Cognitive Self-Management and Academic Achievement in Science of High School Students

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by

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DECLARATION

I, do hereby declare that this dissertation entitled "**COGNITIVE SELF-MANAGEMENT AND ACADEMIC ACHIEVEMENT IN SCIENCE OF HIGH SCHOOL STUDENTS"** has been originally carried out by me under the guidance and supervision of Dr. V. S. Pavithra Kumar, Assistant Professor of Physical Science. N.V.K.S.D. College of Education, Attoor, Kanniyakumari district and this dissertation has not been submitted to any other university for the award of any other degree or diploma.

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CERTIFICATE

This is to certify that the dissertation entitled "**COGNITIVE SELF-MANAGEMENT AND ACADEMIC ACHIEVEMENT IN SCIENCE OF HIGH SCHOOL STUDENTS"** submitted in fulfilment of the requirement of the degree of Master of Education is a record of research work done by Bismi Heather J (Reg. No: 10122MED0513) under my guidance and supervision. It is further certified that the work is an original one free from any duplication.

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CHAPTER I

INTRODUCTION

Education is a process and an instrument to bring out the innate behaviour of the individual. Students are the backbone of the educational process. The destiny of a nation lies in its classrooms. The strength of our nation depends on the students' ability in terms of well-educated, responsible, well-adjusted youth. Education in its general sense is a form of learning in which knowledge, skills and habits of a group of people are transferred from one generation to the next through teaching, training, research, or simply through auto-didacticism. Generally, it occurs through any experience that has a formative effect on the way one thinks, feels, or acts. Education was introduced to the Indian society in order to eradicate the level of illiteracy irrespective of caste, religion, sex, race or birth. Education is one of the vital factors that help in the development of a human being. It has been observed that early childhood education plays a stimulating role for the Physical, Intellectual, Language, Social and Emotional development of the child. At present various opportunities are provided and several avenues are open that helps in imparting education to the children all over the world. Education in broad sense refers to ways in which people learn skills, knowledge and develop understanding about the world and themselves. It is an integral part of the whole process of development in a person. The aim of educational endeavour is to develop one's potentialities and innate capacities of both body and mind. At the social level the major concern of education is to enable a man to become a good and useful citizen and fulfil his rights and duties for the betterment of a nation. It is also concerned about wellness of a person by building character and inculcating values in life.

Education is one of the vital pillars of life. The cognitive development, psychological, and personality aspects, largely feeds from the quality and versatility of the kind of education a person receives from childhood. It gives a strategic and valuable insight to shape the cognitive and overall development that kicks start since early school education. The skills and learnings incorporated in children through education, academics, and various other procedures can be worthy of shaping up a human into a fully developed human being.

Cognitive self-management is an ability to think in abstract terms. It is the highest stage of intellectual functioning. It is the way of controlling one's self or the ability of individual to control one's self in a systematic problem solving. It includes different dimensions like positive focus which means a way of perceiving problem in an optimistic way in self-monitoring, systematic problem solving which is a planned approach in solving problem, task-efficacy which refers to carry out the able task with greater motivation whether one could complete it effectively, self-blame which is a sort of introspective reward to be overtly self-punishing, it converts consequences a self-reinforcement, and reasonable goal setting which refers to remove the depressive ideas and feelings with intrinsic motivation to set up a real goal, both by past experience and by insight learning. Cognitive self-management skill which is often called executive control of behaviour (Paris, Lipson and Wixon,1983) refers to student's abilities and planning before they handle a task and make necessary adjustments and revisions during their work. The skills which are commonly used to indicate the presence of student's self-management are the ability to plan, regulate and evaluate their learning. Planning involves activities such as setting goals, analysing tasks and selecting strategies achieve

specific goals. Regulating refers to the fine-tuning and continuous adjustment of learner's cognitive activities. Evaluating or maintaining refers to assessing learner's current knowledge state. Evaluating activities include tracking of learner's attention as they learn, self-testing and questioning. Evaluating occurs continuously, before, during and after a task. Cognitive self-management has a direct implication on student's performance. When thinking skills are lacking poor decision making and planning result.

Academic achievement serves as a multifaceted measure of a student's success in their educational pursuits, encompassing a range of accomplishments and competencies. It extends beyond traditional metrics such as grades and test scores to encompass critical thinking skills, problem-solving abilities, and a deep understanding of subject matter. The pursuit of academic achievement involves a combination of dedicated effort, effective study habits, and engagement with learning materials. It reflects a student's capacity to set and attain educational goals, demonstrating resilience in the face of challenges. Moreover, academic achievement is influenced by various factors, including the quality of teaching, institutional support, and the socio-economic environment. A comprehensive understanding of academic achievement provides valuable insights into the effectiveness of educational systems, enabling educators, policymakers, and researchers to enhance learning experiences and outcomes for students.

Good academic achievement allows students to enhance and develop essential skills required for a successful life. Students need to develop important life skills such

as leadership, time management, effective communication, logical thinking, problem-solving, and many more. Developing these skills not only helps students achieve academic performance but also supports them in various aspects of their lives. Cognitive self-management refers to the ability to regulate and control one's cognitive processes, including attention, memory, and problem-solving skills. Academic achievement, on the other hand, is a measure of a student's success in academic pursuits, typically assessed through grades, test scores, and overall academic performance. Developing cognitive self-management skills can enhance various aspects of academic performance and contribute to long-term success in education. Educational interventions and support programs that target the enhancement of cognitive self-management skills may prove beneficial for students aiming to improve their academic outcomes.

Need and Significance of the Study:

The present education system prepares young to meet the challenges and demands of the competitive world. The students struggle to cope up with the demands from the teachers, parents, and the society. The students who are able to associate the past experience into productive way are able to perform well in academics. In recent years, the term “self-management” has replaced” self-control” because self-control implies changing behaviors through sheer will power self-management, on the other hand, involves becoming aware of the natural processes that affect a particular behaviour and consciously altering those processes resulting in the desired behaviour change. The thinking ability is the higher order cognition. It is the awareness of one's even thoughts.

It is the problematic act, which can be students in selection, evaluation, revision of cognitive tasks, goals and strategies. The prospective teachers have hypothetical thinking ability and they can solve any type of problems. The main purpose of this study is to find out the relationship between cognitive self-management and achievement of students. The field of cognitive psychology has traditionally been concerned with cognition. This level includes functions and processes at its best, this is a process in which one learns about oneself and how one can perform to one's potential under any circumstances, not just accidentally. It involves developing an understanding about how personal opinions, attitudes and states of mind influence success. Fundamental to that process is self-awareness based on reflection and self-evaluation, so that one can know that they do well and why, and what needs to be improved and how.

Cognitive self-management is not limited to cognitive processes but also extends to emotional regulation. Students who can manage stress, anxiety, and other emotions effectively are better positioned to cope with the demands of academics and perform well under pressure. Awareness of one's own cognitive processes, known as metacognition, is a key aspect of cognitive self-management. Students who reflect on their learning, understand their strengths and weaknesses, and adapt their strategies accordingly are more likely to succeed academically. In a rapidly changing world, the ability to self-regulate cognitive processes is essential for adapting to new information, technologies, and challenges. Research in this area can help ensure that educational systems prepare students with the cognitive skills necessary for success in future careers and endeavours.

Now a day's children feel that they have the attention and support of teachers and parents in their academic and school activities, they will naturally develop a special sense of belonging and attachment to school and school-related activities, including academic activities, thus there is a tendency for such children to achieve higher grades and generally show better academic achievements. Having a strong sense of self-confidence brings about may positive outcomes in students. They know how to plan and implement their tasks, put in greater effort, are more persistent, set high but achievable targets for themselves, fed less anxiety, are more effective in their life strategies, are cognitively efficient and generally achieve a higher level of achievement. Adolescents who are persistent and effortful may engage more seriously in academic activities that promotes better academic performance. Cognitive self-management is very necessary for achieving the goals.

Statement of the problem

Cognitive self-management plays a crucial role in the academic achievement of students, influencing various aspects of their learning process and overall performance. Cognitive self -management is a foundational aspect of academic structure, influencing student's ability to learn, organizing information, solve problems and persist in the face of challenges. The study seek to addresses the questions like, How do individual differences in cognitive self-management contribute to variations in academic performance, and are there identifiable patterns or trends? , Are there moderating factors, such as socio-economic status or cultural background, that influence the strength and nature of the relationship between cognitive self-management and academic achievement?. This study strives to contribute valuable insight into the

relationship between cognitive self-management and academic achievement in science and is entitled as “Cognitive self-management and academic achievement in science of high school students”.

Operational Definitions of Key terms

The investigator adopted the following operational definitions for the terms used in the title

Cognitive Self-Management:

Cognitive self-management is an ability to think in abstract terms. It is the highest stage of intellectual functioning. It is the way of controlling one’s self or the ability of individual to control one’s self in a systematic problem solving. It includes different dimensions like positive focus, systematic problem solving, task-efficacy, self-blame and reasonable good setting.

Academic Achievement:

Academic achievement is the extent to which a student has attained their educational goals, often measured through examinations or continuous assessments. It reflects the proficiency and understanding a student has acquired in their academic subjects. This definition aligns with the comprehensive view that academic achievement includes not only grades but also the development of critical thinking and problem-solving skills.

High school students:

High school students are individuals enrolled in grades 9 through 12 in public or private educational institutions. They are typically between the ages of 14 and 18 and

are engaged in a curriculum designed to prepare them for post-secondary education or vocational training

Objectives of the study

The objectives of the study are listed as follows;

- To construct a scale on cognitive self-management.
- To find out the level of cognitive self-management in science of high school students.
- To find out the significant difference in the mean score of cognitive self-management and academic achievement of high school students based on gender, local, type of institution, nature of institution, parent occupation, monthly income.
- To find out the significant difference in the mean score of academic achievement in science of high school students based on gender, local, type of institution, nature of institution, parent occupation, monthly income.
- To find out the significant relationship between cognitive self-management and academic achievement in science of high school students for the total score.

Hypotheses of the study

The following are the major hypotheses formed for the present study.

- There exists significant difference in the mean score of the cognitive self-management of male and female high school students.
- There exists significant difference in the mean score of the cognitive self-management of rural and urban high school students.

- There exists significant difference in the mean score of the cognitive self-management of government, private and aided high school students.
- There exists significant difference in the mean score of the cognitive self-management of high school students studied in boys, girls and coeducation institution.
- There exists significant difference in the mean score of the cognitive self-management of high school students with parental occupation like government and private.
- There exists significant difference in the mean score of the cognitive self-management of high school students with parental qualification as below SSLC, between SSLC-HSC, and above HSC.
- There exists significant difference in the mean score of the cognitive self-management of high school students with parental income like below 25000, between 25000-50000 and above 50000.
- There exists significant difference in the mean score of the academic achievement of male and female high school students.
- There exists significant difference in the mean score of the academic achievement of rural and urban high school students.
- There exists significant difference in the mean score of the academic achievement of government, private and aided high school students.
- There exists significant difference in the mean score of the academic achievement of high school students studied in boys, girls and coeducation institution.

- There exists significant difference in the mean score of the academic achievement of high school students with parental occupation like government and private.
- There exists significant difference in the mean score of the academic achievement of high school students with parental qualification as below SSLC, between SSLC-HSC, and above HSC.
- There exists significant difference in the mean score of the academic achievement of high school students with parental income like below 25000, between 25000-50000 and above 50000.
- There exists significant relationship between cognitive self-management and academic achievement in science of high school students.

Methodology in brief

Method used

Normative survey method was used for conducting the present study

Population

The population of the present study consists of all High school students study in Kanyakumari district during the academic year 2023-2024.

Sample

The present study was conducted on a sample of 350 High school students in Kanyakumari district. Simple random sampling technique was used.

Tools to be used

The tool used for the study was Cognitive Self-management scale constructed and validated by the investigator.

Statistical techniques to be used

In the present study the following statistical techniques will be used.

- ➔ Arithmetic Mean
- ➔ Standard Deviation
- ➔ t test
- ➔ ANOVA
- ➔ Coefficient of Correlation

Delimitation's of the study

The following are the delimitations for the present study:

i. The study will be restricted to Kanyakumari district only

ii. The sample size will be limited to 350 High school students only

Organisation of the report

The present investigation of the study is reported under five chapters.

Chapter I deals with the introduction, need and significance of the study, statement of the problem, operational definition, objectives of the study, hypotheses framed for the study and delimitations of the study.

Chapter II deals with the theoretical overview and review of related literature.

Chapter III deals with the methodology of the study. The chapter consists of the test development and research design.

Chapter IV deals with the analysis and interpretations of the collected data.

Chapter V deals with the findings, conclusions, educational implications of the study and suggestions for the further research.

CHAPTER II

REVIEW OF RELATED LITERATURE

- **Introduction**
- **Objectives of Literature Review**
- **Need for Review of Related Literature**
- **Importance and Purpose of the Review**
- **Theoretical Review**
- **Review Studies**
- **Critical Review**

CHAPTER II

REVIEW OF RELATED LITERATURE

Review of related literature is an important part in any research work. It enables the investigator to design and conduct the study. It provides an up-to-date information regarding the topic. It enables researchers to contextualize their studies, identify gaps in current understanding, and build upon established theories and methodologies. As highlighted by Pubrica (2024), literature reviews help researchers understand the current state of knowledge, identify gaps, and build a theoretical framework for their studies. Furthermore, literature reviews play a crucial role in evaluating and synthesizing research findings, allowing researchers to assess the strengths and weaknesses of previous studies. This critical analysis aids in refining research questions, selecting appropriate methodologies, and justifying the significance of the study. According to McMaster University (2024), literature reviews help in identifying gaps, resolving conflicts in previous studies, and locating new research within the context of existing literature. In essence, a well-conducted literature review not only informs and guides the research process but also ensures that the study contributes meaningfully to the advancement of knowledge within its discipline.

The review of related literature places the researcher in a better position to interpret in the significance of his own result. A careful review of research journals, books, dissertations and other sources of information on the problem to be investigated is one of the important steps in the planning of any research study.

Objectives of the review

- To enable the researcher to define the limits of his field

- To avoid unfruitful and useless problem areas
- To avoid unintentional duplication of well-established findings
- To give an understanding of the research methodology
- To know the previous recommendations

Need for review of related literature

A thorough examination of the literature by means of the articles in journals, review articles, books and other writings which deal with a particular subject.

a) To access the level of theory and research that have been developed in the field of study and thus to define what is already known and what remains to be investigated in the specific field of study
b) To understand the definition of the established concepts and variables in the chosen field
c) To identify and adopt the research design, analytical methods, scales, instruments and data analysis procedures
d) To become fully aware of all the difficulties encountered by other workers and thus to avoid waste of time and money in the proposal research
e) To learn how to write the research report

The review of literature involves the systematic identification, location and analysis of documents containing information related to the research problem. The term is also used to describe the written component of a research plan or report that discusses the reviewed documents. These documents include articles, abstracts, reviews, dissertations, books, other research report and electronic media.

Importance and purpose of the review

- The review of literature provides us with an opportunity of gaining insight into the methods, measures, subjects and approaches employed by other research workers leads to design
- The review of the related literature enables the researcher to define the limits of his field. It helps the researcher to delimit and define the problem
- The knowledge of related literature brings the researcher up to date on the work which others have done and thus to state the objectives clearly and consciously.

The major purpose of the review of literature is to determine what has already been done that relates to the topic. It is to discover research strategies and specific data collection approaches that have or have not been productive in investigation of similar topics. The final and important and specific reason for reviewing the related literature is to know about the recommendation of previous researchers listed in their studies for further research. The present study was planned to investigate Cognitive self-management and Academic achievement of Science in High school students. The review of literature has been divided into two sections.

I. Theoretical review of Cognitive self-management and Academic achievement
II. Review studies related to Cognitive self-management and Academic achievement

I. Theoretical review of cognitive self-management and academic achievement

Cognitive Learning

Cognitive learning is a powerful mechanism that provides the means of knowledge, and goes well beyond simple imitation of others. Cognitive learning is defined as the acquisition of knowledge and skill by mental or cognitive processes; the procedure one has for manipulating information in their hand.

In cognitive learning the individual learns by listening, watching, touching, reading or experiencing and then processing and remembering the information. Cognitive learning might seem to be passive learning, because there is no motor movement. However, the learner is quite active, in a cognitive way, in processing and remembering newly incoming information.

Process of Cognitive Structure

Piaget was interested in biology and how an organism changes to fit its environment. The individual employs mental structures called schemes to reflect the outside environment and define actions, which control their behavior. An innate biological urge to achieve harmony between systems and the environment is what motivates this adaptation. Piaget identified two methods that a person uses to adapt: assimilation and accommodation. Both of these methods are used as the individual adjusts to their surroundings in a more complex way throughout their lifetime. An individual integrates new experiences into the past through assimilation. This pushes the person to adopt fresh perspectives, reconsider prior misconceptions, and assess what matters most, ultimately changing their perceptions. Contrarily, accommodation involves reshaping the world and new experiences to fit the existing mental capability. People have certain ideas about how the world should function.

