“Multiple Intelligence (MI) and Academic Performance (AP) of Secondary School Students”

A Thesis Submitted To

Avinashilingam Institute for Home Science and Higher Education for Women

Coimbatore - 641043, Tamil Nadu, India

By

Sakelu Chikro

[Roll No.:20PHD019]

Under the Guidance of

Mrs. Vijaya Lakshmi.G

Assistant Professor

Department of Human Development

In partial fulfillment of the requirements for the degree of

Master of Science (Human Development)

May, 2022

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24/5/2022
Signature of the guide

31/5/2022
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DECLARATION

I hereby declare that dissertation entitled, "**Multiple Intelligence and Academic Performance of Secondary School Student**" submitted to Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore in partial fulfillment of the requirements for the award of the **Degree of Master of Science in Human Development**, is a record of original research work done by me under the supervision and guidance of **Mrs. Vijaya Lakshmi. G M.Sc., M.Phil., Assistant Professor, Department of Human Development**, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore and that it has not formed the basis for the award of any Degree/ Diploma/ Associateship/ Fellowship or similar title to any candidate of any other University and it represents entirely an independent work on the part of the Candidate.

31-5-2022
Signature of the Researcher

31/5/2022
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Signature of the Head of the Department

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ACKNOWLEDGEMENT

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INTRODUCTION

I. INTRODUCTION

The twenty-first century is the century of knowledge, divergent thinking, smart students, smart classes, students with profound knowledge of the academic field, social field, and environment field i.e. surrounding knowledge. So it has become necessary for students of secondary level to prepare themselves well in all types of knowledge and smartness activities to face higher class challenges and to prepare themselves for success in life.

Students differ in the way they approach learning. All students have strengths and abilities, but each student may have a preferred way of using these abilities for learning. Students learn in different ways and vary in their abilities to perform certain tasks. The teaching and learning styles of the classroom instructor and students have important implications for effective teaching. For many years educational leaders have recognized the need for alternative instructional approaches to meet the wide variety of students in the classrooms. Students vary in their needs and interests.

Teachers sometimes become frustrated when they fail to meet the needs of students in their classroom. Not being able to accommodate the unique learning styles of students is the one reason for this problem. When the teachers are able to analyze the differences and needs of their students, the educational process is likely to become optimized for both students and teachers. Teaching in the twenty-first century emphasizes diversity and recognizing that each student possesses his or her own set of unique strengths, needs, interests and learning styles. In today's classrooms, educators are expected to provide equitable opportunities for students to achieve their full potential in all aspects of development. Students come into the classroom as individuals with unique cultures, ethnicities, beliefs and attitudes (McFarlane, 2011). It is believed and assumed that educators embrace these differences by adapting their teaching practices to better meet the abilities, personalities and learning styles of their students. Unfortunately, this assumption is generally not reflected in teachers' planning, teaching and evaluation (Levy, 2008)

Through the implementation of differentiated instruction and teaching to students' Multiple Intelligences, teachers can effectively meet students' needs and promote student engagement, motivation and participation (Gable et. al, 2000; Guild, 2001). The phenomenon of differentiated instruction is closely related to Howard Gardner's theory of Multiple Intelligences. American psychologist, Howard Gardner (1983), developed the theory of Multiple Intelligences. His theory states that people have different intelligences and learn in different ways.

Furthermore, according to this theory no two individuals have exactly the same profile of intelligences.

He suggests that humans have nine intelligences: Verbal-Linguistic Intelligence, Logical Mathematical Intelligence, Visual-Spatial Intelligence, Bodily Kinesthetic Intelligence, Musical/Rhythmic Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence, Naturalistic Intelligence and Existential Intelligence. In Gardner's theory abilities in diverse areas would be valued as indicators of intelligence and deemed worthy of further nurturance and development in school.

The concept of intelligence has been existing from the time man began to express himself in a form of a discourse or in writing. From early philosophical thoughts, human beings have attempted to find answer to the most important aspects of what intelligence is and how it could be measured. According to Socrates, intelligence was nothing but a human knowing oneself. Descartes stated, "I think therefore I am." Hence, intelligence and thinking did not have two different connotations. Herbert Spencer was convinced that the man could make adjustments to different situations because of the very intelligence in man. Numerous psychologists and educationists worked on the task of finding a definition for intelligence. However, there had been no agreement on a single definition of intelligence. Most could arrive at certain opinions on the fact that intelligence is ability to think in terms of abstract ideas, the general mental ability to adapt to numerous situations faced in day-to-day life, ability to solve the problems of human beings and that of nature and so on.

Intelligence is a general cognitive problem-solving skill. It is a mental ability involved in reasoning, perceiving relationships, analogies, and calculating. It helps individuals to face and solve the complicated problems and situations, in learning things, and making adjustments to the environment (Shaikh, Khan, & Wakpainjan, 2016)

Intelligence refers to the capacity to learn with speed and accuracy, the Capacity to solve problems, and the Capacity to adjust to society (Sreelakshmi, 2013). There is a challenge in the education field regarding the variation of student progress. No two individuals are alike in the universe. If any student wants to reach his or her goals or aims he or she has to meet many challenges like cognitive ability, efficient methods of learning, concentration, memory, intelligence, learning environment, and the student progress. Children differ immensely in intelligence.

Intelligence is a sort of mental energy, in the form of mental or cognitive abilities and available to an individual which enables him to handle his environment in terms of adaptation to face novel situations as effectively as possible. In terms of definition, we can access a person's intelligence in proportion to his ability to use his mental energy to handle his problems and lead a happy and well-contented life. Intelligence is the aggregate or global capacity of an individual to act purposefully, think rationally, and deal effectively with the environment. This mental capacity or mental energy helps an individual to face new challenges and problems of life as successfully as possible. One's mental energy can be judged in terms of the quality of his behavior or performance.

Intelligence plays an important role in life and contributes to the personal and social development of an individual and the harmonious development of the personality of an individual. Intellectual development implies progressive changes in the mental process which go on from birth to death. Intellectual development includes various aspects such as the development of concepts, perception, language, memory, reasoning, thinking, and imagination. Making use of these multiple intelligences can help us restructure our classrooms into places where everyone has a higher degree of success than ever imagined.

Gardner realized that individuals possessed different types of talents and abilities which cannot be explained by the idea and existing concept of Intelligence alone. He used a variety of sources – including neuron-physiological research and studies with autistic people, geniuses and protégés – to support his model that various parts of the brain provide different types of intelligence. Howard Gardner claimed that all human beings possess not just a single intelligence, rather, as a species; the human beings are better described as having a set of relatively autonomous intelligences. He felt that a fuller appreciation of human cognitive capacities emerges if one takes into account, not only the general intelligence, thus far known, but more than that. He thought of intelligence as a bio-psychological potential to process information in certain ways in order to solve problems or create products that are valued in at least one culture or community.

Multiple Intelligences (MI) theory thus can be described as a philosophy of Education. Even though each individual possesses all these nine intelligences in greater or lesser degrees, they may be strong in a few areas and prefer to gather information and experience the world

through particular intelligences. It is a set of strategies that assist teachers in meeting each students' needs by ensuring flexibility in what they teach, how they teach it, and how students demonstrate what they have learned (Levy, 2008). The key to effective differentiation is flexibility and adaptability. Students will have optimum learning if the concepts, principles and skills being taught are presented in their learning style and they are able to express themselves well. The Multiple Intelligence Theory (Gardner,1999,2004) has significant implications for education in general, and can help students' achievement in particular (Barrington, 2004:Christion and Kennedy,2004:Ozdemir,Guneysu and Tekkaya, 2006).

The theory of Multiple Intelligences emphasizes the highly individualized ways in which people learn and recognize that each of them have unique intellectual potentials. Schools can help students by acknowledging and fostering individual abilities in a variety of areas. Kagan and Kagan (1998) described Multiple Intelligences theory as a powerful catalyst in education: "It is revitalizing the search for more authentic, student-centred approaches to curriculum, instruction and assessment." From his perspective, Multiple Intelligence theory can be used to meet three visions:

a) To match teaching to the ways students learn
b) To encourage students to stretch their abilities and develop all their intelligences as fully as possible.
c) To honour and celebrate diversity.

Multiple intelligence theory is assuming an important place in the recognition of the diversity of ways that learners approach the curriculum; it helps teachers and learners to successfully programme for individualized instruction. Consequently, many researchers stress the importance of identifying the profiles of the learners and empowering them with recognition of their intelligences, in order to enhance and develop learning (Gurbuz, 2010). Thus, it seems necessary to recognize students' intelligences in order to consider them, when designing for the teaching and learning process to enhance their learning performance

Multiple Intelligence is defined and elucidate as the mental capacity and potential that enable an individual to adapt himself to his environment and the more important part of it is the ability of the individual to adapt the environment to fulfilling needs such as psychological, social, emotional and spiritual (Garder,1999). Learning as a process of acquiring change in the behaviour through intellectual and emotional attempts, depends much on multiple intelligence

and its various dimensions. If learning is to lead to achievement, Multiple Intelligences has to play its significant role in leading the change of behaviour towards a desirable and expected role. The investigator thought of a pedagogy which directly sharpens up on the increased capabilities of students other than rote memorization and numerical supremacy: so that by providing learning experiences in tune with the increased capability present in them can guarantee increased scholastic achievement and psycho-motor excellence in their field. The present attempt is hoped to give some insight in to the extent of Multiple Intelligence among students at Secondary level. This will enable the experts, researchers in the field and evaluators to chalk out programmes for the development of the students.

Multiple intelligences are needed to reason, plan, problems solving, think abstractly, comprehend complex ideas, learn quickly and learn from experience. Intelligence is not merely book learning, a narrow academic skill. But it reflects a broader and deeper capability for comprehending our surroundings. No two individuals are alike. Each and every individual show their own traits and personality characteristics. Likewise learning styles, cognition as well as perceptual rates of individuals are totally different from one another. Gardner states that the development of a child and the way the child interprets life experiences is influenced by his or her education. Gardner believes that teachers should use Multiple Intelligence in lessons because it helps students relate to real world experiences (Smith, 2002). Gardner (1999) suggested that human beings have eight distinct units of intellectual functioning, and that these units are actually separate intelligence with their own observable and measurable abilities.

Gardner stated that the list of intelligences, presented by him, be exhaustive. Yet, at the same time, there is something awry about a list that leaves glaring and obvious gaps, or one that fails to generate the vast majority of roles and skills valued by human cultures. Thus, a prerequisite for a theory of Multiple Intelligences, as a whole, is that it captures a reasonably complete gamut of the kinds of abilities valued by human cultures.

The nine type of Intelligence mention below:-

1. **Linguistic Intelligence**

It's the ability to effectively use spoken and written language to express oneself. It is the sensitivity to the meaning of words, the order among words and the sound, rhythms, inflections and meter of words. Examples of professionals who may possess high linguistic intelligence are

poets, writers, lawyers and speakers. It is stated by Gardner that linguistic skill being called intelligence is consistent with the stance of traditional psychology.

A specific area of the brain, called Broca's area, is responsible for the production of grammatical sentences. A person with damage to this area can understand words and sentences quite well but has difficulty in putting words together in anything other than the simplest of sentences. Other thought processes may be entirely unaffected.

2. Logical-Mathematical Intelligence

Ability to analyze problems logically, work effectively with mathematical operations and investigate issues using the scientific method. It is the capacity to conceptualize the logical relations among actions or symbols. Examples of people possessing high logical-mathematical intelligence are the scientific and mathematical communities.

Gardner states that Logical-mathematical intelligence is supported by empirical criteria. Certain areas of the brain are more prominent in mathematical calculation than others; indeed, recent evidence suggests that the linguistic areas in the front temporal lobes are more important for logical deduction, and the visuospatial areas in the parietofrontal lobes for numerical calculation. There are savants who perform great feats of calculation even though they are tragically deficient in most other areas. Child prodigies in mathematics are in plenty.

3. Musical Intelligence

Ability to perform, composes, and appreciates musical patterns. It is the sensitivity to rhythm, pitch, meter, tone, melody and timbre which involves in the ability to sing, play musical instruments or compose music.

Examples of professionals who possess high musical intelligence are musicians, composers and people involved in music production. According to Gardner, certain parts of the brain play important roles in the perception and production of music. These areas are characteristically located in the right hemisphere, although musical skill is not as clearly localized in the brain as natural language. Although the particularly susceptibility of musical ability to brain damage depends on the degree of training and other individual characteristics, there is clear evidence that a selective loss of musical ability occurs.

4. Bodily-Kinesthetic Intelligence

It is the ability to use the body for expression. It is the ability to use one's whole body or parts of the body to solve problems or create products. It is the ability to solve problems or to

fashion products using one's whole body, or parts of the body. Professional dancers, sports personalities, athletes, surgeons and craftspeople possess and use high bodily-kinesthetic intelligence. Gardner states that control of bodily movement is localized in the motor cortex, with each hemisphere dominant or controlling bodily movements on the contra-lateral side. In right-handers, the dominance of bodily movement is ordinarily found in the left hemisphere. The ability to perform movement when directed so, can be impaired even in individuals who can perform the same movements reflexively or on a non-voluntary basis.

5. Spatial Intelligence

It is the ability to recognize, use, and interpret images and patterns, and to reproduce objects in three dimensions. It is the ability to conceptualize and manipulate large scale spatial arrays. It is the ability to form a mental model of a spatial world and to be able to maneuver and operate using that model. Spatial problem solving is required for navigation and for the use of the notional system of maps. Other kinds of spatial problem solving are brought to bear in visualizing an object from different angles and in playing chess.

The visual arts also employ this intelligence in the use of space. Examples of professionals who are likely to possess high spatial intelligence are airplane pilots, sailors, architects, sculptors, chess players and designers. Gardner states that evidence from brain research is clear and persuasive. Just as the middle regions of the left cerebral cortex have, over the course of evolution, been selected as the site of linguistic process in right-handed persons, the posterior regions of the right cerebral cortex prove most crucial for spatial processing. Damage to these regions causes impairment of the ability to find one's way around a site, to recognize faces or scenes, or to notice fine details.

6. Interpersonal Intelligence

It is the ability to understand people's intentions, motivations and desires. It is the ability to interact effectively with others. It is the sensitivity to others' moods, feelings, temperaments and motivations. Interpersonal Intelligence is the ability to understand other people: what motivates them, how they work, how to work cooperatively with them. In more advanced forms, this intelligence permits a skilled adult to read the intentions and desires of others, even when they have been hidden.

Therapists, counselors, negotiators, teachers, politicians, clinicians, religious leaders and sales persons are able to use high interpersonal intelligence and attract people towards them. It is

stated by Gardner that all indices in brain research suggest that the frontal lobes play a prominent role in interpersonal knowledge.

Damage in this area can cause profound personality changes while leaving other forms of problem solving unharmed – after such an injury, a person is often not the "same person". He states that Alzheimer's disease, a form of dementia, appears to attack posterior brain zones with special ferocity, leaving spatial, logical, and linguistic computations severely impaired. Yet people with Alzheimer's often remain well groomed, socially proper and continually apologetic for their errors. In contrast, Pick's disease, a variety of dementia that is localized in more frontal regions of the cortex, entails a rapid loss of social graces.

7. Intrapersonal Intelligence

It is the ability to understand one and to interpret and appreciate one's own feelings and motivations. It is a correlative ability, turned inward. It is the capacity to form an accurate, veridical model of one and to be able to use that model to operate effectively in life. It is the sensitivity to one's own feelings, goals, and anxieties and the capacity to plan and act in light of one's own traits. It is very difficult to pinpoint specific careers; rather, it is a goal for every individual in a complex modern society, where one has to make consequential decisions for oneself. Since, this intelligence is one of the most private evidence from language and music, or even some other more expressive form of intelligence is required if it is to be detected.

