students’ fail so often and so universally that some people are convinced that failure is an essential and inevitable aspect of the educational process. Failure often produces harmful consequences that work against the goals of education. The students receiving repeated and consistent evidence of failure show stress and frustration. Peace and stress free life for today’s students appears to be a miracle. The student is caught in dynamic technological whirlpool and seems to be precariously poised on the brink of disaster. Adolescents are full of dreams, ideas, ambitions, achievements and promises and on the other hand they face problems, disillusionments, frustrations, breakdowns and stress.

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.
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The ultimate goal of education is the all round development of the personality of the individual. Despite large measures taken in this direction theoretically, but practical implementation are very less in this direction. Stress occurs when there is substantive imbalance between environmental demand and response capability of the organism. The most important agency, which can help in minimizing the stress factor in the child, is his family. A secure and emotionally stable home is most important for the cognitive development and smooth functioning of the child.

1.1: 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 skill has three characteristics.

❖ It represents a chain of motor responses.
❖ It involves co-ordination of hand and eye moments.
❖ It requires the organization of chains into complex responses patterns.

A skill is the total response pattern, resulting out of S-R units and S-R chains welded into a single response pattern. The skills are presumed to be hierarchical response patterns.

Cognitive skills can be characterized as acquired superior performance on tasks for which perception of stimuli is easy and the required motor responses are simple and part of the subjects’ repertoire of responses. This definition clearly includes skills in Mathematics, Natural Science, and other academic subjects. Most laboratory tasks in psychology use readily perceivable stimuli and simple responses, usually button presses or vocationlization of single words. Acquired superior performance on these laboratory tasks as a result of practice also qualifies them as cognitive skills.

Much of our understanding of cognitive skills comes from the study of real-life expertise. Some insight into cognitive skills can be gained through our observation of the performance of every day skills. Many cognitive skills in everyday life have been shown to develop in a way consistent with the three-stage model of skill. Most children learn to read by sounding out words and with further practice the reading of words is converted to automatic access of the meaning of words. Children
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learn to generate sums by sequential continuity initially using figures, then by internalized silent counting and finally by retrieval of familiar facts of single digit additions. Similarly, multiplication is initially generated by sequential addition, but with instruction and training, this process is replaced by direct retrieval from a memorized multiplication table. More complex cognitive skills for solving algebra word problems and physics problems show a similar transformation with experience and practice (Hinsley, Hayes and Simon, 1977).

A number of studies have examined the long-term retention of everyday 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. Characteristics of human intellectual functioning such as thinking, planning, knowing, relating, creating, problem solving, have been traditionally labeled as cognitive skills. A skill is the total responses pattern, resulting out of stimulus-response units and stimulus-response chains welded into a single response pattern. The skills are presumed to be hierarchical response patterns. Skill is a well-developed capability of any kind including intellectual, physical or artistic capabilities.

Cognitive skills are any mental skills that are used in the purpose of acquiring knowledge; these skills include reasoning, perception, and intuition. Mid-Continent Research for Education and Learning (1998) describes the importance of cognitive skills in acquiring literacy skills:

"Reading and writing rely on a specific set of cognitive skills such as attention, memory, symbolic thinking, and self-regulation. As children learn to read and write, they continue to improve these skills, making them more purposeful and deliberate. Deliberate attention is required to differentiate between letters, even if they look alike, and to isolate specific portions of a word for encoding or decoding it. Children must remember the previous words as they decode the subsequent words in a sentence. If they do not make a purposeful attempt to remember, they cannot extract what the sentences means. Writing and reading are the use of symbols and if children cannot..."
think symbolically, they cannot learn to manipulate letters and words. Finally, self-
regulation must be in place so that children can monitor their own understanding of
the print so they can abandon ineffective reading strategies and move on to more
effective ones."

1.1.1: Acquisition of Cognitive Skills

Fitts (1962) identified three phases of learning skills:

- The cognitive phase
- The fixation
- The autonomous

These phases overlap and are not distinct units and moving from one phase to
another is a continuous process. In the **Cognitive phase**, one attempts to
intellectualize the skill that one has to perform. During this phase the learner tries to
analyze the skills and to verbalize about what is being learned. In the **Fixation phase**, the correct behavior patterns are practiced until the chance of making incorrect
responses is reduced to zero; the behavior becomes fixed. The learner at this stage
learns to link together the basic units of the chain. At an advanced level, he learns to
organize the chains into an overall pattern. The **Autonomous phase** is characterized
by increasing speed of performance in skills in which it is important to improve
accuracy to the point at which errors are very unlikely to occur.

Anderson (1982) developed a model for the acquisition of cognitive skill
based on Fitts’s three phrases. Anderson usually describes skill acquisition in terms of
two stages: **Declarative** and **Procedural**, which corresponds to Fitts’s cognitive and
autonomous phases, respectively. Rather than postulating a separate association
phase, Anderson describes a process of knowledge complication by which
knowledge is converted from declarative to procedural form.

The distinction between declarative and procedural knowledge is fundamental
to Anderson’s framework. Roughly speaking, declarative knowledge is the body of
facts and information that a person knows, whereas procedural knowledge is the set of
skills a person knows how to perform. In the declarative stage, instructions and
situation characteristics are encoded as a set of facts. These facts must be rehearsed
and retained in an active state in working memory to be used by general interpretive
mechanisms. As the person practices, procedures specific to the task at hand develop
that do not require the active maintenance of declarative knowledge about how to do the task. These procedures, also called productions, are basically if-then rules. If the condition specified in the production is specified, then the action is carried when performing mental arithmetic.

Performance continuous to improve gradually after the task-specific procedures have been developed and the procedural stage have been reached. This improvement is accomplished through what Anderson (1982), calls tuning, which involves refinement of procedures through processes of:

❖ Generalization (that broaden the range of applicability)
❖ Discrimination (that narrow the rules to only appropriate situations)
❖ Strengthening (that weaken poorer rules and strengthen better rules)

Cognitive Development

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.

Development changes occur through the process of adaptation, which begins in infancy (where cognitive development primarily involves physical experience) and continues through adulthood (where cognitive development is primarily represented by symbolic structures such as those represented in language and mathematics). The two components of adaptation are the processes of assimilation and accommodation. Through assimilation the information provided by an activity is transformed to become compatible with whatever knowledge structures (Schemata) are already available. Even though more sophisticated conceptualizations might be more adaptive in the long run; they may not be possible at a given immature level of development. The clearest representative of schema usage is play; where the primary aims of make believe games are to duplicate behaviorally the products of the imagination (Piaget, 1969).

Assimilation never occurs without some degree of accommodation (and vice-versa). Through accommodation new knowledge taken into the schema of existing knowledge changes the character of the schema itself; in short, accommodation results
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in schema changes. Thus, a different point of view, a different interpretation, or a new way of thinking is required, resulting in progressive changes not only in what the individual knows but, just as important, in the ways of knowing. The general course of accommodation moves from the inherent structures involving the reflexes, through perceptual organization of information, to logical or symbolic organizations (structural knowledge). Imitation is predominantly an accommodative activity (Piaget, 1969).

Always there is equilibrium between the two processes, regardless of the level of development. An event that cannot be understood by sheer assimilation demands accommodation, if equilibrium (balance) is to be achieved. Equilibrium is more readily achieved from middle childhood to maturity than in infancy and early childhood.

Cognitive development occurs linearly (continuously) when the fundamental nature of the fact of the mental function remains unchanged and the growth is quantitative. To examine cognitive growth in linear terms, one or more abilities or achievements (vocabulary, arithmetic, digit-span memory) would be operationally defined and the ability to handle progressively larger qualitatively related units of similar information would be measured over the age range.

➤ Instructions for Cognitive Skills

Jones (1986) defines cognitive instruction as any effort on the part of the teachers or the instructional materials to help students to process information in meaningful ways and become independent learners. He adds that cognitive instruction has the potential to alter substantially the capability of the learner, especially the low-achieving learner, in much the same way as those microchips radically altered the capability of the computer.

Therefore if teachers are going to help students to use cognitive skills and strategies, they should help them to:

- Monitor their cognitive processes effectively.
- Avoid the use of simplistic, primitive routines when better strategies are available.
- Develop an adequate knowledge base of general and specific information and of the strategies available in various subjects’ areas.
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• Develop a pattern of attributing both success and failure to the effectiveness of their efforts.
• Help them to transfer effective strategies to new situations. Cognitive strategy instruction should help learners to develop these skills.

The essential feature of cognitive instruction is a focus on how and why specific topics are to be mastered, with an emphasis on how the specific topic fits into an overall framework of related topics and skills. Instruction can be direct to the extent that the teacher or material makes explicit what is to be learned or indirect to the extent that students themselves make the connection between thinking skills and problem solution. In effective strategy instruction, the teachers serves as a mediator by helping to activate prior knowledge, represent information, select learning strategies, construct meaning, monitor understanding, assess the use of a strategy, organize the related ideas, summarize and extend learning. The most successful programs regarding cognitive skills instructions are those that:
• Stimulate the learners to be active.
• Provide clear feedback regarding the effectiveness of that learner activity.
• Provide instruction in the questions of when, why and where; such activities are likely to be effective (Brown, Day and Jones, 1993).

1.1.2: Piaget’s Periods of Cognitive Development

The course of cognitive growth can be exemplified in Piaget’s description of the periods of cognitive development, where the interest is in species- general functions of mental development. According to Piaget (1969), the chronological ages (CA) typically designated for the four major periods of development are:

- The sensory motor (CA: 0-2 years)
- Pre-operational (CA: 2-7 years)
- Concrete operational (CA: 7-11 years)
- Formal operational (CA: 11-15 years)

• Sensory Motor Period

As the name implies the sensory motor period is one in which the infant employs the capacity (primarily reflexes) with which it is born. At CA: 1-4 months,
clear manifestations of acquired behavior are observed. In the next phase CA: 4-8 months, vision pretension co-ordination is extended to other objects in the environment. At the third phase, CA: 8-12 months, child shows definite co-ordination of mental structures or skills that the person uses to understand new events. At CA: 12-18 months, some degree of inventiveness is exhibited, whereas at CA: 18-24 months deferred initiation is exhibited. At the culmination of the sensory motor period, the child is able to use symbolic behavior.

• Pre-Operational Period

Several new behavior patterns emerge in this period. Although they do not appear in any particular temporal order (i.e. they appear more or less simultaneously), they differ in complexity. These behaviors are deferred as semiotic function, imitation, symbolic play, drawing or direct graphic representation, mental imagery and verbal evocation of events that are not present at the time. As a result of these changes, the child’s ability to communication grows. The child can gather information and transmit it to others, accomplishments that permit rapid learning. He or she can respond to the commands of others, control others verbally, make demands or requests of others, instruct, and be instructed and the like. Language, too, can be used to control one’s own behavior. Speech, at first impulsive, gradually gives way to its primary semantic function: conveying meaning. It proceeds through three stages:

1) Behavior control by verbal commands of another person;
2) Child’s own overt speech regulates the action called for;
3) Behavior is regulated by internal speech (thinking).

• Concrete Operational Period

The changes occurring with the transition to a new period are not jumps, as may seem to be implied. Changes occur gradually during a given period, each period containing vestigial reminders of earlier periods. Those points will become more apparent in the following description of the concrete operations period, which corresponds roughly to the elementary school years.

Children enter this period with several cognitive skills related to their growing knowledge. Language and other symbol systems are skillfully used to communicate both to peers and adults for self-regulation of behavior. Invariants (identity of objects)
are dealt with on a qualitative basis. Differentiation can be made among groups of people a necessary requirement for perspective taking. Memory improves. Nevertheless, these capabilities evolve gradually. During this period the child begins to think accurately and to separate the intuitive from the logical, judgments are based on observations rather than guesses. The child is able to draw conclusions to related observations to classes of objects, and to count, all of which are important for testing reality.

The task traditionally used to represent the changes occurring in the concrete operations period is the conservation task. The conservation task requires that the child deal with the initial stage, the intervening process of transformation, and the final state. A characteristic of the concrete operations period is ability to handle such considerations concurrently, provided the materials can be perceived directly. However, the child is unable to deal with verbal statements of hypothetical problems or statements that require mental manipulations of three or more premises. The child’s performance on the conservation tasks reflects progressive changes in cognitive ability.

Conservation in several kinds of tasks emerges in approximately the following order (Paget and Inhelder, 1969): number, area, length, mass and volume. In all these tasks, children in the concrete operational period are no longer depending on sheer perceptual differences. They know what constitutes a problem and what does not. They can engage in proof by quantitative means without regard for irrelevant apparent differences.

More skills than conservation are required during the concrete operational period. The relation of the person’s schemata to memory can be seen clearly in one of Piaget’s interesting observations regarding seriating. Up to reproducing by drawing, a series of progressively larger sticks, the pre-operational child tends to draw the sticks in groups of the same size, or sets of small and large sticks rather than as a uniformly ascending series. However, when asked six months later to draw from memory the earlier presentation, the child draws the representation accurately. Thus, changes in one part of the system for example, the knowledge structure can affect another part of the system, such as memorial capacity.
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The understanding of numbers, an important concept in a technological society, grows concomitantly with classification and seriating. It occurs when numbers of objects can be separated from their spatial arrangement. Earlier, in the pre-operational period, the child believed that two rows, with equal number of objects in each are not numerically equivalent when one of the rows is spread out.

Flavell (1977) summarized some of the skills from several sources that are acquired in understanding numbers (Gelman, 1978; Schaeffer, Eggleston and Scott, 1974) as follow:

- One skill to be developed in the use of numbers is the ability to recognize, spontaneously, and the number of objects simply by perceiving an array.
- Counting is important numerical skill that is acquired early.
- During the middle childhood period the child learns that numbers have both cardinal and ordinal properties. Children in middle childhood can use either written or Arabic forms of numerals.

Each of the number skills described undergoes subtle changes. In the early stages of counting, for example, children are in difficulty in just touching each of a series of objects once in turn (Potter and Levy, 1968). Later, in counting, they may skip a number or may forget the number of the last object named (Wang, Resnick and Boozer, 1971). In sum, the child does not learn arithmetic skills in isolation but learns the understanding that accompany them as well (i.e. the spatial arrangement is not an indicator of the number of items in a row). Again illustrating that cognitive development in any area is gradual accrual of many functions rather than a sudden appearance of a single important function at a given age (Gelman, 1978).

Other skills accomplished at this stage are acquisitions, including notions of time, velocity, causality, space and motion. Other realms of growth during this period, which touch on cognitive development, include the social, moral and affective facets of the child’s life.

- **Formal Operations Period**

  The final stage of mature thought is initiated in the pre adolescent period and continuous throughout adolescence. The child who has successfully accomplished the cognitive tasks involved in the concrete operations period can now begin to use
formal operations. Thus, the adolescent can think logically about abstract and hypothetical concepts, as well as, about concrete situations. In the formal operations period, objects no longer need to be present in order for the reasoning about them to occur; the problems can be context-free. Since symbolic representations can be employed, it is possible for the person to combine objects, ideas and events that otherwise would seem disconnected or impossible to arrive at a reasonable solution. Assumptions rather than concrete objects can be acted upon. Symbols without referential meaning can be manipulated. Several statements can be related in systematic, logical fashion. Operations can be employed for performing logical combinations, whether of objects, propositions, or variables, to arrive at conclusions.

The reversibility of inversion and reciprocity (compensation), which make their initial appearance in middle-childhood period, now function in dynamic relation to each other. One schema in which processes appear is that of proportionality. At formal operations period, the solution can be arrived at by employing the logic of inverse proportionality between hypothetical and real values for the variables.

Research studies on facets of cognitive that develop with maturity can be classified as changes in capacity, changes in strategies and changes in the form of knowledge acquired (Siegler, 1978). Other changes include memory development, perceptual development, schema development, concept development, meta-memory and perspective taking skills.