Cognitive development

A child develops attention, perception, concept formation, memory, thinking, imagination, reasoning, problem solving and so on. Cognition is a process of knowing. Cognition encompasses decision making, judging, creativity and so on. These mental abilities can’t be observed directly.

Piaget's stages of development are part of a theory about the phases of normal intellectual development, from infancy through adulthood. This includes thought, judgment, and knowledge. The stages were named after psychologist and developmental biologist Jean Piaget, who recorded the intellectual development and abilities of infants, children, and teens.

Piaget's four stages of intellectual (or cognitive) development are;

- Sensorimotor. Birth through ages 18-24 months
- Preoperational. Toddlerhood (18-24 months) through early childhood (age 7)
- Concrete operational. Ages 7 to 11
- Formal operational. Adolescence through adulthood

Sensorimotor Stage

During the early stages, according to Piaget, infants are only aware of what is right in front of them. They focus on what they see, what they are doing, and physical interactions with their immediate environment. Because they don't yet know how things react, they're constantly experimenting. They shake or throw things, put things in their mouth, and learn about the world through trial and error. The later stages include goal-oriented behavior that leads to a desired result.

Preoperational Stage

During this stage (toddler through age 7), young children are able to think about things symbolically. Their language use becomes more mature. They also develop memory and imagination, which allows them to understand the difference between past and future, and engage in make-believe. But their thinking is based on intuition and still not completely logical. They cannot yet grasp more complex concepts such as cause and effect, time, and comparison.

Concrete Operational Stage

At this time, elementary-age and preadolescent children -- ages 7 to 11 -- show logical, concrete reasoning. Children's thinking becomes less focused on themselves. They're increasingly aware of external events. They begin to realize that their own thoughts and feelings are unique and may not be shared by others or may not even be part of reality. But during this stage, most children still can't think abstractly or hypothetically.

Formal Operational Stage

Adolescents who reach this fourth stage of intellectual development -- usually at age 11-plus -- are able to use symbols related to abstract concepts, such as algebra and science. They can think about things in systematic ways, come up with theories, and consider possibilities. They also can ponder abstract relationships and concepts such as justice. Although Piaget believed in lifelong intellectual growth, he insisted that the formal operational stage is the final stage of cognitive development. He also said that continued intellectual development in adults depends on the buildup of knowledge.

Cognitive development of learning

Piaget identified formal operational stage (adolescence and adulthood) of cognitive development at higher secondary school level. In this stage, intelligence is demonstrated through the logical use of symbols related to abstract concepts. Early in the period, there is a return to egocentric thought. Discovery learning and supporting the developing interests of a child are two primary instructional techniques. It is recommended that parents and teachers challenge the child's abilities, but not present material or information that is too far beyond the child's level. It is also recommended that teachers use a wide variety of concrete experiences to help the child learn (e.g., use of manipulative skills, working in groups to get experience seeing from another's perspective, field trips, etc.)

Learning as a cognitive process

Between the ages of one and five, which are considered to be the most formative, children begin to form an understanding of who they are in relation to their family and community. They also begin to explore the world through play and ask seemingly never-ending questions, which necessitate validating answers from careers. Finally, they are ready to learn about a healthy lifestyle from the strong adult role models they identify most strongly with. A child development may be impacted in ways that last a lifetime by the level of care and stimulation they experience in their first few years of life. Children's physical and emotional growth, as well as many aspects of their intellectual development, are strongly influenced by their early life experiences. The number and quality of the stimuli the brain is exposed to determine how it develops. There are eight neuronal pathways: location, temperature, pain, taste, sound, and touch. The brain's

nerve connections grow as a result of daily activity. Children learn more readily as a result. When all of the brain's neural pathways are activated, brain development is at its peak.

When a child's brain is developing, there are times known as "windows of opportunity" when it is particularly receptive to particular types of learning. These times include up to 18 months of age for the capacity to form a secure attachment, from the latter part of the first year to the end of the second year for the capacity to inhibit and regulate intense feelings, and up to the end of the fourth year for optimal vocabulary growth. When toddlers are taught basic arithmetic concepts like bigger or smaller and more or less, they do better in mathematics as adults. Large muscular skills like jumping, running, and throwing as well as tiny muscle skills like cutting, pasting, and drawing are all part of a child's physical development.

Children's developing capacity for thought and problem-solving is reflected in their cognitive development and is facilitated by toys like puzzles, matching and number games and building blocks.

Learning to experience, recognize, express, and control one's emotions as well as how to relate to others through cooperative games, theatrical play, and helping others are all aspects of social and emotional development. Nowadays, cognitive learning theories are strongly entwined with social learning theories. Learning, according to Long (1990), is primarily a cognitive process that is influenced by a variety of variables, including the learner's current state, prior knowledge, and attitudes and beliefs about the source, content, topic, and mode of presentation. Long is just one of many educators to make this claim. The knowledge that learning includes the activation of particular

cognitive processes has inspired scholars and practitioners to investigate the idea of cognitive engagement. According to Marx and Walsh (1988), pupils may adopt engagement styles that are either enabling or inhibiting. By definition, self-regulated learning is a type of cognitive engagement that is facilitate.

Cognitive theorists emphasize that learning essentially involves a change in cognition and not merely the acquisition of responses. Thus, it involves a change in meaning or understanding. The relationship between an organism and the environment depends on how the organism perceives and organize the environment (cognitive structuring). learning essentially contributes to a reorganization or restructuring of the cognitive structure. Thus, the cognitive theorists emphasize that the role of perception and the changes in perception during the learning process. Learning could be considered as permanent and transferable because it takes place with understanding, motivation and purpose.

The concept of cognitive management style

Each person learns in a different way. The term "cognitive management style" refers to the management of learning style, which includes one's manner of seeing, thinking, making decisions, and solving problems. Similar to self-regulated learning, this. Self-regulated learning, according to Schunk and Zimmerman (1998), is learning that is primarily influenced by students' own thoughts, feelings, techniques, and actions that are geared towards achieving goals.

The literature on adult education is cited to provide evidence that would support the notion that self-regulated learning, which represents the highest form of cognitive

engagement, is epitomized by the task, appropriate use of information acquisition and transformation skills, and appropriate use of meta cognition.

Meta-cognitive control processes

Meta cognition is the process of thinking about thinking. Flavell (1976) describes it as follows: "Meta cognition refers to one's knowledge concerning one's own cognitive processes or anything related to them, e.g., the learning-relevant properties of information or data. Meta cognition has to do with the active monitoring and regulation of cognitive processes.

According to Corno (1986), the volitional strategies mentioned by Kuhl (1983) are equivalent to the control or meta-cognitive elements of self-regulated learning. The possibility of goal achievement is increased, according to her theory, when effective learners use voluntary or self-imposed techniques to shield themselves from internal or external distractions in the learning environment. According to Corno and Kuhl's theory, two motivational factors may have an impact on these volitional strategies: the first is the perception that the task will be difficult to complete; this perception may be influenced by competing interests, social and peer pressure, and stage orientation; the second is the perception that the task will be within the learner's ability range.

Corno describes the volitional or Meta - cognitive strategies, as defined by Kuhl, to include the following:

i) Attention and encoding control: the ability to maintain task focus despite competing distractions;

ii) Selective encoding: attending to the important features of the task;

iii) Information procession control: the ability to allocate appropriate amount of time and mental energy to the pertinent aspects of a task;

iv) Motivation control: these strategies involve "self-reinforcement and self-imposed penance" (Corno, 1986) behavior that are linked to the anticipation of potential consequences regarding task outcome;

v) Emotion control: self-task strategies aimed at controlling performance anxiety.

vi) Environmental control: self-help strategies that are invoked for the purpose of assuring successful task completion. A complete definition of self-regulated learning therefore includes not only the information acquisition and transformational processes; it must also encompass these volitional or Meta - cognitive processes.

Self-management

Self-management is the ability to manage one's personal reactions to responsibilities and challenges in work and life. This involves managing one's time and adapting to changing situations. It requires one to reflect on one's experiences and their effect on one's physical and mental state. Self-management requires background skills of reflection, self-awareness, planning and monitoring, time management, flexibility and self-appraisal.

Goals of Self-Management

Self-management interventions are flexible. They can be used to target skills in all domains, including behavior, social, adaptive, and language/communication.

Examples of specific skills that have been the focus of interventions in the evidence-based studies include:

a) giving compliments to others

b) responding to others

c) sharing

d) increasing on-task behavior

e) initiating interactions

f) reducing the occurrence of interfering behaviors

g) promoting daily living skills

h) increasing play skills and

i) conversing with others

Cognitive self-management

The cognitive self-management is the ability to regulate one's cognitive faculty. It is the highest stage of intellectual functioning where a person displays ability to think in abstract terms. It is the way of controlling one's self or the ability of an individual to control one's self in a systematic problem solving.

Dimensions

Cognitive self-management includes different dimensions which are as follows

- Positive focus
- Systematic problem solving and task efficacy
- Self-blame
- Reasonable goal setting

Positive focus

It is the method of viewing issues in positive light. A person who holds positive beliefs can manage issues and locate pertinent solutions. A person can overcome worry, depression and exhaustion associated with task failure by maintaining a positive focus on the work at hand.

Systematic problem solving and task efficacy

It is the systematic approach to solve the problem. For this proper planning, organizing and execution is needed. This is also related to time and effort management and continuous follow up of the process of task. Task efficacy is successful and creative implementation of the problem-solving skills. When a task is successfully completed, it results in a specific desired outcome, which is referred to as task efficacy.

Self-blame

When situations are beyond control and desired results are not achieved, a person may blame himself for the failure. Taking responsibility for the failure for higher achievement. It protects against unpleasant circumstances that are unpredictable and out of our control. Self-blame is seen as adaptive.

Reasonable goal setting

A person should set a goal which is realistic reasonable and achievable. The systematic and step by step action should be taken in order to achieve the goals. Setting realistic goals ensures achievement. It encourages and guides the person to complete the work. Students who set their objectives based on their prior success and internal motivation may reach the desired result.

Perspective of cognitive self-management

It's more crucial to know how to learn than it is to know a lot of information. One must control their method of learning. In order to be aware of internal dynamics and their influences from the outside, regular self-evaluation is necessary in this process. Here, internal growth and self-control are prioritized. For this, a student combines all of his abilities with 50 external demands and prepares, organizes, and supervises the cognitive development. A few steps help to direct self-management. These are what they are:

i) Allow the students to have a choice in the selection of tasks and activities whenever possible.

ii) Help students‟ to learn to set realistic goals.

iii) Ensure students participation in group-work, especially co-operative learning, in order to develop social and affective skills.

iv) Act as a facilitator for group discussions when appropriate.

v) Be a role model for the attitudes, beliefs and habits you wish to foster, constantly work on becoming better and then share with students.

Academic achievement

Student academic achievement refer to the extent to which a learner has attained their short- or long-term educational goals. Individual differences in academic performance are strongly correlated with differences in personality and intelligence as well as students' level of self-efficacy, self-control and motivation also impact level of achievement.

Characteristics of person who has high academic achievement

- Action oriented
- Optimistic
- Flexible
- Accepting
- Disciplined
- Eager to learn
- Intrinsically motivated

Academic achievement in school is crucial for students as it fosters critical thinking, builds a growth mind set, and opens doors to future opportunities like higher education and job prospects. It also promotes personal development by boosting self-esteem, encouraging persistence, and developing essential life skills. Academic achievement encourages students to develop analytical and problem-solving skills, which are essential for decision-making in various aspects of life. Achieving milestones in academic's boosts self-esteem and confidence. Students develop essential life skills like time management and organization through their academic journey.

II. Review studies related to cognitive self-management and academic achievement

Review studies related to Cognitive self-management

Pradeep, R. V., Bindu, D., and Sameer Babu, M. (2024) conducted a study on "Mediating role of performance approach orientation on the relationship between cognitive self-management and scholastic achievement of secondary school students" The study was conducted to find out the extent of performance approach orientation, cognitive self-management and scholastic achievement of secondary school students of

Kerala and also to ascertain the relationship between performance approach orientation, cognitive self-management and scholastic achievement of secondary school students of Kerala. The sample consisted of 320 secondary school students of Thiruvananthapuram district. The investigator used the tools such as self-made cognitive self-management scale and performance approach orientation scale. The findings revealed that there will be a positive relationship was found between performance approach orientation, scholastic achievement and cognitive self -management of secondary school students of Kerala.

Chirayil, E, et al., (2023) conducted a study on "A comparative analysis of metacognitive awareness, self-regulated learning, critical thinking and academic performance among students of Kerala and Bihar" The objective of the study was to compare the metacognitive awareness, self-regulated learning, critical thinking and academic performance among students from Kerala and Bihar. The sample consisted of two hundred high school students from Kerala and Bihar. The tool used in the study was Schraw and Dennison's Metacognitive awareness inventory, self -regulated learning questionnaire, Saiz and Valenzuela's Critical thinking motivation scale, George J Dupaul and Mark D Rapport's Academic performance rating scale. The results revealed that the students from Kerala held higher metacognitive awareness, self-regulated learning, critical thinking ability and academic performance than those from Bihar.

Pushpa, L. V., and Sheeba, K. A. (2022) conducted a study on "A study on problem solving ability among Higher secondary students" The objective of the study is to find out the difference in problem solving ability among students studying in difference mediums and among students studying in government, government aided,

and private schools. The methodology used in the study was survey method. The tool used in the study was Problem Solving Inventory (PSI) by P.Paul Heppner (1988). The findings revealed that there is significant difference in the problem-solving ability of XI standard students owing to the differences in the medium of instruction. Government school students have the low problem-solving ability when compared with private school and government aided school students.

Shi Yueqi and Qu Shaowei (2022) studied how cognitive ability affects academic achievement among 572 secondary school students aged 15–18. They looked at five types of cognitive abilities—memory, representation, information processing, logical reasoning, and thinking flexibility—and how these influence students' academic performance. The study found that cognitive ability has a direct positive effect on academic achievement. It also showed that self-discipline partly explains this relationship (a mediating effect), and that planning strengthens the effect of self-discipline on academic achievement (a moderating effect). In other words, students with better planning skills benefit more from self-discipline when it comes to achieving academic success.

Mikkili,R.N, (2021) conducted a study on " Meta cognitive awareness and academic self-concept among seventh standard school students" The objective of this study was to study the correlation between meta cognitive awareness and academic self-concept. The sample consisted of twenty seventh standard students in Hyderabad which has been selected by simple random sampling method. The tool used in the study was Screw and Dennison's Meta Cognitive Awareness Inventory and Reynold's Academic

self-concept scale. The major findings showed that there was positive correlation between meta cognitive awareness and academic self-concept of class seven students.

Priyadarshini, N., and Alexander, T.D. (2021) conducted a study on "Well-being of the High school students in relation to their Achievement goal orientation and Cognitive self-management" The study was conducted to find out the level, influence and relationship between well-being, achievement goal orientation and cognitive self-management of high school students. The sample consisted of 1108 high school students from Tirunelveli, Tuticorin and Kanyakumari districts. The investigator used the tools such as Stephanie Rude's Cognitive self-management test and self-made student well-being scale and achievement goal orientation inventory. The findings revealed that there will be a moderate level of well-being, achievement goal orientation and cognitive self-management among high school students. There is a positive relationship between well-being, achievement goal orientation and cognitive self-management of High school students.

Shi Yueqi, Qu shaowei., (2021) conducted a study on "Cognitive ability and self-control's influence on High school students' comprehensive academic performance" This study uses a hierarchical linear model (HLM) to examine the effects of cognitive ability and self-control on comprehensive academic performance among students in a high school in Beijing. The study included 572 participating students, including 291 boys and 281 girls, ranging in age from 16 to 18 years old. In this study, the individual level of students' cognitive abilities is used as the first-level variables, including memory ability (MA), information processing ability (IPA), representation ability (RA), logical reasoning ability (LRA), and thinking transformation ability (TCA). Consider

self-control at the class level as the second-level variable. The research results show that the five cognitive abilities have a significant positive impact on comprehensive academic performance. Self-control plays an active role in regulating the relationship between RA, LRA, TCA, and comprehensive academic performance.

Lugard, I. A., and Osuafor, A. M. (2021) conducted a study on "Self-efficacy as a predictor of secondary school students' academic achievement in computer studies in Delta State." This study explored the predictive role of students' self-efficacy on their academic achievement in computer studies. The sample consisted of 600 secondary school students from Delta State, Nigeria. A self-efficacy questionnaire was used to assess students' confidence in their academic capabilities. The results showed a significant positive correlation between self-efficacy and academic achievement, indicating that students who believed more in their abilities performed better in academics.