Examples of professionals who possess high intrapersonal intelligence are therapists, actors, caregivers and writers who bring high levels of personal awareness to their work. Gardner stated that as with the interpersonal intelligence, the frontal lobes play a central role in personality change. Injury to the lower area of the frontal lobes is likely to produce irritability or euphoria, whereas injury to the higher regions is more likely to produce indifference, listlessness, slowness, and apathy – a kind of depressive personality.

In persons with frontal lobe injury, the other cognitive functions often remain preserved. In contrast, among aphasics who have recovered sufficiently to describe their experiences, we find consistent testimony: while there may have been diminution of general alertness and considerable depression about the condition, the individual in no way felt oneself to be a different person. One recognizes one's own needs, wants, and desires and tried as best he / she could to achieve them.

8. Naturalist Intelligence

It is the ability to recognize and appreciate the human relationship with the natural world. It is the ability to make consequential distinctions in the world of nature, between plants or even among the formation of clouds. There is a core capacity to recognize instances as members of a species. There is also the evolutionary history of survival often depending on recognizing nonspecifics and on avoiding predators. Astronomers, biologists and zoologists are examples of persons using high levels of naturalist intelligence.

This is the eighth intelligence that Gardner added at a later stage. In the view of Gardner, examining the naturalist intelligence through the cultural or brain lenses brings some interesting phenomena into focus. The study of brain damage provides intriguing evidence of individuals who are able to recognize and name inanimate objects but who lose the capacity to identify living things; less often, one encounters the opposite pattern, where individuals are able to recognize and name animate entities but fail with man-made objects.

9. Existentialistic Intelligence

This dimension was later included in Gardner's Theory of Multiple Intelligence. It is an ability to contemplate phenomena or questions beyond sensory data, such as the infinite and infinitesimal.

Existentialism is a 20th-century philosophy concerned with human existence, finding self and the meaning of life, and personal responsibility. The belief is that people are searching to find themselves throughout life as they make choices based on their experiences, beliefs, and outlook without the help of laws, ethnic rules, or traditions. These types of people have a vision, function, and relationship with society. Scientists, Religious people, Philosophers are some the examples of people having existentialistic intelligence. Career which suits those with this intelligence include cosmologists, and philosophers.

MI theory posits a set of several computational devices. Strength or weakness in one does not predict strength or weakness in another.

As stated by Gardner, on a scientific level, the theory makes two claims. First, all human beings possess these intelligences; put informally, they are what made us human, cognitively speaking. Second, no two human beings – not even identical twins – possess exactly the same profile of intellectual strengths and weaknesses. That is because most of us are genetically

different from our conspecifics, and even identical twins undergo different experiences and are motivated to distinguish themselves from one another.

Later, in 2001, Gardner proposed three distinct uses of the term Intelligence, based on his MI Theory, which may be enumerated in the following:

A property of all human beings, that is, all of us possess the nine intelligences. It is an attempt for a general characterization of human capacities. It speaks of human intelligence as the capacity to solve complex problems, or to anticipate the future, or to analyze patterns, or to synthesize disparate pieces of information.

A dimension on which human beings differ, that is, no two people, not even identical twins, possess exactly the same profile of intelligences. This meaning of intelligence is the one that has been most widely employed by psychologists. It is on the assumption that intelligence is a trait. Individuals can be usually compared with one another on the extent to which they exhibit this trait or ensemble of traits.

The way in which one carries out a task in virtue of one's goals, that is, the manner in which a task is executed. One often speaks on a decision to be wise or ill-advised, whether the manner in which the decision was reached was clever or foolish, whether a leadership transition was handled intelligently or ineptly, whether a new concept was introduced intelligently into lecture, and so forth.

Gardner went on to state that one cannot characterize an act or decision as intelligent without some sense of the goal or purpose at the issue, the choices involved in a genre, and the particular value system of the participants. There do not exist example-independent criteria for what constitutes a wise or foolish decision, planning process, leadership transition, introduction of a topic in a class, and so on. Yet, armed with information about goals, genres, and values, one can make assessments about whether these tasks have been performed intelligently, even as one can even agree to disagree about the conclusions reached.

Gardner speculates that different tasks call on different intelligences or combinations of intelligence. For example, to perform music intelligently involves a different set of intelligences than preparing a meal, planning a course, or resolving a quarrel.

Following the theory of Multiple Intelligence, if one has to conclude that a particular student has little potential for the development of spatial intelligence; one is faced with clear cut educational choices. This can range from giving up, to working much harder, to searching for

alternative ways to deliver instruction, be the topic of geometry, ancient history or a lesson on classical music.

The MI Theory since its introduction has been involving the minds of educationists and has motivated many to effectively use the same in the education at different stages in order to provide the best to the students. The theory has been used in the curriculum development and transaction.

Plato says "Education is the capacity to feel pleasure and pain at the right moment and it develops in the body and in the soul of the pupil, all the beauty and all the perfection which he is capable of'. Such a capability by education can be assessed by academic achievement.

Children's ways of learning are as different as the colors of the rainbow. Educational system today aims to design a creative and effective interdisciplinary approach to teaching, learning and assessment taking in to account the intellectual gifts of each student (Diaz-Lefebvre and Finnegan,2007).Learning takes place when it can be individualized, meeting the particular needs and interests of each student. It is important to know what helps students learn and adjust teaching strategies to enhance the method of instruction. Students can learn from a combination of modalities, hands-on activities, oral and visual instruction and a combination of these methods (Perkins, 2001).

Students will have optimum learning if the concepts, principles and skills being taught are presented in their learning style and they are able to express themselves well. Students and parents will benefit because students will come to know about the strengths and weakness of their intelligences. Hopefully, this could start guiding them on a career path and make important decisions that will impact their future. Also, if students are aware of their intelligences it may assist them in being able to complete assignments more efficiently. They will also, hopefully, learn techniques to stimulate their intelligence domain and find ways to use them across the curriculum. Parents, then, will be able to encourage their children and help in finding sources of motivation to help them to succeed. All individuals can benefit from knowing how their intelligences influence their achievement in a school or a work environment.

It is widely accepted notion that knowledge gained through the excitation of many sense organs are retained for a longer period and this aspect has given due emphasis by the Theory of Multiple intelligences. The present study aims to assess the relation between student academic performance and Multiple Intelligences among Secondary School students. Hence the problem

under investigation is entitled as **"Multiple Intelligence and Academic Performance of Secondary school students."**

Academic achievement is a measure of knowledge gained in formal education usually indicated by test scores, grades, points, average, and degrees. (Encyclopedia Dictionary of Psychology and Education 2005). It is level of attainment of instructional objectives fixed for the secondary students to reach by the end of a term of teaching or training pivoted around a well-defined curriculum.

Academic achievement is related to the acquisition of principles and generalizations and the capacity to perform efficiently on certain manipulations, objectives, symbols, and ideas. It is the competence of students shown in school subjects for which they have taken instructions. The test scores or grades assigned to the students based on their performance in the achievement test determine the status of pupils in the classroom (Singh, 2003).

Academic performance is the measurement of student achievement across various academic subjects. Teachers and education officials typically measure achievement using classroom performance, graduation rates, and results from standardized tests. Academic performance is defined by students' reporting of the past semester's CGPA/GPA and their expected GPA for the current semester. The grade point average or GPA is now used by most tertiary institutions as a convenient summary measure of the academic performance of their students. The GPA is a better measurement because it provides greater insight into the relative level of performance of individuals and different groups of students.

This is the age for the development of career choosing, career success, personal well-being, and leadership to improve student achievement and success. It enables the learner to understand and develop their unique way of understanding and this empowers that person with great self-esteem and enthusiasm. This theory can help each of us build upon both our strong and weak bits of intelligence to become a more whole, happy, and productive human being.

According to Gardner (2005) "multiple intelligences theory has had a considerably important impact upon the whole world of education". Actually Gardner never thought of any application of Multiple Intelligences theory in educational situations. He developed his theory of multiple intelligences with a goal of getting well advances in the fields of neuroscience, biology, and psychology. His effort was the formation of an alternate way of thinking about human cognition. Numerous educators welcomed the idea of multiple intelligences. Thousands of

school teachers and researchers in many different countries have applied multiple intelligences theory in the field of education. It is clear that multiple intelligences theory can be used to identify children's relative strength and profile of intelligences.

Education is something that is provided by an external force as a teacher, tutor or parent. Education helps us to develop our natural intelligence in different ways. Many people have abilities in different areas that are made to shine, when they receive education. Others do not receive the right type of education and their abilities lie latent within them. The construction of a mental picture of teaching is easy for only those who gives a major role to evaluation. Teachers are supposed to collect, synthesis, and evaluate information about their students' learning. They need to know the state of knowledge and skills of their students. Based on this, they begin to plan teaching. As teaching proceeds, they should know that students are in the same or not in the same path of learning. This is clear through teachers' own observations and monitoring of students in the classroom. It is used for a variety of purposes such as planning future instruction, adapting teaching styles, providing feedback, placing students in instructional groups and diagnosing problems of students.

All the above mentioned purposes are for acquiring better achievement for students. A student's achievement in different subjects depends upon the level of their learning capacity. This learning capacity will vary in different students. Also a student may be bright in one subject may not be so bright in other subjects. Which factor makes this possible? The level of achievement is an indication of his capability to grasp things. So achievement is the action of accomplishing something. Level of attainment in any subject, is estimated by performance on a test. According to Margaret Mead, "If we can develop ways to teach and learn all nine intelligences, we will increase the possibilities for student success and create the opportunity to weave a social fabric in which each diverse human gift will find a fitting place." The different types of intelligences in a High school classroom help educators to meet students' needs more efficiently. If an educator looks into students' unique learning styles, these students will be more able to succeed in the classroom. Two ways to develop the ability of the students in classroom are by making group in class and allowing the students to choose the lesson according to their interest. One effective way to teach students of varied intelligences in the same classroom is to determine their intelligence strength and then group them accordingly. After evaluation of

students, lesson plans that allow many activities should be prepared. Four to six groups may be organized. Different activities for each group may lead to different learning approaches. Students should be allowed to choose their learning style. Students attend each group for a set amount of time.

Allow students for the formation of learning objectives to fulfill their intelligence strengths. It also makes the students feel that they have control over their learning. After teaching a lesson, give a difficult project to show mastery level of the learning objective. Give students a list of several activities from which they can choose. Allow them to determine which project they would like to complete. Activities can be construction or designing something, creating a play or story, drawing a picture or sketch, writing an essay or writing a song.

Secondary school level refers to level of students who are studying at VIII,IX and X Standards of Coimbatore schools. In the present study the investigator took the sample from standard VIII, IX and X. Based on that the objective were formulated.

Objectives:-

Primary-

- To examine the relationship between Multiple Intelligence (MI) and Academic Performance (AP) of secondary school students.

Secondary-

- To observe the level of Multiple Intelligence (MI) of secondary school students.
- To analyze the Academic Performance (AP) of selected respondents.

REVIEW OF LITERATURE

II. REVIEW OF LITERATURE

The review of related literature is one of the essential aspects of research process and plays a crucial role in planning of the study. This helps the researcher to gather-up to date information about what has been done in the particular area on which the investigator intends to study. This chapter deals with the review of research journals, dissertations, thesis and other sources of information related to the problem **"Multiple Intelligence and Academic Performance of secondary school students."** selected by the investigator.

The studies reviewed are broadly grouped under five sections. They are:-

1. **History**
2. **Theoretical Framework of Multiple intelligence**
3. **Academic performance of school students**
4. **Relationship of Multiple Intelligence and Academic performance relevant studies.**
5. **Evaluation of Multiple Intelligence**

1. History of Multiple Intelligence

Intelligence has been defined as higher level abilities such as abstract reasoning, mental representation, problem solving, and decision making, the ability to learn, emotional knowledge, creativity, and adaptation to meet the demands of the environment effectively. Some researchers argue that intelligence is a general ability; whereas others make the assertion that intelligence comprises specific skills and talents. Psychologists contend that intelligence is genetic, or inherited, and others claim that it is largely influenced by the surrounding environment.

Gardner defines intelligence as a "biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (Gardner, 2000).

Howard Gardner built off the idea that there are multiple forms of intelligence. He proposed that there is no single intelligence, but rather distinct, independent multiple intelligences exist, each representing unique skills and talents relevant to a certain category.

Multiple Intelligences is a theory that proposes the differentiation of human intelligence into certain modalities of intelligence. This theory goes against the norm of defining intelligence using a single, general ability. However, the theory has been criticized for its lack of empirical evidence.

Howard Gardner proposed the theory of multiple intelligences. According to him, an intelligence modality should fulfill eight criteria. These criteria are potential for brain isolation by brain damage, place in evolutionary history, presence of core operations, susceptibility to encoding, a distinct developmental progression, the existence of exceptional people or prodigies, support from experimental psychology, and psychometric findings. In the year 1975 Gardner published the book 'The shattered Mind' in this Book he described about how different parts of the brain are dominant for different Cognitive functions.

In 1976 he wrote an outline for a book with title 'Kinds of Minds'. It described about different human faculties. Later this book was published by the name 'Frames of Mind'. In 1979 the researchers of the Harvard School received a sizeable grant from a Dutch foundation, called Bernard Van Leer Foundation, a study proposed by that foundation. The members of the project on Human Potential were expected to work out on the nature of human potential and its peculiarities. At that time Gardner wrote a book about human cognition. This was based on the discoveries in the biological and behavioral sciences .This was the first research program that led to the theory of Multiple Intelligences.

Gardner and his colleague combined the literature from brain study genetics, anthropology and Psychology to make an optimal taxonomy of human capacities. Some psychologists criticized Gardner for using the term Multiple Intelligences instead of abilities or gifts. Gardner said about his colleague David Feldman's words "selection of this name 'Multiple Intelligences' placed Gardner in direct confrontation with Psychological establishment that cherishes IQ tests. As a mission to the Van Leer Foundation Gardner had to say something about the educational implications of Multiple Intelligences theory .So in the concluding chapters he explained about educational implications of the theory.

Gardner said "human beings possess not a single intelligence but asset of relatively autonomous intelligences most writing about intelligence focuses on a combination of linguistic

and logical- mathematical intelligence a full appreciation occur when considering spatial, bodily-kinesthetic, musical, interpersonal and intrapersonal intelligence."

The Frames of Mind was published in 1983.He was then called by others as the 'Father of Multiple Intelligences' or as 'MI guru'. After one year teachers from Indian polis began a school and they used MI theory there .This was the first school which used the MI theory. He and his colleagues created a curriculum for middle school called 'Practical Intelligences for school'. They also developed the use of computers in education. In 1994-95 he reviewed the existence of a new intelligence as 'Naturalistic Intelligence'. Also suggested possibility of an Existential Intelligence.

Snyder (2000) the study on learning styles, multiple intelligences and, academic achievements of students. To observe the learning style of students to observe the achievement of students on MI, there was a positive relationship between grade point and categories of working alone, self motivated visual and logical intelligence for male students. Also there was a positive correlation between female students and other intelligences.

Reena (2000) conducted an Intervention program for young children on multiple intelligences. A multiple intelligence tool was developed on seven intelligences of Gardner and the same was administered on 400 children of 6-8 years of age of Hisar and Gurgaon city. The study found that the majority of the children found to be identified as average all the multiple intelligences except in musical intelligence. The investigator then organized an intervention program to enhance the intellectual abilities of children. 70 children, i.e., 10 children under each intelligence, were selected for the administration of intervention programs. The results revealed the significant differences between pre and post-intervention performance of children. The study suggested very important advice to parents and teachers that timely identification of multiple intelligences in the children and intervention programs do help to achieve optimum growth and development of the intellectual skills of children at or before age.