1.1.3: Cognitive Skills Based On Bloom’s Classification

Another source of identification of Cognitive Skills is Bloom’s classification of cognitive behavior. The cognitive skills commonly referred to as intellectual ability and skills may also be described as including the behaviors like remembering, reasoning, problem solving, concept formation and to a limited extent, creative thinking. 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.
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Table 1.T.1

<table>
<thead>
<tr>
<th>Category</th>
<th>Example and Key Words (verbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge:</strong></td>
<td>Examples: Recite a policy. Quote prices from memory to a customer. Knows the safety rules. Key Words: defines, describes, identifies, knows, labels, lists, matches, names, outlines, recalls, recognizes, reproduces, selects, states.</td>
</tr>
<tr>
<td><strong>Comprehension:</strong></td>
<td>Examples: Rewrites the principles of test writing. Explain in one's own words the steps for performing a complex task. Translates an equation into a computer spreadsheet. Key Words: comprehends, converts, defends, distinguishes, estimates, explains, extends, generalizes, gives an example, infers, interprets, paraphrases, predicts, rewrites, summarizes, translates.</td>
</tr>
<tr>
<td><strong>Application:</strong></td>
<td>Examples: Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test. Key Words: applies, changes, computes, constructs, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses.</td>
</tr>
<tr>
<td><strong>Analysis:</strong></td>
<td>Examples: Troubleshoot a piece of equipment by using logical deduction. Recognize logical fallacies in reasoning. Gathers information from a department and selects the required tasks for training. Key Words: analyzes, breaks down, compares, contrasts, diagrams, deconstructs, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, relates, selects, separates.</td>
</tr>
<tr>
<td><strong>Synthesis:</strong></td>
<td>Examples: Write a company operations or process manual. Design a machine to perform a specific task. Integrates training from several sources to solve a problem. Revises and process to improve the outcome. Key Words: categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, rewrites, summarizes, tells, writes.</td>
</tr>
<tr>
<td><strong>Evaluation:</strong></td>
<td>Examples: Select the most effective solution. Hire the most qualified candidate. Explain and justify a new budget. Key Words: appraises, compares, concludes, contrasts, criticizes, critiques, defends, describes, discriminates, evaluates, explains, interprets, justifies, relates, summarizes, supports.</td>
</tr>
</tbody>
</table>
In the application of the original taxonomy, several weaknesses and practical limitations have been revealed, a notable weakness is the assumption that cognitive processes are ordered on a single dimension of simple-to-complex behaviour (Furst, 1994), as required in a cumulative hierarchy, the categories were presumed not to overlap. Anderson et al. (2000) suggest “Cumulative Hierarchy” which indicates that “mastery of a more complex category required prior mastery of all the less complex categories below it” is a “stringent standard.” However, in applying the original taxonomy, Ormell (1974) reported contradictions in the frequent inversion of various objectives and tasks. For examples, certain demands for knowledge are more complex than certain demands for analysis or evaluation. Also evaluation is not more complex than synthesis; synthesis involves evaluation (Krietzer et al., 1994). Recent decades gave rise to numerous criticisms, implying that the model was out of date. These criticism included concerns with setting applicability, contemporary language, and process conceptualization.
1.1.4: Revised Bloom’s Taxonomy

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. Unlike the 1956 version, the revised taxonomy differentiates between “knowing what”, the content of thinking, and “knowing how”, the procedures used in solving problems.

The Knowledge Dimension is the “knowing what”. It has four categories: Factual, Conceptual, Procedural and metacognitive. Factual knowledge includes isolated bits of information, such as vocabulary definitions and knowledge about specific details. Conceptual knowledge consists of systems of information, such as classifications and categories. Procedural knowledge includes algorithms, heuristics or rules of thumb, techniques and methods as well as knowledge about when to use these procedures. Metacognitive knowledge refers to knowledge of thinking processes and information about how to manipulate these processes effectively.

The Cognitive Process Dimension of the revised Bloom’s Taxonomy like the original version has six skills. They are, from simplest to most complex: Remember, Understand, Apply, Analyze, Evaluate and Create. Remembering consists of recognizing and recalling relevant information from long-term memory. Understanding is the ability to make your own meaning from educational material such as reading and teacher explanations. The sub skills for this process include interpreting, exemplifying, classifying, summarizing, inferring, comparing and explaining. The third process, Applying, refers to using a learned procedure either in a familiar or new situation. The next process is Analysis, which consists of breaking knowledge down into its parts and thinking about how the parts relate to its overall structure. Students analyze by differentiating, organizing and attributing. Evaluation, which is at the top of the original taxonomy, is the fifth of the six processes in the revised version. It includes checking and critiquing. Creating, a process not included in the earlier taxonomy, is the highest component of the new version. This skill involves putting things together to make something new. To accomplish creating tasks, learners generate, plan, and produce.

According to this taxonomy, each level of knowledge can correspond to each level of cognitive process, so a student can remember factual or procedural
knowledge, understand conceptual or metacognitive knowledge, or analyze metacognitive or factual knowledge. According to Anderson and his colleagues, “Meaningful learning provides students with the knowledge and cognitive processes they need for successful problem solving”.

➢ **Rationale for the revised Taxonomy**

Revised taxonomy has to take into consideration the recent developments in the educational and psychological literature. At the time of the publication of the original taxonomy in 1956, behaviourist learning theories extensively influenced school curriculum and instruction. Since the publication of the original taxonomy in 1956 psychological and education research has witnessed the introduction of several theories and approaches to learning which makes students more knowledgeable of and responsible for their own learning, cognition, and thinking (e.g., Constructivism, Metacognition, Self-regulated, learning). All these theories and approaches see learning as “a proactive activity, requiring self-initiated motivational and behavioural processes as well as metacognitive ones” (Zimmerman, 1990). The revised taxonomy has to incorporate these new learners – centered learning paradigms into its structure. Constructivism, for example, assumes that students must discover, construct and transform knowledge if they are to make it their own. Self-regulated learning is the ability to use and develop knowledge, skills and attitudes acquired in one context in another context (Boekaerts, 1999). Self-regulated learners identify what task requires in terms of cognitive, motivational, and environmental strategies and determine if their personal resources are adequate to effectively accomplish the task (Ertmer and Newby, 1996). Self-awareness, Self-monitoring, and Self-evaluation are crucial to effective self-regulated learning and performance (McCobs, 1994). Metacognition is central to self-regulated learning (Kriewaitd, 2001). Some researchers have suggested that self-regulated learning is synonymous with metacognition (Brown, Hedberg & Harper, 1994).

In order to address the weakness in the original taxonomy and respond to the recent educational and psychological developments, a group of cognitive psychologists, curriculum and instructional researchers, and testing and assessment specialists revised the original taxonomy (Anderson et al., 2000). The revised taxonomy includes several significant changes with reference to assumptions, structure and terminology.
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Table 1.1
Examples of cognitive domain of Bloom’s Taxonomy

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy</th>
<th>The Knowledge Dimension</th>
<th>The Cognitive Process Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Knowledge Dimension</td>
<td>The Cognitive Process Dimension</td>
<td></td>
</tr>
<tr>
<td>Factual Knowledge</td>
<td>List</td>
<td>Summarize</td>
</tr>
<tr>
<td>Conceptual Knowledge</td>
<td>Describe</td>
<td>Interpret</td>
</tr>
<tr>
<td>Procedural Knowledge</td>
<td>Tabulate</td>
<td>Predict</td>
</tr>
<tr>
<td>Meta-Cognitive Knowledge</td>
<td>Appropriate Use</td>
<td>Execute</td>
</tr>
</tbody>
</table>

The following charts list examples of each skill of the Cognitive and Knowledge Dimensions.

Cognitive Processes Dimensions

<table>
<thead>
<tr>
<th>Cognitive Processes</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remembering: Produce the right information from memory.</td>
<td></td>
</tr>
<tr>
<td>Recognizing</td>
<td>• Identify frogs in a diagram of different kinds of amphibians.</td>
</tr>
<tr>
<td></td>
<td>• Find an isosceles triangle in your neighbourhood.</td>
</tr>
<tr>
<td></td>
<td>• Answer any true-false or multiple-choice questions.</td>
</tr>
<tr>
<td>Recalling</td>
<td>• Name three 19th century women English authors.</td>
</tr>
<tr>
<td></td>
<td>• Write the multiplication facts.</td>
</tr>
<tr>
<td></td>
<td>• Reproduce the chemical formula for carbon tetrachloride.</td>
</tr>
<tr>
<td>Understanding: Make meaning from educational material or experiences.</td>
<td></td>
</tr>
<tr>
<td>Interpreting</td>
<td>• Translate a story problem into an algebraic equation.</td>
</tr>
<tr>
<td></td>
<td>• Draw a diagram of the digestive system.</td>
</tr>
<tr>
<td></td>
<td>• Paraphrase Jawaharlal Nehru’s tryst with destiny speech.</td>
</tr>
<tr>
<td>Exemplifying</td>
<td>• Draw a parallelogram.</td>
</tr>
<tr>
<td></td>
<td>• Find an example of stream-of-consciousness style of writing.</td>
</tr>
<tr>
<td></td>
<td>• Name a mammal that lives in our area.</td>
</tr>
<tr>
<td>Classifying</td>
<td>• Label numbers odd or even.</td>
</tr>
<tr>
<td></td>
<td>• List the events of the Sepoy Mutiny of 1857.</td>
</tr>
<tr>
<td></td>
<td>• Group native animals into their proper species.</td>
</tr>
<tr>
<td>Summarizing</td>
<td>• Make up a title for a short passage.</td>
</tr>
<tr>
<td></td>
<td>• List the key points related to capital punishment that the web site promotes.</td>
</tr>
<tr>
<td>Inferring</td>
<td>• Read a passage of dialogue between two characters and make conclusions about their past relationship.</td>
</tr>
<tr>
<td></td>
<td>• Figure out the meaning of an unfamiliar term from the context.</td>
</tr>
<tr>
<td></td>
<td>• Look at a series of numbers and predict what the next number will be.</td>
</tr>
<tr>
<td>Comparing</td>
<td>• Explain how the heart is like a pump.</td>
</tr>
<tr>
<td></td>
<td>• Compare Mahatma Gandhi to a present day leader.</td>
</tr>
<tr>
<td></td>
<td>• Use a Venn diagram to demonstrate how two books by Charles Dickens are similar and different.</td>
</tr>
<tr>
<td>Explaining</td>
<td>• Draw a diagram explaining how air pressure affects the weather.</td>
</tr>
<tr>
<td></td>
<td>• Provide details that justify why the French Revolution happened when and how it did.</td>
</tr>
<tr>
<td></td>
<td>• Describe how interest rates affect the economy.</td>
</tr>
</tbody>
</table>
### Introduction

<table>
<thead>
<tr>
<th>Applying: Use a procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Executing</strong></td>
</tr>
<tr>
<td>• Add a column of two-digit numbers.</td>
</tr>
<tr>
<td>• Orally read a passage in a foreign language.</td>
</tr>
<tr>
<td>• Have a student open house discussion.</td>
</tr>
<tr>
<td><strong>Implementing</strong></td>
</tr>
<tr>
<td>• Design an experiment to see how plants grow in different kinds of soil.</td>
</tr>
<tr>
<td>• Proofread a piece of writing.</td>
</tr>
<tr>
<td>• Create a budget.</td>
</tr>
<tr>
<td><strong>Analyzing: Break a concept down into its parts and describe how the parts relate to the whole</strong></td>
</tr>
<tr>
<td><strong>Differentiating</strong></td>
</tr>
<tr>
<td>• List the important information in a mathematical word problem and cross out the unimportant information.</td>
</tr>
<tr>
<td>• Draw a diagram showing the major and minor characters in a novel.</td>
</tr>
<tr>
<td><strong>Organizing</strong></td>
</tr>
<tr>
<td>• Place the book in the classroom library into categories</td>
</tr>
<tr>
<td>• Make a chart of often-used figurative devices &amp; explain their effect.</td>
</tr>
<tr>
<td>• Make a diagram showing the ways plants &amp; animals in your neighborhood interact with each other.</td>
</tr>
<tr>
<td><strong>Attributing</strong></td>
</tr>
<tr>
<td>• Read letters to the editor to determine the authors' point of view about a local issue.</td>
</tr>
<tr>
<td>• Determine a character's motivation in a novel or short story.</td>
</tr>
<tr>
<td>• Look at brochures of political candidates &amp; hypothesize about their prospective on issues.</td>
</tr>
<tr>
<td><strong>Evaluating: Make judgment based on criteria &amp; syllabus guidelines</strong></td>
</tr>
<tr>
<td><strong>Checking</strong></td>
</tr>
<tr>
<td>• Participate in a writing group, giving peers' feedback on organization &amp; logic of arguments.</td>
</tr>
<tr>
<td>• Listen to a political speech &amp; make a list of any contradictions within the speech.</td>
</tr>
<tr>
<td>• Review a project plan to see if all the necessary steps are included.</td>
</tr>
<tr>
<td><strong>Critiquing</strong></td>
</tr>
<tr>
<td>• Judge how well a project meets the criteria of a rubric.</td>
</tr>
<tr>
<td>• Choose the best method for solving a complex mathematical problem.</td>
</tr>
<tr>
<td>• Judge the validity of arguments for and against astrology.</td>
</tr>
<tr>
<td><strong>Creating: Put pieces together to form something new or recognize components of a new structure</strong></td>
</tr>
<tr>
<td><strong>Generating</strong></td>
</tr>
<tr>
<td>• Given a list of criteria, list some option for improving race relations in the school.</td>
</tr>
<tr>
<td>• Generate several scientific hypotheses to explain why plants need sunshine.</td>
</tr>
<tr>
<td>• Propose a set of alternative for reducing dependence on fossil flues that address both economic &amp; environment concern.</td>
</tr>
<tr>
<td>• Come up with alternative hypothesis based on criteria.</td>
</tr>
<tr>
<td><strong>Planning</strong></td>
</tr>
<tr>
<td>• Make a story board for a multimedia presentation on insects.</td>
</tr>
<tr>
<td>• Outline a research paper on mark Twain's views on religion.</td>
</tr>
<tr>
<td>• Design a scientific study to test the effect of different kinds of music on hens' egg production.</td>
</tr>
<tr>
<td><strong>Producing</strong></td>
</tr>
<tr>
<td>• Write a journal from the point of view of mountaineer.</td>
</tr>
<tr>
<td>• Build a habitat for pigeons.</td>
</tr>
<tr>
<td>• Put on a play based on a chapter from a novel you're reading</td>
</tr>
</tbody>
</table>
The Knowledge Dimension

<table>
<thead>
<tr>
<th>Factual Knowledge: Basic information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of terminology</td>
<td>Vocabulary terms, mathematical symbols, musical notation, alphabet</td>
</tr>
<tr>
<td>Knowledge of specific details &amp; elements</td>
<td>Components of the Food Pyramid, names of congressional representatives, major battles of WWII</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conceptual knowledge: The relationships among pieces of a larger structure that make them function together</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of classification and categories</td>
</tr>
<tr>
<td>Knowledge of principles and Generalizations</td>
</tr>
<tr>
<td>Knowledge of theories models and structures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedural knowledge: How to do something</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of subject-specific skills &amp; algorithms</td>
</tr>
<tr>
<td>Knowledge of subject-specific techniques &amp; methods</td>
</tr>
<tr>
<td>Knowledge of criteria for determining when to use appropriate procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metacognitive Knowledge: Knowledge of thinking in general and your thinking in particular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Knowledge</td>
</tr>
<tr>
<td>Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge</td>
</tr>
<tr>
<td>Self-knowledge</td>
</tr>
</tbody>
</table>

1.1.5: Taxonomies of the Cognitive Domain
### Introduction

1. **Knowledge**: Remembering or retrieving previously learned material. Examples of verbs that relate to this function are: Know, Define, Record, Identify, Recall, Name, Relate, Memorize, Recognize, List, Repeat and Acquire.

2. **Comprehension**: The ability to grasp or construct meaning from material. Examples of verbs that relate to this function are: Restate, Identify, Illustrate, Locate, Discuss, Interpret, Report, Describe, Draw, Recognize, Discuss, Represent, Explain, Review, Differentiate, Express, Infer and Conclude.

3. **Application**: The ability to use learned material or to implement material in new and concrete situations. Examples of verbs that relate to this function are: Apply, Organize, Practice, Relate, Employ, Calculate, Develop, Restructure, Show, Translate, Interpret, Exhibit, Use, Demonstrate, Dramatize, Operate, Illustrate.

4. **Analysis**: The ability to break down or distinguish the parts of material into its components so that its organizational structure may be better understood. Examples of verbs that relate to this function are: Analyze, Differentiate, Experiment, Compare, Contrast, Scrutinize, Probe, Investigate, Discover, Inquire, Detect, Inspect, Examine, Survey, Dissect, Contrast, Classify, Discriminate, Categorize, Deduce and Separate.

5. **Synthesis**: The ability to put parts together to form a coherent or unique new whole. Examples of verbs that relate to this function are: Compose, Plan, Propose, Produce, Invent, Develop, Design, Formulate, Arrange, Assemble, Collect, Construct, Create, Set up, Organize, Prepare, Generalize, Originate, Predict, Document, Derive, Modify, Combine, Write, Tell, Relate and Propose.