Obumse, N. A., and Nwokedi, O. J. (2021) conducted a study on "Self-efficacy as correlates of academic achievement of secondary school students in Anambra State." The purpose of the study was to investigate the relationship between self-efficacy and academic achievement among 1,710 secondary school students in Anambra State, Nigeria. The General Self-Efficacy Scale was administered to assess students' beliefs in their academic capabilities. Findings revealed a significant positive relationship between self-efficacy and academic achievement, supporting the idea that students with higher levels of self-belief are more likely to succeed academically.

Florence, P., and Perumalil, T.S. (2020) conducted a study on "Friendship study habits and Cognitive self-management of Higher secondary students" The objective of

the study was to find the level, relationships and influence of friendship, study habits and cognitive self-management of higher secondary students. The sample consisted of 900 higher secondary school students from Ranchi and Kunthi districts. The tool used in the study was Stephanie Rude's Cognitive self-management scale, dimensions of friendship scale and study habits inventory which has been constructed by the investigator. The findings revealed that there is significant difference in the mean scores of friendship, study habits and cognitive self-management of higher secondary school students and also there is significant difference between the mean scores of cognitive self-management and friendship, cognitive self-management and study habits, friendship and study habits of higher secondary school students.

Sajitha, S., and Xavier, A.S. (2016) conducted a study on "Cognitive self-management of Primary school teachers" The objective of the study was to find out the level of cognitive self-management of primary school teachers. The sample consisted of 1490 primary school teachers from the southern districts of Tamil Nadu. The tool used in the study was Stephanie Rude's Cognitive self-management inventory. The findings revealed that there is significant difference between mean scores of cognitive self-management of primary school teachers with respect to gender and significant difference exists among Thoothukudi, Trinelveli and Kanyakumari districts primary school teachers.

Sajitha, S., and Xavier, A.S. (2016) conducted a study on "Modernity Personal values and Cognitive self-management of Primary school teachers" The objective of the study was to find the level, relationships and influence of modernity, personal values and cognitive self-management of primary school teachers. The sample consisted of

300 primary school teachers in Thoothukudi, Trinelveli and Kanniyakumari district. The tool used in the study was Stephanie Rude's cognitive self-management scale, Modernity scale and Personal values inventory developed by the investigator. The findings revealed that there was an moderate level of modernity, personal values and cognitive self-management among primary school teachers and also there is an influence between modernity, personal values and cognitive self-management.

Thanavathi, C, (2015) conducted a study on "Cognitive self-management and achievement among B.Ed students" The objective of the study was to find out the level of cognitive self-management among B.Ed students and to find the relationship between mean scores of cognitive self-management and achievement among B.Ed students. The sample consisted of six hundred and forty students from various colleges in Thoothukudi. The tool used in the study was cognitive self-management scale prepared by the investigator. The findings revealed that there will be significant difference between the mean scores of cognitive self-management and achievement among B.Ed students and most of the B.Ed students have moderate level of Cognitive self-management.

Jayaghandhi, T., and Sughanthi, M. (2015) conducted a study on "A study on cognitive self-management among Teacher Trainees of second year D.TEd students". The objective of the study was to find out the study of cognitive self-management among teacher trainees of second year D.T.Ed. students. • To determine the significant difference between the cognitive self-management with reference to gender, age, locality, marital status, staying, parent's educational qualification, parent's income and newspaper reading. The study has been conducted on a sample of 80 students to

examine the level of cognitive self-management. The sample consisted of second year D.T.Ed. Teacher trainees in District Institute of Education and Training, Madurai district. The random sampling technique was used in this study. The data were analysed statistically by using mean, standard deviation and t test. The study revealed that there is no significant difference in the mean scores of cognitive self-management with respect to gender, age, marital status, staying, mother's educational qualification, parent's annual income and newspaper reading. And also the study revealed that there is significant difference in the mean scores of cognitive self-management with respect to father's educational qualification and locality.

Olorunfemi-Olabisi, F. A., and Akomolafe, M. J. (2013) conducted a study on "Effects of self-management technique on academic self-concept of under-achievers in secondary schools." The study aimed to examine how self-management techniques influence the academic self-concept of secondary school students with low academic performance. A quasi-experimental design was employed, and a sample of 40 under-achieving students participated in a six-week intervention using self-management strategies. The researchers used a self-developed academic self-concept scale. The findings revealed that self-management training significantly improved the academic self-concept of the students, thereby indicating a positive impact on their academic motivation and performance.

Reviews related to academic achievement

Chowdhury, S. (2023) conducted a study on "Emotional intelligence of secondary school students in relation to their Academic achievement" The study was conducted to find out the level of emotional intelligence secondary school students and

to study the academic achievement of secondary school students. The methodology used in the study is simple survey method. The sample consisted of 200 secondary school students. For ascertaining the academic achievement of the students, the researcher has collected the aggregate marks obtained by the sample students in all subjects in their previous classes. The finding revealed that the academic achievement of secondary school students of the entire sample is average and there will be significant difference between male and female, urban and rural, government and private secondary school students with regard to their academic achievement.

Ricci, F. J., and Benjamin, E. W. A. (2023) conducted a study on "Attitude towards Achievement in Science at the High school level". The objective of the study is to find out the significant difference in the effective, cognitive and behavioral attitudinal responses in the attitude towards achievement in science with respect to the medium of study. The method adopted in the study was normative survey method. The sample consists of 50 students of class IX selected from St. Joseph's High school, Trichy by random sampling technique from the population of 170 students. The tool used in the study was 'Attitude towards Achievement in Science lessons' developed by Cheung (2009). The findings revealed that there is no significant difference between IX standard Tamil and English medium students in their liking for the theory part in science lessons and liking for science laboratory work. But there is significant difference between IX standard Tamil and English medium students in their evaluation belief about science, behavioral tendencies to learn science and attitude towards achievement in science.

Kumar, N. A. (2023) conducted a study on “Academic Achievement of Higher Secondary School Students in Relation to their Family Relationship” The objective of the study is to compare the academic achievement of higher secondary school students in relation to their poor and healthy family relationship and to find out the relationship between academic achievement and family relationship of higher secondary school students. Academic achievement and family relationship of 140 Higher secondary school students (Male=70, Female=70) was studied. Family Relationship Inventory (FRI) developed by Sherry and Sinha (2011) was used to study the family relationship and marks scored in the previous class were used to assess the academic achievement. Demographic information was collected and Mean, S. D., t test and product moment correlation of Pearson were calculated. Significant difference was found among higher secondary school students having Poor and healthy family relationship. Significant positive relationship was found between academic achievement and family relationship among higher secondary school students.

Nanaware , R.B ., and Bhaviskar , C.(2023) conducted a study on “A Study on Academic Achievement in Relation to Learning Styles of Senior Secondary School Students” The study's primary goal was to identify secondary students' preferred sensory modalities for learning and investigate the relationship between academic accomplishment and learning style sub-dimensions, which fall along one of three distinct learning styles. Secondly, it sought to determine if there was any association between gender, locale, nature of the institution and preferred learning styles concerning students' performance scores. These are included as a second variable since individual differences can influence students' performance scores. The students at senior secondary

schools of Karnataka's Bangalore Urban and Rural form the population of this study. The researcher drew the study's sample using a simple random sampling approach. The 100 participants in this endeavor included both males and females from urban and rural vicinity secondary school students from government and private institutions. The VAK Learning Styles Self-Assessment Standardized Questionnaire (Chislett & Chapman, 2005) was utilized in this study as a tool for data collection. Findings reveal that the predominant sensory modality of learning was aural and more prevalent than visual and kinesthetic learning (34%). The relationship between learning style and academic success is statistically significant ($p< 0.05$). The main effects of the three variables - visual, auditory and kinesthetic are also substantial on academic achievement. The female students were more dominant in the blend of all (Collaborative) learning styles.

Rani, S, Anjali., Usha., and Sudesh. (2023) conducted a study on “A study of Academic Achievement of secondary school students in relation to self -concept” The present study was carried out to investigate the impact of self-concept on academic achievement. A sample of 100 secondary school students from diverse backgrounds in the Sonipat district was selected using a stratified random sampling technique. The population was distributed equally. For measurement of self-concept, Self-Concept Inventory (SCQ) by Dr. Raj Kumar Saraswat was administered. After the analysis, the result showed a positive correlation between self-concept and academic achievement of secondary school students. It was also found that there was no significant difference between academic achievement and self-concept of boys and girl’s students based on gender and type of schools.

Thapa, Y. (2023) conducted a study on “Impact of Emotional Intelligence on Academic Achievement in Secondary Education in Nepal.” The study aimed to determine the relationship between emotional intelligence and academic achievement among secondary school students in Nepal. A sample of 640 students was assessed using the Schutte Self-Report Emotional Intelligence Test (SSEIT) and their academic performance records. The findings revealed a significant positive correlation between emotional intelligence and academic achievement, indicating that students with higher emotional intelligence tend to perform better academically.

Nath, H., Nath, H., and Das, M. (2023) conducted a study on “An Empirical Study on Emotional Intelligence of Higher Secondary School Students of Hojai District of Assam.” The study aimed to investigate the level of emotional intelligence among higher secondary school students in Hojai district, Assam. A sample of 169 students was selected using simple random sampling. The researchers found that the students exhibited a moderate level of emotional intelligence, with the 'motivation' dimension contributing most significantly to their emotional intelligence.

Lakshmanan, M., and Rajasekaran, K. (2022) conducted a study on “A study on the emotional intelligence and academic achievement among higher secondary students.” The study aimed to explore the relationship between emotional intelligence and academic achievement among higher secondary students. A sample of 321 students from various educational boards was selected. The findings indicated a positive significant correlation between emotional intelligence and academic achievement, suggesting that students with higher emotional intelligence tend to achieve better academic results.

Parsysngattu, J., and Eagavalli, K. (2022) conducted a study on “Effect of anxiety on Academic achievement of standard X students in Coimbatore district”. The objective of the study is to find out the significant difference in effect of anxiety and academic achievement of X standard students based on gender, locality of school, locality of residence, medium of instruction and type of management. The method adopted for the study is normative survey method. The sample consists of 300 X standard school students in Coimbatore district. The tool used in the study was Anxiety Awareness Inventory constructed and standardized by the researcher. The academic achievement is based on the online examination marks. The findings revealed that there is significant relationship between anxiety and academic achievement of X standard school students.

Sawhney, N., and Sneh, B. (2019) conducted a study on “Self-efficacy and Academic Achievement among High school students” The purpose of the investigation was meant to study the relationship between self-efficacy and academic achievement. The study comprised of 150 students from two unaided schools randomly selected from Chandigarh, UT. The tool used for the data collection was Self Efficacy questionnaire for children (SEQ-C) by Muris, P. (2001) which measured academic, social and emotional self-efficacy. For academic achievement, data was collected from previous academic scores in class. The obtained data were analysed by using Pearson product moment correlation and by using ‘t’ test. The results revealed that there exists a significant positive relationship between self-efficacy and academic achievement of 10th grade Students of Chandigarh city. No significant differences were found between high and moderate level of academic achievement with respect to their Self- Efficacy

in various areas i.e. academic, social and emotional. However, significant difference with respect to social and total efficacy have been found between the students with moderate and low level of academic achievement. In addition, significant differences were found between high and low level of academic achievement with respect to their self –efficacy in all the areas i.e. academic, social and emotional.

Suvarna, V, D., and Bhata, G. (2016) conducted a study on "A study on Academic Achievement and personality of secondary school students". The objective of the study is to find out the difference in academic achievement across the demographic variables, to find the difference in personality across the demographic variables and to examine the relationship between Academic Achievement and Personality. This study is concerned with the Academic Achievement and Personality of 300 students of secondary schools of Mandya city. The Raven's Standard Progress Matrices was used to obtain the Academic Scores and Eysenk Personality Inventory was used to collect data regarding their Personality. Result reflects that there is negligible positive relationship between Academic Achievement and Personality of Secondary School Students.

Mwangi, C. N., Okatcha, F. M., Kinai, T. K., and Ireri, A. M. (2015) conducted a study on "Relationship between academic resilience and academic achievement among secondary school students in Kiambu County, Kenya". This study sought to establish the relationship between academic resilience and academic achievement among secondary school students in Kiambu County. A descriptive correlational design was adopted. The sample comprised of 390 form three students. Data were collected using a demographic form and the California Healthy Kids Survey-Module B, 2007

version. Academic achievement was inferred from the school performance records. The main data analysis techniques were Pearson's Product Moment Correlation Coefficient and regression analysis. Findings revealed a positive and significant relationship between academic resilience and academic achievement.

Yadav, R. (2015) conducted a study on "Self-concept, Study habits and Academic achievement of High school students studying in Government and Public schools". The objective of the study is to compare the academic achievement, self-concept and study habits of students of the government and public schools. The methodology adopted in the study was Descriptive survey method. The sample used in the study was 150 students which 80 were of government and 70 of public schools from Mehindergarh district of Haryana state. The tool used in the study was Self-concept questionnaire (1981) by Dr. Raj Kumar Sarawat, Study habit Inventory by Palsana and Sharma (1989) and Academic achievement was measured by the marks achieved by students in their previous exams. The findings revealed that there is significant difference in the self-concept, academic achievement and study habits of government and public-school students. The students of public schools have higher academic achievement than the students of government schools.

Vaishnav, R. S., and Chirayu, K. C. (2013) conducted a study on "Learning style and academic achievement of secondary school students". This study is an analysis of learning styles prevalent among secondary school students. It was conducted on three learning styles-visual, auditory and kinesthetic (VAK). It also tries to find out relation and effect of different learning styles on academic achievements of students. A sample of 200 students of class 9th, 10th and 11th standard of Maharashtra state was selected

for the study. Findings of the study reveal that, kinesthetic learning style was found to be more prevalent than visual and auditory learning styles among secondary school students. There exists positive high correlation between kinesthetic learning style and academic achievement. The main effects of the three variables - visual, auditory and kinesthetic are significant on academic achievement.

Ahmed Gul, B. S. (2013) conducted a study on “Academic Achievement of Secondary school students in relation to Self-concept and Parental encouragement” This study explored the extent to which the self-concept and parental encouragement have the relation with academic achievement among secondary school students. The descriptive survey research method was used for the study, the sample consisted of 228 students were selected by using stratified random sampling technique. A self-concept scale developed by Dr. Rastogi & Mukta Rani, and a three-Dimensional Parental Behavioral Inventory designed by Hardeo Ojha on 2009 were used for data collection. Moreover, for academic achievement examination marks of class 9th and 10th students obtained by them in annual examination of one previous class were noted down from the school records. The finding of the study revealed that: (i) there is a significant relationship between the self-concept and academic achievement of male and female students; (II) there is no significant relationship between the father's encouragement with academic achievement of female students; (iii) there is significant relationship between the father's encouragement with academic achievement of male students; (iv) there is significant relationship between the mothers encouragement with academic achievement of both male and female students.

Anwar, M. N., Aness, M., Khizar, A., Naseer, M., and Muhammad, G. (2012) conducted a study on "Relationship of creative thinking with the academic achievements of secondary school students". The major purpose of the present study was to explore the relationship between Creative Thinking and Academic Achievements of Secondary School Students. The study was conducted using survey design method. A total number of 256 students participated in the study. Participants were selected using random table. Torrance Tests of Creative Thinking [TTCT] was used to measure creative potential of participants on four elements. Pearson Correlation and one-way ANOVA were used to verify hypothesis. Results revealed a statistically significant relationship between i) creative thinking and students' academic achievements on different aspects of test of creative thinking, ii) creative thinking and academic achievements. However, the relationship could be altered when different level of academic achievement is examined and when creative thinking measure employed.

Hassan, D., and Rao, A. A. V. (2012) conducted a study on "Relationship between Study habits, Socio economic status and Academic achievement of class X students"

The objective of the study is to find out is there any significance difference between male and female, OC, BC, SC community students in relation to their study habits and academic achievement. The investigator used questionnaire to collect the sample. The methodology used in the study is survey method. The sample consisting of class X pupils in selected secondary schools of Maharashtra. The findings revealed that there is no significant difference between male and female students, OC and BC communities, OC and SC communities, BC and SC communities in their study habits; in academic

achievement there is no significant difference between male and female students, OC and BC communities, OC and SC communities, BC and SC communities.

Panda, M. (2005) conducted a study on "Correlation between Academic achievement & Intelligence of class IX students". The objective of the study is to find out the effect of intelligence on academic achievement in different categories of schools and to assess interrelationship between academic achievement and intelligence in different categories of schools. The sample comprising of 550 students of class IX of different categories of Dhankand district of Orissa. The tool used in the study was Non erbal standardized group test of intelligence developed by J.C.Raven (1956) and the achievement scores of different categories of school students were taken from the last annual examination. The findings revealed that there is significant difference in academic achievement of students studying in different categories of school and there is no significant difference in intelligence of students studying in different categories of school. There is low relationship between academic achievement and intelligence in different categories of school.