Smith Wade et.al (2000) conducted a study titled "The typologies of successful and unsuccessful in the core subjects of language Arts, Mathematical science and social studies. Using the theory of Multiple Intelligence in a high school environment." The purpose of the research was using the theory of Multiple Intelligence of academic success of 10th grade students. Results showed that the theory of Multiple Intelligence was found to be unproductive in

the areas of students meta cognitive activities, awareness and the and the areas of student academic success under the M.I theory, the more successful students should have had a significantly different typology of meta cognitive awareness and activities across all subject areas from that of unsuccessful student. The typologies were significantly different, the typologies themselves were not the same across differing subject areas.

Wills Joday (2001) conducted a study on the use of multiple intelligence to master multiplication. This study explored the use of multiple intelligence in mastering multiplication. It focused on helping children to use their different intelligence strengths to attain conceptual understanding of multiplication. Result showed that the student developed their own thinking strategies for harder facts and built mastery through practice and problem solving.

Şahin (2001) investigated about "the significant difference between Multiple Intelligences Theory and traditional methods on third grade Social Science students' achievement and what opinions and views experimental group students and their teacher possessed about the implementation of the theory. This research was conducted in the second term of 1999-2000 academic years with third graders in Zonguldak Primary School. Pretest-posttest experimental and control group design, observations, and interviews were utilized in the study. According to results of tests, students' achievement scores in the experimental group were significantly higher than the students in the control group. Besides, in the experimental group, there was no significant difference in terms of sex. In addition to those, the results of the observations and interviews made with the students in the experimental group indicated that using multiple intelligences activities and materials in the social science lessons affected students' multiple intelligences positively. Teacher interview results showed that he had positive views on Multiple Intelligences activities and materials."

Sharp Patricia (2002) conducted a study on "Improving students comprehension skills through instructional strategies." Various instructional methods were used which include thinking skill instruction co-operative groups, multiple intelligence strategies and meta cognition skills. Results showed that there was an increase in students reading comprehension skills.

Hastey Chris (2002) Conducted a study on "Improving students interest and achievement in social studies using a multiple intelligence approach" This paper described a programme initiated by teacher investigators to improve academic achievement and interest in

social studies, Result showed that interest in social studies increased 11% as evidenced by the students observation check list surveys.

Bednar Janet (2002) Conducted studies on "Improving students motivation and achievement in mathematics through teaching multiple intelligence." This action research project described strategies for improving students motivation and achievement in mathematics through multiple intelligence, probable cause data indicated that students learnt best when instruction was geared to their multiple intelligences. Improvement was noted in students participation and student enthusiasm during mathematical class.

Shearer C. Branton, (2002) in their study "Using Multiple intelligence assessment to facilitate teacher development" Result indicated that multiple intelligence profile can sensitize teachers to their own weakness and help them empathize with students who are struggling. Teachers were able to understand the multiple intelligence profile as a description narrative of intellectual and creative life.

Thomas Hoer, (2002) the principal of New City School, Massachutes after experimenting in his school found that the kids were more likely to find learning fun and less likely to find school boring. Discipline problems, tend to disappear when students are excited about learning and finding success and he can readily extoc the virtues of Multiple Intelligences after experimenting in his school.

Katz Mirenda (2002) investigated the engaged behavior and social interactions of 10 students with developmental disabilities in two types of inclusive classrooms which are the one ascribed to MI pedagogy, instruction, and assessment and the one that used no specific educational theory or approach to instruction. They found at the end of the study that the experiences of the participants in both typical and MI-inclusive classrooms were more alike than different. They observed more frequently the participants in the MI classroom to be engaged in multiple response activities. They observed the participants in MI classrooms spent more time interacting with their typical peers, whereas those in typical classrooms spent more time interacting with adults during 1:1 activities that were different from those of their peers.

Michael B. et.al (2003) conducted "A study on learning style and Gardener's intelligence." The sample consisted of three hundred and forty students from a secondary level business education a variety of web based international methods are utilized throughout the school year and the students overall performance in course was monitored. The result showed that there is an association between learning styles and Gardner's intelligence.

Rideal Jennifer et.al (2003) conducted a study on "Improving student's academic reading achievement through the use of multiple intelligence teaching strategies the sample consisted of 90 students the age 68 group ranged between 10 to 11 of fifth grade. The study found that, through the use of multiple intelligences, there was an increase in reading comprehension and skill mastery that built a stronger, more confident and motivated reader. Students showed a marked improvement in reading comprehension motivation and student engagement.

Asçı, (2003) investigated the effects of multiple intelligences based instruction on ninth grade students ecology achievement, their attitudes toward ecology, and their multiple intelligences. She made an experimental study which consists of two groups called experimental group and control group. She applied Ecology Achievement Test, Ecology Attitude Scale and Multiple Intelligences Inventory. She analyzed the results with MANCOVA and concluded that the multiple intelligences based instruction is more effective than the traditional instruction in terms of achievement and multiple intelligences; however she found no significant results between the two groups.

Barrington Erine (2004) in their study "How multiple intelligence can help in teaching to student's diversity in higher education" found that multiple intelligence could be a vehicle by which the demands of the society are met. She also reported that the academicians who attended workshops on multiple intelligence viewed the ideas as useful pedagogical tools for higher education, especially with regard to the diversity of students.

Gardner, (2004) the first volume published under this project is Howard Gardener's *Frames of Mind* which dealt with human intellectual potential, psychological research, biological sciences and development and use of knowledge in different cultures.

Persia Celine, (2005) conducted an experimental study at the secondary school level titled "A study strategy based on multiple intelligence. A powerful tool at secondary level" The sample size was limited to 100. The study showed that the lessons based on multiple intelligence theory were more effective than the ones based on the traditional text books.

2. Theoretical Framework

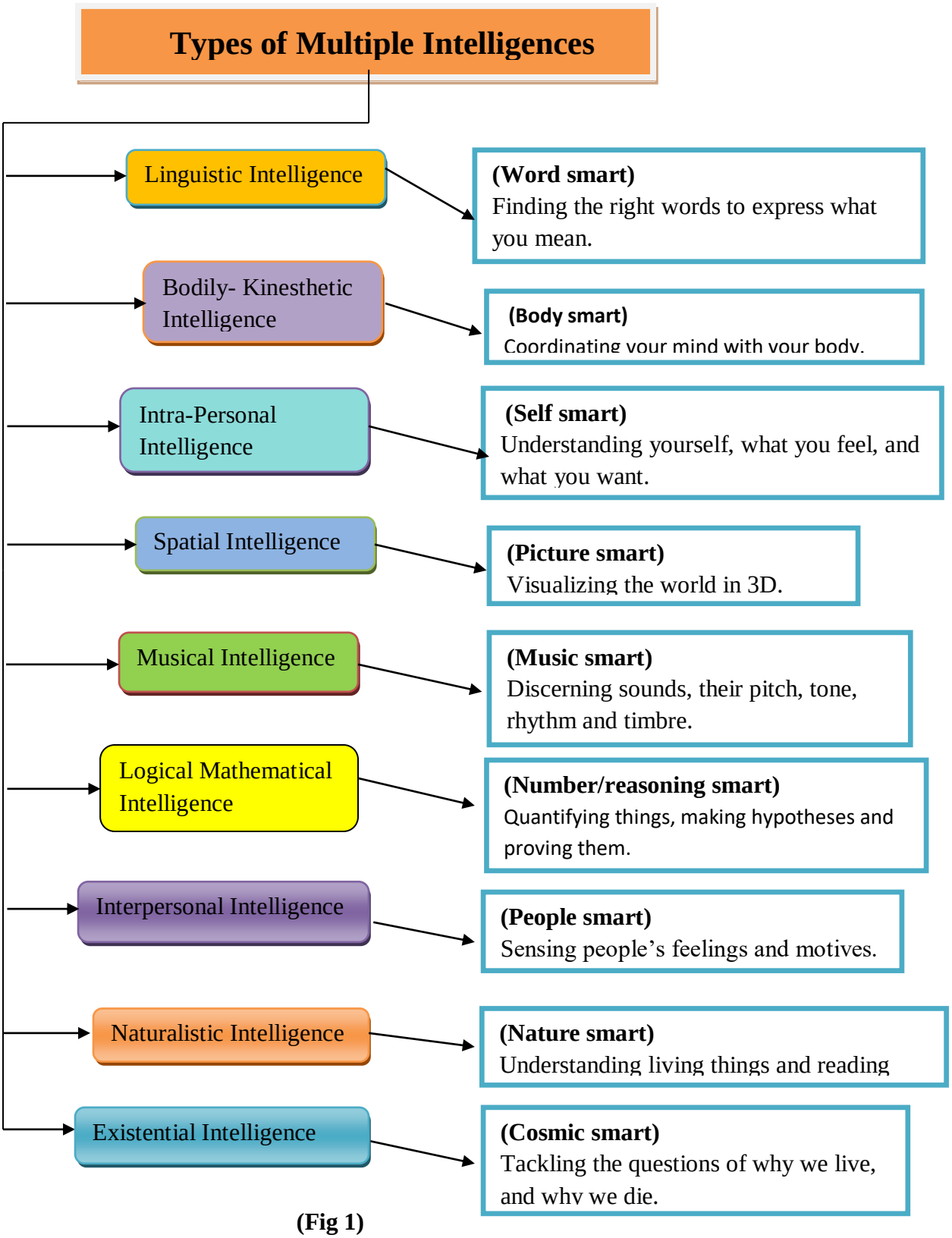
The Theory of Multiple Intelligences is an idea proposed by Howard Gardner and it is assessed on the basis of nine dimensions. Gardner initially formulated a list of seven intelligence. In addition, he revised the theory by adding naturalist intelligence as the eighth. Moreover, he has also considered inclusion of existential intelligence as the ninth intelligence in his theory (Slavin, 2009).

The first two have been typically valued in schools; the next three are usually associated with the arts. The next two are what Gardner called 'personal intelligence'. While the newly added final two are related to aesthetics and philosophical views of life (Gardner 1999).

He proposes that the variant of intelligence relies on personal context, as well as biological and psychological potentials based on the interaction of individual genetics, life experience and cultural circumstances (Gardner, 2003).

For those who are interested in self-learning and impart 'Accelerated Learning Techniques' to make their children to grow as holistic adults, it would be of help to understand different types of **Gardner's 'Multiple Intelligence Theory'**. However, by way of a general note, it may be relevant to mention that no value judgments as happiness or sadness could be attached to Intelligences, as they are emotionally neutral.

For many years, intelligence has been equated with the ability to carry out abstract logical reasoning. The controversial discussion about intelligence as a singular or general factor or a number of favors led to the recognition of the idea that Theoretical Overview 23 for certain purposes it will be more helpful to distinguish different forms of intelligence.


Types of Multiple Intelligences
Linguistic Intelligence
(Word smart)
Finding the right words to express what you mean.
Bodily- Kinesthetic Intelligence
(Body smart)
Coordinating your mind with your body.
Intra-Personal Intelligence
(Self smart)
Understanding yourself, what you feel, and what you want.
Spatial Intelligence
(Picture smart)
Visualizing the world in 3D.
Musical Intelligence
(Music smart)
Discerning sounds, their pitch, tone, rhythm and timbre.
Logical Mathematical Intelligence
(Number/reasoning smart)
Quantifying things, making hypotheses and proving them.
Interpersonal Intelligence
(People smart)
Sensing people's feelings and motives.
Naturalistic Intelligence
(Nature smart)
Understanding living things and reading
Existential Intelligence
(Cosmic smart)
Tackling the questions of why we live, and why we die.

(Fig 1)

3. Academic performance of school going students

Good (1959) defines Academic performance as the knowledge attained or skill developed in the school subjects, usually designated by test scores or marks assigned by the teachers. According to Christian (1980) the word performance generally indicates the learning outcome of the students.

Academic achievement or **academic performance** is the extent to which a student, teacher or institution has attained their short or long-term educational goals. Completion of educational benchmarks such as secondary school diplomas and bachelor's degrees represent academic achievement.

Academic achievement is commonly measured through examinations or continuous assessments but there is no general agreement on how it is best evaluated or which aspects are most important procedural knowledge such as skills or declarative knowledge such as facts. Furthermore, there are inconclusive results over which individual factors successfully predict academic performance, elements such as test anxiety, environment, motivation, and emotions require consideration when developing models of school achievement. Now, schools are receiving money based on its student's academic achievements. A school with more academic achievements would receive more money than a school with fewer achievements.

Nguyen (2000) conducted "a study of the differential effect of a Multiple Intelligences based curriculum on student performance. Study results shows that there is no difference between multiple intelligences curriculum and traditional system."

Goodnough (2001) postulated that "as a pedagogical organizer, multiple intelligences helps educators consider and reflect on their curriculum and teaching styles as well as their beliefs about learners. Multiple intelligences also help educators structure engaging learning experiences that are accessible to every learner. Also multiple intelligences can promote positive teacher learning that transforms into improved student learning."

Ruggieri (2002) showed a reflection on Multiple Intelligences and transcendentalism .Many students hate math and love other subjects. Most people can be excelling in every subject due to scarcity of variety in capturing meaningful connections and method of instruction. The investigator suggest that Multiple Intelligence theory provides provisions to the educator and

students to enrich their knowledge through meaning full connections through comics, music, social commitment, free reading and multiple intelligences.

Akbas (2004) made a study called "The Effects of Multiple Intelligences Based Instruction on Six Graders' Science Achievement and Attitudes toward Science". His study was an experimental type study conducted in the 2nd term of 2002-2003 educational years with six grade students of METU Ankara College Primary School and lasted for three weeks. He used science achievement test and science attitude scale. At the end of the study, he justified the idea that the multiple intelligences based instruction was more effective than the traditional instruction. However, the statistical analysis indicated no significant result about students' attitudes toward science.

Gogebakan, (2003) studied about "How students' multiple intelligences differ in term of grade level and gender'. The purpose of the study was to investigate the students' multiple intelligences according to their preferences and how students' multiple intelligences differ in terms of grade level (first, third fifth and eighth) and gender. Results showed that students multiple intelligences showed variety according to their grade levels. For example, the students at the first grade level demonstrated strong preference for linguistic intelligence and logical-mathematical intelligence in the first grade and the two intelligences were followed by spatial intelligence, and bodily kinesthetic intelligence. While the third grade students' most dominant intelligences preferences were interpersonal, spatial, logical-mathematical, and linguistic intelligence the fifth and eighth grade students' preferences were interpersonal intelligence bodily-kinesthetic intelligence, musical intelligence, and spatial intelligence. When results are examined in terms of gender, it can be said that the male students' logical-mathematical and bodily kinesthetic intelligence were higher than female students' whereas the female students' musical intelligence was higher than male students."

Bagchi (2004) conducted a study on "Scholastics achievement in life science in relation to cognitive style social disadvantages and interest of secondary students in Tripura". The major objectives of the study were to find out gender differences, if any, on all the variables under consideration and to determine the relationship between scores of the students on cognitive style, social disadvantages, interest and their scholastic achievement in life sciences. The sample consisted of 689 students (358 boys and 331 girls) of class X studying in schools affiliated to Tripura Board of Secondary Education. The major findings were:

i) boys significantly differed from girls on the variables like life science interest on medical matters, interest on technical matters and interest on crafts, and

ii) no difference was observed between boys and girls in the areas of cognitive style

iii) Social disadvantages and different measures of interest on fine arts, literacy scientific, agriculture, outdoor sports and household activities and

iv) Boys were found to be significantly more proficient in the subject of life science.

Davis (2004) examined "the effect of Multiple Intelligences learning on student achievement .Students test scores increased an average of 66.25% to 82.25%."

Benette (2004) conducted "a study on the effectiveness and suitability of the strategies involving Multiple Intelligences on the achievement in Physics. It is found that these strategies are more effective than traditional way."

Diaz-Lefebvre (2004) studied about 2400 students who were studied in Multiple Intelligences class. It was found that student's achievement increased through this method.