6. **Evaluation**: The ability to judge, check and even critique the value of material for a given purpose. Examples of verbs that relate to this function are: Judge, Argue, Validate, Assess, Decide, Consider, Compare, Choose, Appraise, Evaluate, Rate, Value, Conclude, Select, Criticize, Measure, Estimate, Infer and Deduce.

- **1. Remembering**: Retrieving, Recalling or Recognizing knowledge from memory. Remembering is when memory is used to produce definitions, facts, or lists, or recite or retrieve material.

- **2. Understanding**: Constructing meaning from different types of functions, written or graphic messages activities like Interpreting, Exemplifying, Classifying, summarizing, Inferring, Comparing and Explaining.

- **3. Applying**: Carrying out or using a procedure through executing or implementing. Applying related and refers to situations where learned material is used through products like models, presentations, interviews or simulations.

- **4. Analyzing**: Breaking material of concepts into parts, determining how the parts relate or interrelate to one another or to an overall structure or purpose. Mental actions included in this function are differentiating, organizing, and attributing, as well as being able to distinguish between the components or parts. When one is analyzing he / she can illustrate this mental function by creating spreadsheets, or graphic representations.

- **5. Evaluating**: Making judgments based on criteria and standards through checked and critiquing. Critiques, recommendations, and reports are some of the products that can be created to demonstrate the processes of evaluation. In the newer taxonomy evaluation comes before creating as it is often a necessary part of the precursory behavior before creating something.

  - Remember this one has now changed places with the last one on the other side

- **6. Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing. Creating requires users to put parts together in a new way or synthesize parts into something new and different a new form or product. This process is the most difficult mental function in the new taxonomy.

  - This one used to be # 5 in Bloom’s known as synthesis.
1.1.6: How the Taxonomy promotes active learning

Clark (2002) provided an adaptation of Bloom’s work to facilitate active learning. Although originally the tool was developed by a class of teachers for use in curriculum building in the high school level, the suggestions would work for college level classes as well. The inner ring contains the original levels of Bloom’s taxonomy. The middle ring offers synonyms for the various academic processes that comprise that taxonomic level. The outer ring links process to product. For example, if we want to increase application skills, we might ask student to construct diagrams of the key concepts involved in the content of the class. If we wish to improve evaluation skills, we might ask students to produce an editorial for the student newspaper in which they discuss the strengths and weaknesses of a particular side of a controversial issue. We have modernized the language of the original circle to reflect the latest version of Bloom’s Taxonomy.

![New Cognitive Taxonomy Circle](image_url)

**Figure 1.F.2: New Cognitive Taxonomy Circle**
1.1.7: Why use new Bloom’s Taxonomy?

As history has shown, this well known, widely applied scheme filled a void and provided educators with one of the first systematic classifications of the processes of thinking and learning. The cumulative hierarchical framework consisting of six categories each requiring achievement of the prior skill or ability before the next, more complex, one, remains easy to understand. Out of necessity, teachers must measure their students’ ability. Accurately doing so requires a classification of levels of intellectual behaviour important in learning. Bloom’s Taxonomy provided the measurement tool for thinking.

With the dramatic changes in society over the last five decades, the revised Bloom’s Taxonomy provides an even more powerful tool to fit today’s teachers’ needs. The structure of the revised Taxonomy Table matrix “provides a clear, concise visual representation” (Krathwohl, 2002) of the alignment between standards and educational goals, objectives, products, and activities.

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. The Revised Bloom’s Taxonomy table clarifies the fit of each lesson plan’s purpose, “essential question”, goal or objective.

**Importance of new Bloom’s Taxonomy**

A search of the World Wide Web will yield clear evidence that Bloom’s Taxonomy has been applied to a variety of situations. Current results include a broad spectrum of applications represented by articles and websites describing everything from corrosion training to medical preparation. In almost all circumstances when an instructor desires to move a group of students through a learning process utilizing an organized framework, Bloom’s Taxonomy can prove helpful. Moreover, revised taxonomy helps in:

- Analyze the objectives of a unit or a syllabus
- Help teachers not to confuse activities with objectives
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• Help teachers realize the relationship between assessment and teaching/learning activities
• Examine curriculum alignment

Revised taxonomy includes specific verbs and product linkage with each of the levels of the cognitive process dimension. However, due to its 19 subcategories and two-dimensional organization, there is more clarity and less confusion about the fit of a specific verb or product to a given level. Thus, the revised Taxonomy offers teachers an even more powerful tool to help design their lesson plans.

As touched upon earlier, though the years, Bloom’s Taxonomy has given rise to educational concepts including terms such as high and low level thinking. It has also been closely linked with multiple intelligences (Noble, 2004) problem solving skills, creative and critical thinking, and more recently, technology integration.

Implications for prospective teachers and teachers

The taxonomy table may provide a framework within which prospective teachers as well as teachers can model not only the way they teach but also the way they examine and analyze their teaching. They should learn that they can only judge the effectiveness of their teaching in terms of what student actually learn. Hence, the revised taxonomy moves prospective teachers away from a “best practice” approach to teaching (Byrd, 2002). Prospective teachers, as well as teachers, should collaboratively engage in meaningful dialogues about answers to such questions: “What is the student supposed to learn from his or her participation in this activity? What knowledge is to be acquired or constructed? What cognitive processes are to be employed?” Without answers to these questions, it is impossible to properly classify instructional activities in terms of the Taxonomy Table. This provides a good exercise in reflective practice.

1.1.8: Cognitive Skills Based On Larry and John Model

Larry and John (1977) identified intellectual processes and skills, attitudes and values for cognitive development. The diagrammatic frame work of this division has been borrowed from the source and presented below:
The category of intellectual processes includes those thinking or cognitive activities that one assumes must have occurred based on perceptions of students overt behavior or examination of products they have made. The levels ranges from interpreting where the students gives an initial indication of understanding to evaluating where the students judges the merit, worth or value of an object, proposition, or activity in terms of defined criteria.

The processes are arranged in a general order based on the increasing complexity involved in the task at hand. Students must be able to interpret (give meaning to) information before they can make comparisons, classifications, or draw generalizations etc. Therefore, the progressive order of the levels provides a guide when planning activities, questions and assessment devices. The intellectual processes

![Figure 1.F.3: Showing Cognitive Skills Based On Larry and John Model](image_url)
have been divided into two groups, first and second levels, for convenience of presentation.

**First level of Intellectual Processors**

- **Interpreting**
  - It includes nothing sources of data used as a basis for an interpretation; translating information from one form to another, explaining the meaning of terms and using them in discussion; summarizing main points and stating conclusions; and expressing the mood, feeling or reaction that was stimulated by an event.

- **Comparing**
  - It includes identifying the basis for making a comparison; discriminating the characteristics to be compared; describing similarities and differences; comparing against criteria and summarizing similarities and differences.

- **Classifying**
  - It includes abilities in all types of classifying activities include arranging and changing groups for various purposes, identifying characteristics and then similarities and differences in items, deciding on attributes or criteria for classifying and naming the group.

- **Generalizing**
  - It includes identifying common elements, identifying concepts that cluster common elements, linking concepts together in a statement that fits but does not go beyond the data, and double checking to be sure that the generalization holds up against all data studied.

- **Inferring**
  - It includes identifying the differences between an inference and an observation, an interpretation and a generalization, identifying a generalization to be caused as a basis for making an inference, relating the inference to what is given; checking for consistency in applying the generalization to similar situations and checking the conclusion against the generalization on what it is based.

**Second level of Intellectual Processes**

- **Analyzing**
  - It involves key abilities involved in the breaking of an item into elements; includes identifying and defining each parts; classifying data related to each part;
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distinguishing facts from opinions, normative statements and conclusions and identifying stated and unstated assumptions.

- **Analysis of relationships**: It requires abilities as identifying connections between ideas in a communication, relating evidence and assumptions to conclusions or line of argument; identifying cause-effect, part-whole, analogous, sequential and time-space relationships and distinguishing relevant from irrelevant data and logical from illogical statements.

- **Analysis of organizing principles**: It involves such abilities as identifying themes, principles, time periods, patterns or other organizers; identifying connections, interactions and arrangements of parts; and identifying or inferring purposes, viewpoints biases, or assumptions, and how they are related to structure.

- **Synthesizing**
  
  It involves the basic abilities writing, expressing ideas orally, designing, experimenting, dramatizing, map making, and the like are put to use as needed to create the new product.

- **Hypothesizing**
  
  It includes defining a problem; identifying relationships (rules, principle or theory); stating a proposition based on the rule; principle or theory identified; collecting data in an objective and systematic manner; and analyzing the data to determine whether or not the hypothesis is confirmed and the rule, principle or theory was valid or properly chosen for this situation.

- **Predicting**
  
  It includes identifying the factors or conditions of greatest importance; identifying trends or directions of change; identifying steps in a sequence as a basis for projecting what may follow; and ranking or weighting the factors and conditions in terms of relative importance.

- **Evaluating**
  
  It includes clarifying what’s to be evaluated and the purpose of the evaluation; clarifying the uses, functions, or objectives or roles of the item to be evaluated; deciding whether a qualitative or quantitative judgment is needed; defining or selecting standards; gathering evidence related to each standard; and starting why a given judgment has been made.
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The skills category includes a variety of activities, both cognitive and psychomotor, that students are expected to master and execute, precisely, independently, and with appropriate speed. Skills teaching is found in virtually every subject in the curriculum with special skills ranging from decoding words, handwriting, constructing circles, and pronouncing words to typing, preparing reports, using the library, operating business machines, repairing automobiles and playing musical instruments, skills that place emphasis on motor activity extend from running, jumping, forming letters and cutting with scissors, to playing baseball, swimming and typing. Skills that emphasize mental activity include decoding in reading, computing in mathematics, constructing graphs in science and social studies, writing a business letter and locating and using reference in the library. The cognitive skills included in almost all the curriculum have been summarized below (Larry and John, 1977).

- **Imitation**
  It includes noting steps and details presented in the model (observing); recalling how to perform previously learned skills, which are needed (remembering); copying the individual steps as they are demonstrated; and reproducing details presented in models.

- **Patterning**
  It includes executing an act while directions are being given; following a sequence of steps outlined in instructional material; blending finite steps; and making progress toward achieving execution independent of direction or assistance.

- **Mastering**
  It is ability, depending on the skill to be learned, includes developing appropriate precision, speed, agility, coordination, consistency, endurance, proportion and strength.

- **Applying**
  It includes identifying the appropriate skill to solve a problem, do a task etc., identifying the steps, operations or procedures and maintaining precision and appropriate speed.

- **Improvising**
  It includes attaining an adequate level of performance of the basic skill; identifying a situation where the skill can be applied appropriately and intentionally introducing new elements to the skill to improve its use in a given situation.
1.1.9: Cognitive Skills Based on Desoete and Roeyers (2006) Model

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. This nine-skill model has been represented below in the Table 1.T.3 along with definition of each skill and examples.

Table 1.T.3
Showing Desoete and Roeyers Model on Cognitive Skills

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>SKILLS</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Number-Naming or Reading (NR) Skills</td>
<td>Here numbers are translated from one kind of presentation to another kind of representation e.g. Read (or Write down) ‘9’ or ‘47’.</td>
</tr>
<tr>
<td>2.</td>
<td>Symbol Skill (S)</td>
<td>This skill deals with the non-semantic translation within the Mathematics lexicon. E.g. Read and explain the meaning of ‘+’ or ‘=’.</td>
</tr>
<tr>
<td>3.</td>
<td>Knowledge Skill (K)</td>
<td>This skill depends on the insight in the number structure or on the knowledge of the position of decades and units and the ability to establish base-ten structure relationship e.g. How many units and 10’s are there in 47.</td>
</tr>
<tr>
<td>4.</td>
<td>Procedural Skills (P)</td>
<td>This skill deals with procedural calculation and to solve Mathematical tasks in a number problem format (e.g. 47 - 9 = __________).</td>
</tr>
<tr>
<td>5.</td>
<td>Linguistic Skills (L)</td>
<td>These Cognitive conceptual skills enable the children to understand and to solve one sentence Mathematical problems in a word problem formal (e.g. ‘9’ less than ‘47’ are __________).</td>
</tr>
<tr>
<td>6.</td>
<td>Mental Representation Skills (M)</td>
<td>This skill is required in most word problems, since a simple translation of key words in a problem (e.g. ‘less’) into calculation or ‘number crunching’ (e.g. ‘47’ is ‘9’ less than __________).</td>
</tr>
<tr>
<td>7.</td>
<td>Contextual Skills (C)</td>
<td>These are cognitive skills, also using general language modules, enabling the Mathematical problem solving in a more than one sentence word problem (e.g. Wanda has ‘47’ cards. Willy has ‘9’ cards less than Wanda and ‘2’ cards more than Linda. How many cards does Willy have?)</td>
</tr>
<tr>
<td>8.</td>
<td>Relevant Information Skills (R)</td>
<td>These are required in selecting relevant information in order to create an adequate mental representation of the problem (e.g. Wanda has ‘47’ cards. Willy has ‘9’ cards less than Wanda and ‘2’ cards more than Linda. How many cards does Willy have?)</td>
</tr>
<tr>
<td>9.</td>
<td>Number Sense Skills (N)</td>
<td>This ninth cognitive skill enables the solving of tasks without giving the exact answer. Number Sense Skills depend on a semantic magnitude judgment (e.g. 47 is nearest to _______ Choose between 4, 7, 40 or 70).</td>
</tr>
</tbody>
</table>
1.1.10: Cognitive Skills As Specified Through MLL (1991)

Minimum Learning Continuum was drawn indicating the learning outcomes expected to be achieved by all children completing class II, III, IV and V. It can be stated as expected learning outcomes defined as observable terminal behaviors. One may also go for a taxonomic analysis of learning objectives such as knowledge, comprehension, application, analysis, synthesis, evaluation and so on and accordingly indicate the expected learning outcomes. One can also state the MLL’s in terms of learning competencies expected to be mastered by every child by the end of a particular class or stage of education.

It was emphasized in the project minimum levels of learning that every curriculum attempts to modify the cognitive as well as non-cognitive domains of the development of learners. The learning is presumed to be a continuum on which units of learning are segmented hierarchically so that clusters of skills in one unit build as directly as possible on the skills in the preceding units. Minimum levels of learning are a prescription of same levels of learning for the National Formal Education System for primary education. The exercise of laying down levels of learning is not based on syllabus and contents of primary school but specify learning outcomes in the form of functionally relevant skills and competencies.

The specifications of these skills have been made stage wise in terms of five grades I to V. The skills have been identified for Mathematics as follows:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Grade-I</th>
<th>Grade-II</th>
<th>Grade-III</th>
<th>Grade-IV</th>
<th>Grade-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Understanding</td>
<td>Understanding</td>
<td>Understanding</td>
<td>Understanding</td>
<td>Understanding</td>
</tr>
<tr>
<td>2.</td>
<td>Applying</td>
<td>Applying</td>
<td>Applying</td>
<td>Applying</td>
<td>Applying</td>
</tr>
<tr>
<td>3.</td>
<td>Solving</td>
<td>Solving</td>
<td>Solving</td>
<td>Solving</td>
<td>Solving</td>
</tr>
<tr>
<td>4.</td>
<td>Recognizing</td>
<td>Recognizing</td>
<td>Recognizing</td>
<td>Recognizing</td>
<td>Recognizing</td>
</tr>
</tbody>
</table>
1.1.11: Cognitive Skills in Mathematics

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.

➢ Overall Objectives of Teaching of Mathematics

The twelve years of Mathematics training in school should aim at the following:

• To enable the learner to solve mathematical problems of daily life.
• To prepare the learner for technical profession such as those of accountant, auditors, bankers, surveyors, cashiers, engineers, scientists, statisticians and mathematics teachers.
• To prepare the learner for economics, purposeful, productive, creative and constructive living.
• To develop in the learner a sense of appreciation of cultural arts.
• To prepare the learner for elementary as well as higher education in sciences, economics, engineering, psychology etc.
• To develop the habit of concentration, self-reliance and discovery.
• To develop in the learner the powers of thinking, reasoning and expression.
• To develop in the learner a scientific and realistic attitude towards life.
• To bring about all-round harmonious development of the personality of the learner.

➢ Aims of Teaching Mathematics by Levels

Although the overall aims of teaching mathematics are the same at all levels and although each level of study forms the basis for the next higher level, here is a change in priorities for each level. For example, the aim of teaching mathematics at elementary level is to give a good beginning in mathematics training. The syllabus is constructed in such a way to facilitate the understanding of main facts and methods of mathematics. The priority is on understanding. It also aims to arouse and sustain the
Introduction

learner’s interest in solving practical problems. The application of facts and methods are related to simple practical problems.