Critical Reviews

The investigator reviewed 15 studies related to cognitive self-management and 18 studies related to academic achievement. Most of the studies have been conducted based on normative survey method. From the above review of related literature, there exists a positive correlation between cognitive self-management and academic achievement. Questionnaires were mostly used as tools for the studies. Statistical techniques were analyzed by using mean, median, standard deviation, t test, Pearson's product moment correlation. From the studies reviewed none of the study directly deal with the cognitive

self-management of high school student in relation to academic achievement of science. Further, the present study differs from the studies discussed in terms of population, area of sample. So, the investigator has conducted a study on cognitive self-management and academic achievement in science of high school students.

CHAPTER III

METHODOLOGY

- **Method adopted for the study**
- **Characteristics of normative survey method**
- **Tool used for the study**
- **Procedure of tool development**
- **Population and sample**
- **Statistical techniques used for the study**

CHAPTER III

METHODOLOGY

Research is an essential and powerful tool in leading man towards progress. Research is an endless question knowledge or unending search for truth. It brings to light new knowledge or corrects previous errors and misconceptions in an orderly way to the existing body of knowledge. The knowledge obtained by research is scientific and objective and is a matter of rational understanding, common verification and experience. It is a deliberate effort to collect information, to analyse it, to organize and pursue it hopefully to a successful conclusion. It is a careful search for solutions to the problems that plague and puzzle the mankind. Methodology is the mapping strategy of research. According to Woody (1984)"Methodology is a procedure adopted by the investigator in conducting investigation". Research Methodology involves various activities. They are identifying problems, review of literature, formulation of hypotheses, data collection, analysis of data, interpreting and finally conclusion. It is a way to solve the research problem systematically. Methodology occupies a very important place in any type of research as the validity and the reliability of findings. "According to Kothari (2009), research methodology is a systematic way to solve research problems and can be understood as the science of studying how research is conducted scientifically". (Kothari, 2009). It involves the systematic procedures by which the researcher starts from the initial identification of the problem to its final conclusions.

METHOD ADOPTED FOR THE STUDY

The selection of a method and a specific design within the method appropriate in investigating a research problem depends upon the kind of data that the problem entails. However, the method selected should be in harmony with scientific principles and adequate enough to lead to dependable generalization. The present study attempts to find out the influence of cognitive self-management in high school students and their academic achievement in science. Since the problem selected is concerned with 'survey' type the investigator has selected normative survey method for conducting the present study. "The normative survey method is used to collect detailed descriptions of existing phenomena, with the aim of using the data to justify current conditions and practices, or to develop more informed plans for their improvement". The objective of this is not only to analyse, interpret, and report the status of an institution, a group or area under to guide practice in the immediate future but also to determine the adequacy of status by comparing it with established standards. Survey studies may take different forms depending upon the scope, nature and purpose of the problem under investigation. This may be broad or narrow in. Some surveys encompass several countries, state, district, city, school system or some other unit. Surveys data may be collected from every unit of a population or from are presentative sample. Normative survey method studies, describes and interprets what exists at present. They are concerned with existing conditions or relations, prevailing, practices, beliefs, attitudes, ongoing processes and the emerging trends. Such investigations are variously termed in research literature as descriptive survey, normative survey, status studies or trend analysis.

CHARACTERISTICS OF NORMATIVE SURVEY METHOD

The following are the characteristics of normative survey method.

1) It gathers data from a relatively large number of cases.
2) It is essentially cross sectional.
3) It is not concerned with the characteristics of the individual but with generalized statistics of the whole population.
4) It requires logical and skilful reporting of a data gathered.
5) It requires expert imaginative planning.
6) It is more reliable.
7) It determines the present trends and solves current problems.

TOOL USED FOR THE STUDY

The instruments which are used to gather new facts are called tools. Tools are essential for the collection of data from the sample. Suitable tools are used for collecting the data required for the study. The selection of suitable tool is necessary for successful research. The investigation can use one or more tools for a single study. The nature of the tools depends upon the nature of the problem under investigation and sample of the study. By keeping various objectives of the study in mind, here the investigator used the Cognitive Self-Management Scale for data collection.

PROCEDURE OF TOOL DEVELOPMENT

Cognitive self-management scale was prepared by Bismi Heather J and Dr. V. S. Pavithra Kumar aims at collecting the cognitive self-management among High school

students of Kanyakumari district. The steps followed in the development of Cognitive self-management scale are the following,

- Planning of the test
- Item writing
- Item editing
- Arrangement of item
- Preliminary tryout
- Draft scale
- Final tryout
- Scoring
- Item analysis
- Item selection
- Establishing reliability and validity
- Final format of the test

1. PLANNING OF THE TEST

As a first step, the investigator planned to measure cognitive self-management among students. The investigator reviewed related literature on cognitive self-management and its dimensions. They are positive focus, systematic problem solving, task-efficacy, self-blame and reasonable goal setting. The investigator planned to construct relevant items for each selected dimensions.

2. ITEM WRITING

The most important step in the construction of any tool is writing the suitable item for the tool. After a thorough study of literature available on cognitive self-management the investigator collected items on different aspects of cognitive self-management based on the selected dimensions and construct a maximum number of questions for preparing cognitive self-management scale. The investigator prepared a three-point scale on the tool. The respondent could select the correct response in the scale. The prepared items are given for editing.

3. ITEM EDITING

Item editing is the process of checking and scrutinizing items. The items were subjected to the experts for modification. It was given to three experts in the field of education and psychology. As per their suggestion, the ambiguous item was rewritten in the simple language.

4. ARRANGEMENT OF ITEMS

All the items were grouped and arranged in a coherent order to increase the interest of the respondents and maintain the attention for responding. Each dimension has both positive and negative statements.

5. PRELIMINARY TRYOUT

The test was tried out on a high school student in order to find out the accuracy and relevancy of each statement. Difficulties in responding the items and a rough estimation of the time limit for responding were noted. This step helps the investigator to modify

certain items which were vague and questionable. After that minor changes were made out in the language and sentence construction in some of the items.

6. DRAFT FROM OF THE TOOL

The draft form of the tool was prepared by printing the items with the provision to mark responses. It was printed in English and Tamil. Necessary instruction for the respondent were also printed in the draft scale. The draft form consisted of total 50 statements. The draft form is provided in Appendix II.

7. FINAL TRYOUT

The tool was administered to a sample of 100 high school students of various schools in Kanniyakumari district for the purpose of the item analysis. They were selected randomly from the population.

8. SCORING

The tool consisting of three-point scale namely strongly agree, agree and disagree. The scoring pattern was 3,2,1 for positive statements and 1,2,3 for negative statements.

9. ITEM ANALYSIS

Items can be analysed qualitatively in terms of their content and quantitatively in terms of their statistical properties. Item analysis is a statistical technique which is used for selecting and rejecting the items of a test on the basis of their difficulty value and discriminative power. The Difficulty level (D_L) for each test item could be found out by using the formula

$$DL = \frac{R_U + R_L}{N_1 + N_2}$$

Where,

R_U - Number of correct responses in the upper group.

R_L- Number of correct responses in the lower group.

N_1 – Total number of students in the upper group

N_2 – Total number of students in the lower group

The total score for each subject for all the items was then found out. The scoring pattern was followed for each correct answer. For carrying out item analysis, the answer script of pupils in the final try-out conducted is arranged in the descending order, from the top score to the bottom score. 27% of the answer script from the top is designated as 'Upper Group' and 27% of the scripts in the bottom constitute the 'Lower Group'.

For every individual item the number of students who answered it correctly in the two groups should be counted. The 'Discriminative Power' (DP) for each test item could be found out by using the following formula.

Discriminating Power, $D_P = R_U - R_L / N$

Where,

R_U= Number of correct responses in the upper group.

R_L= Number of correct responses in the lower group.

N = Number of teachers in the upper or lower group.

10. ITEM SELECTION

Items having discriminative power between 0.3 and 0.7 and above 0.2 are selected for the final result. The items having difficulty index between 0.4 and 0.6 are selected for the final test. The details of item selection are given in table 3.1.

Table 3.1

Details of selected items in Cognitive Self-Management Scale

Item Analysis			
Question Number	**R_U**	**R_L**	**Discriminative Power**
1	35	15	0.74*
2	20	18	0.074
3	21	20	0.037
4	25	12	0.481*
5	13	11	0.074
6	15	7	0.296*
7	22	11	0.407*
8	5	4	0.037
9	15	11	0.148
10	15	3	0.44*
11	20	15	0.185
12	20	2	0.666*
13	20	12	0.296*

14	30	9	0.777*
15	18	13	0.185
16	13	12	0.037
17	20	12	0.296*
18	8	7	0.037
19	7	3	0.148
20	15	9	0.22
21	12	11	0.037
22	12	12	0
23	10	8	0.074
24	6	4	0.074
25	25	12	0.481*
26	20	14	0.222
27	30	12	0.296*
28	4	3	0.037
29	12	4	0.296*
30	12	6	0.222
31	20	8	0.44*
32	6	5	0.037
33	14	6	0.296*
34	18	15	0.111
35	8	8	0
36	18	4	0.518*

37	6	4	0.074
38	15	4	0.407*
39	24	8	0.592*
40	10	8	0.074
41	16	15	0.037
42	10	3	0.259
43	20	4	0.592*
44	8	3	0.185
45	22	12	0.37*
46	2	4	-0.074
47	18	5	0.481*
48	15	14	0.037
49	20	18	0.444*
50	14	3	0.407*

11.ESTABLISHING VALIDITY AND RELIABILITY

Reliability and validity are essential to the effectiveness of any data gathering procedure.

Reliability

Reliability is the accuracy or precision of measuring instrument. The reliability of a test can be measured in different ways, such as test- retest method and split-half method. In the present study, the reliability co-efficient was found out by split half

method. It measures the degree of homogeneity of the item in a test. For calculation of split half reliability of the test, the scores obtained by a sample of 100 high school students are used. The scores on odd items and even items were taken separately and correlation was calculated. The coefficient of correlation indicates the reliability of the half test. The correlation coefficient of the whole test is then estimated by using Spearman - Brown Prophecy formula. The reliability of coefficient was found to be 0.7942.

Validity

Validity of the test answers the question what does a test measures and how well it measures it whatever it is designed to measure for. Best (1978) clarifies, "A test possess validity to the extent that it measures what it claims to measure". The two types of validities established for this tool were face validity and content validity. Face validity means the given tool appears to measure what is intended to measure. The tool was submitted to panel of experts and based on their opinion, it appeared to measure the relevant objectives of the tool. A close look on the items of the test reveals that each and every item is capable of reflecting the variable. This provides face validity for the tool. Content validity is one way of gathering evidences which will support the ideas that a test measures. Certain characteristics are to make a careful examination of the test taking situation and the test behaviour in it. The content validity of the present test was found by systematically analysing the area by the panel of 1 expert in the field of education and psychology. On the basis of their opinion the test has sufficient coverage to its contents. The content average is as an indication of its validity.

12.Final format of the test

Out of 50 items in the final try out, 23 items were selected for the final try out. The final form of the questionnaire includes all the selected items arranged in order with the necessary instruction. The final format of the test is provided in Appendix III.

POPULATION AND SAMPLE

The present study was conducted on a population of high school students who studied in Kanniyakumari district of Tamil Nadu during the academic year 2023-2024. The present study is conducted on a sample of 350 high school students who were Studied in Kanniyakumari district. Simple random sampling technique was used to select the sample. While selecting the subjects the representations were given to factors such as gender, locality, type of institution, nature of institution, parental occupation, parental qualification and parental income. The details of schools and number of students from each school are given in table 3.2

Table 3.2

Details of the sample selected for the study

S.No	Name of School	Sample Size
1	K.A.B.D.Matriculation School Kootalumoodu	120
2	Janet Matriculation School Munchirai	81
3	Government Higher Secondary School Vettumani	30
4	ChristhuRaja Matriculation School Marthandam	69
5	Goodshepherd Matriculation School Marthandam	50

DISTRIBUTION OF THE SAMPLE BASED ON GENDER

Table 3.3

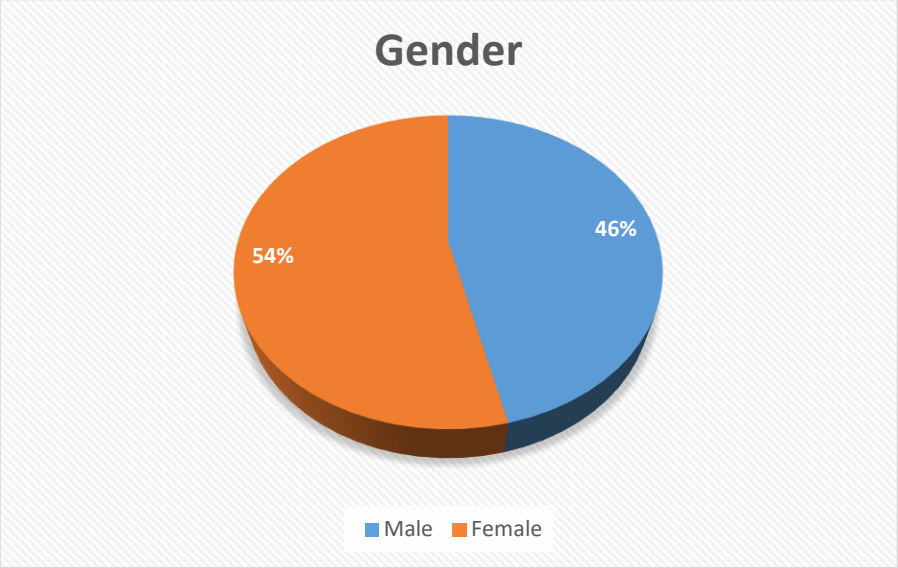
Distribution of the sample based on Gender

Gender	Count	Percent
Male	162	46.29
Female	188	53.71
Total	350	100

From the above table, it is found that the sample consisted of 162 male and 188 female high school students The percentage corresponding to male and female high school students were 46.29% and 53.71% respectively.

Figure 3.1

Distribution of the sample based on Gender



DISTRIBUTION OF THE SAMPLE BASED ON LOCALE

Table 3.4

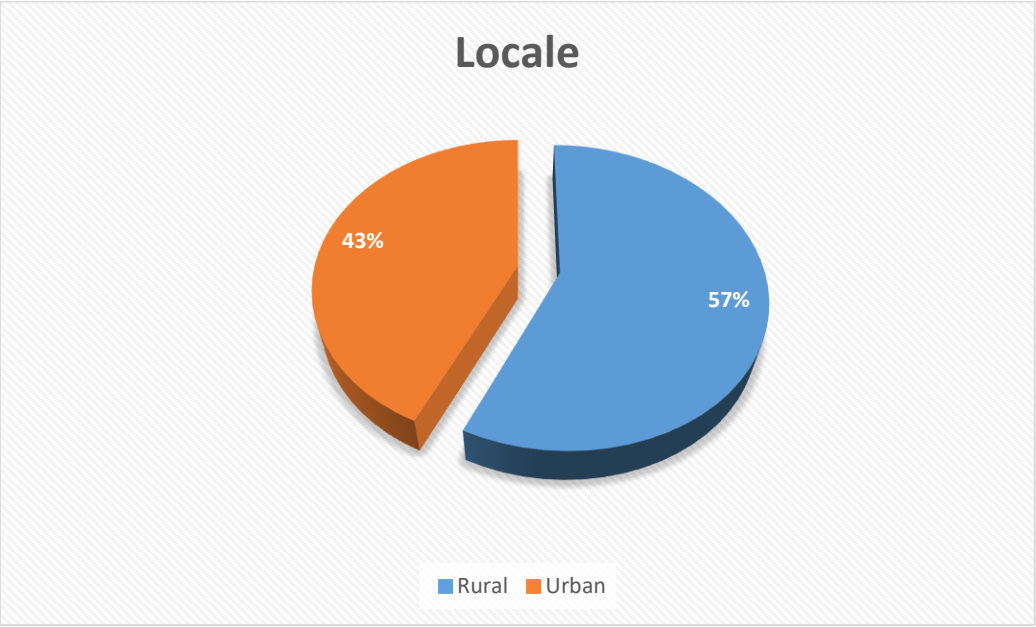
Distribution of the sample based on locale

Locale	Count	Percent
Rural	200	57.14
Urban	150	42.86
Total	350	100

From the above table, it is found that the sample consisted of 200 rural and 150 urban high school students The percentage corresponding to rural and urban high school students were 57.14% and 42.86% respectively.