Hoerr (2004) suggests that "Multiple Intelligences -based curriculum helps students solve practical 'real-life' problems, perform high on standardized tests, and strive toward excellence. New City School graduates who enjoy learning, are leaders in their community, and seek extra rigorous coursework. New City School is recognized worldwide as a 'model school' and welcomes 700 visiting educators every year. Multiple intelligences have the potential to empower students to become motivated, successful learners. There are many positive manifestations of multiple intelligences -based curriculum including improved behavior, increased student confidence, intrinsic motivation, engagement, and performance on standardized tests".

Thomas et.al (2005) conducted a study on the relation between learning styles and multiple intelligence, among the student's of 9^{th} standard. The result showed that there is an association between learning styles and multiple intelligence among the students.

Bindu Gowri (2005) conducted a study on the title "Impact of learning environment on academic achievement of higher secondary students." The study focuses on the relationship between to achievement of higher secondary students and their perceived learning environment and dimensions. In this study, survey method was adopted, research tools such as learning environment scale prepared and validated by the investigator and the marks abstained in the find examination in standard XI for the academic achievement were used to collect data. A sample of

250 students were selected using random sampling method, the major findings are there was no correlation between the achievement of higher secondary students and their learning environment and its dimension in terms of group study, age, boy's school, urban located schools, English medium students, watching educational programme in TV reading newspaper sometimes whereas there is significant relationship exists in teams of participation in co-curricular activities, Malayalam medium, daily newspaper readers, co-education school, girls school

Manivannan (2006) conducted a study on "Cognitive strategies and academic achievement of students at secondary level". The major objectives of the study were: i) to study the level of cognitive strategies and quality of academic achievement of students in secondary level, ii) to study the impact of gender on cognitive strategies and academic achievement of students, iii) to investigate the relationship between the cognitive strategies and the academic achievement of students. The sample was selected from 12 high schools in Erode district, Tamil Nadu of 320 students, 160 were male and 160 were female. Sample was selected using random sampling procedure. The tools used were student's cognitive strategies scale and academic achievement scores. The major findings were: i) there was no significant difference between the scores of students in 'cognitive strategies' on the basis of gender, ii) the result revealed that the girls had higher attitude scores than the boys with regard to cognitive strategies, iii) the girl students had higher attitude scores than boys with regard to academic achievement, iv) there was no significant relationship between the scores of male and female students in cognitive strategies and v) there was no significant relationship between the scores of male and female students in academic achievement.

Kumbar Rashmi (2006) in their study "Application of Howard Gardener's multiple intelligence theory for the effective use of library resources by K-2 students an experimental model". This research involves the children and parents their observation is that the children look forward for the library periods is the school quite enthusiastically. The results show that multiple intelligence theory helps in developing skills to analyses a resource logically and use it effectively to increase the level of success of the students.

Vedapriya (2008) studied about "implementing Differentiated instructions (DI) in third grade math classroom. Based on the conclusions that DI appeared successful for max instruction, the recommendation was extended that educators should more generally implement DI in order to improve student's achievements."

Meenakshi Metha (2009) conducted a study on "Personality needs and academic achievement of senior secondary students"

The major objectives of the study were:

- To find out the relationship between n-achievement and academic achievement.
- To find out the relationship between n-exhibition and academic achievement.
- To find out the relationship between n-autonomy and academic achievement.

The population for this study has been designed as all class XI students of public schools of Ghaziabad city. The investigator selected 50 high achievement students and 70 low achievement students. Thus 120 students were selected out of 1200 students. Meenakshi Personality Inventory (MPI) constructed by Meenakshi Bhatnagar measuring only 10 needs and containing 100 pairs of items was used. The major findings were: The present study had revealed that need achievement, need-dominance, need-nurturance, and need-endurance were positively and significantly related to students to academic achievement while needs-succulence, affiliation, abasement and aggression were significantly, but negatively related to academic achievement.

Al-Qaisy et.al (2011) this study aims to determine the levels and relationships of creativity self-concept and achievement motivation of adolescents. Among a sample of 800 adolescents in the age group of 16-18 years 78 studying in the 10th, 11th and 12th standard in the higher secondary schools of both private and state syllabus in the geographical area of Amman city are selected as a randomized cluster sample of the study from the population. The results indicate that that self-concept and achievement motivation of high creative male and female adolescents is less than the low creative male and female adolescents. Self-concept and achievement motivation of low creative male and female adolescents is less than the average and is greater than the high creative male and female adolescents. Additionally, the results indicate that achievement motivation of the high self-concept of the male and female adolescents is greater than the average self-concept and is greater than the low self-concept. It is also indicate that the achievement motivation of low average and high self-concept of private syllabus and state syllabus adolescents that the achievement motivations of the high self-concept total adolescents is less than the average self-concept and is greater than the low self-concept. And the correlation between the creativity with their physical self, social self, temperament self, educational self, moral self intellectual self and total self-concept, of sub –samples are not significant.

A survey conducted by the National Science Teachers Association (NSTA) (2006), revealed "the top two barriers in student achievement in science

(1) Students are not taught enough science at the early grades

(2) Lack of classroom time dedicated to science instruction (science.nsta.org, 2006). In spite of these barriers and challenges, educators must find avenues to make science instruction and content accessible to every learner".

Ahila (2015) researched on multiple intelligence study involvement and academic achievement of orphan students. Two inferences of the study were that there was significant difference between male and female orphan students in verbal / linguistic and interpersonal intelligences and not in the rest of the six multiple intelligences and that there was no significant difference between the orphan students studying in unisex schools and co-education schools in multiple intelligences.

Jemila (2016) conducted a study on multiple intelligence and achievement of higher secondary students in commerce. Objective of the study was to find relation between multiple intelligences and achievement in commerce population of the study was higher secondary commerce students of Tirunelveli district. 250 samples were collected by stratified random sampling. Tools for the study were multiple intelligence inventory by H. Gardner (1983) reliability (0.80) and achievement test prepared by the investigator and its reliability (0.79). Mean, correlation and ANOVA were the statistics used to analyze the data. Findings of the study indicated that there was a significant relation between multiple intelligence and achievement test.

4. Relationship of Multiple Intelligence and Academic performance relevant studies

At the heart of MI theory is the belief that each individual has a rich and differentiated mind; that no two persons have exactly the same cognitive configuration; and that education is most likely to be successful if it pays attention to these individual differences in the course of fashioning curriculum, pedagogy, and assessment.

The theory of Multiple Intelligence makes its greatest significance to education by encouraging teachers to expand their repertoire of teaching, tools and strategies, breaking free from the traditional linguistic and logical approaches and functions not only as a specific remedy to one-sidedness in teaching but also as an organizational tool that facilitates and complements

existing educational pedagogy and to develop innovative teaching strategies (Ozdemir et al., 2006).

The application of Multiple Intelligences theory does not discourage testing as a primary source of classroom assessment. Instead its primary focus should be to incorporate Intelligences into instructional practices in order to assist students to master difficult concepts. Therefore the testing of those concepts is most appropriate.

Carver, Pricee, and Wilken (2000) tried "to improve the ability of applying knowledge to real-life experiences. They made research on second, sixth and tenth grade students at a school outside the city .They collected data by teacher generated assessments, observations and students responses. Analyzing of these data revealed that students had difficulty in transferring knowledge due to the lack of motivation and the inability to make connections between classroom lessons and real life situations. Researchers reviewed solution strategies and founded three strategies that were multiple intelligences, cooperative-learning and journaling experiences. The study took 15 weeks and these strategies were implemented. At the end of 15 weeks the results showed that students improved their knowledge transfer through the use of multiple intelligences, cooperative-learning experiences and these three strategies improved students' knowledge transfer from classroom to daily life activities".

Batulayan (2001) "Relationships between multiple intelligences and academic achievement of grade six pupils in Northern Luzon Mission. The study explored the relationship of multiple intelligences to the academic achievement of grade six pupils in Northern Luzon Mission. The theory developed by Howard Gardner was the basis of the theoretical concept. Data were obtained from 310 pupils who were enrolled for the Year 2001 – 02 in the 24 church schools operated and supervised under the Northern Luzon Mission. This comprised 61.5% of the total population of 504 pupils in 44 schools. Participants responded to the Multiple Intelligences Questionnaire (MIQ), a self-construct instrument, which was personally administered by the researcher. It contains 70 items with 10 questions each representing the seven intelligences namely: verbal-linguistic, logical-mathematical, bodily-kinesthetic, musical, visual-spatial, intrapersonal and interpersonal. The statistical analyses of the study employed mean, frequency, percentage, multiple regression and chi-square. Major findings in the study led to the following conclusions: The most dominant intelligences of the grade six pupils were logical-mathematical, musical, bodily kinesthetic, and intrapersonal. The academic achievement

level was 84. 09%, this is average in the grading standard of the Mission. The study also found that logical mathematical and intrapersonal intelligences were related to the academic achievement with a contribution of 9.25%. The other five intelligences, namely: verbal-linguistic, visual-spatial, musical, bodily-kinesthetic, and interpersonal did not have significant relationships to academic achievement. Gender among the grade six pupils does not confine one to a certain specific intelligence. The study found that male and female participants in the study did not have significant correlations in the multiple intelligences".

Mcmahon (2004) studied about "the relationship between multiple Intelligences and reading achievement with the help of Teele Inventory of Multiple Intelligences. The study examines the relationship between Intellectual preference and Reading Achievement. Students with higher scores on Logical-mathematical Intelligence were more likely to demonstrate at above grade level reading comprehension scores compared to students who scored lower on logical Mathematical Intelligence."

Hickey (2004) reported "increased student achievement in history, geography, literature and music. Multiple intelligences -based units were developed and implemented in various classrooms by teachers enrolled in a multiple intelligences graduate course. The five case studies revealed an increase in student engagement and participation among others. In a music unit, students were more actively engaged, remembered information for longer periods of time, and utilized higher level thinking skills to make connections between different musical eras and artists."

Bauerlein (2005) reviewed the theory of Multiple Intelligence and said that "this theory has had an enormous influence on educational thinking and practice throughout the world. Educators know that individuals have different intelligence strengths and profiles .But multiple intelligence is another thing. All of we are in favor of different talents which independent mental aptitudes."

Onika (2008) studied the effect of the multiple intelligences teaching strategy on the academic achievement. The results suggested that "performance on a post mathematics assessment for students exposed to multiple intelligences showed considerable increase when compared to those using direct instruction."

Bhujbal (2010) studied the effectiveness of team teaching based on MI. The research was carried out among standard8thstudents for the subject Marathi. Results of the study showed that the study was found to be effective.

Baran et.al (2011) Investigating "Multiple Intelligence Fields of 11thGrade Students with Respect to Some Variables and Physics Achievement. The aim of this study was to investigate the relationship between students' multiple intelligence fields and some variables the relationship between intelligence fields and students' physics achievement. The study was carried out with students 327 attended to high school. In the study data was collected through Multiple Intelligences Scale, physics achievement scores and personal information questionnaire." The findings of the study demonstrated that "among the study-group students, the mean scores of those attending the Science High School were higher in such sub dimensions of intelligence as intrapersonal intelligence, visual-spatial intelligence and mathematical-logical intelligence than those of the other students attending the other three types of high schools. The comparisons with respect to the school types revealed that there were significant differences between the Science High School and the Vocational High School in favor of the former and between the Vocational High School and General High School."

Beichner (2011) studied relationship between multiple intelligences and students' academic self-efficacy. A higher Self-efficacy was reported for students in classrooms where teachers used two of their 3 dominant multiple intelligence than the other two groups: classrooms where the teacher used one of their three dominant multiple intelligence and the group in which none of students' dominant multiple intelligence were emphasized.

Gangadevi and Ravi (2014) conducted a study on Multiple Intelligence based curriculum to enhance inclusive education to bring out human potential. In this article the authors suggest that multiple intelligences based common school curriculum allows a wider range of students to successfully participate in mainstream classroom learning and thus enhancing inclusive education at school level.

Kaur (2014) aimed to investigate the gender differences in the multiple intelligences among adolescents with respect to grade levels. For the study 200 respondents from Amritsar city of Punjab state were selected. The result of the investigation revealed that majority of the respondents were found to be having average levels of intelligence for all the eight components of Gardner's multiple intelligences. The investigation revealed that boys of eighth grade rated

themselves higher on Visual-spatial Intelligence when compared to girls of the same grade. In ninth grade significant gender differences were observed for Musical, Logical-Math, Bodily-Kinesthetic and Naturalist intelligences. It was found that in Ninth grade girls excelled boys whereas boys excelled girls in the eighth grade.

Alex (2014) analyzed the relationship between the components of multiple intelligences and science interest scores. It was found that there was a significant visual-spatial, naturalistic and intrapersonal intelligence with Science interest. The other components of intelligence were not significantly correlated with Science interest.

Taheri and Zarei (2015) investigated the different types of intelligences as predictors of self-efficacy for self-regulated learning. The sample of the study included participants of 148 male and female Iranian B.A. students. Data were analysed using through multiple regression analyses. The results of the study indicated that spatial/visual intelligence made a significant contribution to predicting self-efficacy for self-regulated learning.

Davoudi and Milad (2016) aimed to investigate the relationship between listening self-efficacy and multiple intelligences of Iranian EFL learners. Initially, ninety intermediate male learners were selected randomly from among 20 intermediate classes. In order to assure the homogeneity of the participants in terms of overall language proficiency, PET was administered to the learners. Afterwards, based on the standard deviation and mean, 60 participants were chosen from among the original ninety learners. Following that, the learners were asked to complete the listening self-efficacy and multiple intelligences questionnaires. The results of statistical analysis indicated that there was a significant relationship between total multiple intelligence scores and the Listening self-efficacy of the learners. Moreover, all of the intelligence types, except kinesthetic intelligence as well as verbal and visual intelligence were significantly related to Listening self-efficacy. Additionally, it was found that interpersonal intelligence uniquely explained 5.4 percent of the variance in Listening self-efficacy scores and is thus the best predictor of listening self-efficacy scores.

5. What is the Evaluation of Multiple Intelligences?

Evaluation is the process of determining the value of something or the extent to which goals are being achieved. It is a process of making a decision or reading a conclusion.

An evaluation should be as systematic and impartial as possible (UNEG, 2005). An evaluation is methodical, providing information that is credible, reliable, and useful to enable the incorporation of lessons learned into decision-making process of users and funders (OECD, 2010).

It may aim to identify what works, for whom, in what respects, to what extent, in what contexts, and how (Pawson and Tilley, 2004).

Evaluation can focus on any kind of initiative such as programs, projects, sub-programs, sub-projects, and/or their components or elements (Yarbrough et al, 2011; Scriven, 2003).

Multiple Intelligences is a theory developed by Dr. Howard Gardner in 1983 to propose that our potential is not limited by just intelligence but in fact shaped by nine different intelligences. Understanding what those intelligences allow educators to recognize these strengths in children and thus be able to encourage certain natural skills in those children.

Multiple Intelligences (MI) helps to evaluate the brain processes of individuals. Identifying the types of multiple intelligences can help teachers to understand their students better. Several studies have identified MI in school children.

MI-based teaching recognizes that each student has all these types of intelligence but they are not always developed well or effectively, and individuals differ in the strengths of these. Therefore, the purpose of the assessment of MI is to know the intellectual capabilities of the students in the context of practice activities in the classroom, with appealing material, without time constraints, and giving children the freedom to manipulate this material.

Generally, MI theory has been used as a way to explore and compare the different types of intelligence among students as a tool to help students with deficient school achievement and to contrast the benefits of MI theory and general intelligence (g) theory (Almeida 2010)

Ruiz (2004) elaborated the mind scale of multiple intelligences. It consisted of 72 questions looking for responses on a seven-point Likert scale that ranges from totally disagree (1) to totally agree (7). It evaluated the nine multiple intelligences classified by Gardner: Logical-Mathematical Intelligence, Linguistic Intelligence, Bodily-Kinesthetic Intelligence, Musical Intelligence, Spatial Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence, Naturalistic Intelligence, and existentialistic intelligence. The score is achieved with the sum of the items that correspond to each of the types of intelligence; higher scores mean there is a higher presence of the various types of intelligence. The scale has obtained good internal consistency with a Cronbach alpha of 0.88 compared to 0.94 in previous studies. In this study, Cronbach's alpha was 0.92.