At the same time, as the students go to the secondary level, abstract concepts are introduced. The priority shifts towards analysis and it prepares the students for specialization in mathematics at the higher secondary level. Some amount of independent thinking and clarity in expression is expected at this stage. Accordingly the methods of teaching incorporate student activities in terms.

At the higher secondary level, there is a distinct shift towards further specialization and it prepares the students for higher studies that may require a reasonable foundation in mathematics. It also aims to provide the necessary skills for gainful employment for those who will have higher secondary education as the terminal studies. Consequently, the learners are trained to apply the facts and methods independently to solve problems.

In line with the above mentioned objectives, an attempt has made to present the objectives of teaching mathematics according to different levels and they need to be discussed and firmed up.

➢ OBJECTIVES OF MATHEMATICS AT PRIMARY LEVEL

In particular, at the primary level, the objectives would be as follows:

• To give a good start to the students in learning mathematics.
• To provide to them clarity on fundamental concepts and processes of the subject.
• To create in them an enduring interest and faith in the subject and to develop a love for it.
• To introduce them to mathematical games, puzzles, recreations, hobbies and activities and to unravel before them the mysteries of the subject.
• To ensure in them accuracy and efficiency in fundamental processes and develop appreciation for accuracy.
• To acquaint them with the relationship of mathematics with their present as well as future life.
• To develop in them the habits like regularity, practice, patience, self-reliance and hard work.
• To acquaint them with mathematical language and symbolism.
• To prepare them for the learning of mathematics of higher classes.
OBJECTIVES OF MATHEMATICS AT SECONDARY LEVEL

At the secondary level, the shift in focus should be towards application, analysis and attitude. A school leaver who has studied mathematics up to the secondary level should be able to

- Demonstrate a good level of understanding of the basic concepts of mathematics.
- Demonstrate a good level of skill in calculation.
- Demonstrate a good level of skill in manipulation of simple data.
- Apply the mathematics principles to solve practical problems independently.
- Present clear arguments and conclusions to problem situations.
- Demonstrate the ability to carry out simple projects that deal with data independently.
- Demonstrate the ability to find solution to unfamiliar practical problems with little guidance.

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
- APPLYING
- SOLVING

1.2: 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 in the present day world is believed to cause more ailments than anything else known to modern medicine. Scientific and technological
Introduction

progress all over the globe has made man highly sensitive, critical and creative. Associated with this growth is the emergence of stress.

The concept of stress was first introduced in the life science by Hans Selye in 1936. It is a concept borrowed from the natural sciences; derived from the Latin word *stringere*. Stress was popularly used in the seventeenth century to mean hardship, strain adversity or affliction. It was used in the eighteenth and nineteenth centuries to denote force, pressure strain or strong effort with reference to an object or person.

We are all familiar with distress i.e. stressing due to an unpleasant event such as the demise of a loved one, the loss of a job, divorce or an accident. However even an extremely joyous event such as the birth of a child, marriage, passing an exam with flying colours or being selected for a much sought after job produces the same physiological reaction as distress. Such happy occasions, which all the same produce intense emotional reactions, lead to eustress. While distress generally produces unhappiness for the individual, eustress leads to immense joy and happiness and is good for the individual. Too little or too much stress i.e. hypo stress or hyper stress is bad. An optimal level of stress, varying from individual to individual is good and necessary. Stress can be due to both pleasant and unpleasant events. The goal should be to strike a balance between the equally destructive force of hypo stress and hyper stress. At the same time, one should try to maximize eustress and minimize distress.

![Stress Diagram](image-url)

**Figure 1.F.4: Showing The Four Variants of Stress**

Stress is a systematic response induced by the wave of cellular alterations identical to those which initiate inflammation *(Eyring and Dougherty, 1955)*.

Stress originally a concept of the physical sciences has come into common usage in the biological and human science to describe a state in which the vital functioning of the organism is threatened. Stress involves a sufficiently potent danger to psychological or physical well being as to require extra ordinary measures for the
maintenance of organized behavior or these failing, stress may lead to disordered behaviors, anxiety or other emotional disturbance (Korchin, 1963).

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.

Levi (1972) has suggested that stress is one of the mechanisms suspected of leading under certain circumstances to disease. A transactional views of stress draws from both response and stimulus based conceptualizations of stress. The transactional view proposed that stress arises from the existence of some relationships between the individual and his environment. The individual experiences stress, if after perceiving the objective environment, he feels that the environmental conditions will give rise to an undesirable state of affairs.

The scientific and technological progress all over the world has made man highly sensitive, critical and creative. This has resulted in the emergence of stress. Stressful circumstances are encountered every day at every stage of human development. From the weaning and toilet training, as babies, to the process of formal education and learning social skills, stress is encountered in varying degrees. The term stress has come into wide use in behavioral study only within the past two decades. But in this relatively short time, it has all but pre-empted a field of previously shared by a number of other concepts like anxiety, frustration, conflict etc. Research into the link between stress and disease is heuristic, not phenomenal. It is different from isolating a particular enzyme and studying its effect - stress is not an objective phenomenon that we can study under various circumstances and interpret (Hinkle, 1973).

Manson (1995) reviewed literature on stress and concluded that there was confusion and a lack of consensus regarding its definition. The term stress has been approached in at least four different ways:

- First, as the stimulus or external force acting on the organism.
- Second as the response or changes in the physiological function.
- Third as the interaction between an external force and the resistance opposed to it, as in biology.
- And finally as a comprehensive phenomenon encompassing all the three.
**Introduction**

Selye (1976) defined stress as the non-specific response of the body to any demand. According to Spielberger (1979), the term stress is used to refer to a complex psycho-biological process that consists of three major elements. The process is initiated by a situation or stimulus that is potentially harmful or dangerous stressor. If a stressor is interpreted as dangerous or threatening, an anxiety reaction will be elicited. Thus the definition of stress refers to the following temporal events.

![Diagram of Stress Perception](image)

According to Sahni (1982), stress is the wear and tear of life, caused by an exercise demand on the body system to cope. The pricks and pressures of daily life ranging from bodily adjustment to sudden temperature or humidity or changes in the weather, an emotionally charged argument with spouse or boss, all constitute stress. Stress is any stimulus from the environment, which demands some extra adjustment effort or survival effort from the body.

![Diagram of Stress Perception](image)

Figure 1.F.5: A Diagrammatic Representation of Stress Perception

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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.

Stress consists of any events in which environmental demands, internal demands or both tax or exceed the adaptive resources of the individual, social system or tissue system (**Farmer, Monahan and Hekeler, 1984**).

According to **Patterson (1985)** stress is a condition of felt tension or difficulty. It is usually associated with need or desire to change something.

**Bruno (1986)** defined stress as a system of internal forces, organic or psychological, tending to produce wear and tear in the body. So the message of modern stress research is to avoid all stress but to seek optional levels of stress.

![Diagram of Stress](image)

*Figure 1.F.6: A Diagrammatic Representation of Stress*

There is simply no way to define an event as a stressor without referring to the properties of persons that make their well-being in some way vulnerable to that event. If one accepts this reasoning, it is counterproductive to keep trying to reify the environmental input as a stressor, and it is essential to find principles for predicting
Introduction

the stress response from the person-environment relationship, and from the rest of the variables and processes that influence the outcome (Lazarus & Folkman, 1984).

According to Solanki and Ganguli (1987), stress refers to a state of imbalance within an organism that (1) is elicited by an actual or perceived disparity between environmental demands and the organism's capacity to cope with these demands. (2) is manifested through a variety of psychological, emotional, and behavioural responses.

Kyriacou (1989) viewed stress as a negative feeling or an unpleasant emotional state resulting from achievement. The hypothetical concept of stress can be illuminated for any individual not only by reference to stressors but also by measurement of the strain of the actual responses or consequences exhibited (physically or psychologically). Thus the concept can be tied at both ends to antecedents and responses, leading some investigators to state that the investigation of stressors and strains in the study of stress.

The concept of stress may differ according to the individual's state of contexts and interpretations. It is recognized that certain amount of stress is desirable, tolerable, productive, and facilitates the individual's growing performance but excessive stress may damage person's self and ruin his life (Rajendran and Kaliappan, 1991).

Chrousos and Gold (1992) described stress as a state of disharmony or threatened homeostasis. Every child has his unique nature as regards capabilities, attitudes, personality, characteristics and interests, and as such, he reacts in the unique way to the situations in the class, resulting in very extensive differences and stress. Stress occurs when there is substantive imbalance between environment demand and response capability of organism.

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).

Stress is an agitated physiological state in which the electrical transmission of information along neurons is heightened to the point that the nervous system may collapse and/or bodily functions may perform poorly. Most individuals pursue displacement activities to relieve stress; unfortunately these efforts are halfway...
measures which often make the stressful situation worse. More effective scientific methods are available for alleviating stress. Stress is a heightened electrical activity within the neurons of the central and peripheral nervous systems such that various bodily systems begin to function improperly or feel altogether (Hollar, 1996).

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.

The stress is a perceptual phenomenon arising from a comparison between the demand on the person and his ability to cope. An imbalance in this mechanism, when coping is important, gives rise to the experience of stress, and to the stress response. The latter represents attempts at coping with the source of the stress. Coping is both psychological (involving cognitive and behavioral strategies) and physiological. If normal coping is ineffective, stress is prolonged and abnormal responses may occur. The occurrence of these, and prolonged exposure to stress, may give rise to functional and structural damage. The progress of these events is subject to great individual variation.

One problem with a single definition is that stress is made up of many things: It is a family of related experiences, pathways, responses and outcomes caused by a range of different events or circumstances. Different people experience different aspects and identify with different definitions. Now, the most commonly accepted
Introduction

definition of stress is that stress is a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to mobilize.

1.2.1: Components of Stress

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

**ANXIETY**

Anxiety has become a common symptom of the present day man. It is dread or uneasiness similar to fear but based on an unclear threat (Coon, 1995). Anxiety is a negative emotion. People do not desire negative emotions because they do not bring happiness. It has been found that anxiety is the central problem in many emotional and physical ailments. Apart from its clinical significance anxiety has been found to affect an individual’s performance and behavior in a variety of situations. Boys and girls at the adolescent period are anxious. Anxiety prevents them from doing well in an examination. Anxiety causes a lot of mental tension and is more often stimulated by qualities within the person, that he or she is unaware of, which makes him uneasy.

Anxiety is generally due to imaginary irrational causes rather than real ones and it arises due to some subjective problem. Students with low level of anxiety usually perform better (Singh and Kumar, 1974). Since anxiety is being accomplished by tension and rigidity and it prevents the students from taking initiative and learning of new materials, an anxious student feels very difficult to learn.

Anxiety is the information in the nervous system takes up space in working memory and for that reason can potentially interfere with other cognitive activity (Hamilton, 1983).

Anxiety represents an interrupter of action and a call for reconsideration of which goals deserve one’s most immediate action and efforts (Simon, 1987).

According to Lazarus (1966), anxiety occurs when there is an appraisal of threat in the absence of locating the source of the threat, so that no clear action
tendency is possible. In sum, anxiety occurs when a clear coping impulse has not replaced the primary reaction to threat. As such, ambiguity of threat is the key consideration because it prevents subsequent elaboration of clear action tendencies, even though there may be the impulse to flee or avoid something “unknown”.

Roger (1971) opined that anxiety is experienced when the individual perceives something that is a threat to his self-concept. Cattel (1976) offered two definitions of anxiety. Anxiety is a function of the magnitude of all unfulfilled needs and the degree of uncertainty that they will be fulfilled. The second definition is that anxiety is specific to the fear erg, and results from the threat that occurs when there is anticipation of deprivation of any or all ergs.

Izard and Tomkins (1977) stated that anxiety is a negative effect. They postulated that there are eight innate affects, which are primarily expressed behaviourally as facial responses, and anxiety is subsumed under the affect fear terror.

Madler and Watson (1980) developed an interruption view of anxiety in which they argue that the interruption of an organized behavioural sequence will evoke arousal.

Wolpe (1986) conceptualized anxiety as nothing but a conditioned emotional habit which involves a sympathetic dominated pattern of automatic response.

Natranjan (1986) in his study entitled ‘The Concept of Anxiety’ hypothesized that an anxiety state is produced in an individual in a threat situation due the interaction of three variables. These are:

- Stimulus uncertainly during occurrence of threat (Situation Variable).
- Feeling of helplessness in the presence of danger (Subjective Variable).
- A high level of chronic anxiety (Personality predisposition).

Longman’s Dictionary of Psychology and Psychiatry (1986) states anxiety is a pervasive feeling of dread, apprehension and impending disaster. It is a response to an undefined or unknown threat which is many cases stems from unconscious conflicts, feelings of insecurity or forbidden impulses within us.

Anxiety is unpleasant, distressing emotion and it arises when the danger is imagined or cannot be identified or clearly perceived. It is normal response in stressful situations, but if frequently experienced, it leads to many mental disorders. Anxiety is experienced as a feeling of suspense, helplessness or alternating hope and
despair together with excessive alertness and characteristic bodily changes such as tightness in the throat, disturbances in breathing and heart beat, sweating and diarrhea.

According to Oxford Dictionary of Psychology (2001), anxiety is a state of uneasiness, accompanied by dysphoria; somatic signs and symptoms of tension focused on apprehension of possible failure, misfortune or danger.

In psychiatry, an anxiety state is a type of neurosis in which the anxiety either seems to arise for no reason or else is out of proportion to what may have caused it. Anxiety knows no gestation period, sometimes it is experienced spontaneously. At other times, it goes into abeyance and may take a long time in manifestation. The predominant symptoms of anxiety include:-

- Inability to concentrate
- Difficulty in making decisions
- Extreme sensitivity
- Sleep Disturbances
- Excessive sweating
- Sustained muscle tension

Anxiety is party the feeling of apprehension; partly the behavior of avoiding frightening situations; and partly the associated with bodily changes such as sweating, a false pulse and tense muscles. It is normal to feel anxiety when some danger is expected.

The influence of anxiety may range from minor to major disturbances in human behavior, thought and personality development. It may adversely affect one’s performance i.e. from simple psychomotor to perceptual academic and even intellectual fields. It could even perturb one’s balance i.e. physical, emotional and mental; and may even lead to nervous breakdown in some cases. Exaggerated state of anxiety may culminate in landing one to mental hospitals for treatment ranging from simple relaxation techniques to complex care viz. desensitization or electrical shock therapy in combination with antidepressant drugs of numerous sorts.

### FRUSTRATION

An individual striving to reach a goal is blocked by some kind of barriers. This obstruction produces frustration, a state of internal arousal that is aversive at high levels as shown:
In defining frustration as an intervening variable, there is blocking of a goal as an antecedent condition and cognitive, behavioral and physiological events as the consequent condition as shown below:

According to Longman's Dictionary of Psychology and Psychiatry (1986), frustration is thwarting of impulses or actions by external or internal forces. Typical internal forces are intra psychic conflicts and inhibitions; typical external forces are admonitions of parents and rules of society. According to psychoanalysis, frustration dams up psychic energy, which then seek on outlet in wish fulfilling fantasies and dreams or in various neurotic symptoms.

According to Oxford Dictionary of Psychology (2001), frustration is the blocking or prevention of a potentially rewarding or satisfying act or sequence of behavior; or the emotional response to such hindrance.

A wide range of obstacles, both environmental and internal can lead to frustration. Faminies, wars, droughts, earthquakes, storms, fires, economic fluctuations, social inequalities, marital and occupational dissatisfaction, accidents, disease, the loss of loved ones, physical handicaps, personal failures and even the individuals own ethical restraints can thwart the achievement of desired goals.
Frustrations resulting from personal limitations and mistakes are likely to be particularly stressful, since they lead to self-evaluation.

- **CONFLICT**
  
  Conflict is kindled by the occurrence of failure. Achievement related conflicts can be separated into two basic types on the basis of the time involved.
  
  ✓ The first is characterized by future perspective, is directed toward a goal and is formed around expectation of failure.
  
  ✓ The second is characterized by past perspective and is linked to a past failure. It is formed around the experience of failure.

  Conflict seems to become less acute through expressing psychic tension and in extreme cases, through the destruction of an apparently hopeless situation. A conflict situation produces frustration when one goal is blocked by a competing goal. Virtually all behavior involves same degree of conflict because we are always making choices among competing goals. Conflict has long been considered as basic problem in neurotic behavior. In Freudian theory, for example, conflicts between the Id (such biological drives as sex or aggression) and the Super Ego (socialization) are particularly important. There are two types of conflicts according to psychoanalytic terms.