Figure 3.2

Distribution of the sample based on locale



DISTRIBUTION OF THE SAMPLE BASED ON TYPE OF INSTITUTION

Table 3.5

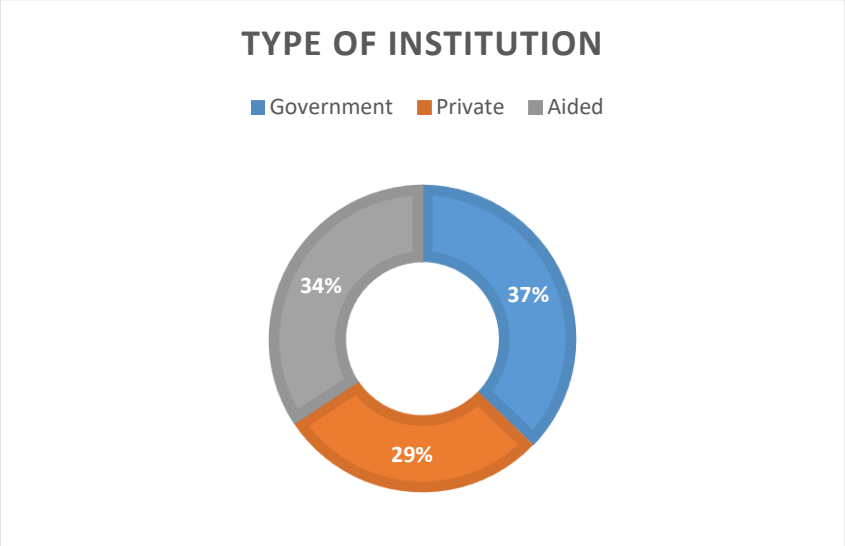
Distribution of the sample based on Type of Institution

Type Of Institution	Count	Percent
Government	130	37.14
Private	100	28.57
Aided	120	34.29
Total	350	100

The distribution of participants based on the type of institution shows a fairly balanced spread across the three categories. A total of 130 participants (37.14%) were enrolled in government institutions, 120 participants (34.29%) were in aided institutions, and 100 participants (28.57%) were in private institutions. Overall, the largest proportion of participants attended government institutions, followed by those in aided institutions, with the smallest proportion in private institutions.

Figure 3.3

Distribution of the sample based Type of Institution



DISTRIBUTION OF THE SAMPLE BASED ON NATURE OF INSTITUTION

Table 3.6

Distribution of the sample based on Nature of Institution

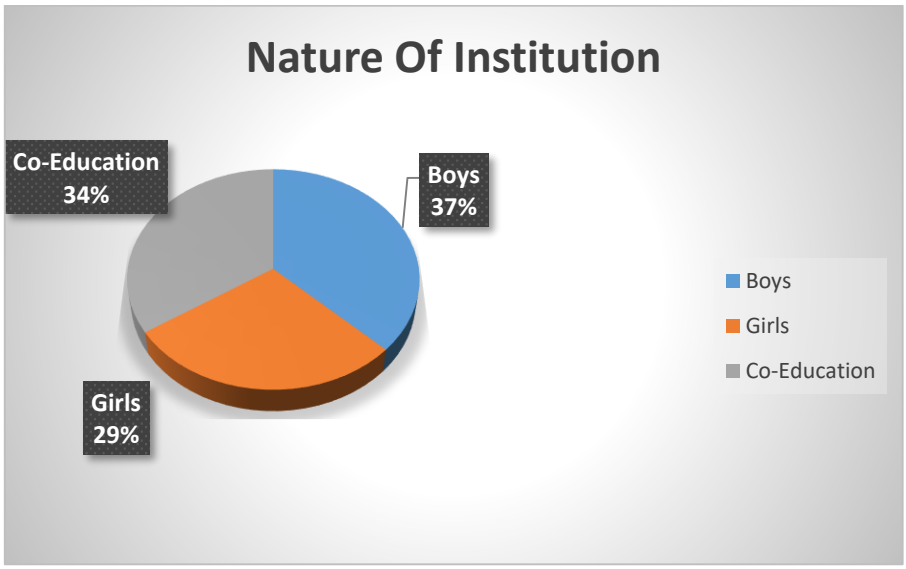
Nature Of Institution	Count	Percent
Boys	100	37.14
Girls	120	28.57
Co-Education	130	34.29
Total	350	100

The distribution of participants based on the type of institution shows a fairly balanced spread across the three categories. A total of 130 participants (37.14%) were

enrolled in government institutions, 120 participants (34.29%) were in aided institutions, and 100 participants (28.57%) were in private institutions. Overall, the largest proportion of participants attended government institutions, followed by those in aided institutions, with the smallest proportion in private institutions.

Figure 3.4

Distribution of the sample based Nature of Institution



DISTRIBUTION OF THE SAMPLE BASED ON PARENTAL OCCUPATION

Table 3.7

Distribution of the sample based on Parental Occupation

Parental Occupation	Count	Percent
Government	149	42.57
Private	201	57.43
Total	350	100

From the above table, it is found that the sample consisted of 149 governments and 201 private employees distributed based on the occupation of the parents. The percentage corresponding to government and private parental occupations were 42.57% and 57.43% respectively.

Figure 3.5

Distribution of the sample based on Parental Occupation

DISTRIBUTION OF THE SAMPLE BASED ON PARENTAL QUALIFICATION

Table 3.8

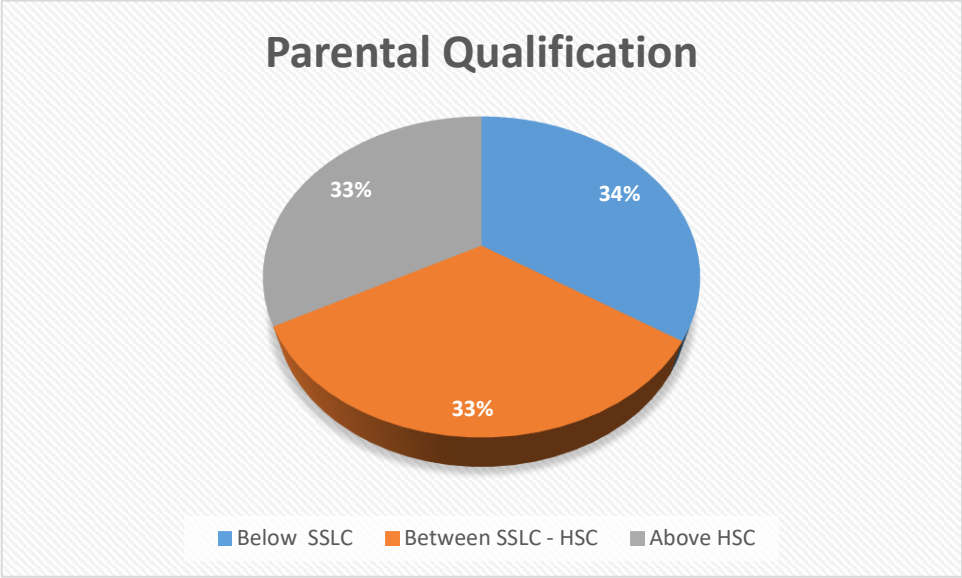
Distribution of the sample based on Parental Qualification

Parental Qualification	Count	Percent
Below SSLC	120	34.29
Between SSLC - HSC	115	32.86
Above HSC	115	32.86
Total	350	100

From the above table, it is found that a total of 120 participants (34.29%) had parents with qualifications below SSLC (Secondary School Leaving Certificate). 115 participants (32.86%) had parents whose qualifications were between SSLC and HSC (Higher Secondary Certificate). The remaining 115 participants (32.86%) had parents with qualifications above HSC. Overall, the distribution shows a relatively balanced spread among the three qualification categories, with the largest proportion of parents having qualifications below SSLC and the smallest proportion falling into the "above HSC" category.

Figure 3.6

Distribution of the sample based on Parental Qualification



DISTRIBUTION OF THE SAMPLE BASED ON PARENTAL INCOME

Table 3.9

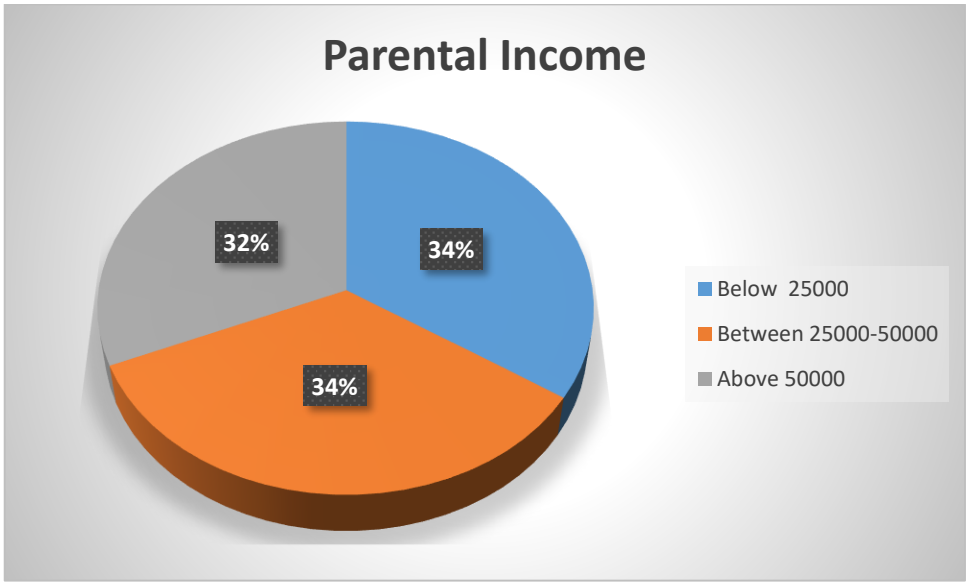
Distribution of the sample based on Parental Income

Parental Income	Count	Percent
Below 25000	120	34.29
Between 25000-50000	120	34.29
Above 50000	110	31.43
Total	350	100

Based on the data provided, the distribution of participants based on parental income shows a relatively balanced spread across the three income categories. A total of 120 participants (34.29%) had parents with an income below 25,000. Another 120 participants (34.29%) had parents whose income falls between 25,000 and 50,000. The remaining 110 participants (31.43%) had parents with an income above 50,000. Overall, the data indicates a fairly even distribution of participants across these income groups, with the largest proportion falling into the "below 25,000" and "between 25,000-50,000" categories, while the smallest proportion is in the "above 50,000" category.

Figure 3.7

Distribution of the sample based on Parental Income



STATISTICAL TECHNIQUES USED FOR THE STUDY

Statistical techniques are very important for any research. The relevant statistical techniques help the investigator to analyse and interpret the data meaningfully in the study. In the present study, the investigator used the following statistical techniques:

1. Percentage Analysis
2. t test
3. ANOVA followed by Scheffe's procedure
4. Correlation Coefficient

1. PERCENTAGE ANALYSIS

Percentage is used for the comparative study of fraction. It always represents 'per hundred' and is always calculated out of 100.

The following are the levels in percentage analysis:

- High level refers to the scores equal to or greater than (Mean + 1 SD).

- Low level refers to the scores equal to or less than (Mean - 1 SD).

- The in-between scores are considered at the average level.

2. TEST OF SIGNIFICANCE (t test)

It is used for finding the significant level of difference between two groups of population. From the mean and standard deviation, the t-value can be calculated.

Interpretation of t-value: - If the obtained t-value is 2.58 and above, then the level of significance is at 0.01.- If the t-value is between 1.96 and 2.58, the level of significance is at 0.05.- If the t-value is below 1.96, the difference is not considered significant.

The formula for calculating the t-value is given below,

$$t = \frac{m_1 - m_2}{\sqrt{\frac{\sigma_1^2 + \sigma_2^2}{N_1 \ N_2}}}$$

Where,

m_1- mean of the first sample

m_2 – mean of the second sample

σ_1 – standard deviation of first sample

σ_2 – standard deviation of second sample

N_1 – Total number of frequency of first sample

N_2 – Total number of frequency of second sample

3. ANALYSIS OF VARIANCE (ANOVA)

F-test or Analysis of Variance method is an improvement over t test. This one method is derived by R.A Fisher in 1923. The F test is used for testing the significance of difference of more than two means simultaneously. The composite procedure for testing the difference between several sample means is known as analysis of variance.

If the F- ratio is significant, the post hoc is used to find out the significant difference between the groups. In such cases, the comparison of the difference between the means for any two groups is done using Scheffe's procedure. Scheffe's test is one of the well-known multiple group comparison test.

$$F = \frac{V_b}{V_w}$$

Where

V_b – Mean square variance between groups

V_w – Mean square variance within groups

4. Correlation Coefficient

The most often used and most precise coefficient of correlation nis knows as the Pearson’s product moment correlation (r). Pearson’s product moment correlation coefficient is used to determine the relationship between variables. The raw score method requires the use of fie columns, as illustrated below using the same data.

$$r = \frac{N \sum XY - \sum X \sum Y}{\sqrt{(N \sum X^2 - (\sum X)^2)\,(N \sum Y^2 - (\sum Y)^2)}}$$

Where,

r – Pearson's Coefficient of correlation

X – Deviation of X from assumed mean

Y – Deviation of Y from assumed mean

∑ - Sum

N – Size of Sample

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

- **Preliminary analysis**
- **Differential analysis**
- **Correlation analysis**

CHAPTER IV

ANALYSIS AND INTTERPRETATION OF DATA

Analysis and interpretation of data is one of the important steps in the research process. It means studying the organized material in order to discover the inherent facts. It is the application of detective and inductive logic to examine critically the results obtained in the light of the previous studies. According to Koul (2007) "a researcher must know the strength and weakness of the statistical methods which he uses so that he may not mislead or be misleads by such methods". Rummel (1970) says that "the analysis and interpretation of data involve the objective material in the possession of the research and his subjective reactions and desires to derive from the data inherent meaning in their relation to the problem". Analysis of data means studying the tabulate materials in order to determine the inherent facts. It involves breaking down existing complex factors into simpler parts and putting the parts together in new arrangements for the purpose of interpretation. The term analysis refers to the computation of certain measures along with the searching of patterns of relationship that exists among the data group. Interpretation aims at the critical examining of the results in the light of the previous studies. Data collected by the investigator get their meaning when they are subjected to statistical analysis which describes the characteristics of the data and will give the investigation an insight into the problem. The result of the analysis along with the interpretation is presented in this chapter.

SECTION A

PRELIMINARY ANALYSIS

Cognitive self-management of High school students

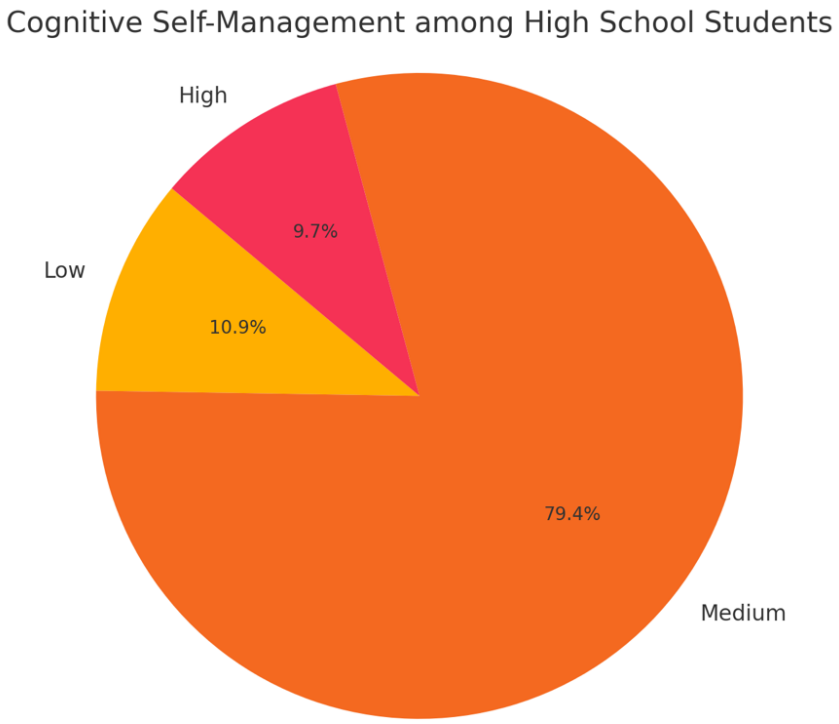
Table 4.1

Percentage distribution of different levels of Cognitive Self-Management

Cognitive Self-Management	Count	Percent
Low	38	10.86
Medium	278	79.43
High	34	9.71
Total	350	100.00

From the table 4.1, it is clear that 10.86% of high school students possess lower level of cognitive self-management, 79.43% of high school students possess medium level of cognitive self-management and 9.71% of high school students possess high level of cognitive self-management. From the above table most of the high school students possess medium level of cognitive self-management.

Figure 4.1


Cognitive Self-Management among High School Students
High
9.7%
Low
10.9%
79.4%
Medium

DIFFERENTIAL ANALYSIS

COMPARISON OF COGNITIVE SELF-MANAGEMENT BASED ON BACKGROUND VARIABLE

Comparison of Cognitive Self-Management of High school students based on Gender

H1 1:

There exists no significant difference in the mean score of the cognitive self-management of male and female high school students.

Table 4.2

Comparison of Cognitive Self-Management of High school students based on Gender

Gender	**Mean**	**SD**	**N**	**t**	***p***	***Remark***
Male	50.67	6.94	162	0.487	*0.626*	*NS*
Female	50.97	3.92	188			

From the table 4.2, it is clear that $p>0.05$ and is not significant at any level. Hence the null hypothesis “There exists no significant difference in the mean score of the cognitive self-management of male and female high school students” is accepted. Therefore, Cognitive self-management of high school students do not differ significantly with respect to gender.