Carver, Pricee et.al (2000) tried "to improve the ability of applying knowledge to real-life experiences. They made research on second, sixth and tenth grade students at a school outside the city .They collected data by teacher generated assessments, observations and students responses. Analyzing of these data revealed that students had difficulty in transferring knowledge due to the lack of motivation and the inability to make connections between classroom lessons and real life situations. Researchers reviewed solution strategies and founded three strategies that were multiple intelligences, cooperative-learning and journaling experiences. The study took 15 weeks and these strategies were implemented. At the end of 15 weeks the results showed that students improved their knowledge transfer through the use of multiple intelligences, cooperative-learning experiences and these three strategies improved students' knowledge transfer from classroom to daily life activities".

Holliday (2000) examined "the responsibilities of teachers in understanding the students learning process for identifying students learning styles and Multiple Intelligences."

Hennigan (2000) conducted a study on "educational implications of computers for learning interacting with Multiple Intelligences. This study gave clear correlation developments in the field of brain studies, education and personal computing."

Muehlbaner (2000) conducted the effect of an art infused Multiple Intelligences program in mathematical achievement. The result shows that there was no satisfactorily significant effect of the arts-infused, Multiple Intelligences program on student's mathematical achievement.

Gulap Shahzada (2013) The main objective of the study was " to find out the relationship between mother's education and students' multiple intelligences.. A significant correlation was found between mother's education and students' verbal/linguistic, logical/mathematical and musical intelligence. An insignificant correlation was found between mother's education and students' visual/spatial, bodily/kinesthetic, interpersonal, intrapersonal intelligence."

Prakash Alex (2013) studied the topic "Interrelationship among multiple Intelligences and Science Interest: An analytic study on students at primary level." The components of Multiple Intelligences like Logical –Mathematical Intelligence, Spatial Intelligence Naturalisic Intelligences and intrapersonal Intelligences have significant correlation with Science Interest at upper primary level.

Pearson (2015) studied about a Multiple Intelligence Approach to counseling: Enhancing Alliances with a Focus on strength. The study investigated the experience of eight councilors as a result of the introduction of multiple intelligence theory and activities into therapy with adult clients.

METHODOLOGY

III. METHODOLOGY

Methodology is the science of methods or principles of procedure. The success of any research depends largely up on the availability of the data and the suitability of the method.

Research methodology not only provides the knowledge of various types of methods and techniques for sampling, data collection, data analysis but also guides that which particular method or technique for sampling, data collection and data analysis should be used. In the words of Mertens (2010), research methodology is a scientific inquiry that is designed to collect, analyze and use data to understand, describe, predict or control an educational phenomena or to empower individuals in such contexts. A suitable method helps the researcher to explore the diverse stands of the study and adequately measures them so as to satisfy the requirements.

The present study was intended to find out the **'Multiple Intelligence and Academic Performance of Secondary School Students.'** The details of methodology adopted for the study are described under the following major heads.

A. Selection of the area
B. Selection of the sample
C. Selection of the tool
D. Conduct of the study
E. Analysis of data

A. SELECTION OF THE AREA

Coimbatore is the second largest city of Tamil Nadu. It is one of the very important educational Cities in south India. The reasons for selecting this place as an area of study were easily approachable, accessible and also have various types of schools located in the area. The investigator confined the study under Coimbatore due to its easy accessibility in which the investigator selected various schools under the city.

B. SELECTION OF THE SAMPLE

Burns and Grove (2003) refer to sampling as a process of selecting a group of people, events or behavior with which to conduct a study.

A population is any group of individuals that have one or more characteristics in common that are of interest to the researcher, whereas sample is a small proportion of a population selected for observation and analysis. The “goodness” of sample determines the meaningfulness and generalizations of the results (Gay and Airasian, 2000).

The dependability of any study is determined to a great extent by the selection of the sample. Of the various techniques, online sampling method is found to be the best suited for the present study. In the present study the population comprises students of Secondary Schools in Coimbatore following Coimbatore State syllabus. Students age ranges from 14-17 were identified as sample of the study.

The sample for the study consists of 200 Secondary School Students of standard VIII-X from various schools. The investigator approached more than ten schools under Coimbatore and was granted permission and collected samples from nine schools.

C. SELECTION OF THE TOOL

The success of a research study depends mostly on the nature of the tools and techniques used. Different types of tools are used for collecting various information’s for different purposes. The tool used determines the quality and quantity of the data. "The use of the particular tool depends upon the type of the problem and each research tool is appropriate in a given situation to accomplish a particular purpose" (Best and Khan, 2006). By keeping different objectives of the study the Investigator decided to use the following tools for the present study.

i.General profile of secondary school students

According to Kothari (2009), questionnaire consists of a number of question printed or typed in a definite order on a form or set of forms. The investigator constructed a simple questionnaire to elicit the background information of the samples which consists of age, gender, religion, community, family type, father’s education, mother’s education, father’s occupation, mother’s occupation and area of residence.

ii. Multiple Intelligence scale

The research is to investigate the multiple intelligences among selected samples; the researcher uses a modified version of multiple intelligence scale by Surbhi Agarwal, Dr. Suraksha Palinventory. The scale used 5 points alternative likert scale from positive to negative, viz., always, mostly, often, rarely and never. The multiple intelligence scale consists of 90 items, 9 dimensions and 10 items in each dimension. Out of 90, 60 items were positively worded and 30 were negative.

Items 1, 4, 7, 11, 14, 17, 21, 24, 27, 28, 31, 34, 38, 41, 44, 48, 51, 54, 55, 58, 61, 65, 68, 71, 75, 78, 81, 82, 85, 88 will be negative in nature wise and items 2, 3, 5, 6, 8, 9, 10, 12, 13, 15, 16, 18, 19, 20, 22, 23, 25, 26, 29, 30, 32, 33, 35, 36, 37, 39, 40, 42, 43, 45, 46, 47, 49, 50, 52, 53, 56, 57, 59, 60, 62, 63, 64, 66, 67, 69, 70, 72, 73, 74, 76, 77, 79, 80, 83, 84, 86, 87, 89, 90 are positive in nature wise.

iii. Academic Performance scale

To check the academic performance of the selected samples, the researcher used the Academic performance scale, the grading of the marks obtained in each subjects are evaluated as fair (less than 35), good (36-65), very good (66-80), excellent (81-90) and outstanding (above 91) and the scoring was evaluated 1 to 5, the higher the marks the higher the scoring. As the students were denying giving their progress report the investigator collected only the marks obtained from the particular subjects.

D. CONDUCT OF THE STUDY

Rapport Building

Rapport building was an important endeavor of the present study since it is seen as a degree of acceptance and cooperation on the part of the participation to the research project (Blohm, 2007). Therefore, efforts were made to establish a good rapport with the concern authority of the participant school. Investigator approached the head of the department through phone and discussed about the study in brief, its significance and details regarding its conduct. Investigator conveyed how important it is for the students to know their multiple Intelligence in the current scenario. As it is a pandemic period the investigator wasn't allowed to meet the

students physically but through online. Permission was sought to conduct the study from the school authority. Consent voluntary participation from each school provides 59 students for the present study. Further, establishing rapport with the potential respondents is always been a prerequisites for data collection of any study. The investigator put efforts to build up a good rapport with the selected respondents and oriented about the study through the respective class tutor.

i. COLLECTION OF DATA

Data collection is the most and crucial aspect of any research. The data for this research study was collected through Google form using the selected tools from the selected respondents in the single phase. Before collecting the data, investigator oriented the study in brief about the type of the information that is being acquired and its purpose, how they were expected to carry out and potential benefits from the study in a paragraph before starting the assessment. Enough instructions were given on top before filling the questions to the respondents about how to fill in the general profile of the student, multiple intelligence scale, that is the primary data and collected academic performance scale, which is the secondary data.

The investigator collected required information from 59 samples from each school in the allotted time and the total samples collected were 236. The specific data on their background information, multiple intelligence and academic performance were collected subsequently. Before answering the questions, the respondents were requested to read carefully and understand the questions and respond accordingly. They were requested to be honest with their answers. Out of the 236 collected forms, only 228 were found to be fully filled, so the rest 8 were discarded due to incomplete information.

E. ANALYSIS OF DATA

Data analysis is considered to be important step in research work. Analysis is a process enters into research in one form or the other, from the very beginning in the selection of the problem, in the determination of methods and in interpreting and drawing conclusions from data gathered. Analysis of data means studying the organized material in order to discover inherent facts.

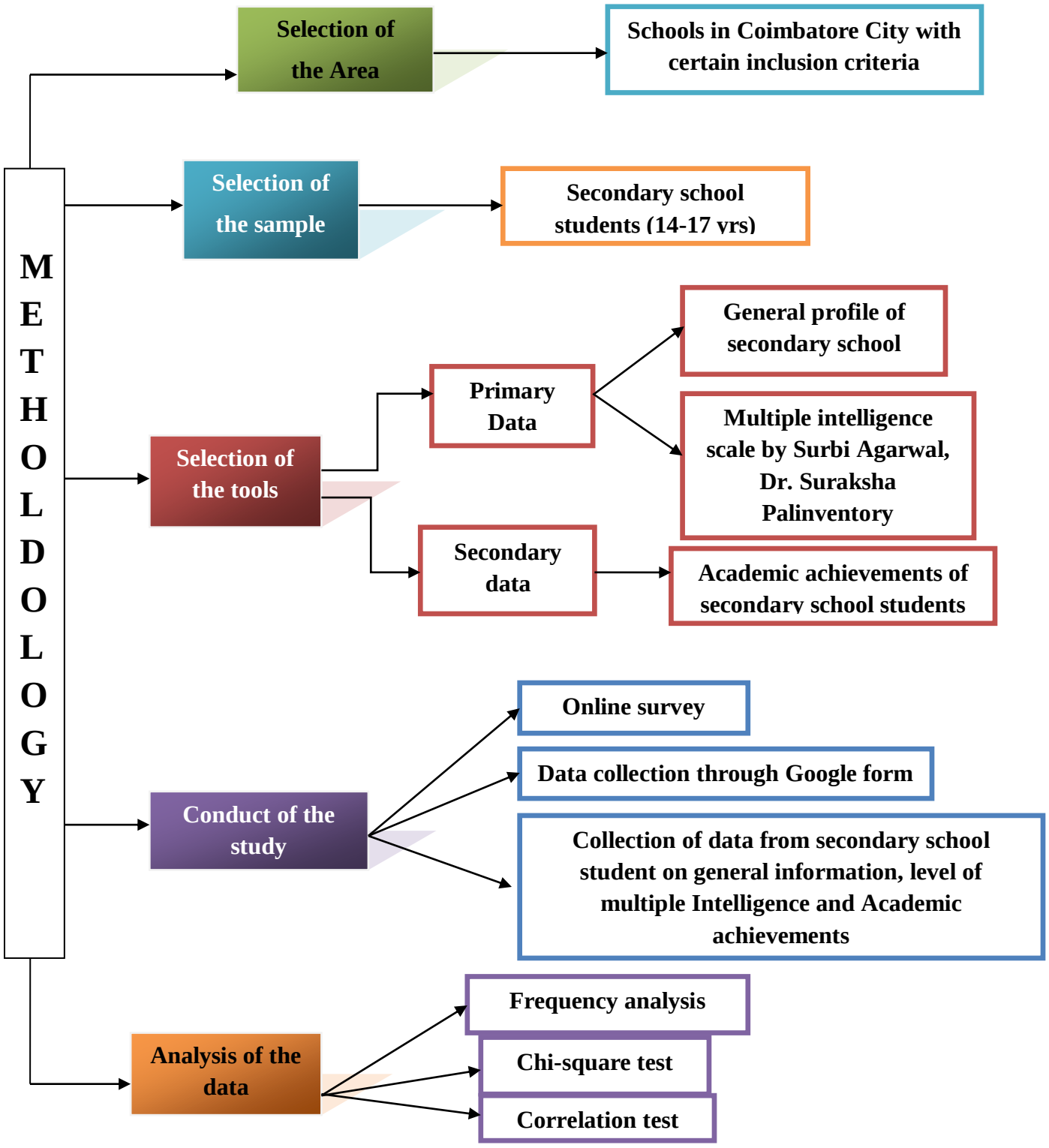
The collected information was consolidated, coded, score and tabulated accordingly providing a raw data which were made ready to be analyzed. The raw data which were entered into the MS excel were imported into SPSS software and analyzed statistically to yield the desired results. Frequency analysis, Chi square test and Standard Deviation were used to analyze the relationship between multiple intelligence and academic performance of secondary school students.

Frequency analysis is used to predict how often certain values of a variable phenomenon may occur and to assess the reliability of the prediction.

A chi-square test is a statistical test used to compare observed results with expected results. The purpose of this test is to determine if a difference between observed data and expected data is due to chance, or if it is due to a relationship between the variables you are studying.

Standard deviation is usually easier to picture and apply. The standard deviation is expressed in the same unit of measurement as the case with the variance.

METHODOLOGY AT A GLANCE



(Fig 2)

RESULT AND DISCUSSION

IV. RESULTS AND DISCUSSION

The chapter presents the finding of the study on **"Multiple Intelligence (MI) and Academic Performance of Secondary school students"**. The analyzed data and corresponding discussions were thrashed out under the subsequent headings.

A. General profile of the selected respondents.

i. Personal information of the selected respondents

ii. Personal profile of the selected respondents parent's

B. Level of Multiple Intelligences.

C. Level Academic Performances.

D. Association between Multiple Intelligence and Academic Performance of Secondary school students.

i. Association between Multiple Intelligence and Academic Performance based on language Tamil

ii. Association between Multiple Intelligence and Academic Performance based on English subject

iii. Association between Multiple Intelligence and Academic Performance based on Mathematics

iv. Association between Multiple Intelligence and Academic Performance based on Science

v. Association between Multiple Intelligence and Academic Performance based on Social Science

E. Correlation between Multiple intelligence and Academic Performance.

A. General profile of the selected respondents.

Collecting and analyzing the background information of the selected respondents is an important task in every research. General information of the respondents comprises of their age, gender, course studying, area of residence, family type, their parent's educational and occupational status which is categorized and findings were discussed under the following subheads.

TABLE I

PERSONAL INFORMATION OF THE SELECTED RESPONDENTS

Variables	Category	Frequency (N=228)	Percentage
Age	**14**	36	15.8
	15	70	30.7
	16	45	19.7
	17	77	33.8
Gender	**Male**	129	56.6
	Female	99	43.4
Class	**8**	25	11.0
	9	38	16.7
	10	165	72.4
Area of residence	**Rural**	125	54.8
	Urban	103	45.2
Type of the family	**Joint family**	107	46.9
	Nuclear family	107	46.9
	Single family	14	6.1

Table I represents the personal information of the respondents including age, gender, class, area of residence and family type.

As you can see the above table, The majority respondents(33.8%) were in 17 years ,followed by 30.7% were in 15 year category, 19.7 % of them were in 16 years 33.8% were 17 year old remaining 15.8% of them were comes under 14 years.

Inspections of the gender differences, more than of the (56.6%) were male respondents and 43.3% were female. The majority respondents were male compared to other counterparts. Tracing the area of residency of the selected respondents, 54.8% were residence of rural area and remaining 45.2% resides in urban area. The majority respondents come from rural area.

Glancing to the given data, the majority of the respondents were in(46.9%) belong to both joint and nuclear family whereas only 14 respondents were from single family.