  - **Extra psychic Conflict:** A conflict arising between the individual and his environment.

  - **Intra psychic Conflict:** A conflict due to the clash of opposing forces within the self such as conflicting drives wishes or goals.

    In psychiatry, conflict is the clash of opposing or incompatible emotional or motivational forces such as drives, impulses or wishes. In many instances stress results not from a single obstacle, but from a conflict between two needs or valued goals in which the choice of either alternative entails frustration with regard to the other.

    According to Oxford Dictionary of Psychology (2001), conflict is the situation that exists when two contradictory tendencies oppose each other in a person’s mind. Some such conflicts are conscious, as when a desire is opposed by a moral constraint, but it is unconscious conflict that is assumed to generate neurotic symptoms. Psychologists generally distinguish four kinds of conflict, as explained below:
**Introduction**

- **Approach-Approach:** This involves two discrete positive alternatives, Goal A and Goal B. As the individual moves towards A, the tendency to approach A is even stronger and the tendency to approach B is less. Therefore, the conflict is easily resolved.

![Approach-Approach Conflict](image)

**Figure 1.F.7: Showing Approach-Approach Conflict**

- **Avoidance-Avoidance:** This involves two aversive goals. As the individual moves away from one, it necessarily moves toward the other and then is forced back toward the first and so on. Such conflict give rise to saying such as between the devil and the deep blue sea, if the individual has to stay in the situation, it should eventually become more or less immobile at the point of minimal aversive stimulation, where the two gradients intersect.

![Avoidance-Avoidance Conflict](image)

**Figure 1.F.8: Showing Avoidance-Avoidance Conflict**
Introduction

- **Approach-Avoidance**: This conflict involves goals with both desirable and aversive features. These conflicts have received considerable experimental attention because they are so common. Usually such a conflict is resolved in the same way and we must assume a shift in the relative strengths of approach and avoidance so that the individual goes either all the way to the goal or so for a way that the approach motivation is no longer effective.

![Approach-Avoidance Conflict Diagram](image1)

**Figure 1.F.9: Showing Approach-Avoidance Conflict**

- **Double Approach Avoidance**: This conflict involves two goals, each having positive and negative features. The choice of one goal results in the loss of another and this loss is a negative feature of the chosen goal. This type of conflict, perhaps better called multiple approach-avoidance because the alternatives may be more than two, is more typical or real-life situations but is also more difficult to analyze experimentally.

![Double Approach-Avoidance Diagram](image2)

**Figure 1.F.10: Showing Double Approach Conflict**
• PRESSURE

Stress may stem not only from goal blocking frustrations and conflicts but also from pressures to achieve particular goals or to behave in particular ways. Pressure may originate either from outside sources or from within the individual himself.

In general, pressure forces a person to speed up, intensify or change the direction of goal-oriented behavior. All of us encounter many different pressures in the course of everyday living and often it is impossible to handle them without undue strain. In some instances, however pressures seriously overtax an individual’s adjustable resources and cause active stress, if they become excessive they may lead to breakdown of organized behavior.

According to Longman Dictionary of Psychology and Psychiatry (1986), pressure is the sensation of stress or strain, compression, expansion, pull or shear, usually caused by a force in the external environment. Receptors for the pressure may interlock or overlap with pain receptors so that the other accompanies one sensation.

Bisht (1987) developed a scale of thirteen types of stress in a Battery of scales which are Existential stress, Achievement stress, Academic stress, Self-concept stress, Self-actualization stress, Institutional stress, Family stress, Financial stress, Vocational stress and Superstition stress, Role stress, Physical stress and Social stress. These stress types were having all the four components of stress viz, Frustration, Conflict, Pressure and Anxiety in them. Frustration items were based on delays, lack of resources, losses and failures. Conflict items showed three types’ conflict: Approach-avoidant, Double-approach and Double-avoidant conflict. Pressure items were based on competitive achievement, sustained concentration of efforts and rapid changes. The worry items of Anxiety were on conscious concerns about consequences, negative expectations and negative self-evaluation. The emotionality items of anxiety were on uneasiness and nervousness. Academic stress seems to be an important variable for teachers to consider before designing their instructions.

Stress has been viewed in three ways:

• Stimulus
• Response
• Process
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Stimulus refers to stress, which can be categorized as emanating from three sources: Catastrophic events, such as Tornadoes and earthquakes, major life events, chronic circumstances, such as living in crowded or noisy conditions.

Response refers to how somebody responds to a particular stress, for example sitting an examination. There are two components: Physiological, heightened bodily arousal—your heart pound, mouth goes dry your stomach feels tight and you perspire and Psychological, involving behavior, thought patterns, emotions and feeling nervous.

Process views stress as a series of interactions and adjustments between the person and the environment. These interactions and adjustments are called transactions. Stress is not seen as a stimulus or a response, but rather as a process. The person suffering stress is seen as an active agent who can influence the impact of a stressor through behavioral, cognitive and emotional strategies.

A good definition of stress would be that stress is the condition that results when the person/environment transactions lead the individual to perceive a discrepancy—whether real or not—between the demands of a situation and the resources of the person’s biological, psychological, or social systems. Success and failure in previous transactions would determine the amount of stress perceived.

1.2.2: Models of Stress

Some of the prominent models of stress used in educational research can be briefly discussed as below which may be categorized as follows:

- Physiological Models such as the General Adaptation Syndrome (GAS), (Selye, 1950).
- Load of Information Models, for example stimulus overload / under load Model (Suedfeld, 1979), and optimal Information Flow and Mood (Hamilton, 1981).
- Interactional Models like Cognitive Model of Stress (Lazarus and Folkman, 1984), P-F fit Model (French, Rodger and Cobb, 1974) and Systems Model (Lumsden, 1975).
### Table 1.T.5: Showing Models of Stress

<table>
<thead>
<tr>
<th>Model</th>
<th>Emphasis</th>
<th>Implications</th>
<th>Stress Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Adoption Model</strong></td>
<td>1) Stress is necessary for biological adaption. 2) Stages of the stress response.</td>
<td>Understanding immediate short-term effects of stress.</td>
<td>1) Preventing distress and promoting en stress by taking each event as a challenge and not a threat. 2) Controlling stress effects so that the stage of exhaust is not reached.</td>
</tr>
<tr>
<td><strong>Overload-Underload Model</strong></td>
<td>Events become stressful either because of under arousal or over arousal.</td>
<td>Understanding that stress is dependent on individual stress tolerance levels.</td>
<td>Know one’s stress tolerance level and programme and one’s activities accordingly Under arousal: 1) Prevent boredom from occurring 2) Keep oneself busy Over arousal: 1) Control behaviour 2) Learn to relax 3) Delegate work 4) Time Management</td>
</tr>
<tr>
<td><strong>Optical Information Flow and Mood Model</strong></td>
<td>Non-optimal stimulation produces negative moods such as depression, anger and anxiety</td>
<td>Understanding that one can optimize stimulation, arousal levels</td>
<td>1) Control negativistic thinking and dysfunctional thought processes. 2) Think positive. 3) Learn to use one’s ARS</td>
</tr>
<tr>
<td><strong>Cognitive Appraisal Model</strong></td>
<td>1) Perception of individual determines stress 2) Perception also determines how one copes with the stressor.</td>
<td>Understanding the factors: 1) Underlying 2) Stress 3) Perception</td>
<td>1) Decide one’s priorities because too many or conflicting commitments cause stress. 2) Be proactive instead of reactive to reduce unpredictable events. 3) Learn problem-solving coping 4) Shun emotion-focused coping.</td>
</tr>
<tr>
<td><strong>Person Environment Fit Model</strong></td>
<td>1) Stress depends on the degree of non-fit between the person and the environment. 2) Need-supplies fit 3) Abilities-demand fit.</td>
<td>Understanding that both actual and perceived discrepancies between personal resources and environmental demands cause stress.</td>
<td>If discrepancies are actual: 1) Make need level more realistic 2) Increase skill level and variety 3) Career planning If discrepancies are perceived but not real: 1) Realistic self-assessment to reduce mismatch between objective and subjective P. 2) Increased contact with reality to decrease mismatch between objective and subjective C.</td>
</tr>
<tr>
<td>Systems Models</td>
<td>Take into account all the previous models. Focuses on both endogenous and exogenous factors as determinants of stress</td>
<td>Stress in any area of life will impinge on all others.</td>
<td>Role analysis to get over role conflicts and other forms of 1) Attempting a balance between home and office, between family and work. 2) Employee support systems such as flexi hours, shared work, and créches.</td>
</tr>
</tbody>
</table>
1.2.3: Stress and Performance

- The Positive Effects of Pressure

Sometimes, however, the pressures and demands that may cause stress can be positive in their effect. One example of this is where sportsmen and women flood their bodies with fight-or-flight adrenaline to power an explosive performance. Another example is where deadlines are used to motivate people who seem bored or unmotivated.

- The Negative Effects of Pressure

In most work situations jobs, our stress response causes our performance to suffer. A calm, rational, controlled and sensitive approach is usually called for in dealing with most difficult problems at work: Our social inter-relationships are just too complex not to be damaged by an aggressive approach, while a passive and withdrawn response to stress means that we can fail to assert our rights when we should.

The relationship between pressure and performance is explained in one of the oldest and most important ideas in stress management, the “Inverted-U” relationship between pressure and performance. The Inverted-U relationship focuses on people’s performance of a task.
1.2.4: Biological Basis of Stress

In human nervous system changes occur in a stressful or frightening situation which has been shown as follows:

- Stress of Frightful Situation
  - Activation of Brain C Hypothalamus
    - Stimulation of Glands
      - Hair shaft becomes erect
      - Eye dilates
      - Heart beats fast, contracts slowly
      - Blood Pressure rises
      - Muscle contract, blood vessels widen to allow additional flow of blood
        - Bronchial tubes open for deeper breathing
          - Surface vessels of the skin contract, causing it to pale
            - Blood sugar increases, digestive system slows

1.2.5: Good Stress and Bad Stress

Stress is like a double-edged sword -- in small, controlled amounts it ensures our productivity; however, too much can be destructive. Since stress is something every student experiences, it is important to include links to sites addressing this issue. The stress response (also called the fight or flight response) is critical during emergency situations, such as when a driver has to slam on the brakes to avoid an
Introduction

accident. It can also be activated in a milder form at a time when the pressure's on but there's no actual danger - like stepping up to take the foul shot that could win the game, getting ready to go to a big dance, or sitting down for a final exam. A little of this stress can help keep you on your toes, ready to rise to a challenge. And the nervous system quickly returns to its normal state, standing by to respond again when needed.

But stress doesn't always happen in response to things that are immediate or that are over quickly. Ongoing or long-term events, like coping with a divorce or moving to a new neighborhood or school, can cause stress, too. Long-term stressful situations can produce a lasting, low-level stress that's hard on people. The nervous system senses continued pressure and may remain slightly activated and continue to pump out extra stress hormones over an extended period. This can wear out the body's reserves, leave a person feeling depleted or overwhelmed, weaken the body's immune system, and cause other problems.

➢ Consequences of Stress

Most researchers and practitioners agree that there are four components of the consequences of stress.

• Physiological Consequences: In order to prepare the person to cope with negative or positive environmental demands, certain ‘automatic’ physiological changes (governed by the autonomic nervous system) are triggered off. These changes help to raise body processes to the level required. Stress affects the heart rate, respiration, blood pressure and digestion among others.

• Emotional Consequences: Emotions refer to the feeling aspect of behavior such as mild irritation, despair, sadness, love and liking. However, whereas the physiological effects of stress can be clearly pinpointed, observed and measured. Emotional changes are highly subjective. One can experience them but cannot express them in words. Three identifiable emotional constellations that are fairly regular outcomes of stress are anxiety, anger and depression.
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Figure 1.F.11: Consequences of Stress

- **Behavioral Consequences**: Stress may do considerable damage to a person internally, but there are external manifestations too. There are at least three important areas of interpersonal behavior, which are affected: relationships within the family, relationships with peers and relationships with other people. Some of the commonly seen behavioral effects are overdependence, uncommunicativeness, unreasonableness, lack of interest etc.

- **Cognitive Consequences**: The relationship between stress and mental functioning is in the form of a U-shaped function. 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.

1.2.6: Strategies for Coping with Stress

Coping is the process by which a person tries to reduce stress; it may or may not solve the problem. It is a behavior by which an individual attempts to deal with stress and in the process is able to relieve him of the ill effects of the stressor. People who cope effectively with stressful situations have first learned to direct their thoughts along productive lines and to avoid being distracted by fear and worry. Generally, people deal with stress in one of the manners described in Figure 1.F.12 below.

Figure 1.F.12: Showing General Responses of People to Stress

The success of a skill in coping with stress depends on the nature of the situation and on the individual’s vulnerabilities and assets. Pestonjee (1983) has also developed a model to explain how we cope with stress reactions. It is called the
‘Bounce Model’ because the behavioral decomposition-taking place due to stress tends to get reflected in interpersonal and other reactions.

Psychologists have identified two major ways in which people cope with stress. In the first approach, a person may decide to suffer or deny the experienced stress; this is the passive approach, or, a person may decide to face the realities of experienced stress and clarify the problem through negotiations with other embers; this is the active approach (Pareek, 1983).

Although there are many ways to classify the coping responses (Moos and Billings, 1983), most approaches distinguished between strategies that are active in nature and oriented towards confronting the problem, and strategies that entail an effort to reduce tension by avoiding dealing with the problem. Moos and Billings (1983) have organized the dimensions of appraisal and coping included in measurement procedures into three domains:

- **Appraisal-focused Coping:** It involves attempt to define the meaning of a situation and includes such strategies as logical analysis and cognitive redefinition.
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- **Problem-focused Coping**: This seeks to modify or eliminate the source of stress to deal with the tangible consequences of a problem or activity change and develop more satisfying situations.

- **Emotion-focused Coping**: This includes responses whose primary function is to manage the emotions aroused by stressors and thereby maintain effective equilibrium.

Maddi and Kokasa (1984) talked about two types of coping:

- **Transformational Coping** involves altering the events so they are less stressful. To do this, one has to interact with events, and by thinking about them optimistically and acting towards them decisively, change when in a less stressful direction.

- **Regressive Coping**, on the other hand, includes a strategy wherein one thinks about the events pessimistically and acts evasively to avoid contact with them.

It is generally agreed that there are two distinct types of coping strategies:

- **Approach Strategies**
- **Avoidance Strategies**

  In the **Approach Strategies**, one attempt to tackle the stressors head on and it is a constructive approach. The approach mode is characterized by:

  - Hope that things will improve.
  - Efforts made by the subject to solve the situation.
  - Expectation from others that they will help, or asking for help in relation to stress.
  - Jointly doing something about the problem.

  In the **Avoidance Strategies**, one attempts to reduce the stress by avoiding the problem. This avoidance mode is characterized by anyone of the following:

  - Aggression and blame.
  - Denying the presence of stress, or finding an explanation for it; such behaviour helps a person is not doing anything in relation to stress.
  - Helplessness and resignation.
  - Minimizing the significance of the stressful situation by accepting it with resignation.
These methods do not solve the problem; they simply help to put off a situation, which one feels in capable of handling.

Lazarus and Folkman (1984) postulated two levels of cognitive appraisal:

- **Primary Appraisal:** This takes place when we interact with environment around us and evaluate environment events to decide whether or not they are stressful. We recognise events, evaluate them and work out a plan of action. Once we have decided that a particular event is threatening, the second level of appraisal, i.e. secondary appraisal begins.

- **Secondary Appraisal:** During this process, we evaluate our options for coping with these presumed threats. In reality they may not be threaten.

‘Points to Follow’ for Both Children and Parents:

- Talk with your child. Find out what's happening in his life. Be honest and open with him. He should talk about his problems or write them down. Teach him to transfer coping strategies to other situations.
Don't burden them with your problems. But, tell children about the family's goals and discuss difficulties in a friendly manner.

Compliment children when they do well, and don't forget hugs and kisses.

Use humor to buffer bad feelings and situations. A child who learns to use humor himself will be better able to keep things in perspective.

Don't overload your child with too many after-school activities and responsibilities. Let children learn to pace themselves. Don't enroll them in every class that comes along, and don't expect them to be first in everything.

Set a good example. Demonstrate self-control and coping skills. He can benefit by seeing how you cope successfully with stress.

Get friends' or professional help when problems seem beyond your skills.