H1 2:

There exists no significant difference in the mean score of the cognitive self-management of rural and urban high school students.

Table 4.3

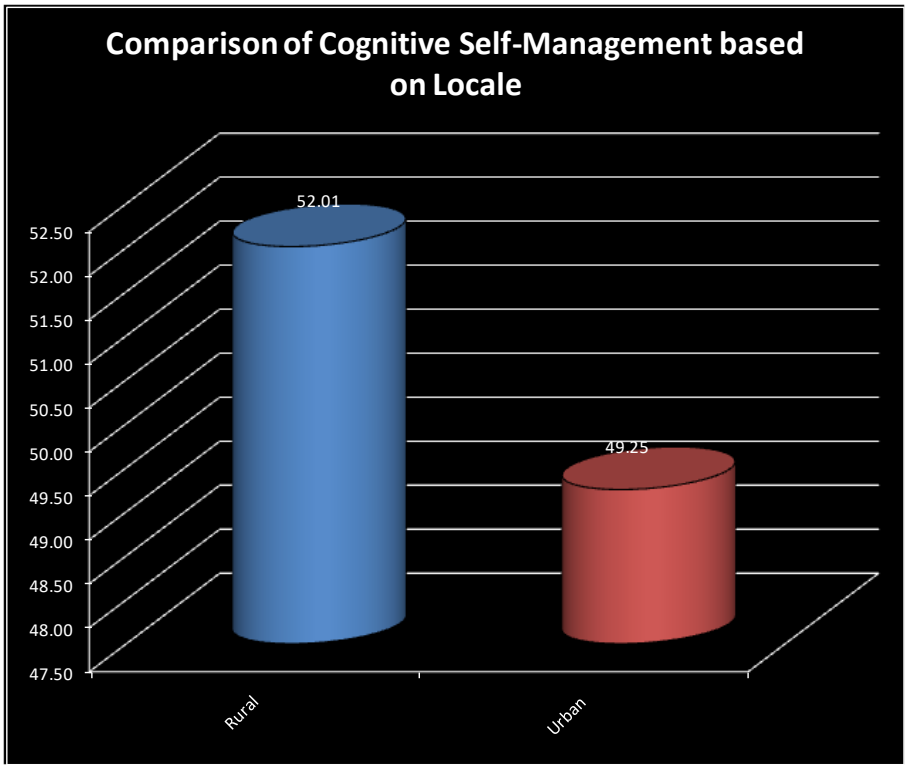
Comparison of Cognitive Self-Management of High School Students based on Locale

Locale	**Mean**	**SD**	**N**	**t**	***p***	***Remark***
Rural	52.01	4.33	200	4.515	*0.000*	*Sig. at 0.01 level*
Urban	49.25	6.48	150			

From the table 4.3, it is clear that $p<0.05$ and is significant at 0.01 level. Hence the null hypothesis “There exists no significant difference in the mean score of the cognitive self-management of rural and urban high school students” is rejected. Therefore, Cognitive self-management of High school students differ significantly with respect to locality of institution. Rural high school students (52.01) possess more cognitive self-management than urban high school students (49.25).

Figure 4.2

Comparison of Cognitive self-management based on locale



H1 3:

There exists no significant difference in the mean score of the cognitive self-management of High school students studied in government, private and aided institutions.

Table 4.4

Comparison of Cognitive Self-Management based on Type of institution

Type of institution	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Government	49.45	6.77	Between Gp	865.54	2	432.77			*Sig. at*
Private	53.25	4.56	Within Gp	9774.17	347	28.17	15.364	*0*	*0.01*
Aided	50.30	3.89	Total	10639.7	349				*level*

From the table 4.4, it is clear that $p<0.05$ and it is significant at 0.01 level. Hence the null hypothesis "There exists no significant difference in the mean score of the cognitive self-management of High school students studied in government, private and aided institutions" is rejected. Therefore, Cognitive self-management of High school students significantly differs with respect to Type of institution. The result does not help to identify exactly the part of group which differ significantly. Hence scheffe's multiple comparison is used for further analysis.

Table 4.4a

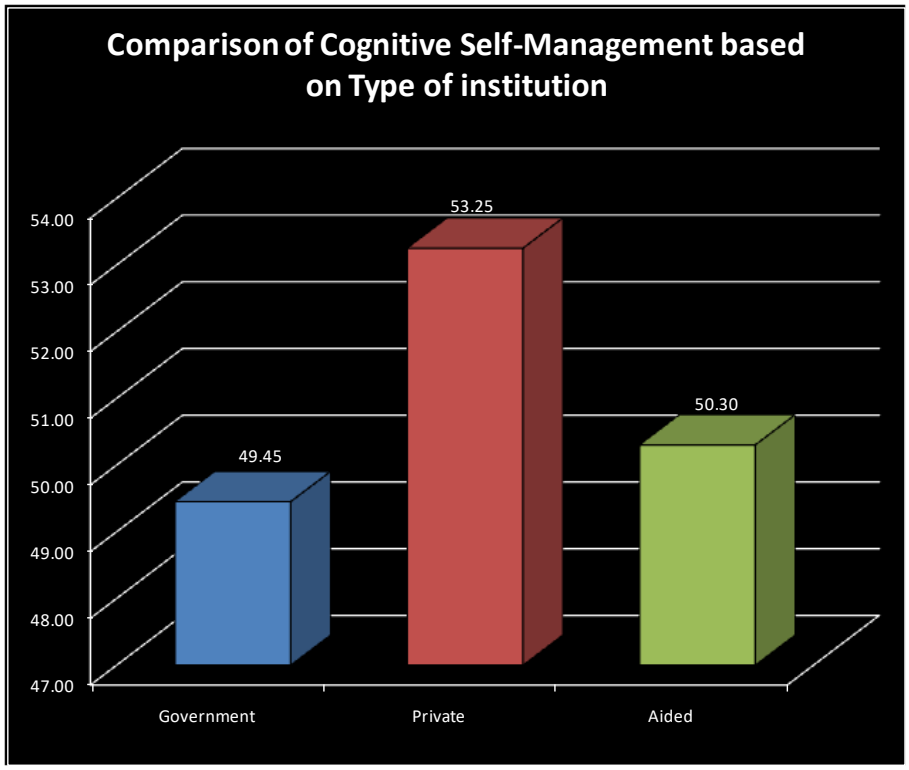
Comparison of Scheffe's Post Hoc Scores of Cognitive self-management with respect to Type of institution

Type of institution	**N**	**Pair**	**p (Scheffe)**	***Remark***
Government (A)	130	A Vs B	0.000	*Sig. at 0.01 level*
Private (B)	100	B Vs C	0.000	*Sig. at 0.01 level*
Aided (C)	120	A Vs C	0.450	*NS*

From the table 4.4a, it is clear that, students study in Government and Private school, and Private and Aided school differ statistically on their cognitive self-management on the basis of the type of institution. The students study in Government and aided school do not differ statistically on the basis of the type of institution. Private high school students (53.25) possess more cognitive self-management than government and aided high school students.

Figure 4.3

Comparison of Cognitive self-management based on Type of institution



H1 4:

There exists no significant difference in the mean score of the Cognitive self-management of High school students studied in boys, girls and coeducation institutions.

Table 4.5

Comparison of Cognitive Self-Management based on Nature of institution

Nature of institution	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Boys	53.25	4.56	Between Gp	865.54	2	432.77			*Sig. at*
Girls	50.3	3.89	Within Gp	9774.17	347	28.17	15.364	*0.00*	*0.01*
Co education	49.45	6.77	Total	10639.7	349				*level*

From the table 4.5, it is clear that $p<0.05$ and it is significant at 0.01 level. Hence the null hypothesis "There exists no significant difference in the mean score of the Cognitive self-management of High school students studied in boys, girls and coeducation institutions" is rejected. Therefore, Cognitive self-management of High school students significantly differs with respect to Nature of institution. The result does not help to identify exactly the part of group which differ significantly. Hence scheffe's multiple comparison is used for further analysis.

Table 4.5a

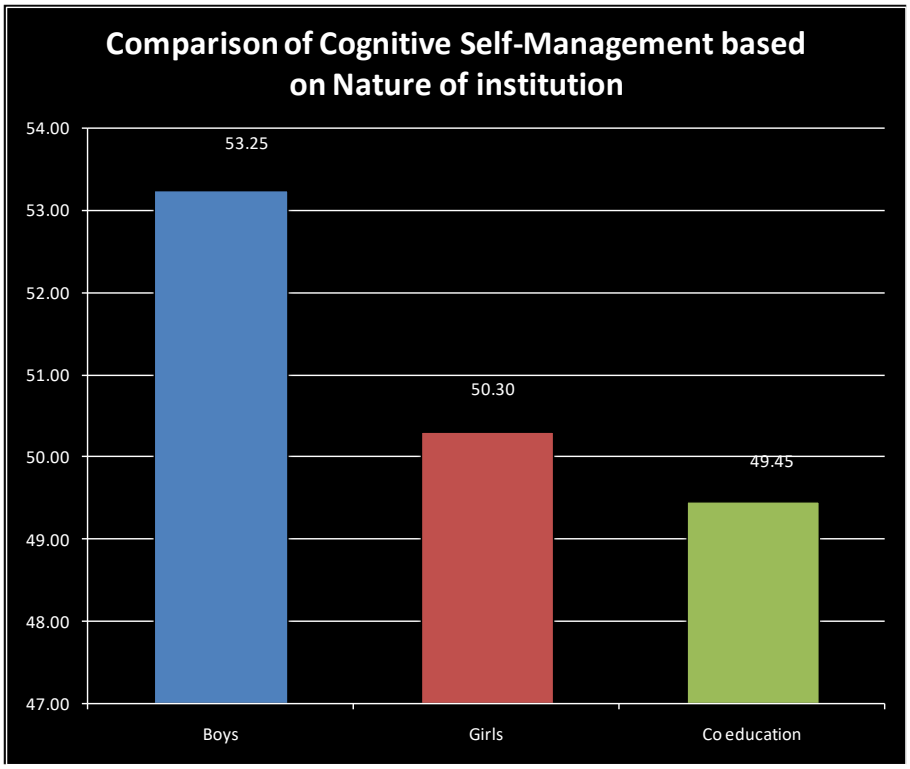
Comparison of Scheffe's Post Hoc Scores of Cognitive self-management with respect to Nature of institution

Nature of institution	**N**	**Pair**	**p (Scheffe)**	***Remark***
Boys (A)	100	A Vs B	0.000	*Sig. at 0.01 level*
Girls (B)	120	B Vs C	0.450	*NS*
Co-education (C)	130	A Vs C	0.000	*Sig. at 0.01 level*

From the table 4.5a, it is clear that, the students studying in boys and girl's institutions and boys and co-education institution differ statistically in their cognitive self-management on the basis of nature of institution. The students studying in girls and co-education institutions do not differ statistically in their cognitive self-management on the basis of nature of institution. The high school students studying in boy's institutions (53.25) possess more cognitive self-management than girls and co-education institutions.

Figure 4.4

Comparison of Cognitive self-management based on Nature of institution



H_1 5:

There exists no significant difference in the mean score of the cognitive self-management of High school students with Parental Occupation like government and private.

Table 4.6

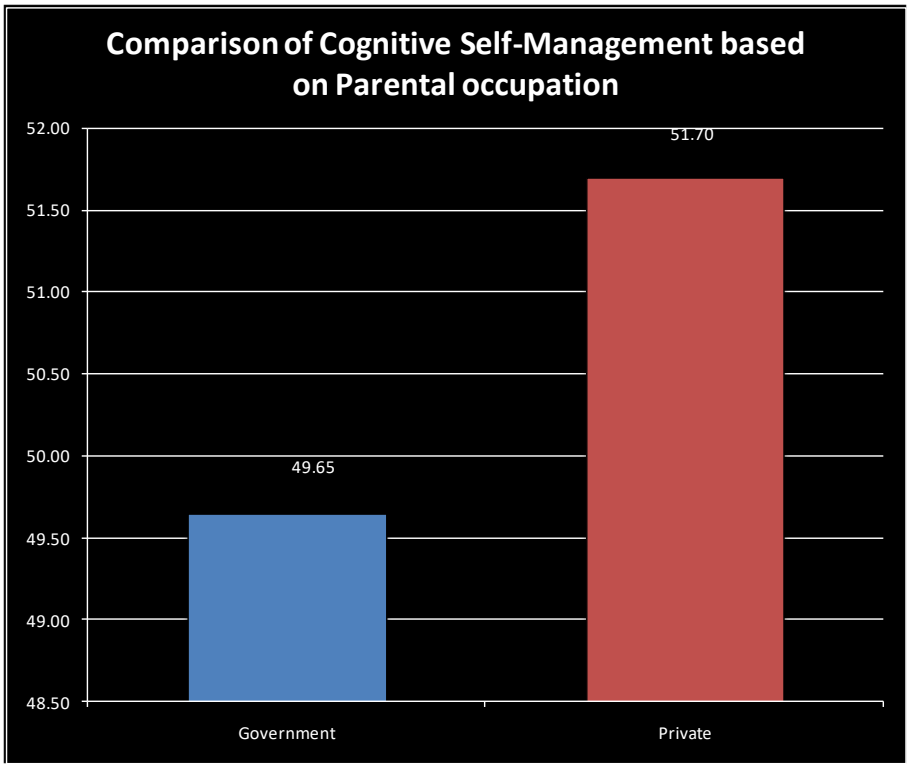
Comparison of Cognitive Self-Management based on Parental occupation

Parental occupation	**Mean**	**SD**	**N**	**t**	***p***	***Remark***
Government	49.65	6.81	149	3.257	*0.001*	*Sig. at 0.01 level*
Private	51.70	4.13	201			

From the table 4.6, it is clear that $p<0.05$ and it is significant at 0.01 level. Hence the null hypothesis "There exists no significant difference in the mean score of the cognitive self-management of High school students with Parental Occupation like government and private" is accepted. Therefore, Cognitive self-management of High school students significantly differs with respect to Parental occupation. The high school students with parental occupation at private (51.70) possess more cognitive self-management that government.

Figure 4.5

Comparison of Cognitive self-management based on Parental occupation



H1 6:

There exists no significant difference in the mean score of the cognitive self-Management of High School students with Parental qualification as below SSLC, between SSLC-HSC, and above HSC.

Table 4.7

Comparison of Cognitive Self-Management based on Parental qualification

Parental qualification	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Below SSLC	53.34	4.24	Between Gp	1268.8	2	634.40			*Sig. at*
Between SSLC-HSC	50.23	3.86	Within Gp	9370.9	347	27.01	23.492	*0.000*	*0.01*
Above HSC	48.81	6.96	Total	10639.7	349				*level*

From the table 4.7, it is clear that $p<0.05$ and it is significant at 0.01 level. Hence the null hypothesis "There exists no significant difference in the mean score of the cognitive self-management of High school students with parental qualification as below SSLC, between SSLC-HSC, and above HSC" is rejected. Therefore, Cognitive self-management of High school students significantly differs with respect to Parental qualification. The result does not help to identify exactly the part of group which differ significantly. Hence scheffe's multiple comparison is used for further analysis

Table 4.7a

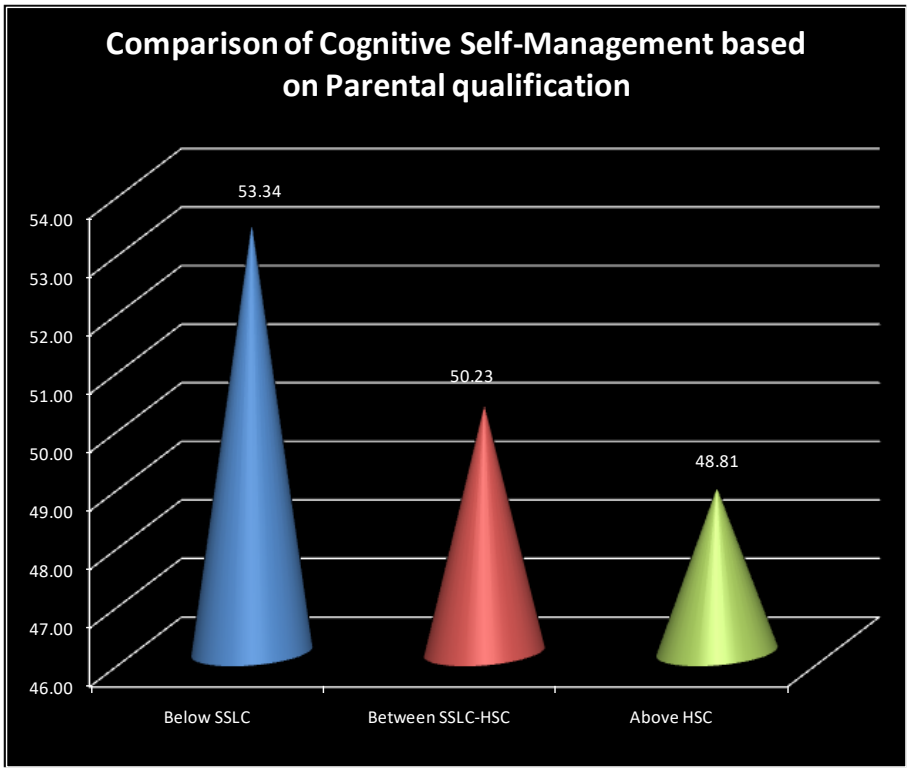
Comparison of Scheffe's Post Hoc Scores of Cognitive self-management with respect to Parental qualification

Parental qualification	**N**	**Pair**	**p (Scheffe)**	***Remark***
Below SSLC (A)	120	A Vs B	0.000	*Sig. at 0.01 level*
Between SSLC-HSC (B)	115	B Vs C	0.118	*NS*
Above HSC (C)	115	A Vs C	0.000	*Sig. at 0.01 level*

From the table 4.7a, it is clear that, the high school students with parental qualification below SSLC and between SSLC-HSC, and below SSLC and above HSC differ statistically on their cognitive self-management on the basis of the parental qualification. The students with parental qualification between SSLC and above HSC do not differ statistically on their cognitive self-management on the basis of parental qualification. The high school students with parental qualification below SSLC possess more cognitive self-management than between SSLC-HSC and above HSC.