TABLE II

PERSONAL INFORMATION OF THE RESPONDENT'S PARENT'S

VARIABLE	PARTICULAR	N=228	%
Father's education	**Post graduate**	34	14.9
	Graduate	62	27.2
	High school	39	17.1
	Higher secondary	40	17.5
	primary	34	14.9
	Illiterate	19	8.3
Father's occupation	**Businessman**	82	36.0
	Government employee	61	26.8
	Labour	2	0.9
	Non-government employee	82	36.0
	Unemployment	1	0.4
Mother's education	**Post graduate**	30	13.2
	Graduate	46	20.2
	High school	37	16.2
	Higher secondary	51	22.4
	primary	36	15.8
	Illiterate	28	12.3
Mother's occupation	**Business**	15	6.6
	Government employee	31	13.6
	Labour	1	0.4
	Housewife	142	62.3
	Non-government employee	39	17.1

Following table II represents the respondent's parent's Education and occupational status. Education is one of the most important characteristics that might affect the person's attitudes and the way of looking and understanding any particular social phenomena.

Looking at the data of educational qualification of the selected respondents parents, the largest numbers of fathers (27.2%) have completed Graduate level followed by higher secondary level of education (17.5%) and (17.1%) of respondents father were found to have high school level of education. The remaining (14.9%) of them studied up to post-graduate and primary level and (8.3%) fathers comes under illiterate level. Glancing to the data of occupational status among selected respondent's parents, it is clear that a larger number of fathers were businessman and non-government employee accounting (36.0%), (26.8%) working as government employee and (9%) as labour and remaining (4%) unemployment.

Looking at mother's education the largest numbers of mothers (22.4%) have completed high secondary level of education followed by graduate level of education (20.2%). Mother those who were High school level (16.2%), Primary (15.8%), post graduate (13.2%) and (12.3%) were illiterate. Accounting mothers occupation, the majority were housewife (62.3%), whereas (17.1%) are non government employee and (13.6%) working as government employee and (6.6%) into business and (4%) working as labour.

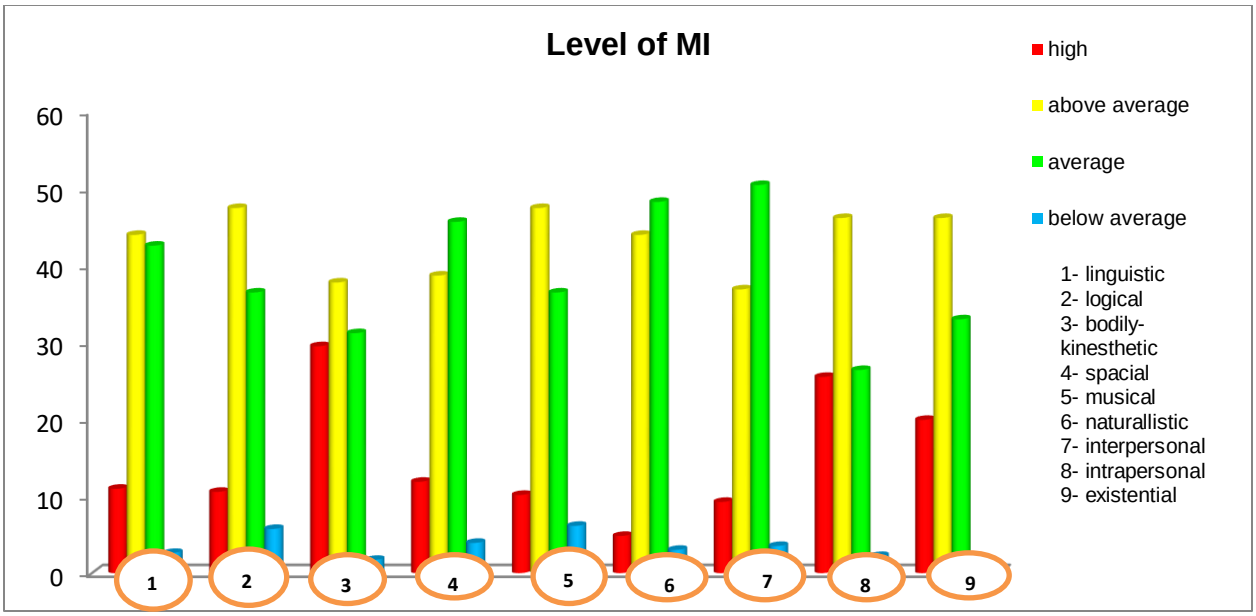
B. Level of Multiple Intelligences.

The below table III depicts the level of Multiple Intelligence among Secondary school Students.

TABLE III

LEVEL OF MULTIPLE INTELLIGENCES

Dimension	LEVEL OF MULTIPLE INTELLIGENCE											
	EXTREMELY HIGH		HIGH		ABOVE AVERAGE		AVERAGE		BELOW AVERAGE		LOW	
	N	%	N	%	N	%	N	%	N	%	N	%
Linguistic	1	.4	24	10.5	100	43.9	97	42.5	6	2.6	0	0
Logical	1	.4	23	10.1	108	47.4	83	36.4	13	5.7	0	0
Bodily-kinesthetic	4	1.8	63	27.6	86	37.7	71	31.1	3	1.3	1	.4
Spatial	1	.4	26	11.4	88	38.6	104	45.6	8	3.5	1	.4
Musical	0	0	23	10.1	108	47.4	83	36.4	14	6.1	0	0
Naturalistic	1	.4	10	4.4	100	43.9	110	48.2	6	2.6	1	.4
Interpersonal	3	1.3	18	7.9	84	36.8	115	50.4	8	3.5	0	0
Intrapersonal	3	1.3	55	24.1	105	46.1	60	26.3	5	2.2	0	0
Existential	2	.9	43	18.9	105	46.1	75	32.9	3	1.3	0	0



(Fig 3)

The above data accounts that the highest respondents comes 'above average' category 47.4% in both logical and musical intelligence, followed by intrapersonal and existential with 46.1%, linguistic and naturalistic with 43.9%, spatial with 38.6%, bodily-kinesthetic with 37.7% and interpersonal with 36.8%.

Looking at the 'high level 'data, the majority respondents comes under bodily-kinesthetic with 67 respondents followed by intrapersonal with 58 respondents, existential with 45, spatial with 27 respondents, linguistic with 25 respondents, logical with 24 respondents, musical with 23 respondents, interpersonal with 21 respondents and naturalistic with 11 respondents. The least respondents count under low level with 1 respondent under bodily-kinesthetic, spatial and naturalistic

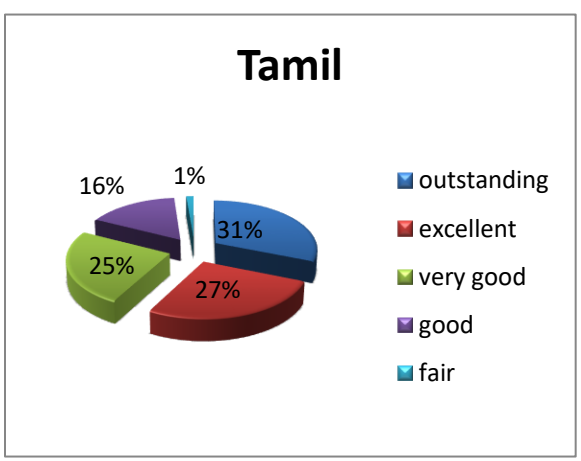
From the average and the majority comes under Interpersonal with 123 respondents, followed by 116 respondents under naturalistic, 112 respondents under spatial, 103 respondents under linguistic, 97 respondents under musical, 96 respondents under logical, 78 respondents under existential, 74 respondents under bodily-kinesthetic and 65 respondents under intrapersonal intelligence.

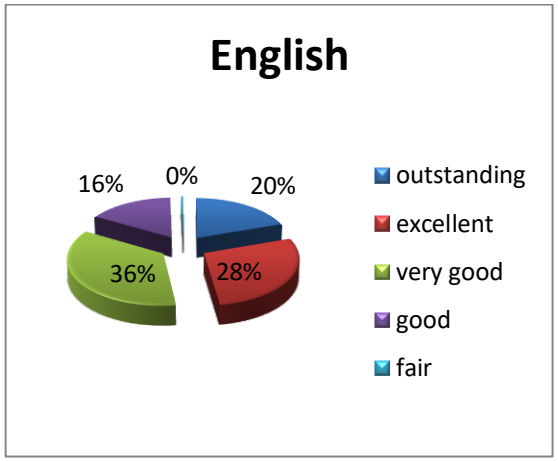
C. Academic Performance of Secondary School Students.

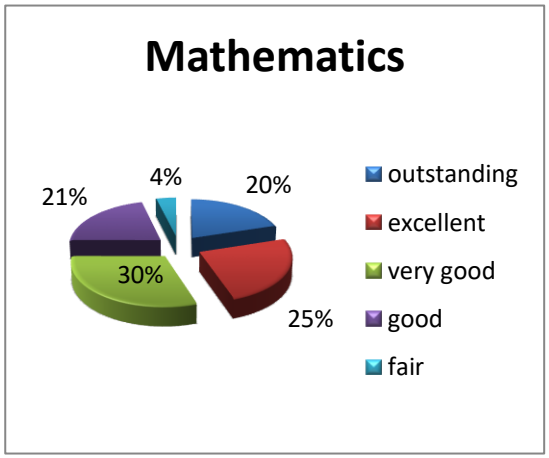
The below table IV depicts the academic performance of secondary students in Tamil, English, Mathematics, Science and Social Science.

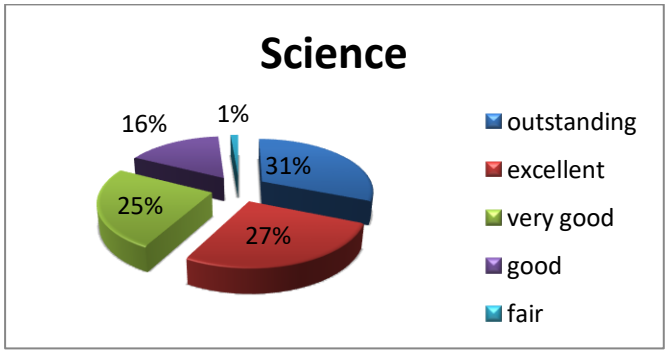
TABLE IV
LEVEL OF ACADEMIC PERFORMANCE

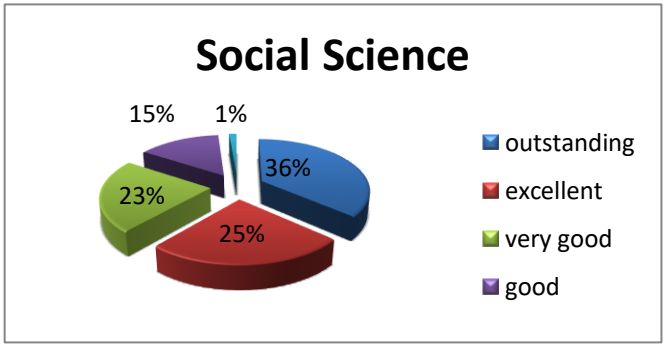
Subjects	O(Outstanding)		A (Excellent)		A^1 (Very good)		B(Good)		C(fair)	
	N	%	N	%	N	%	N	%	N	%
Tamil	71	31.1	61	26.8	56	24.6	37	16.2	3	1.3
English	45	19.7	64	28.1	81	35.5	37	16.2	1	0.4
Mathematics	46	20.2	56	24.6	69	30.3	48	21.1	9	3.9
Science	71	31.1	61	26.8	56	24.6	37	16.2	3	1.3
Social science	83	36.4	57	25.0	52	22.8	33	14.5	3	1.3


Tamil
16%
1%
31%
25%
27%
outstanding
excellent
very good
good
fair


English
16%
0%
20%
36%
28%
outstanding
excellent
very good
good
fair


Mathematics
21%
4%
20%
30%
25%
outstanding
excellent
very good
good
fair


Science
16%
1%
31%
25%
27%
outstanding
excellent
very good
good
fair


Social Science
15%
1%
36%
23%
25%
outstanding
excellent
very good
good

(Fig 3)

Here is the academic performance of the selected respondents.

In Tamil the highest percentage is (31.1%) of respondents performed outstanding in this subject followed by (26.8%) in excellent, (24.6%) in very good level, (16.2%) in good level and (1.3%) in fair.

In English the majority performed as very good i.e. (35.5%), compared to other subjects, followed by (28.1%) as excellent, (19.7%) as outstanding, (16.2%) as good and (0.4%) as fair.

In mathematics (30.3%) respondents were very good in it, (24.6%) as excellent, (21.1%) under good, (20.2) performed outstanding and (3.9%) as fair performance.

Looking at the above table the highest percentage in science is (31.1%) which counts under outstanding followed by (26.8%) performed excellent in science, (24.6%) as very good, (16.2%) as good and only (1.3%) in fair.

Next is social science, the most majority has performed outstanding by (36.4%) of respondents in it, followed by (25%) respondents under excellent, (22.8%) as very good, (14.5%) as good and (1.3%) of respondents comes under fair performance.

The majority of the respondents are outstanding in each subject, followed by very good, excellent, good and the least respondents comes under fair level.

D. Association between Multiple Intelligence and Academic Performance of Secondary school students.

1.

Multiple Intelligences (MI) when applied to the classroom enable teachers to take note of various abilities and interest that students portray and also allow students to have a better learning connection and retention of the lesson (Mokhtar 2008). The tables below show the association between multiple intelligence and academic performance of the respondents.

The association between multiple intelligence and Tamil portrays the level of linguistic, logical, bodily-kinesthetic, spatial, music, naturalistic, interpersonal, intrapersonal, and existential and performance in Tamil, English, Mathematics, Science and Social Science of the respondents.