1.2.7: Types of Stress

Many types of Stress have been identified by researchers like;

- ACADEMIC STRESS

Students, in schools, 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.

Lazarus (1969) defined stress, as the internal response of the individual to pressure, when the pressure experienced is greater than normal abilities. Hence, this kind of stress i.e. academic stress is an important factor accounting for variation in academic achievement.

There was a time when children said good night to their parents and went to bed, now a day often their parents may say goodnight to children and go to bed leaving their young scholars to finish their endless homework or prepare for exam, sometimes before dawn. Stress is a contributing act in causing numerous emotional and behavioral temperament, suicide attempts, child abuse, spouse abuse, physical
assault, destructive expression of anger, feeling of inadequacy of failure, feeling of bitterness and resentment, irritability, impatience, and stuttering. School related stress is the most prevalent untreatment cause of academic failure in our schools. Walbley (1986) investigated the correlation between the performance and academic stress and found a correlation of 0.63 between performance and academic stress.

Raina (1983) listed some of the important behavioral, physiological and health effects which have been suggested to be linked to the experience of stress. These are illustrated in the following table:

Table 1.T.6
Behavioral, Physiological and Health effects of Stress

<table>
<thead>
<tr>
<th>Subject Effects</th>
<th>Anxiety, Aggression, Frustration, Low self esteem, Threat and Tension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Effects</td>
<td>Accident proneness, Drug taking, Emotional outbursts, Excitability, Impulsive behavior and Restlessness</td>
</tr>
<tr>
<td>Cognitive Effects</td>
<td>Inability to make decisions and concentrate, frequent forgetfulness and mental block</td>
</tr>
<tr>
<td>Physiological Effects</td>
<td>Increased blood and glucose levels, Increased heart rate and blood pressure, Sweating, A lump in the throat</td>
</tr>
<tr>
<td>Health Effects</td>
<td>Asthma, Chest and back pain, Coronary heart disease, Frequent urination, Headaches, Nightmares, Psychosomatic disorders, Ulcers and weaknesses</td>
</tr>
<tr>
<td>Organization Effects</td>
<td>Absenteeism, High accident rates, Poor productivity</td>
</tr>
</tbody>
</table>

Apart from physiological and hormonal changes, new societal and environmental expectations have also become a source of stress for adolescents. Mainly three types of stressors are common in adolescents:

- Stress situations, which are foreseeable and avoidable, such as, peer pressure to experiment with drugs
- Stress situations that are neither foreseeable nor avoidable, such as, parental divorce
- Stress situations that are foreseeable but not avoidable, particularly examinations and entry to work force
Introduction

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.

The academic stress faced by students these days is perhaps higher than ever before. They are faced with a new situation when they reach school or college and must then struggle to keep up with their new environment. Many students begin to feel worthless. They measure themselves only is athletic or academic success. This can distort their perception of reality and cause them to blow things out of proportion. The change in attitude may not even be noticeable to close friends because students who begin to feel over whelmed and hopeless tend to hide their feelings by immersing themselves in work, because they do not want to seem weak. This feeling of hopelessness can become a big problem in situations where students are expected to perform at a very high calibre for a long period of time (Corey, 2004).

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.

Stress and anxiety in children and teenagers are just as prevalent as in adults. Stressed out and negligent parents, high expectations in academic or other performances, abused or deprived childhood, growing up tensions and demand for familial responsibility are the main causes of childhood and teen stress. Stressed children show signs of emotional disabilities, aggressive behavior, shyness, social phobia and often lack interest in otherwise enjoyable activities. Research tells us that
Introduction

children, who are forced to live on prematurely adult levels, sometimes become oppositional to following the parents' rules (or those of society). Such children tend to respond to stressors with aggression and indignation. Many teenagers tend to become nonconformists and fall prey to teenage depression in response to a variety of growing up anxieties. However, stress induced fears and anxiety in children, adversely affect children's performances at various levels.

Points That Cause Stress in Students:

- Stress is created by parental pressure to perform and to stand out among other children. When they can't rise up to that expectation, or during the process of meeting it, children may suffer from frustration, physical stress, aggression, undesirable complexes, and depression.

- Students who are under-performers, develop negative traits such as shyness, unfriendliness, jealousy, and may retreat into their own world to become loners.

- Over scheduling a student's life can put them under stress. A child's in school and after school activities should be carefully arranged to give them some breathing space. Parents may want him to learn music, painting, or be outstanding in a particular sport. So many things are crammed in to their schedule, unmindful (often) of the children's choices and capabilities that it puts a lot of mental pressure on them in an effort to fulfill their parents' wishes.

- School systems cram students with a tremendous amount of homework, which they usually have to complete spending their evenings, weekends and most of the vacations. Unable to find enough time of their own, students often lose interest in studies and under perform. They often feel stress by being asked to do too much in too little a time.

- Teenage depression or growing up tensions adds to the academic pressures. If unable to adapt to the transition and change, students often carry enormous amount of anxiety, negative personal traits and can suffer from massive attention problems.

- When 'effortless' learning does not take place, these students lose confidence, motivation and interest, and this creates more stress.
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.

Social Work and Stress

Many students will feel anxious when asked to give a formal talk or presentation, especially for the first time. There could be many reasons for this anxiety which may include any or ll of the following:

- **Unfamiliar situation**: because most people speak formally only rarely to an audience, the novelty of the situation is a cause of apprehension.
- **Lack of Confidence**: this stems often from a feeling that others will be better speakers than us, or that they will know more about the topic in question.
- **Sense of Isolation**: the speaker is alone, the centre of attention, and therefore vulnerable.
- **Self-Consciousness**: about our accents, grammar, voice and image generally.
- **Fear of Looking Foolish**: students may be worried that they will forget what they want to say, or will stumble over words, will say the wrong thing, etc.
- **Fear of the Consequences**: e.g. being judged by others, particularly tutors, as lacking in ability or insight because of a poor public presentation. At least with an essay, mistakes can be made in private!

There are a number of signs of anxiety that can affect students if they are feeling anxious about the presentation: increased heart and breathing rates, increased adrenaline, over-rapid reactions, and tension in the shoulder and neck area. These bodily changes can also affect the voice, making it sound tremulous, or disjointed by over-rapid breathing. Students should be encouraged to overcome anxiety by planning
and preparing presentations and thinking about what they want to say and how they want to say it. By encouraging students to adopt the following strategies, they can learn to prepare for presentations and therefore build confidence.

➢ **Psychosocial Modifiers of Stress**

- **Social support**
  Social support refers to the perceived comfort, caring, esteem, or help the person receives from other people or groups. There are five basic types of social support:

  1) **Emotional support**: It involves the expression of empathy, caring and concern toward the person.

  2) **Esteem support**: This occurs through people's expression of positive regard for the person, encouragement or agreements with the individual's ideas or feelings, and positive comparison of the person with others such as people who are less able or worse off. This kind of support serves to build the individuals feeling of self-worth, competence and of being valued. Esteem support is especially important during the appraisal of stress, when the individual is assessing whether the demands exceed their personal resources.

  3) **Tangible or instrumental support** involves direct assistance.

  4) **Informational support** includes giving advice, suggestions or feedback.

  5) **Network support** provides a feeling of membership in a group of people who share interests.

  The type of support depends upon the stressful circumstances, for instance, emotional and informational support is particularly important for people who are seriously ill. Students who received more frequent esteem support tended to report less depression following stressful experiences.

➢ **Social Causes of School Stress**

Many kids experience some level of stress or anxiety in social situations they encounter in school, while some of these issues provide important opportunities for growth, they must be handled with care and can cause anxiety that must be dealt with.

- Teachers
- Friends
- Over-scheduling
Introduction

- Lack of family time
- Not enough sleep
- Work that’s too hard
- Work that’s too easy
- Home work problems
- Test Anxiety
- Poor diet
- Noise pollution
- Lack of preparation

How to reduce student stress

- Manage time wisely
- Get organized
- Create a good study environment
- Knowledge of learning style
- Practice visualizations
- Develop optimism
- Get enough sleep
- Use stress management techniques
- Learn study skills

The present investigation has been restricted only to Academic Stress and Social Stress.

1.3: ASPIRATIONS

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!

It is a known fact that we are living in an age which is known for a high level of aspirations. People aspire more and more in every walk of life. Parents are keen that their children should achieve the highest marks in their school subjects. The word Aspire refers to the ambition or desire a want, which has yet not been fulfilled and a
man still works for it. Parental Aspirations tell us about the ambition and desires of
the parents for their children. It is very strictly confined to the unmet goals by the
parents, which unintentionally get reflected by the way children are brought-up, and
continuous parental waxing and encouragement for some particular career or line of
vocation. Perhaps not the most compelling, but certainly the most pervasive of all
socially determined rewards and punishments are those leading to feeling of success
or failure. In the home, in the school, on the playground, in the church, competitive
strivings for positions and prestige vitalize the social organization change after
change, event after event is conditioned by some one’s desire for achievement.

From earliest childhood, praise and criticism show its impact on the
performance of the individual. In any competition, the winner gets the prize and the
looser has only fatigue for his efforts. The former is cheered, the later feared. These
very expressions themselves eventually develop rewarding and punishing properties
and the older child or adult will work for the rewards of social approval alone. And if
he is familiar with the pains of failure, he will struggle to avoid disapproval as much
as to gain. Everyone tends to fail occasionally; one is not good enough at everything
so that he is never subordinated at anything. In our social milieu nearly every kind of
goal directed activity is tinged in some way with competition. With adolescence and
adulthood, new sources start creeping in viz: striving for love affairs, vocational
activities and social position. Every face-to-face contact serves as a challenge or a
threat. This rich variety of opportunities for winning and loosing ensures that no
person can lack the complexities of personality structure, the habit of attack and
defense that are inextricably dependent upon success and failure.

Aspirations refer to the level of education/occupation for which a person
aspires. In general, aspirations mean the fantasy of the individual regarding future
occupation or settlement. It indicates what a person wants to be in his future life
irrespective of the limitations imposed by reality.

**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).

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**Introduction**

Academic aspirations are the degree to which an individual sets his educational goals realistically in relation to his physical and mental attributes and in accordance with environment. But the educational goals, which an individual sets for his own self, differ from one individual to another due to certain factors, which play a significant role in shaping the level of educational aspirations of students.

Some important distinctions need to be made regarding aspirations. First, there is a difference between educational and career aspirations, on the one hand, and quality of life aspirations on the other. Education and career aspirations relate to how much value people assign to formal education and how for they intend to pursue it i.e. do they seek a high school diploma, a four-year college degree or other post-secondary training, or perhaps a Ph.D. or M.D. degree? Career aspirations pertain to what type of vocation or profession they want to pursue. Quality of life aspirations are those related to such questions as where individuals would prefer to live, what kind of community they’d prefer, the kind of family they want, the type of schools they want for their children etc. While these two major categories of aspirations are different, they nonetheless are inextricably interdependent.

A second distinction is to be made between expressed aspirations and manifest aspirations. Expressed aspirations are self-reported statements of what individuals say they want to do. It is possible for those to be spur of the moment, transient, or the "popular thing to say” reports of personal goals, and as such, do not always present genuine, well-developed aspirations. Manifest aspirations on the other hand are reflected in what individuals actually do with their lives. These readily observable indicators can serve to support or contradict what they say they want to do. For example, the statement, “I really want to do well in high school so that I can go on a good college”, represents an expressed aspirations while that student’s actual daily attendance record and overall academic performance in school would serve as manifest aspiration indicators.

Aspirations are influenced considerably by the communicated expectations of the significant people who interact with the individual. If those expectations were high and consistent over time, then there would appear to be a greater likelihood that the individual’s aspirations will be similarly high. Conversely, low expectations often result in low aspirations.
Introduction

The human mind has always been a subject of debate since times immemorial. Its nature is to always question the unquestionable. Words that best describe the nature of a human being are inquisitive and curious. The mind wants information every single minute and it this nature that has given rise to glorious inventions in the past and present. We should never stop asking questions because asking questions helps us to know things better in every aspect of life. In the earlier days the technology was not so advanced and getting instant information and news was difficult. Even the education system was not so advanced as in the present, which could provide us with all that additional bit of information. Generally, every parent want that their child should get good and high quality education for which they put their children in the best of institutes and universities. This helps the child to build up a good career oriented future. In the present day scenario in order to get good and high class education parents spend money like water in the form of fees and donations and put them good institutes but what one need to see first is that are the youth really living up to the expectations and aspirations of the parents and the society and secondly are the aspirations of the youth fulfilled?

The first stage where the problem arises is when the child is in the 10th grade as here is where the child has to select the stream of his choice. If the child is an average scorer with merely 65% to 70% marks then it is not the child who decides as to what stream to take. It is the head of the educational institute or the teacher of the student who decides the stream for the child. Now it doesn’t always end up in the satisfaction of the child when he is forced to take the course given by the teacher merely on the basis of his marks. His aspirations and career objective might be totally different from what has been offered to him. The same problem arises when the child finishes his schooling and wants to get admission in some university in a particular course. The root cause of this problem is our educational set up. There are students who come with recommendations and get admission in the courses of their choice leaving the not-so-privileged and average scorers with no other option but to take what is offered to them. Doesn’t the average student deserve to study what they want? The only way to correct this problem is to revise the whole education system. (i) Firstly, the education should be decentralized. It should not be restricted to only a few big universities and institutes but should be within the reach of every youth. (ii) Secondly, the education should be job-oriented. It has also been noticed that the
Introduction

Education is also biased. A girl after having finished her graduation is made to do her Masters or post graduation not because she has to make her career but because it comes as an additional qualification in getting her a good groom. Therefore, indicating that in many cases for the parents educating the girl is nothing more than passing time usefully. So what is actually required from the parents is that they channelize the interest of the child from the initial years of education as to what he/she wants to become keeping aside the bias. Only a parent can know what a child wants to pursue as a career. It is very unfortunate to see that in the absence of proper guidance from the parents and the teachers the youth are trying to ape the West in terms of culture and trends. They have made these trends their role models in order to become successful in their careers.

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).

Aspirations reflect individuals' ideas of their "possible selves," what they would like to become, what they might become, and what they do not wish to become. Realizing aspirations requires the investment of time, energy, and resources--both from the young person and from others. The extent to which communities mobilize such support bears on the quality of life--both among students and among adults. A similar observation applies to realizing career or employment aspirations. In short, conditions in the community interact with the imaginations of students as they realize their aspirations.

Theories of Influence: The combined influence of parents and peers supports theorists who argue those parents' educational aspirations for their children, and children's own aspirations, stem from socially constructed roles. Role Theory suggests that beliefs are derived from expectations held by groups for the behavior of its individual members (e.g., a family's expectations for a child's academic achievement). Roles are also sets of behaviors characteristic of specific kinds of group
members (e.g., minority elementary-school students). As such, role construction involves three interactive processes: (1) structural demands (i.e., what do others expect of me?), (2) personal role conceptions (i.e., what do I expect of myself?), and (3) role behavior (i.e., what do I/should I do?). Put simply, Role can be characterized by two components: beliefs individuals' hold and actions that individuals take.

Because it accounts for interactions among varied psychological and sociological factors experienced by members of different races, social classes, and ethnicities, role theory is a valuable tool for explaining the conflicting evidence surrounding parents' influence on children's educational aspirations. Further, some researchers speculate that understanding how parental roles are constructed may enhance educators' abilities to effectively involve parents in their children's education, and thus enhance student outcomes.

Another useful theoretical tool for disentangling differential patterns of parental belief and behavior systems is John U. Ogbu’s cultural ecological theory. From this perspective, within minority groups, students' choice of strategies for succeeding in school are believed to stem from their desire to take the path of least resistance to the dominant social group, and to improve their status within their own peer group. Further, Ogbu characterizes minority groups' status as voluntary (i.e., immigrant families) and involuntary (i.e., native-born families), and he contends that voluntary minorities have more social pressure to do well in school than involuntary minorities. His argument is supported by a collection of ethnographies and other qualitative studies describing the combined influence of self, peer, and parental expectations and valuing of education among immigrant students and their native-born peers.

Specifically, these studies have noted that while many immigrant students invest personal time and energy in studying and seeking extra help, what appears to drive these self-regulatory efforts is a constellation of self, peer, and parental values that place great importance on the role of education. Moreover, when voluntary and involuntary minority families are compared, the children of immigrant families appear to have higher educational aspirations and academic achievement than their native-born peers. Compounding the difficulty in understanding how parental aspirations influence children's ability beliefs and learning behaviors is the fact that children receive and require differing levels of support and guidance from parents and peers.
according to their cognitive, social, and emotional development. In general, educational psychologists view the development of beliefs and behaviors conducive to achievement as a movement from largely socially regulated experiences in the early grades to more self-regulated learning experiences in middle and high school. Thus, the quality and quantity of parental influence on students' positive aspirations for achievement differ as children move from elementary to high school.