Figure 4.6

Comparison of Cognitive self-management based on Parental qualification



H_1 7:

There exists no significant difference in the mean score of the cognitive self-management of High school students with Parental income as below 25000, between 25000-50000 and above 50000.

Table 4.8

Comparison of Cognitive Self-Management based on Parental income

Parental income	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Below 25000	48.98	6.57	Between Gp	753.78	2	376.89			*Sig. at*
Between 25000-50000	52.52	5.11	Within Gp	9885.93	347	28.49	13.229	*0.000*	*0.01*
Above 50000	51.00	3.87	Total	10639.71	349				*level*

From the table 4.8, it is clear that $p<0.05$ and it is significant at 0.01 level. Hence the null hypothesis "There exists no significant difference in the mean score of the cognitive self-management of High school students with Parental income as below 25000, between 25000-50000 and above 50000" is rejected. Therefore, Cognitive self-management of High school students significantly differs with respect to Parental income. The result does not help to identify exactly the part of group which differ significantly. Hence scheffe's multiple comparison is used for further analysis.

Table 4.8a

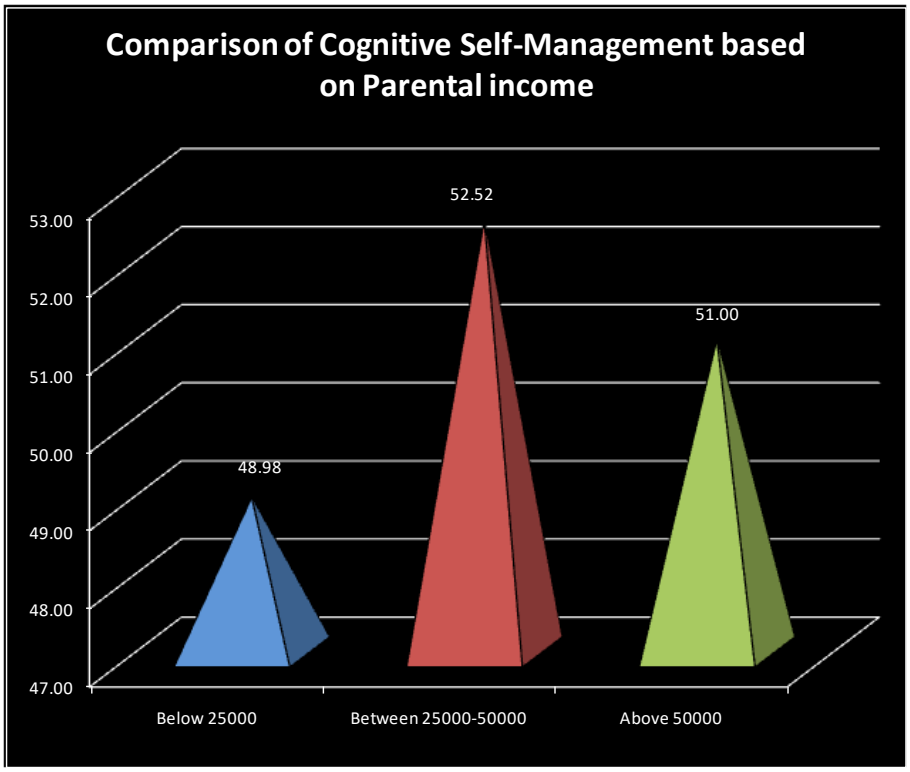
Comparison of Scheffe's Post Hoc Scores of Cognitive self-management with respect to Parental income

Parental income	**N**	**Pair**	**p (Scheffe)**	***Remark***
Below 25000 (A)	120	A Vs B	0.000	*Sig. at 0.01 level*
Between 25000-50000 (B)	120	B Vs C	0.099	*NS*
Above 50000 (C)	110	A Vs C	0.017	*Sig. at 0.05 level*

From the table 4.8a, it is clear that, the high school students with parental income as below 25000 and between 25000-50000, and below 25000 and above 50000 differ statistically on their cognitive self-management on the basis of parental income. The students with parental income between 25000-50000 and above 50000 do not differ statistically on their cognitive self-management on the basis of parental income. The high school students with parental income between 25000-50000 possess (52.52) more cognitive self-management than students with parental income below 25000 and above 50000.

Figure 4.7

Comparison of Cognitive self-management based on Parental income



SECTION B

PRELIMINARY ANALYSIS

Academic achievement of High school students

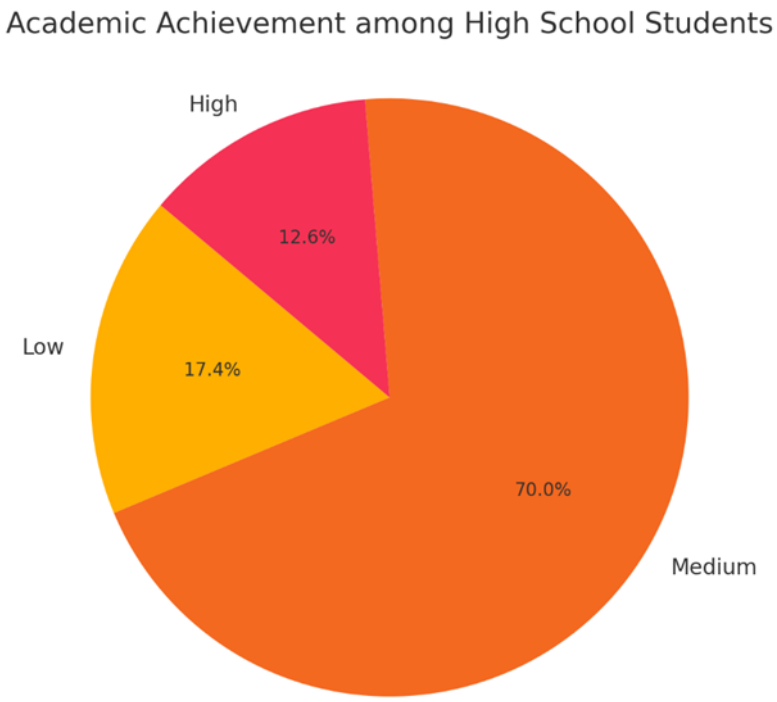
Table 4.9

Percentage distribution of different levels of Academic Achievement

Academic Achievement	Count	Percent
Low	61	17.43
Medium	245	70.00
High	44	12.57
Total	350	100.00

From the table 4.9, it is clear that 17.43% of high school students possess lower level of academic achievement, 70% of high school students possess medium level of academic achievement and 12.57% of high school students possess high level of academic achievement. Hence most of the high school students possess medium level of academic achievement.

Figure 4.8


Academic Achievement among High School Students
High
12.6%
Low
17.4%
70.0%
Medium

DIFFERENTIAL ANALYSIS

Comparison of academic achievement based on background variables

H_2 1:

There exists no significant difference in the mean score of the academic achievement of male and female high school students.

Table 4.10

Comparison of Academic Achievement based on Gender

Gender	Mean	SD	N	t	*p*	*Remark*
Male	79.15	10.50	162	0.587	*0.557*	*NS*
Female	79.82	10.80	188			

From the table 4.10, it is clear that p>0.05 and is not significant at any level. Hence the null hypothesis "There exists no significant difference in the mean score of the academic achievement of male and female high school students" is accepted. Therefore, Academic Achievement of high school students do not differ significantly with respect to gender.

H2 2:

There exists no significant difference in the mean score of the academic achievement of rural and urban high school students.

Table 4.11

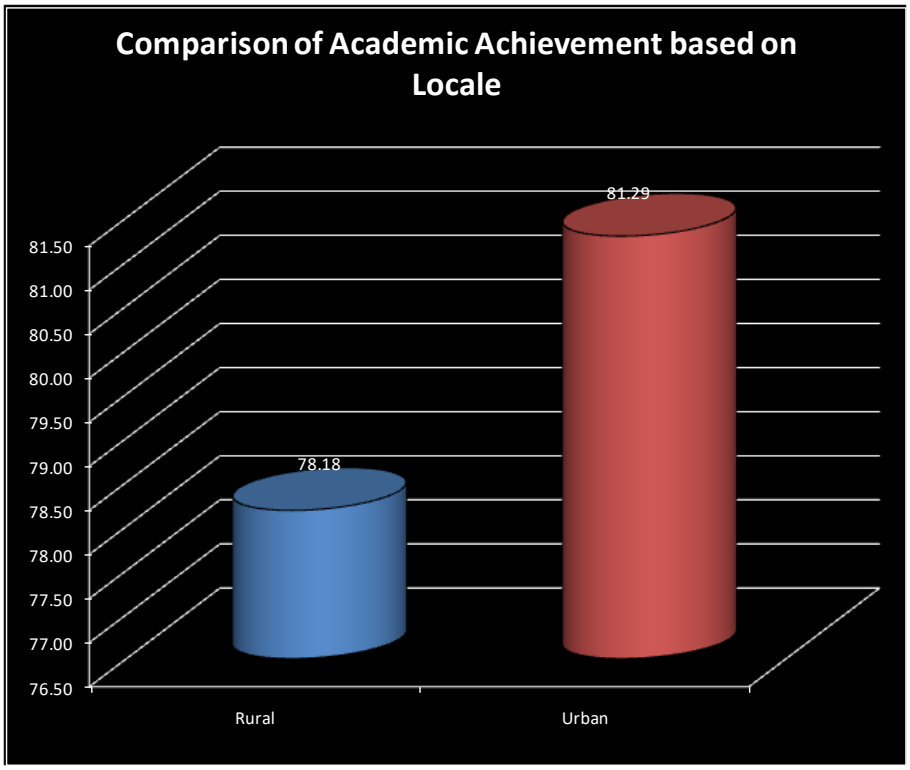
Comparison of Academic Achievement based on Locale

Locale	**Mean**	**SD**	**N**	**t**	***p***	***Remark***
Rural	78.18	11.04	200	2.772	*0.006*	*Sig. at 0.01 level*
Urban	81.29	9.87	150			

From the table 4.11, it is clear that $p<0.05$ and it is significant at 0.01 level. Hence the null hypothesis "There exists no significant difference in the mean score of the academic achievement of rural and urban high school students" is rejected. Therefore, Academic achievement of High school students significantly differs with respect to locale. Urban high school students possess (81.29) more academic achievement than rural high school students.

Figure 4.9

Comparison of Academic achievement based on locale



H_2 3:

There exists no significant difference in the mean score of the academic achievement of high school students studied in government, private and aided institutions.

Table 4.12

Comparison of Academic Achievement based on Type of institution

Type of institution	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Government	79.99	10.11	Between Gp	1007.0	2	503.4777			*Sig. at*
Private	76.94	11.54	Within Gp	38596.499	347	111.23	4.526	*0.011*	*0.05*
Aided	81.13	10.14	Total	39603.454	349				*level*

From the table 4.12, it is clear that $p<0.05$ and it is significant at 0.05 level. Hence the null hypothesis "There exists no significant difference in the mean score of the academic achievement of high school students studied in government, private and aided institutions" is rejected. Therefore, Academic achievement of High school students significantly differs with respect to Type of institution. The result does not help to identify exactly the part of group which differ significantly. Hence scheffe's multiple comparison is used for further analysis.

Table 4.12a

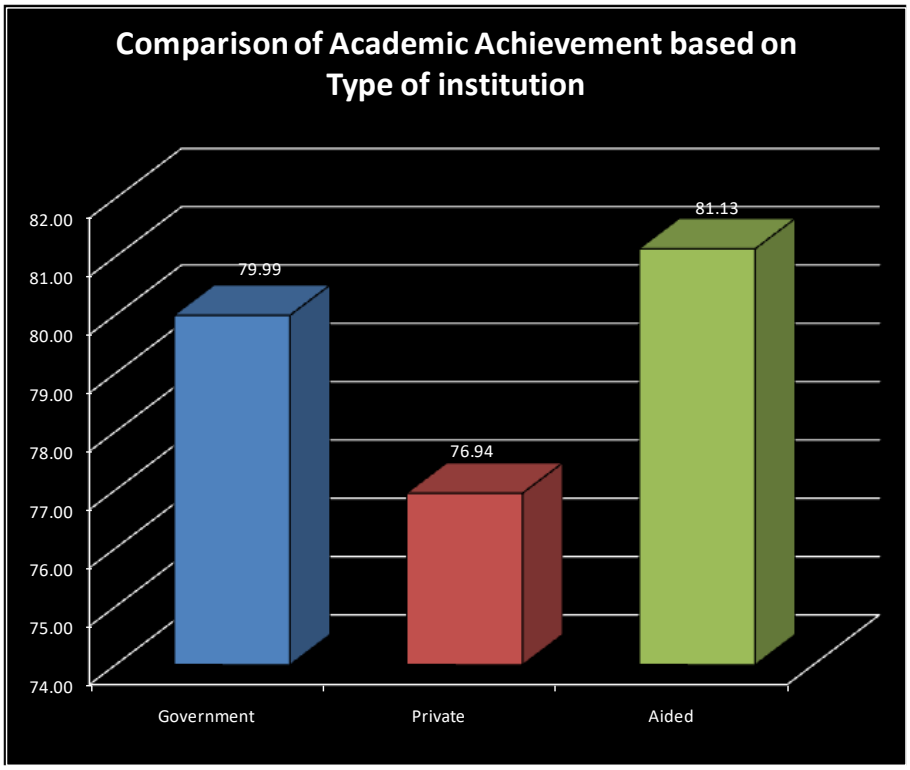
Comparison of Scheffe's Post Hoc Scores of Academic achievement with respect to Type of institution

Type of institution	**N**	**Pair**	**p (Scheffe)**	***Remark***
Government (A)	130	A Vs B	0.096	*NS*
Private (B)	100	B Vs C	0.014	*Sig. at 0.05 level*
Aided (C)	120	A Vs C	0.695	*NS*

From the table 4.12a, it is clear that, the students studying in government and private school, and government and aided schools do not differ statistically in their academic achievement on the basis of type of institution. The students studying in private and aided schools differ statistically in their academic achievement on the basis of type of institution. Aided school students possess (81.13) more academic achievement than government and private high school students.

Figure 4.10

Comparison Academic achievement based on Type of institution



H_2 4:

There exists no significant difference in the mean score of the academic achievement of high school students studied in boys, girls and coeducation institution.

Table 4.13

Comparison of Academic Achievement based on Nature of institution

Nature of institution	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Boys	76.94	11.54	Between Gp	1006.9553	2	503.48			*Sig. at*
Girls	81.13	10.14	Within Gp	38596.499	347	111.23	4.526	*0.01*	*0.05*
Co education	79.99	10.11	Total	39603.454	349				*level*

From the table 4.13, it is clear that $p<0.05$ and it is significant at 0.05 level. Hence the null hypothesis "There exists no significant difference in the mean score of the academic achievement of high school students studied in boys, girls and coeducation institution" is rejected. Therefore, the Academic achievement of High school students significantly differs with respect to Nature of institution. The result does not help to identify exactly the part of group which differ significantly. Hence scheffe's multiple comparison is used for further analysis.