TABLE V

ASSOCIATION BETWEEN MULTIPLE INTELLIGENCE AND ACADEMIC PERFORMANCE BASED ON LANGUAGE (TAMIL)

Level of Multiple Intelligence		Academic Performance						Chi-square value	Sig.
		Outstanding	Excellent	Very good	Good	Fair	Total		
		N%	N%	N%	N%	N%			
Linguistic	Extremely high	1(0.4%)	0	0	0	0	1	13.497[a]	.636[ns]
	High	10(4.4%)	6(2.6%)	7(3.1%)	1(0.4%)	0	24		
	Above average	25(11.0%)	33(14.5%)	23(10.1%)	19(8.3%)	0	100		
	Average	21(9.2%)	33(14.5%)	29(12.7%)	13(5.7%)	1(0.4%)	97		
	Below average	1(0.4%)	2(0.9%)	1(0.4%)	2(0.9%)	0	6		
	low	0	0	0	0	0	0		
Logical	Extremely high	1(0.4%)	0	0	0	0	1	13.741[a]	.618[ns]
	High	8(3.5%)	6(2.6%)	5(2.2%)	4(1.8%)	0	23		
	Above average	32(14.0%)	30(13.3%)	32(14.0%)	14(6.1%)	0	108		
	Average	16(7.0%)	32(14.0%)	19(8.3%)	15(6.6%)	1(0.4%)	83		
	Below average	1(0.4%)	6(2.6%)	4(1.8%)	2(0.9%)	0	13		
	Low	0	0	0	0	0	0		
Bodily-Kinesthetic	Extremely high	0	1(0.4%)	1(0.4%)	2(0.9%)	0	4	20.006[a]	.458[ns]
	High	22 (9.6%)	18(7.9%)	19(8.3%)	4(1.8%)	0	63		
	Above average	22(9.6%)	27(11.8%)	21(9.2%)	15(6.6%)	1(0.4%)	86		
	Average	12(5.3%)	27(11.8%)	19(8.3%)	13(5.7%)	0	71		
	Below average	1(0.4%)	1(0.4%)	0	1(0.4%)	0	3		
	Low	1(0.4%)	0	0	0	0	1		
Spatial	Extremely high	1(0.4%)	0	0	0	0	1	15.075[a]	.772[ns]
	High	7(3.1%)	8(3.5%)	5(2.2%)	6(2.6%)	0	26		
	Above average	22(9.6%)	27(11.)8%	25(11.0%)	13(5.7%)	1(0.4%)	88		
	Average	28(12.3%)	34(14.9%)	29(12.7%)	13(5.7%)	0	104		
	Below average	0	4(1.8%)	1(0.4%)	3(1.3%)	0	8		
	Low	0	1(0.4%)	0	0	0	1		
Music	Extremely high	0	0	0	0	0	0	24.365[a]	.018[ns]
	High	10(4.4%)	8(3.5%)	3(1.3%)	2(0.9%)	0	23		
	Above average	26(11.4%)	34(14.9%)	33(14.5%)	15(6.6%)	0	108		
	Average	19(8.3%)	28(12.3%)	22(9.6%)	14(6.1%)	0	83		
	Below average	3(1.3%)	4(1.8%)	2(0.9%)	4(1.8%)	1	14		
	Low	0	0	0	0	0	0		
Naturalistic	Extremely high	0	1(0.4%)	0	0	0	1	18.688[a]	.542[ns]
	High	1(0.4%)	5(2.2%)	3(1.3%)	1(0.4%)	0	10		
	Above average	29(12.7%)	32(14.0%)	26(11.4%)	12(5.3%)	1(0.4%)	100		

	Average	27(11.8%)	35(15.4%)	27(11.8%)	21(9.2%)	0	110		
	Below average	1(0.4%)	1(0.4%)	4(1.8%)	0	0	6		
	Low	0	0	0	1(0.4%)	0	1		
Interpersonal	Extremely high	0	1(0.4%)	1(0.4%)	1(0.4%)	0	3	16.354[a]	.429[ns]
	High	8(3.5%)	5(2.2%)	3(1.3%)	2(0.9%)	0	18		
	Above average	21(9.2%)	22(9.6%)	24(10.5%)	16(7.0%)	1(0.4%)	84		
	Average	29(12.7%)	40(17.5%)	31(13.6%)	15(6.6%)	0	11		
	Below average	0	6(2.6%)	1(0.4%)	1(0.4%)	0	8		
	Low	0	0	0	0	0	0		
Intrapersonal	Extremely high	1(0.4%)	2(0.9%)	0	0	0	3	13.278[a]	.652[ns]
	High	18(7.9%)	15(6.6%)	13(5.7%)	9(3.9%)	0	55		
	Above average	28(12.3%)	32(14.0%)	29(12.7%)	16(7.0%)	0	105		
	Average	11(4.8%)	24(10.5%)	15(6.6%)	9(3.9%)	1(0.4%)	60		
	Below average	0	1(0.4%)	3(1.3%)	1(0.4%)	0	5		
	Low	0	0	0	0	0	0		
Existential	Extremely high	0(0.0%)	1(0.4%)	1(0.4%)	0	0	2	6.153[a]	.908[ns]
	High	14(6.1%)	15(6.6%)	7(3.1%)	7(3.1%)	0	43		
	Above average	0	0	0	0	0	0		
	Average	44(19.3%)	57(25.0%)	51(22.4%)	27(11.8%)	1(0.4%)	180		
	Below average	0	1(0.4%)	1(0.4%)	1(0.4%)	0	3		
	low	0	0	0	0	0	0		

NS: Not Significant

Table IV Explains the association between Level of Multiple Intelligence and subject (Tamil) of the students. Looking at the table above, as per the dimensions, existential has the highest percentage i.e. (25%) which comes under average level and performance wise the respondent's majority comes under excellent performance.

Now comes the least percentage of the respondents in dimension wise, bodily-kinesthetic (0.4%) comes under low level but performance wise the respondent is outstanding in Tamil followed by spatial (0.4%) comes under low level but performance wise the respondent stands as excellent in Tamil and then naturalistic (0.4%) one comes under extremely high and performance wise stands at excellent and the other comes under low level with good in performance wise and the other remaining dimensions, none of them are in low level and all the nine dimensions has the least percentage (0.4%) that stands as fair in performance wise. It shows that there's no significant association between level of multiple intelligence and Tamil.

In the dimension Linguistic the highest respondents comes under above average and average level of linguistic intelligence with (14.5%) those respondents comes under excellent performance in Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, high, average, below average in linguistic and performance wise they are under outstanding, very good, good and fair in Tamil. And none of the respondent comes under low level of linguistic Intelligence.

In the dimension Logical the highest respondents comes under above average and average level of logical intelligence with (14%) those respondents comes under outstanding, excellent and very good performance in Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, average and below average in logical and performance wise they are under outstanding and fair in Tamil. And none of the respondent comes under low level of logical Intelligence.

In the dimension bodily-kinesthetic the highest respondents comes under above average and average level of bodily-kinesthetic intelligence with (11.8%) those respondents comes under excellent performance in Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, above average, below average and low in bodily-kinesthetic and performance wise they are under outstanding, excellent, very good, good and fair in Tamil.

In the dimension Spatial the highest respondents comes under average level of Spatial intelligence with (14.9%) those respondents comes under excellent and performance in Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, above average, below average and low in Spatial and performance wise they are under outstanding, excellent, very good and fair in Tamil.

In the dimension Music the highest respondents comes under above average level of Music intelligence with (14.9%) those respondents comes under excellent performance in Tamil. And the least percent of respondents is (0.4%) which comes under below average in Music and performance wise they are fair in Tamil. And none of the respondents comes under extremely high and low in Music.

In the dimension Naturalistic the highest respondents comes under average level of Naturalistic intelligence with (15.4%) those respondents comes under excellent performance in

Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, high, above average, below average and low in Naturalistic and performance wise they are under outstanding, excellent, good and fair in Tamil.

In the dimension Interpersonal the highest respondents comes under average level of Interpersonal intelligence with (17.5%) those respondents comes under excellent performance in Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, above average and below average in Interpersonal and performance wise they are under excellent, very good, good and fair in Tamil.

In the dimension Intrapersonal the highest respondents comes under above average level of Intrapersonal intelligence with (14%) those respondents comes under excellent performance in Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, average and below average in Intrapersonal and performance wise they are under outstanding, excellent, good and fair in Tamil.

In the dimension Existential the highest respondents comes under average level of Existential intelligence with (25%) those respondents comes under excellent performance in Tamil. And the least percent of respondents is (0.4%) which comes under extremely high, average and below average in Existential and performance wise they are under excellent, very good, good and fair in Tamil.

Accounting the overall data it shows that there's no significant, which means there's no association between multiple intelligence and Tamil. One is they are from English medium school and it might be because of the environment they live in.

Haley et al. (2004) found that teachers involved in the multiple intelligences based second language action research study found that behavior problems were minimized and students in multiple intelligences based classroom reported a higher degree of satisfaction and more positive attitude towards their second language study than in the control group

TABLE VI

ASSOCIATION BETWEEN MULTIPLE INTELLIGENCE AND ACADEMIC PERFORMANCE BASED ON ENGLISH SUBJECT

Level of Multiple Intelligence		Academic Performance						Chi-square	Sig.
		Outstanding	Excellent	Very Good	Good	Fair	Total		
		N%	N%	N%	N%	N%			
Linguistic	Extremely high	0	0	1(0.4%)	0	0	1	11.781[a]	.798[ns]
	High	7(3.1%)	8(3.5%)	8(3.5%)	1(0.4%)	0	24		
	Above average	17(7.5%)	33(14.5%)	34(14.9%)	15(6.6%)	1(0.4%)	100		
	Average	20(8.8%)	22(9.6%)	36(15.8%)	19(8.3%)	0	97		
	Below average	1(0.4%)	1(0.4%)	2(0.9%)	2(0.9%)	0	6		
	low	0	0	0	0	0	0		
Logical	Extremely high	0	1(0.4%)	0	0	0	1	10.851[a]	.819[ns]
	High	4(1.8%)	9(3.9%)	7(3.1%)	3(1.3%)	0	23		
	Above average	23(10.1%)	32(14.0%)	38(16.7%)	15(6.6%)	0	108		
	Average	16(7.0%)	21(9.2%)	30(13.2%)	15(6.6%)	1(0.4%)	43		
	Below average	2(0.9%)	1(0.4%)	6(2.6%)	4(1.8%)	0	13		
	Low	0	0	0	0	0	0		
Bodily-Kinesthetic	Extremely high	1(0.4%)	0	1(0.4%)	2(0.9%)	0	4	17.583[a]	.615[ns]
	High	16(7.0%)	21(19.2%)	19(8.3%)	7(3.1%)	0	63		
	Above average	15(6.6%)	24(10.5%)	31(13.6%)	15(6.6%)	1(0.4%)	86		
	Average	11(4.8%)	18(7.9%)	29(12.7%)	13(5.7%)	0	71		
	Below average	2(0.9%)	1(0.4%)	0	0	0	3		
	Low	0	0	1(0.4%)	0	0	1		
Spatial	Extremely high	0	1(0.4%)	0	0	0	1	29.868[a]	.072[ns]
	High	4(1.8%)	12(5.3%)	7(3.1%)	3(1.3%)	0	26		
	Above average	19(8.3%)	32(14.0%)	25(11.0%)	12(5.3%)	0	88		
	Average	20(8.8%)	19(8.3%)	46(20.2%)	1(7.9%)	1(0.4%)	104		
	Below average	1(0.4%)	0	3(1.3%)	4(1.8%)	0	8		
	Low	1(0.4%)	0	0	0	0	1		
Music	Extremely high	0	0	0	0	0	0	12.211[a]	.429[ns]
	High	4(1.8%)	10(4.4%)	8(3.5%)	1(0.4%)	0	23		
	Above average	20(8.8%)	31(13.6%)	37(16.2%)	20(8.8%)	0	108		
	Average	16(7.0%)	22(9.6%)	32(14.0%)	12(5.3%)	1(0.4%)	83		
	Below average	5(2.2%)	1(0.4%)	4(1.8%)	4(1.8%)	0	14		
	Low	0	0	0	0	0	0		
Naturalistic	Extremely high	1(0.4%)	0	0	0	0	1	17.122[a]	.645[ns]
	High	2(0.9%)	4(1.8%)	3(1.3%)	1(0.4%)	0	10		
	Above average	22(9.6%)	32(14.0%)	31(13.6%)	15(6.6%)	0	100		
	Average	20(8.8%)	26(11.4%)	45(19.7%)	18(7.9%)	1(0.4%)	110		
	Below average	0	2(0.9%)	1(0.4%)	3(1.3%)	0	6		

	Low	0	0	1(0.4%)	0	0	1		
Interpersonal	Extremely high	1(0.4%)	1(0.4%)	0	1(0.4%)	0	3	12.381[a]	.717[ns]
	High	2(0.9%)	9(3.9%)	6(2.6%)	1(0.4%)	0	18		
	Above average	15(6.6%)	25(11.0%)	33(14.5%)	11(4.8%)	0	84		
	Average	25(11.0%)	28(12.3%)	38(16.7%)	23(10.1%)	1(0.4%)	115		
	Below average	2(0.9%)	1(0.4%)	4(1.8%)	1(0.4%)	0	8		
	Low	0	0	0	0	0	0		
Intrapersonal	Extremely high	2(0.9%)	1(0.4%)	0	0	0	3	21.500[a]	.160[ns]
	High	10(4.4%)	22(9.6%)	19(8.3%)	4(1.8%)	0	55		
	Above average	24(10.5%)	26(11.4%)	36(15.8%)	18(7.9%)	1(0.4%)	105		
	Average	7(3.1%)	13(5.7%)	25(11.0%)	15(6.6%)	0	60		
	Below average	2(0.9%)	2(0.9%)	1(0.4%)	0	0	5		
	Low	0	0	0	0	0	0		
Existential	Extremely high	1(0.4%)	1(0.4%)	0	0	0	2	10.952[a]	.533[ns]
	High	10(4.4%)	14(6.1%)	15(6.6%)	4(1.8%)	0	43		
	Above average	0	0	0	0	0	0		
	Average	32(14.0%)	49(21.5%)	66(28.9%)	32(14.0%)	1(0.4%)	180		
	Below average	2(0.9%)	0	0	1(0.4%)	0	3		
	low	0	0	0	0	0	0		

NS- Not Significant

Table IV Explains the association between Level of Multiple Intelligence and English of the students.

Looking at the table above, as per the dimensions, existential has the highest percentage i.e. (28.9%) which comes under average level and performance wise the respondent's majority comes under very good performance.

Now comes the least percentage of the respondents in dimension wise, linguistic (0.4%) comes under extremely high, performance wise it comes under very good in English, followed by logical (0.4%) comes under extremely high level but performance wise the respondent is excellent, bodily-kinesthetic (0.4%) comes under low level but performance wise the respondent stands as very good, spatial (0.4%) comes under extremely high level and performance wise the respondent stands as excellent and then naturalistic (0.4%) one comes under extremely high and low level but performance wise stands at outstanding and very good and the other remaining dimensions, none of them are in low level and in music none are in extremely high neither low level. It shows that there's no significant association between level of multiple intelligence and English.

In the dimension Linguistic the highest respondents comes under average level of linguistic intelligence with (15.8%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, high, above average and below average in linguistic and performance wise they are under outstanding, excellent, very good, good and fair in English .

In the dimension Logical the highest respondents comes under above average level of logical intelligence with (16.7%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, average and below average in logical and performance wise they are under excellent and fair in English.

In the dimension bodily-kinesthetic the highest respondents comes under above average level of bodily-kinesthetic intelligence with (13.6%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high and above average in bodily-kinesthetic and performance wise they are under outstanding, excellent, very good and fair in English.

In the dimension Spatial the highest respondents comes under average level of spatial intelligence with (20.2%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, average, below average and low in Spatial and performance wise they are under outstanding, excellent and fair in English.

In the dimension Music the highest respondents comes under above average level of Music intelligence with (16.2%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under high, average, below average in Music and performance wise they are excellent, good and fair in English.

In the dimension Naturalistic the highest respondents comes under average level of Naturalistic intelligence with (19.7%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, high, average, below average and low in Naturalistic and performance wise they are under outstanding, very good, good and fair in English.

In the dimension Interpersonal the highest respondents comes under average level of Interpersonal intelligence with (16.7%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, high, average and below average in Interpersonal and performance wise they are under outstanding, excellent, good and fair in English.

In the dimension Intrapersonal the highest respondents comes under above average level of Intrapersonal intelligence with (15.8%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, above average and below average in Intrapersonal and performance wise they are under excellent, very good and fair in English.

In the dimension Existential the highest respondents comes under average level of Existential intelligence with (28.9%) those respondents comes under very good performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, average and below average in Existential and performance wise they are under outstanding, excellent, good and fair in English.

Accounting the overall data it shows that there's no significant, which means there's no association between multiple intelligence and English. Though they are from English medium school, they are negative in linguistic as well as all the other intelligences; it might be because of less interaction and not social and also they speak much in Tamil.

Ramlah (2002) stressed that "there are still a huge figure showing most of the student haven't reach the minimum level for general examination, for example subjects like Mathematics and English. Now, people are more concern and some even argued for the graduates' quality."