1.3.1: Levels of Aspirations

Levels of aspirations are defined most often as wished for or expected outcomes. In the classroom, students establish expectations, which may affect achievement. Certainly, success or failure in achievement appears to determine the expectation set. Students who can be realistic in assessing their own abilities, strengths and limitations apparently gain more from their efforts, relatively, than those who are unrealistic. Level of aspirations pertains to goal setting and consequent goal achievement. Teachers may affect a pupil’s aspiration level by the nature of goals imposed on the student, and the willingness of the teacher to insist upon realistic goal setting by the student.

Individual differences, sometimes related to past history of success and failure in other activities such as school, may be important determiners. Regularity of success was associated with quicker development of expectation of failure when success stopped than it was for mixed success failure within a series of mazes. Level of aspirations may denote a type of conflict situation a person faces when trying to decide what goals to set for him, whether to try tasks that appears very difficult to achieve or to remain content with the success at a much easier task.

For the variety of conditions found to affect level of aspirations, it is obvious that it cannot be restricted only to attainment of goals. One must regard aspirations level as one of the many factors that influence performance level. The level of aspirations of an individual is a point in the positive region of his utility scale of an achievement variable, it is at least upper bound of that chord (connecting two goals) which has maximum scope i.e. the level of aspirations is associated with the higher of the two goals between which the rate of change of the utility function is maximum, in other words, level of aspirations is that goal which has the largest distance (difference) in utility between it and the next lower group. So the level of aspirations
is a goal to achieve, which is just above one’s functional level of potentialities and is within his maximal capacities.

Level of aspirations is a psychological construct, which reflects a cognitive type of motivation of the individual. It may be viewed in terms of the level of future performance in a familiar task, which an individual, knowing his level of past performance in that task, explicitly undertakes to reach. One of the major findings is that the value of an incentive or the goal of performing a task at a given level appears to be modified by the subject’s expectation of achieving it, that is, by his subjective estimate of the probability that he will attain it. An individual’s aspirations level represents him not only as he is at any particular moment, but also as he would like to be at some point in the future. Level of aspirations is an index of the person as an individual and as a member of the society, which is determined by the amount of self-esteem he needs to maintain.

Each one of us has goals to which one aspires. In many instances, these goals are of the immediate type, which we reasonably expect to meet. Others will be of a long-range variety, and attainment may be less sure. Thus the success one has in reaching goals probably influences the future goals one sets. A child who has difficulty in learning to read in grade I probably should not set a dramatic increase in reading competence as a goal in grade II or in other words, it will not be realistic to expect a dramatic increase in grade II. Conversely, the child who makes rapid strides in reading competence in grade I many reasonably expects such increments to continue in grade II. Implicit in this description is the construct of the level of aspiration, which entails at least three dimensions:

- To what goal does the individual aspire?
- What are the discrepancies (if any) between the goals aspired to and those actually attained?
- What are the goals achieved?

There is a future component to complicate the construct. A person may state goals he wishes to reach and those he expects to reach. Wishes and expectations can differ, and each can be compared with actual goals attained. The construct has face validity for the classroom teachers since it is apparent that the goals desired and reached by students determine and are determined by learning in the classroom.
Introduction

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.

The subject tends to set his own goal (level of aspirations) within the area in which he can experience success or failure. As shown in the figure, a task may be “too easy” then the person experiences no sense of success, even though he accomplishes the task or a task may be “too difficult”. Here one has no sense of ego involvement as one is bound to fail. The intermediate rage is realistic.

Level of aspirations is not a uni-dimensional but multi-dimensional phenomenon. No two individuals are alike in aspirations. Many psychological and environmental factors develop the aspirations of an individual.

The difference between the level of the last performance and that of the new goal is called ‘Goal Discrepancy’ whereas the difference between the goal level and that of the new performance is called ‘Attainment Discrepancy’. The greater the discrepancy, whether goal or attainment, the lesser the chances of attaining the goal and the wider the frustration that the individual may experience. Thus neither the
overestimation nor the underestimation whatsoever they may be, but it is the realistic estimation in terms of least goal or attainment discrepancy that brings him the highest level of satisfaction as his reality oriented personality and consistency between his goal setting behavior and his ability and efforts to attain the same.

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 undertakes 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.

Level of aspirations means an individual’s ambition in a dynamic situation; it is an individual’s goal or expectation in regard to the goodness of his own future to a given task. 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.

Table 1.T.7

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Developmental Stage</th>
<th>Behavioral Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Infant (Dependent)</td>
<td>Hysterical, Dysfunctional, Hopeless, Depressing</td>
</tr>
<tr>
<td>2.</td>
<td>Child (Dependent)</td>
<td>Needy, Clinging, Manipulating, Expecting others to satisfy their demands and to make them happy.</td>
</tr>
<tr>
<td>4.</td>
<td>Adult (Conventionally independent)</td>
<td>Accountable, Responsible, Respectful</td>
</tr>
<tr>
<td>5.</td>
<td>Elder (Interdependent)</td>
<td>Feel the sense that everything is the manifestation of the reality</td>
</tr>
</tbody>
</table>

A level of aspirations criterion of success and failure is valid only where the individual sets his own goals and decides whether or not he has achieved them. Most research on the construct has actually assigned some goal for the individual and he
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has not been allowed to change it in any fashion. Probably many formal classroom-
learning goals are of the latter type and for such situations an estimate of probability
of success by the student himself is more valid.

In every day usage, ambition and aspirations are nearly synonymous and are
often used interchangeably. Ambition means eagerness or an ardent desire to achieve
a particular end rank, fame, honor, superiority or power. Aspirations refer to a longing
for and striving after something higher than one self or one’s present status. This
longing may be enabling or uplifting or it may be unwarranted or presumptuous. In
aspirations the motivation for achievement is improvement, whereas ambition for
motivation is the end result itself. It is somewhat closer to ambition but more realistic
than ambition. Ambition is wider and sprawling than aspiration. Aspirations serve as
an active psychological force. Aspirations differ from passive wish fulfillment.

Aspirations are the ego-involved goals- a person sets for himself. The more
ego-involved goals a person sets for himself, the more ego involved his aspirations are
and the more they relate to areas of behavior that are important to him, the greater will
be their influence on his personality. Aspirations may be positive, negative,
immediate, remote, realistic or unrealistic. Levels of aspirations are chiefly
determined by two sets of opposing principals in the individual:

- Ego forces which tend to set high goals even at the cost of failure.
- Pleasure principle, which seek success, thus lowering the aspirations level.

There is a close relationship between the level of aspirations and goal setting
and motivation. Goal setting also recently labeled as, risk taking in this sense is to day
used as a synonym for level of aspirations. It is customary to understand level of
aspirations as the defined, absolute level of goal pursued in performing a given task.

The laws of shifting (upward after success and downward after failure) however are
not meaningful for the point of view of motivational psychology. It is more
productive to understand level of aspirations as a relatively defined goal as a variation
in the goal related to attained performance level goal discrepancy.

Hence level of aspirations is a psychological construct which reflects a
cognitive type of motivation of the individual. It may be viewed in terms of the level
of future performance in a familiar task, explicitly undertakes to reach. An
individual’s aspirations level represents him not only as he is at any particular
moment but also as he would like to be at some point in the future. Level of
aspirations is an index of the person as an individual and as a member of society, which is determined by the amount of self esteem and needs to maintain.

1.3.2: Determinants of Level of Aspirations

Level of aspirations is influenced by two types of factors—environmental and personal. In early childhood, before the child is old enough to know what his abilities, interests and values are, his aspirations are largely shaped by his environment. As he grows older and is more aware of his abilities and interests, personal factors have a greater influence, but many of his aspirations, his values, for example, are still environmental in origin.

➢ **Environmental Determinants**

- **Parental Ambitions**: Parental ambitions influence the level of aspirations of the child. Parents always expect more and more from the first born, and therefore the level of aspirations may be higher for first born than that of those born later.

- **Social Expectation**: Society expects more and more from some people than others. It is generally assumed that one who is successful in a particular area may also be successful in other area if he wishes.

- **Peer Pressure**: Friends may encourage or discourage a child for anything. If they encourage him, it is possible that he will develop a tendency of high goal setting.

- **Culture**: Culture traditions are important factors for setting the goal better and rich cultural background helps the child in fulfilling high expectations.

- **Social Value**: It also varies with the area of achievement. Social rewards and prestige also works as reinforces.

- **Competition**: Competition with siblings and peers in the hope of showing better than others is also an affecting factor for level of aspiration.

- **Group Cohesiveness**: It is also considered as a determinant of goal setting. One does better and sets high goal when he is acting in a group.
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- Personal Determinants
  - **Wishes:** If one’s need to achieve something or he has high achievement motivation, his level of aspirations for achieving will be higher, and thus he wishes influence the level of aspirations.
  - **Personality:** The personality characteristics also determine the kind and strength of his aspirations.
  - **Past Experience:** The previous success strengthens one’s aspirations whereas failure weakens it.
  - **Values and Interest:** Personal values and interest also determines the extent of level of aspirations.
  - **Gender:** It is generally found that boys have higher aspirations than girls because of their different interests, likings, goals and expectations of family and society.
  - **Socio-Economic Background:** It is noticed that middle and upper groups have higher degree of aspirations than those of lower group.
  - **Racial Background:** Minority groups aspire higher than majority group. It is just a sort of compensation on the part of minority groups.

- Apart from above following factors also play important role:
  - Norms
  - Socio-Economic Status
  - Composition of group or society
  - Level of attainment
  - Traditions
  - Superstitions

Thus level of aspirations is the expected level of achievement of the individual where difference is obtained between person’s performance in a test and his estimate of future performance in that task and level of aspirations affects the vocational interest of the individual to a great extent. The aspirations of a person also spell out in detail what the person want to achieve and when.

1.3.3: Method of studying the Levels of Aspirations

For the measurement of level of aspirations, a person is asked to fix some amount of work (generally a mechanical task) which he can perform within a given
time (generally part of a minute) This behavior is known as goal setting behavior. In experiments of level of aspirations which means an immediate goal, almost within reach whatever a subject sets as his momentary goal may be taken as his measure of level of aspirations. Level of aspirations is a cognitive type of motivation in which the person concerned becomes involved in the task estimate and his own level of achievement. His experiences of success or failure guide him throughout the process to change his goal setting behavior, facilitating the measurement of level of aspirations. Level of aspirations refers to a level of interest or expectation of accomplishment. Mental health is very much related to level of aspirations. Different effects on aspirations may result from mental health.

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. Sears (1940) found that discrepancy scores (between level of success expected and success attained) for successful students were closely grouped in a small positive range, whereas the failure group revealed generally higher discrepancy which is larger for those students who have experienced continual failure. So, success perpetuates goal setting and leads to a higher level of aspirations. Failure tends to lower the aspiration level.

Because of the difficulties involved in direct methods, indirect methods have been used to get clues about adolescent’s levels of aspirations. The following techniques have proved to be most fruitful:

- **Studies of wishes**: Studies of wishes give clues about the adolescent’s immediate as well as remote aspirations.

- **Studies of Ideals**: If his ideal is an athletic hero, it suggests that the adolescent aspires to be a successful athlete.

- **Studies of resolutions**: When a person resolves to changes, it suggests that he is dissatisfied with himself. If for example, he resolves to improve, we get some idea of his aspirations.

- **Laboratory Experiments**: Laboratory experiments of level of aspirations must, through necessity, is focused on a study of immediate aspirations.
1.3.4: Types 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. 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.

Educational Aspirations is a psychological construct, which reflects a cognitive type of motivation of the individual. It can be defined in terms of level of future performance in a familiar task, which an individual, knowing his level of past performance in that task explicitly undertakes to reach. It is a frame of reference involving self-esteem or alternatively as a standard with reference to which an individual experience, i.e. has a feeling of success or failure.
In general, the researches on the level of aspirations can be put under three groups:

- In the first, one can include all those investigations where the main aim has been in determining principles applicable to the theory of personality.
- In the second group we can put those studies in which it has been used as a technique whose reliability and validity and assumption have been attended to while interpreting its results.
- In the third group can be included such researches wherein this technique has been tried to investigate other personality variables also.

A growing body of research provides evidence that student aspirations are related to:

- Leadership skills
- Use of coping strategies
- Adult income
- Choice of a college to attend

Deprivation had negative effect on achievement in science and level of aspirations, measures for mitigating the effect of criterion aspects of deprivation- lack of parental sympathy and care, bitter childhood experiences, lack of proper educational facilities had a positive effect on the achievement of the students and would enhance the level of aspirations of the students as well. There was a positive correlation between level of aspirations and achievement.

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. Health responses are related to measures of anxiety, affectivity, optimism, positive outcome, expectancies and locus of control. 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. Apart from outcomes research work on student aspirations occurs in three general areas:

- Firstly, most students' aspirations research is focused on the measurement of aspirations. Although many of these efforts focus on the aspirations of the students in general, a majority of recent efforts deal with specific sub populations, including rural and minority students.
Secondly, area of activity involves the development of interventions to increase student aspirations.

The final area of student aspiration effort involves the identification of variables that influence aspirations development. Categories of variables most often investigated include parental influences, family structure, demographic variables (SES level, ethnicity, gender), and anticipated benefit for entering certain occupations and student ability and achievement.

**OCCUPATIONAL ASPIRATIONS**

Occupational aspirations mean what the individual considers to be ideal vocation for him and refer to the point of hierarchy of prestige of various vocational fields which an individual views as a goal. Occupational Aspirations has assumed a great significance in the lives of the individual, as they are generally considered tentative decisions regarding feature occupations.

An individual’s occupation is a fair index of his mode of life and educational attainments, the sort of people whom he would meet on equal terms.

Occupational Aspirations refers to the aspirations of the parents regarding the occupations of their children. At the same time it relates to the motivational guiding forces, which prompts adolescents to join any particular stream.

Career is a very important aspect of adolescents. Therefore, all efforts need to be made to provide them with the knowledge to make good career. Because of their influence, parental views on education and occupational guidance must be considered. These days’ parents are very much concerned about their children’s education and career.

Parents’ personal outlook on occupation seems to vary according to their educational levels. Perspectives on education of respondents with high school qualifications tend to be more favorable. Parents are interested in child’s future. It indicates that parents, with less education may not have positive attitudes toward their own job or resources to help children make wise work choices.

In the Indian social structure the institution of family has been found as an important factor in the development of human beings. Parents in India generally decide the educational and career aspirations of their children, though there may be some expectations that a child develops independently. There is a positive relationship between the education of the parents and their educational aspirations for their
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children. The family contributes in many subtle ways to career decision-making as reported by most occupational theorists. Since occupational choices are attitudes towards work and towards occupations, it follows that children who identify with their parents and their subculture, develop preferences for the type of occupations which their parents value.

However in the present investigation, only Educational Aspirations were identified.

1.4: 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. As a matter of fact, it means clusters of factor including occupation, qualification, income cultural influences religious and living standards etc. Socioeconomic status (SES) is a combined measure of an individual's or families’ economic and social position relative to others, based on income, education and occupation. When analyzing a family’s SES, the mother's and father’s education and occupation are examined, as well as combined income, versus with an individual, when their own attributes are assessed. Socioeconomic status is typically broken into three categories, high SES, middle SES, and low SES to describe the three areas a family or an individual may fall into. When placing a family or individual into one of these categories, all variables are assessed. A fourth variable, wealth, may also be examined when determining socioeconomic status. Additionally, income, occupation and education have shown to be strong predictors of a range of physical and mental health problems, ranging from respiratory viruses, arthritis, and coronary disease.

SES is a measure of an individual or family’s relative economic and social ranking. In the analyses in this publication, SES is constructed based on father’s education level, mother’s education level, father’s occupation, mother’s occupation, and family income. Also, students are classified into high, middle, and low SES based on a standardized composite index score of their parents’ education level, mother’s and father’s occupation, family’s income, and certain household items. The terms “high SES,” “middle SES,” and “low SES,” respectively, refer to the upper, middle two, and lower quartiles of the composite index score distribution. By definition, one-quarter of each cohort of students will be in the bottom SES quartile, even if
education levels, average family incomes, and the number of persons in more prestigious occupations change.