Table 4.13a

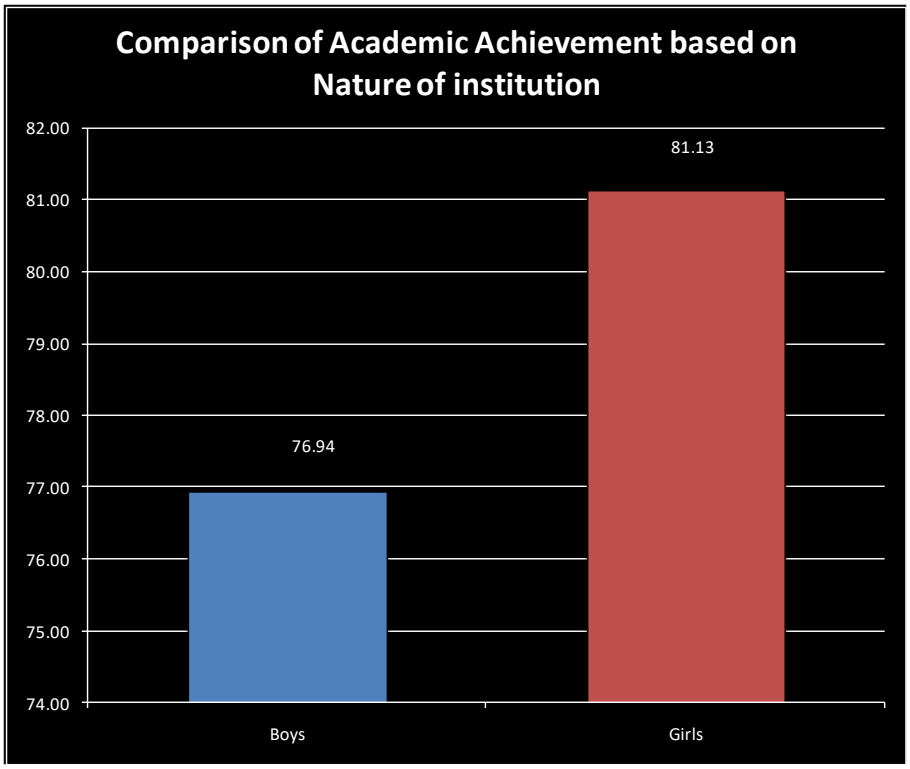
Comparison of Scheffe's Post Hoc Scores of Academic achievement with respect to Nature of institution

Nature of institution	**N**	**Pair**	**p (Scheffe)**	***Remark***
Boys (A)	100	A Vs B	0.014	*Sig. at 0.05 level*
Girls (B)	120	B Vs C	0.695	*NS*
Co-education (C)	130	A Vs C	0.096	*NS*

From the table 4.13a, it is clear that, the high school students studying at boys and girl's institution differ statistically in their academic achievement on the basis of nature of institution. The high school students studying in girls and co-education institution, and boys and co-education institution do not differ statistically in their academic achievement on the basis of nature of institution. The high school students studying in girl's school possess (81.13) more academic achievement than the students studying in boys and co-education institution.

Figure 4.11

Comparison of Academic achievement based on Nature of institution



H_2 5:

There exists no significant difference in the mean score of the academic achievement of high school students with Parental occupation like government and private.

Table 4.14

Comparison of Academic Achievement based on Parental occupation

Parental occupation	**Mean**	**SD**	**N**	**t**	***p***	***Remark***
Government	79.72	9.98	149	0.326	*0.745*	*NS*
Private	79.35	11.15	201			

From the table 4.14, it is clear that p>0.05 and it is not significant at any level. Hence the null hypotheses “There exists no significant difference in the mean score of the academic achievement of high school students with Parental occupation like government and private” is accepted. Therefore, the Academic achievement of High school students do not differ significantly with respect to parental occupation. The high school students with parental occupation in government possess (79.72) more academic achievement than the students with parental occupation in private.

H2 6:

There exists no significant difference in the mean score of the academic achievement of high school students with Parental qualification as below SSLC, between SSLC-HSC, and above HSC.

Table 4.15

Comparison of Academic Achievement based on Parental qualification

Parental qualification	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Below SSLC	77.18	11.8	Between Gp	1074.9	2	537.46			*Sig. at*
Between SSLC-HSC	81.31	10.09	Within Gp	38528.542	347	111.03	4.840	*0.008*	*0.01*
Above HSC	80.15	9.53	Total	39603.454	349				*level*

From the table 4.15, it is clear that $p<0.05$ and it is significant at 0.01 level. Hence the null hypothesis "There exists no significant difference in the mean score of the academic achievement of high school students with Parental qualification as below SSLC, between SSLC-HSC, and above HSC" is rejected. Therefore, the Academic achievement of High school students significantly differs with respect to parental qualification. The result does not help to identify exactly the part of group which differ significantly. Hence scheffe's multiple comparison is used for further analysis.

Table 4.15a

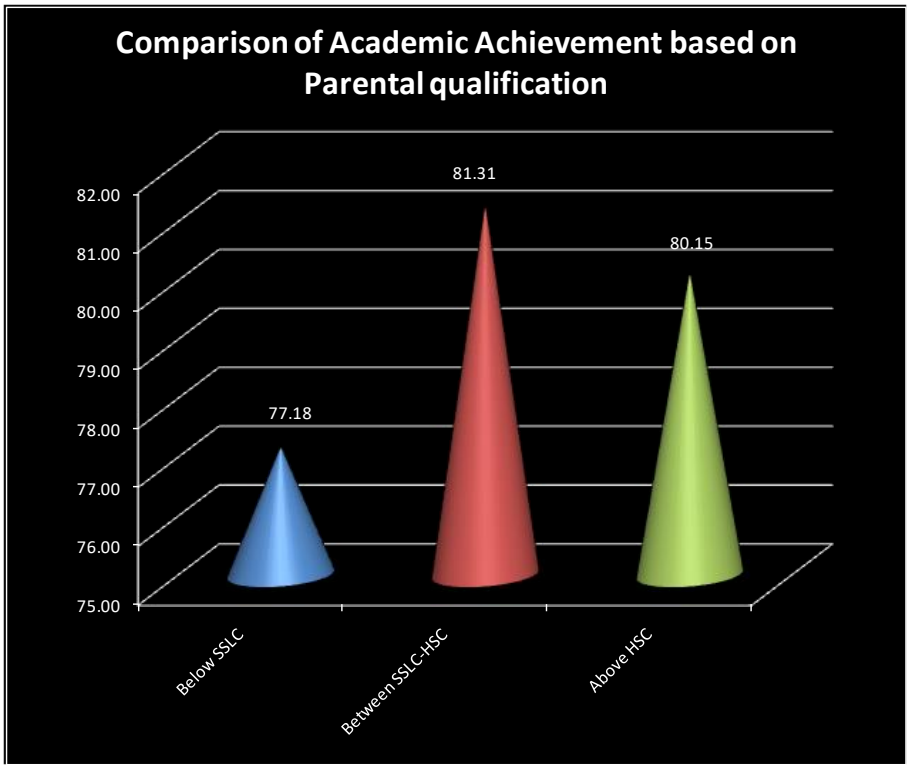
Comparison of Scheffe's Post Hoc Scores of Academic achievement with respect to Parental qualification

Parental qualification	**N**	**Pair**	**p (Scheffe)**	***Remark***
Below SSLC (A)	120	A Vs B	0.012	*Sig. at 0.05 level*
Between SSLC-HSC (B)	115	B Vs C	0.706	*NS*
Above HSC (C)	115	A Vs C	0.099	*NS*

From the table 4.15a, it is clear that, the high school students with parental qualification as below SSLC and between SSLC-HSC differ statistically in their academic achievement on the basis of parental qualification. The high school students with parental qualification as between SSLC-HSC and above HSC, and below SSLC and above HSC do not differ statistically in their academic achievement on the basis of parental qualification. The high school students with parental qualification as between SSLC-HSC possess (81.31) more academic achievement than students with parental qualification as below SSLC and above HSC.

Figure 4.12

Comparison of Academic achievement based on Parental qualification



H_2 7:

There exists no significant difference in the mean score of the academic achievement of high school students with Parental income as below 25000, between 25000-50000 and above 50000.

Table 4.16

Comparison of Academic Achievement based on Parental income

Parental income	**Mean**	**SD**	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	***p***	***Remark***
Below 25000	80.79	10.22	Between Gp	555.3	2	277.66			
Between 25000-50000	77.83	11.23	Within Gp	39048.1	347	112.53	2.467	*0.086*	*NS*
Above 50000	79.95	10.32	Total	39603.5	349				

From the table 4.16, it is clear that p>0.05 and it is not significant at any level. Hence the null hypotheses “There exists no significant difference in the mean score of the academic achievement of high school students with Parental income as below 25000, between 25000-50000 and above 50000” is accepted. Therefore, the Academic achievement of High school students do not differ significantly with respect to parental income. The high school students with parental income as below 25000 possess (80.79) more academic achievement than students with parental income as between 25000-50000 and above 50000.

CORRELATION ANALYSIS

H3:

There exists no significant relationship between Cognitive self-management and Academic achievement in science of High school students.

Table 4.17

Pearson correlation between Cognitive Self-Management and Academic Achievement of High School Students based on background characteristics

Background characteristics	**Pearson Correlation**	***p***	***Remark***
Total	0.343	*0.000*	*Sig. at 0.01 level*

From the table 4.17, it is clear that, $p<0.05$ and it is significant at 0.01 level. Hence the null hypotheses "There exists no significant relationship between Cognitive self-management and Academic achievement in science of High school students" is rejected. Therefore, there exists moderate positive correlation between cognitive self-management and academic achievement in science of high school students.

CHAPTER V

FINDINGS, IMPLICATIONS AND CONCLUSION

- **The study in retrospect**
- **Objectives of the study**
- **Hypotheses framed for the study**
- **Methodology in brief**
- **Major findings**
- **Educational implication**
- **Conclusion**
- **Suggestion for further research**

CHAPTER V

FINDINGS, IMPLICATIONS AND CONCLUSION

THE STUDY IN RETROSPECT

The study under the investigation is entitled as “Cognitive Self-Management and Academic achievement of Science in High school students”. This chapter attends to summarize all the findings, conclusions and suggestions drawn from the present investigation.

OBJECTIVES OF THE STUDY

The objectives of the study are listed as follows;

- To construct and validate a scale on cognitive self-management.
- To find out the level of cognitive self-management in science of high school students.
- To find out the significant difference in the mean scores of cognitive self-management of high school students based on gender, local, type of institution, nature of institution, parental occupation, parental qualification, and parental income.
- To find out the significant difference in the mean scores of academic achievement in science of high school students based on gender, local, type of institution, nature of institution, parental occupation, parental qualification, and parental income.

To study the correlation between cognitive self-management and academic achievement in science of high school students for the total score.

HYPOTHESES FRAMED FOR THE STUDY

The following are the major hypotheses formed for the present study.

1. There exists significant difference in the mean score of the cognitive self-management of male and female high school students.
2. There exists significant difference in the mean score of the cognitive self-management of rural and urban high school students.
3. There exists significant difference in the mean score of the cognitive self-management of government, private and aided high school students.
4. There exists significant difference in the mean score of the cognitive self-management of high school students studied in boys, girls and coeducation institution.
5. There exists significant difference in the mean score of the cognitive self-management of high school students with parental occupation like government and private.
6. There exists significant difference in the mean score of the cognitive self-management of high school students with parental qualification as below SSLC, between SSLC-HSC, and above HSC.
7. There exists significant difference in the mean score of the cognitive self-management of high school students with parental income like below 25000, between 25000-50000 and above 50000.

8. There exists significant difference in the mean score of the academic achievement of male and female high school students.
9. There exists significant difference in the mean score of the academic achievement of rural and urban high school students.
10. There exists significant difference in the mean score of the academic achievement of government, private and aided high school students.
11. There exists significant difference in the mean score of the academic achievement of high school students studied in boys, girls and coeducation institution.
12. There exists significant difference in the mean score of the academic achievement of high school students with parental occupation like government and private.
13. There exists significant difference in the mean score of the academic achievement of high school students with parental qualification as below SSLC, between SSLC-HSC, and above HSC.
14. There exists significant difference in the mean score of the academic achievement of high school students with parental income like below 25000, between 25000-50000 and above 50000.
15. There exists significant relationship between cognitive self-management and academic achievement in science of high school students.

METHODOLOGY IN BRIEF

Method used

Normative survey method was used for conducting the present study

Population

The population of the present study consists of all High school students study in Kanyakumari district during the academic year 2023 - 2024.

Sample

The present study was conducted on a sample of 350 High school students in Kanyakumari district. Simple random sampling technique was used.

Tools to be used

The tool to be used for the study will be Cognitive Self-management scale constructed and validated by the investigator.

Statistical techniques to be used:

In the present study the following statistical techniques will be used.

- ➔ Arithmetic Mean
- ➔ Standard Deviation
- ➔ t test
- ➔ ANOVA
- ➔ Coefficient of Correlation

MAJOR FINDINGS

1) The high school students possess medium level of cognitive self-management and academic achievement in science.
2) There is no significant difference in the mean scores of cognitive self-management of male and female high school students. The findings are supported by the following result ($t=0.487$, $p>0.05$)

3) There is significant difference in the mean scores of cognitive self-management of rural and urban high school students. The findings are supported by the following result ($t=4.515$, $p<0.05$)
4) There is significant difference in the mean scores of cognitive self-management of high school students studied in government, private and aided institutions. The findings are supported by the following result ($F=15.364$, $p<0.05$)
5) There is significant difference in the mean scores of cognitive self-management of high school students studied in boys, girls and co-education institutions. The findings are supported by the following result ($F=15.364$, $p<0.05$)
6) There is significant difference in the mean scores of cognitive self-management of high school students with parental occupation like government and private. The findings are supported by the following result ($t=3.257$, $p<0.05$)
7) There is significant difference in the mean scores of cognitive self-management of high school students with parental qualification as below SSLC, between SSLC-HSC, above HSC. The findings are supported by the following result ($F=23.492$, $t<0.05$)
8) There is significant difference in the mean scores of cognitive self-management of high school students with parental income like below 25000, between 25000-50000 and above 50000. The findings are supported by the following result ($F=13.229$, p,0.05)
9) There is no significant difference in the mean scores of academic achievement of male and female high school students. The findings are supported by the following result ($t=0.587$, p.0.05)

10) There is significant difference in the mean scores of academic achievement of rural and urban high school students. The findings are supported by the following result ($t=2.772$, $p<0.05$)

11) There is significant difference in the mean scores of academic achievement of high school students studied in government, private and aided institutions. The findings are supported by the following result ($F=4.526$, $p<0.05$)

12) There is significant difference in the mean scores of academic achievement of high school students studied in boys, girls and co-education institutions. The findings is supported by the following result ($F=4.526$, $p<0.05$)

13) There is no significant difference in the mean scores of academic achievement of high school students with parental occupation as government and private. The findings are supported by the following result ($t=0.326$, $p>0.05$)

14) There is significant difference in the mean scores of academic achievement of high school students with parental qualification like below SSLC, between SSLC-HSC, above HSC. The findings are supported by the following result ($F=4.840$, $p<0.05$)

15) There is no significant difference in the mean scores of academic achievement of high school students with parental income like below25000, between 25000-50000 and above 50000. The findings are supported by the following result ($F=2.467$, $p>0.05$)

16) There is significant moderate positive correlation exists between cognitive self-management and academic achievement in science of high school students.

CONCLUSION

From the study it is concluded that the high school students possess medium level of cognitive self-management. Also it was found out that locality, type of institution, nature of institution, parental occupation, parental qualification and parental income of high school students had influence on cognitive self-management. Gender had no influence on cognitive self-management of high school students.

For academic achievement in science the study concluded that the high school students possess medium level of academic achievement in science. Also it was found out that the locality, type of institution, nature of institution and parental qualification had influence on academic achievement in science. Gender, parental occupation and parental income had no influence on academic achievement in science of high school students. Also there is a positive moderate correlation exists between cognitive self-management and academic achievement in science of high school students.

EDUCATIONAL IMPLICATION

- The teachers should be trained to recognize and cultivate cognitive self-management in students. This includes using scaffolding techniques to help students gradually take ownership of their learning process.
- The teachers could include strategies like goal setting, self-monitoring, time management, and self-reflection into the science curriculum. This promotes better learning habits that can directly impact academic performance.
- The educators may need to design targeted programs or supports to help male students develop cognitive self-management skills more effectively. This can

include mentorship, guided reflection, structured routines, or the use of checklists and visual planners tailored to their learning styles.

- Digital tools and apps that help with reminders, time tracking, and goal setting can support students in developing cognitive self-management skills alongside science learning.
- Science instruction should include metacognitive practices like prediction, planning, and evaluating one's understanding. This helps students not only learn content but also become more aware of how they learn.

SUGGESTION FOR FURTHER RESEARCH

1. The variables selected for the study were cognitive self-management and academic achievement in science of high school students. More variables such as cognitive flexibility, meta cognitive strategy, goal setting ability, attention control, standardized test scores, grade point average can be conducted for further study.
2. Influence of socio economic and cultural factors in cognitive self-management and academic achievement can be studied elaborately.
3. The perception of teachers on student self-management can be conducted.

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