It means status refers to the prestige of an individual or individuals which is derived from the position, he (she) or they hold in the society. In social science two kings of status are distinguished namely ascribed status and achieved status when an individual enjoys a particular amount of prestige from the position which is in herited by him (her) from his (her) family or the groups to which he belongs it may be stated that this is his (her) ascribed status. If the individual acquires some positions in his life time and derives the prestige from that position, then he is having the achieved status.

A family's socioeconomic status is based on family income, parental education level, parental occupation, and social status in the community (such as contacts within the community, group associations, and the community's perception of the family). Families with high socioeconomic status often have more success in preparing their young children for school because they typically have access to a wide range of resources to promote and support young children's development. They are able to provide their young children with high-quality child care, books, and toys to encourage children in various learning activities at home. Also, they have easy access to information regarding their children's health, as well as social, emotional, and cognitive development. In addition, families with high socioeconomic status often seek out information to help them better prepare their young children for school.

**STATUS**

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 (Maclver and Page, 1937). They are, thus the ancient powers and privileges of the family bestowing prestige, authority and power (Mussen, Conger and Kagan, 1963).

Societies have thus developed two types of distinct status— The ascribed and the achieved (Linton, 1936; Cole and Montgomery, 1959; Ogburn and Nimcoff, 1960). The ‘ascribed status’ is the recognition which a society gives to a person because of his position (Cole et al., 1959). It is assigned to individuals without any
reference to their innate differences or abilities (Linton, 1936). Thus it can be predicted and ascertained since birth.

The ‘achieved statuses’ are as minimum, those requiring special qualities although they are not necessarily limited to those. They are not assigned to an individual since birth but are left open to be filled through competitions (Linton, 1936; Ogburn and Nimcoff, 1960) and individual efforts (Linton, 1936; Cole et al., 1959).

### SOCIAL STATUS

A social person is one who conforms to the three criteria of social development. He should behave in approved manner, play the role which society prescribes for him and possess favorable attitudes towards people and social activities (Hurlock, 1964).

‘Social Status’, therefore, is an indication of one’s position of respect, prestige and influence in the social structure (Maclever and Page, 1937; Cole and Montgomery, 1959; Rogers, 1962) apart from his personal attributes (Maclever 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).

### ECONOMIC STATUS

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.

#### 1.4.1: Socio-Economic Status

The ‘Socio-Economic Status’ is obviously a blending of the two statuses as enumerated earlier. Though none of the two can exist without each other yet they are distinctively different. ‘Socio-economic Status’ appear to be the resultant of the position of an individual in a society by virtue of a complex fusion of both of them, which often do not run parallel to each other in their own areas. This intermingling
takes place in an undefined and curious manner eventually to present an indicator to ‘Socio-economic Status’.

‘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.

The blended complex of two statuses in terms of ‘Socio-Economic Status’ as such remains a highly important sociological concept and is usually measured in terms of occupation of father, education of father, house, income, social caste and class, neighborhood, material possession, land farm powers and family, residential address, reading matters, quantity of clothes, amount of social participation, number of servants, genealogy, family reputation and morals.

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.

Cronbach (1955) contends that social class refers to social stratification. Social stratification indicates that both individuals and group of individuals are conceived as forming lower or higher differentiation strata and classes on the basis of some specific or generalized characteristics. The dimensions of social stratifications include power, occupation, prestige, wealth, education, family positions and local community status etc.

Socio-Economic Status is an individual’s standing in terms of his social and financial position in relation to others. It is a different way to look at the social structure of a society. Social class or position based on income, educational level and occupational prestige are the indicators of socio-economic status. Maclver 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.

The term Socio-Economic Status implies many factors in the life of an individual. It may refer to the individual’s past and involve a study over a period of time concerning the socio-economic conditions of his home including such factors as social, economic or educational which influences the development of the child for the time being or permanently. An important consideration in regard to the family background relates to its state in the socio-economic hierarchy comprising of
variables such as education, income and occupation. Family state conceptually refers to the socio-economic position of the family and its location in the social strata (Good, 1959).

English and English (1958), in their comprehensive dictionary of psychological and psycho analytical terms define socio-economic status as ‘an individual’s position in a given society as determined by wealth, occupation and rural class’.

Socio-economic status consists of a cluster of factors which include occupations, income and cultural features of home. Good (1959) defines, socio-economic status as the level indicative of both the social and the economic development of an individual or a group.

Status refers to the prestige of an individual or individuals which is derived from the position, he or they hold in the society. In social sciences, two kinds of status are distinguished, namely, ‘ascribed status’ and ‘achieved status’. When an individual enjoys particular amount of prestige from the position which is inherited by him from his family or the groups to which he belongs, it may be stated as his ‘ascribed status’. If the individual acquires some position in his life time and derives the prestige from that position, he is holding the ‘achieved status’.

The dictionary meaning of socio-economic status is “State, condition or standing of a person”. The International Dictionary of Education (1977) explains socio-economic status as a person’s position in any given ‘group’, ‘society’ or ‘culture’ as determined by wealth, occupation, education and social class. Here social class is the grouping of the people on a scale of prestige in a society according to their social status. Many factors such as occupation, income, family history, social grouping, organizations and type of schooling and area of residence determine it.

In Kuppuswamy’s view (1962), the attempts made to estimate the socio-economic status of an individual are based on three assumptions. These are:

- There is a class structure in the society.
- Status position is mainly determined by a few commonly accepted characteristics.
- These characteristics can be scaled and combined by using statistical procedures.
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. Demarest et.al. (1993) state that socio-economic status has usually been confined to give five components:

- Education of the parents and other members of the family.
- Profession of parents and other family members.
- Income of the family from all sources.
- Size of the family.
- Total status of the family.

Families with high socio-economic status often have more success in preparing their young children for school because they typically have access to a wide range of resources to promote and support young children’s development. Also, they have easy access to information regarding their children’s health, as well as social, emotional and cognitive development. In addition, families with high socio-economic status often seek out information to help them better prepare their young children for school.

Even in the families with above average incomes, parents often lack the time and energy to invest fully in their children’s preparation for school, and they sometimes face a limited array of options for high quality child care both before their children starts school and during the early school years. Kindergarten teachers throughout the country report that children are increasingly arriving at school inadequately prepared.

Families with low socio-economic status often lack of the financial, social and educational support that characterized families with high socio-economic status. Poor families also may have inadequate or limited access to community resources that promote and support children’s development and school readiness.

Crnic and Lamberty (1994) discuss the impact of socioeconomic status on children's readiness for school: “The segregating nature of social class, ethnicity, and race may well reduce the variety of enriching experiences thought to be prerequisite for creating readiness to learn among children. Social class, ethnicity, and race entail a set of 'contextual givens' that dictate neighborhood, housing, and access to resources that affect enrichment or deprivation as well as the acquisition of specific value systems.”
Ramey and Ramey (1994) describe the relationship of family socioeconomic status to children's readiness for school: "Across all socioeconomic groups, parents face major challenges when it comes to providing optimal care and education for their children. For families in poverty, these challenges can be formidable. Sometimes, when basic necessities are lacking, parents must place top priority on housing, food, clothing, and health care. Educational toys, games, and books may appear to be luxuries, and parents may not have the time, energy, or knowledge to find innovative and less-expensive ways to foster young children's development. Even in families with above-average incomes, parents often lack the time and energy to invest fully in their children's preparation for school, and they sometimes face a limited array of options for high-quality child care—both before their children start school and during the early school years. Kindergarten teachers throughout the country report that children are increasingly arriving at school inadequately prepared."

Families with low socioeconomic status often lack the financial, social, and educational supports that characterize families with high socioeconomic status. Poor families also may have inadequate or limited access to community resources that promote and support children's development and school readiness. Parents may have inadequate skills for such activities as reading to and with their children, and they may lack information about childhood immunizations and nutrition. Zill, Collins, West, and Hausken (1995) stated that "low maternal education and minority-language status are most consistently associated with fewer signs of emerging literacy and a greater number of difficulties in preschoolers." Having inadequate resources and limited access to available resources can negatively affect families' decisions regarding their young children's development and learning. As a result, children from families with low socioeconomic status are at greater risk of entering kindergarten unprepared than their peers from families with median or high socioeconomic status.

1.4.2: Main Factors of Socio-Economic Status

- Income

Income refers to wages, salaries, profit, rents and any flow of earnings received. Income can also come in the form of unemployment or workers compensation, social security, pensions, interests or dividends, royalties, trusts, alimony, or other governmental, public, or family financial assistance.
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• Education

Educational attainment is preferable to analyze for SES because it can be figured for all individuals. A person’s educational attainment is considered to be the highest level (grade or degree) of education they have completed. Education also plays a role in income. Median earnings increase with each level of education. Higher levels of education are associated with better economic and psychological outcomes (i.e.: more income, more control, and greater social support and networking). Education plays a major role in skill sets for acquiring jobs, as well as specific qualities that stratify people with higher SES from lower SES.

• Occupation

Occupational prestige as one component of SES encompasses both income and educational attainment. Occupational status reflects the educational attainment required to obtain the job and income levels that vary with different jobs and within ranks of occupations. Additionally, it shows achievement in skills required for the job. Occupational status measures social position by describing job characteristics, decision making ability and control, and psychological demands on the job. Occupations are ranked by the Census (among other organizations) and opinion polls from the general population are surveyed. Some of the most prestigious occupations are physicians and surgeons, lawyers, chemical and biomedical engineers, computer support specialists, and communications analysts. These jobs, considered to be grouped in the high SES classification, provide more challenging work and ability and greater control over working conditions. Those jobs with lower rankings were food preparation workers, counter attendants, bartenders and helpers, dishwashers, janitors, maids and housekeepers, vehicle cleaners, and parking lot attendants. The jobs that were less valued were also paid significantly less and are more laborious, physically hazardous, and provide less autonomy. Occupation is the most difficult factor to measure because so many exist, and there are so many competing scales. Many scales rank occupations based on the level of skill involved, from unskilled to skilled manual labor to professional, or use a combined measure using the education level needed and income involved.

• Wealth

Wealth, a set of economic reserves or assets, presents a source of security providing a measure of a household's ability to meet emergencies, absorb economic...
shocks, or provide the means to live comfortably. Wealth reflects intergenerational transitions as well as accumulation of income and savings. Income, age, marital status, family size, religion, occupation, and education are all predictors for wealth attainment.

The increasing cost of colleges and universities seems to be a deterrent for students of lower socio-economic status. Students may feel that cost itself would hold them back. This belief, although commonly held, might be overcome if the students were counseled to find economic assistance through scholarships and loans. Children whose parents are of a higher socio-economic status are more likely to have higher IQ’s, test better and advance in their education further than those of a lower socio-economic status. This may be due to several reasons. First, there is genetics: if the parents received advanced education, they are probably intelligent and therefore passed that on to their children. These parents are more likely to value education because of their experience in the efforts of higher education students whose parents don’t have advanced degree don’t have time or money to spend on helping their children advance to a higher level. Therefore, a cycle is created where in middle and lower classes generally stay in those classes. Lower socio-economic status can be a factor in poor health. Studies have shown mental health to be impaired due to the daily stress due to unemployment, economic displacement and housing dislocation, including homelessness. In addition, it is more difficult to provide healthy food, safe communities and clean work environments in areas of lower socio-economic status. On the flip side, those people with higher socio-economic status have more exposure to health care and information that promotes healthy behaviors. In today’s society, students of lower socio-economic background are generally lacking the technology needed to keep up with the general population. The obvious reason is the high price of technology. Studies have shown that by using computers and the internet in the classroom helps to equalize students of all socio-economic backgrounds. It allows students to be more involved academically and professionally in their futures. They may even become as technologically literate as their more economically advantaged peers.

Social class or status of the family refers to the hierarchical distinctions between individuals or groups in societies or cultures. Social class influences socio-economic status because low people are treated depending on the class they come
from, which may be determined by various factors. Socio-Economic Status strongly influences the varying student perspectives on the value and attainability of higher education. The probability of students attending schools of higher education is more likely in students from higher socio-economic backgrounds. Education increase opportunities for income and job security. One’s level of education can also be an indicator of socio-economic status. Socio-Economic Status is based on income, but too often is connected to race as well.

To sum up, socio economic status can be defined as a position which, apart from its personal attributes or special service, determines for its possessors, a degree of respect, prestige and influence. Further, it can be said that socio-economic status refers to the relationship between the individual and the racial set up in which he propagates. It encompasses the entire social environment that is provided to the individual and attitudes to a cluster of factors including his occupation, income, cultural features of home, religion beliefs, family relationships, living standards, caste etc.

1.5: EMERGENCE OF THE PROBLEM

Education is never ending process of inner growth and development and its period stretches from cradle to grave. Education in real sense is to humanize humanity and to make life progressive, cultured and civilized. It is through education that man develops his thinking and reasoning; problem solving capacity and creativity; interest, intelligence and aptitude; positive sentiments and skills; good values and attitude; and ability to meet life’s situations.

With the advancement of technology and recent globalization, the complexities of life have increased manifold. The world is becoming more and more competitive. Quality of performance has become the key factor for personal progress. Parents’ have desires that their children climb the ladder of performance to as high a level as possible, causing concerns for educationists. This desire for a high level of achievement puts a lot of pressure on students, teachers, and schools and in general the education system itself. In this learning process there is too much pressure and burden on pupils for achieving more according to competitive world and parental aspirations. It creates a kind of stressful atmosphere around the students especially adolescents.
Adolescence is a very crucial period of an individual's development as the incidents of this period greatly affect the whole personality of the individual. It is the period of transition from childhood to adulthood. Adolescents experience a number of physiological and psychological changes in this transitional period. An adolescent usually is a person of strong impulses. At this stage, adolescents have to start their vocational planning and for them achieving a good score is really necessary. Due to which an unwanted stress arise in their minds. This can only be relieved by the help of teachers as well as parents.

Every child has unique nature as regard to capabilities, attitudes, personality, characteristics and interests and as such, he reacts in his unique way to the situation in the class. Success or failure in school is related to the child’s relationship with education and stress. This is the factor which differentiates the children in terms of their achievement in academics.

Mackean (1995) concluded that females had more effective time management behaviors than males, but also experienced higher academic stress and anxiety. Males benefited more than females from leisure activities. Benson (1999) found that university groups had a statistically significant higher mean stress score than community college group. Wilson (2005) concluded that student athletes reported more stress than non-athletes in a wide verity of variable have a lot of responsibilities, not getting enough time for sleep and having heavy demands from extracurricular activities. On the other hand, non-athletes reported more stress than their athletes’ counterparts in areas such as financial burdens, making important decisions about their education get rapped off, social conflicts over smoking with a room mate or friend, being ignored, social isolation etc. Brown (2008) concluded that stress is intense at the beginning of the academic programme and declines gradually as a function of a reduction in the academic work load rather than as a function of time.

Campos (1994) concluded that younger skilled children can perform similar to older skilled children if they were freely equated on the amount of soccer skill. Wang (1998) concluded that parents’ advice giving skills were more strongly related with parents’ perceptions of child social cognitive skills, less so with parent desires for child social cognitive endorsements. Hutton (2003) concluded that children’s cognitive skills, short term memory and working memory were rather similar in term
of memory. Holtzer (2007) concluded that executive control and memory function were important when the individual had to walk in a busy environment.

Ponec (1994) concluded that there were some similarities in the aspirations among African-American females for post-high school education. Wentzel (1998) concluded that the social address variables were related to parental aspirations indirectly, by way of significant relations to parental belief. Chung (2000) concluded that children whose mothers were working full time had lower educational aspirations, compared with those whose mothers were not in the labor force. Dennison (2005) concluded that socio-economic factors were closely related to students’ intention. Schoon, Ross and Martin (2007) concluded that interest and attainment to a science related career were formed early in life, often by the end of primary education. School experiences were crucial in attracting young people to a career in science.

Marmont and Shipley (1996) concluded that a non-work based measure of socio-economic status (car ownership) predicted mortality less well than employment grade before retirement but its ability to predict mortality declined less after retirement. According to Kennedy and Kawachi (2000), when personal characteristics and household income were controlled for, individuals living in states with the greatest in equalities in income were 30% more likely to report their health as fair or poor than individuals living in states with the smallest inequalities in income. Ball and Crawford (2005) gave little support for a relationship between SES and weight gain for black samples. Goesch and Schwarz (2008) concluded that socio-economic factors of well being were negatively associated with bed net use such as living in a stone house, running water in the house, belonging to the highest group in the economic score. So the present investigation will be a humble attempt to investigate: The effect of stress on cognitive skills of X graders in relation to their Aspirations and socio-economic status in Indian socio-cultural settings.