TABLE VII

ASSOCIATION BETWEEN MULTIPLE INTELLIGENCE AND ACADEMIC PERFORMANCE BASED ON MATHEMATICS

Level of Multiple Intelligence		Academic Performance						Chi-square	Sig.
		Outstanding	Excellent	Very good	Good	Fair			
		N%	N%	N%	N%	N%	Total		
Linguistic	Extremely high	1(0.4%)	0	0	0	0	1	13.609[a]	.628[ns]
	High	4(1.8%)	6(2.6%)	7(3.1%)	6(2.6%)	1(0.4%)	24		
	Above average	18(7.9%)	23(10.1%)	34(14.9%)	23(10.1%)	2(0.9%)	100		
	Average	23(10.1%)	26(11.4%)	26(11.4%)	16(7.0%)	6(2.6%)	97		
	Below average	0	1(0.4%)	2(0.9%)	3(1.3%)	0	6		
	low	0	0	0	0	0	0		
Logical	Extremely high	0	0	1(0.4%)	0	0	1	17.860[a]	.332[ns]
	High	8(3.5%)	4(1.8%)	6(2.6%)	5(2.2%)	0	23		
	Above average	24(10.5%)	30(13.2%)	34(14.9%)	17(7.5%)	3(1.3%)	108		
	Average	13(5.7%)	21(9.2%)	26(10.5%)	20(8.8%)	5(2.2%)	83		
	Below average	1(0.4%)	1(0.4%)	4(1.8%)	6(2.6%)	1(0.4%)	13		
	Low	0	0	0	0	0	0		
Bodily-Kinesthetic	Extremely high	0	0	1(0.4%)	3(1.3%)	0	4	20.317[a]	.438[ns]
	High	12(5.3%)	16(7.0%)	20(8.8%)	12(5.3%)	3(1.3%)	63		
	Above average	22(9.6%)	24(10.5%)	20(8.8%)	16(7.0%)	4(1.8%)	86		
	Average	11(4.8%)	16(7.0%)	26(11.4%)	16(7.0%)	2(0.9%)	71		
	Below average	0	0	2(0.9%)	1(0.4%)	0	3		
	Low	1(0.4%)	0	0	0	0	1		
Spatial	Extremely high	0	0	1(0.4%)	0	0	1	19.199[a]	.509[ns]
	High	8(3.5%)	3(1.3%)	8(3.5%)	6(2.6%)	1(0.4%)	26		
	Above average	19(8.3%)	23(10.1%)	26(11.4%)	17(7.5%)	3(1.3%)	88		
	Average	18(7.9%)	30(13.2%)	29(12.7%)	22(9.6%)	5(2.2%)	104		
	Below average	0	0	5(2.2%)	3(1.3%)	0	8		
	Low	1(0.4%)	0	0	0	0	1		
Music	Extremely high	0	0	0	0	0	0	9.167[a]	.689[ns]
	High	7(3.1%)	5(2.2%)	9(3.9%)	2(0.9%)	0	23		
	Above average	20(8.8%)	29(12.7%)	32(14.0%)	25(11.0%)	2(0.9%)	108		
	Average	16(7.0%)	19(8.3%)	24(10.5%)	18(7.9%)	6(2.6%)	83		
	Below average	3(1.3%)	3(1.3%)	4(1.8%)	3(1.3%)	1(0.4%)	14		
	Low	0	0	0	0	0	0		
Naturalistic	Extremely high	0	0	1(0.4%)	0	0	1	23.577[a]	.261[ns]
	High	1(0.4%)	1(0.4%)	6(2.6%)	2(0.9%)	0	10		
	Above average	23(10.1%)	19(8.3%)	34(14.9%)	19(8.3%)	5(2.2%)	100		
	Average	21(9.2%)	32(14.0%)	28(12.3%)	25(11.0%)	4(1.8%)	110		
	Below average	0	4(1.8%)	0	2(0.9%)	0	6		

	Low	1(0.4%)	0	0	0	0	1		
Interpersonal	Extremely high	0	0	2(0.9%)	1(0.4%)	0	3	11.413[a]	.783[ns]
	High	5(2.2%)	2(0.9%)	8(3.5%)	2(0.9%)	1(0.4%)	18		
	Above average	18(7.9%)	19(8.3%)	26(11.4%)	19(8.3%)	2(0.9%)	84		
	Average	21(9.2%)	34(14.9%)	30(13.2%)	24(10.5%)	6(2.6%)	115		
	Below average	2(0.9%)	1(0.4%)	3(1.3%)	2(0.9%)	0	8		
	Low	0	0	0	0	0	0		
Intrapersonal	Extremely high	1(0.4%)	0	1(0.4%)	1(0.4%)	0	3	6.166[a]	.986[ns]
	High	13(5.7%)	13(5.7%)	14(6.1%)	13(5.7%)	2(0.9%)	55		
	Above average	19(8.3%)	29(12.7%)	34(14.9%)	19(8.3%)	4(1.8%)	105		
	Average	12(5.3%)	14(6.1%)	18(7.9%)	13(5.7%)	3(1.3%)	60		
	Below average	1(0.4%)	0	2(0.9%)	2(0.9%)	0	5		
	Low	0	0	0	0	0	0		
Existential	Extremely high	0	0	1(0.4%)	1(0.4%)	0	2	12.188[a]	.431[ns]
	High	8(3.5%)	9(3.9%)	12(5.3%)	12(5.3%)	2(0.9%)	43		
	Above average	0	0	0	0	0	0		
	Average	37(16.2%)	47(20.6%)	55(24.1%)	35(15.4%)	6(2.6%)	180		
	Below average	1(0.4%)	0	1(0.4%)	0	1(0.4%)	3		
	low	0	0	0	0	0	0		

NS: Not Significant

Table IV Explains the association between Level of Multiple Intelligence and Mathematics of the students.

Looking at the table above, as per the dimensions, existential has the highest percentage i.e. (24.1%) which comes under average level and performance wise the respondent's majority comes under very good performance.

Now comes the least percentage of the respondents in dimension wise, linguistic (0.4%)comes under extremely high, performance wise it comes under outstanding in Mathematics, followed by logical (0.4%) comes under extremely high level but performance wise the respondent is very good, bodily-kinesthetic (0.9%) comes under average level but performance wise the respondent stands as fair, spatial (0.4%) comes under extremely high level and performance wise the respondent stands as very good, naturalistic (0.4%) one comes under extremely high level but performance wise stands at outstanding and very good, and the other remaining dimensions, none are in extremely high neither low level. It shows that there's no significant association between level of multiple intelligence and Mathematics.

In the dimension Linguistic the highest respondents comes under above average level of linguistic intelligence with (14.9%) those respondents comes under very good performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high and high in linguistic and performance wise they are under outstanding, excellent and fair in Mathematics.

In the dimension Logical the highest respondents comes under above average level of logical intelligence with (14.9%) those respondents comes under very good performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high in logical and performance wise they are under fair in Mathematics.

In the dimension bodily-kinesthetic the highest respondents comes under average level of bodily-kinesthetic intelligence with (11.4%) those respondents comes under very good performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high, below average and low in bodily-kinesthetic and performance wise they are under outstanding, very good and good in Mathematics.

In the dimension Spatial the highest respondents comes under average level of spatial intelligence with (13.2%) those respondents comes under excellent performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high, high and low in Spatial and performance wise they are under outstanding, very good and fair in Mathematics.

In the dimension Music the highest respondents comes under above average level of Music intelligence with (14%) those respondents comes under very good performance in Mathematics. And the least percent of respondents is (0.4%) which comes under below average in Music and performance wise fair in mathematics. And none of the respondents comes under extremely high and low in Music.

In the dimension Naturalistic the highest respondents comes under above average level of Naturalistic intelligence with (14.9%) those respondents comes under very good performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high, high and low in Naturalistic and performance wise they are under outstanding, excellent and very good in Mathematics.

In the dimension Interpersonal the highest respondents comes under average level of Interpersonal intelligence with (14.9%) those respondents comes under excellent performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high, high and below average in Interpersonal and performance wise they are under excellent, good and fair in Mathematics.

In the dimension Intrapersonal the highest respondents comes under above average level of Intrapersonal intelligence with (14.9%) those respondents comes under very good performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high, and below average in Intrapersonal and performance wise they are under outstanding, very good and good in Mathematics.

In the dimension Existential the highest respondents comes under average level of Existential intelligence with (24.1%) those respondents comes under very good performance in Mathematics. And the least percent of respondents is (0.4%) which comes under extremely high in Existential and performance wise they are under very good and good in Mathematics.

Accounting the overall data it shows that there's no significant, which means there's no association between multiple intelligence and mathematics, because they come under matriculation school and also it might be because of the pandemic and online schooling the students intelligence might have become low in some areas.

Anitha (2013) conducted a study on the association between Gardner‟s Multiple Intelligence variables and certain motivational adjustment variables of personality of secondary school pupils of Kerala. The study revealed that there existed a significant difference in multiple intelligences and motivational adjustment variables of personality when taken in pairs (high-low, high- average, average-low) on the basis of their achievement motivation, career aspiration, emotional adjustment, social adjustment, personal adjustment, sociopersonal adjustment and school adjustment variables.

TABLE VIII

ASSOCIATION BETWEEN MULTIPLE INTELLIGENCE AND ACADEMIC PERFORMANCE BASED ON SCIENCE

Level of Multiple Intelligence		Academic Performance						Chi-square	Sig.
		Outstanding	Excellent	Very Good	Good	Fair			
		N%	N%	N%	N%	N%	Total		
Linguistic	Extremely high	1(0.4%)	0	0	0	0	1	12.577[a]	.703[ns]
	High	10(4.4%)	5(2.2%)	8(3.5%)	1(0.4%)	0	24		
	Above average	30(13.2%)	29(12.7%)	23(10.1%)	16(7.0%)	2(0.9%)	100		
	Average	29(12.7%)	26(11.4%)	24(10.5%)	17(7.5%)	1(0.4%)	97		
	Below average	1(0.4%)	1(0.4%)	1(0.4%)	3(1.3%)	0	6		
	low	0	0	0	0	0	0		
Logical	Extremely high	1(0.4%)	0	0	0	0	1	24.165[a]	.086[ns]
	High	7(3.1%)	7(3.1%)	4(1.8%)	5(2.2%)	0	23		
	Above average	39(17.1%)	29(12.7%)	27(11.8%)	13(5.7%)	0	108		
	Average	22(9.6%)	25(11.0%)	20(8.8%)	13(5.7%)	3(1.3%)	83		
	Below average	2(0.9%)	0	5(2.2%)	6(2.6%)	0	13		
	Low	0	0	0	0	0	0		
Bodily-Kinesthetic	Extremely high	0	1(0.4%)	1(0.4%)	2(0.9%)	0	4	26.528[a]	.149[ns]
	High	30(13.2%)	14(6.1%)	13(5.7%)	6(2.6%)	0	63		
	Above average	20(8.8%)	26(11.4%)	23(10.1%)	14(6.1%)	3(1.3%)	86		
	Average	20(8.8%)	18(7.9%)	19(8.3%)	14(6.1%)	0	71		
	Below average	0	2(0.9%)	0	1(0.4%)	0	3		
	Low	1(0.4%)	0	0	0	0	1		
Spatial	Extremely high	1(0.4%)	0	0	0	0	1	14.264[a]	.817[ns]
	High	9(3.9%)	8(3.5%)	4(1.8%)	5(2.2%)	0	26		
	Above average	28(12.3%)	24(10.5%)	23(10.1%)	12(5.3%)	1(0.4%)	88		
	Average	31(13.6%)	28(12.3%)	27(11.8%)	16(7.0%)	2(0.9%)	104		
	Below average	1(0.4%)	1(0.4%)	2(0.9%)	4(1.8%)	0	8		
	Low	1(0.4%)	0	0	0	0	1		
Music	Extremely high	0	0	0	0	0	0	8.699[a]	.728[ns]
	High	8(3.5%)	8(3.5%)	5(2.2%)	2(0.9%)	0	23		
	Above average	34(14.9%)	27(11.8%)	26(11.4%)	19(8.3%)	2(0.9%)	108		
	Average	25(11.0%)	22(9.6%)	24(10.5%)	11(4.8%)	1(0.4%)	83		
	Below average	4(1.8%)	4(1.8%)	1(0.4%)	5(2.2%)	0	14		
	Low	0	0	0	0	0	0		
Naturalistic	Extremely high	0	1(0.4%)	0	0	0	1	8.276[a]	.990[ns]
	High	4(1.8%)	3(1.3%)	1(0.4%)	2(0.9%)	0	10		
	Above average	31(13.6%)	27(11.8%)	26(11.4%)	15(6.6%)	1(0.4%)	100		
	Average	34(14.9%)	29(12.7%)	26(11.4%)	19(8.3%)	2(0.9%)	110		
	Below average	2(0.9%)	1(0.4%)	2(0.9%)	1(0.4%)	0	6		

	Low	0	0	1(0.4%)	0	0	1		
Interpersonal	Extremely high	0	1(0.4%)	1(0.4%)	1(0.4%)	0	3	12.113[a]	.736[ns]
	High	7(3.1%)	6(2.6%)	2(0.9%)	3(1.3%)	0	18		
	Above average	23(10.1%)	27(11.8%)	22(9.6%)	12(5.3%)	0	84		
	Average	39(17.1%)	26(11.4%)	29(12.7%)	18(7.9%)	3(1.3%)	115		
	Below average	2(0.9%)	1(0.4%)	2(0.9%)	3(1.3%)	0	8		
	Low	0	0	0	0	0	0		
Intrapersonal	Extremely high	1(0.4%)	2(0.9%)	0	0	0	3	25.183[a]	.067[ns]
	High	25(11.0%)	13(5.7%)	11(4.8%)	5(2.2%)	1(0.4%)	55		
	Above average	31(13.6%)	33(14.5%)	22(9.6%)	17(7.5%)	2(0.9%)	105		
	Average	11(4.8%)	12(5.3%0	23(10.1%)	14(6.1%)	0	60		
	Below average	3(1.3%)	1(0.4%)	0	1(0.4%)	0	5		
	Low	0	0	0	0	0	0		
Existential	Extremely high	0	2(0.9%)	0	0	0	2	**36.001[a]**	**<.001****
	High	19(8.3%)	11(4.8%)	8(3.5%)	5(2.2%)	0	43		
	Above average	0	0	0	0	0	0		
	Average	51(22.4%)	48(21.1%)	48(21.1%)	31(13.6%)	2(0.9%)	180		
	Below average	1(0.4%)	0	0	1(0.4%)	1(0.4%)	3		
	low	0	0	0	0	0	0		

: significant at 5% level** *: significant at 1% level** **NS: Not Significant**

Table IV Explains the association between Level of Multiple Intelligence and Science of the students.

The highest percentage is (22.4%) comes under average and performance wise the respondents are outstanding and the least percentage is (0.9%) comes under average and performance wise they come under outstanding, good and fair in science. The chi-square of existential is 36.001 and the p. value is <.001**. Out of all the dimensions, existential intelligence is the only dimension to have 1% significant in the table. Existence is all about sensitivity and capacity to tackle deep questions about human existence and science is also deals with the natural world (as biology or physics), facts learned through experiments and observation. Both deal with the facts that exist, so they associate with each other. Maybe the students are more interested in learning about the nature related studies.

Science is a subject that trains many students' intelligence so that it finally shapes the learning attitude of the students themselves.

Looking at the table above, as per the dimensions, existential has the highest percentage i.e. (22.4%) which comes under average level and performance wise the respondent's majority comes under outstanding in science. Now comes the least percentage of the respondents in dimension wise, linguistic (0.4%)comes under extremely high, performance wise it comes under outstanding in science, followed by logical (0.4%) comes under extremely high level but performance wise the respondent is outstanding, bodily-kinesthetic (0.9%) comes under extremely high level but performance wise the respondent stands as good , spatial (0.4%) comes under extremely high and low level and performance wise the respondent stands as outstanding and then naturalistic (0.4%) one comes under extremely high level but performance wise stands at excellent and very good and the other remaining dimensions, none are in extremely high neither low level. It shows that there's no significant association between level of multiple intelligence and Science, except for existential.

In the dimension Linguistic the highest respondents comes under above average level of linguistic intelligence with (13.2%) those respondents comes under outstanding performance in science. And the least percent of respondents is (0.4%) which comes under extremely high, high and average in linguistic and performance wise they are under outstanding, good and fair in science.

In the dimension Logical the highest respondents comes under above average level of logical intelligence with (17.1%) those respondents comes under outstanding performance in Science. And the least percent of respondents is (0.4%) which comes under extremely high in logical and performance wise they are under outstanding in Science.

In the dimension bodily-kinesthetic the highest respondents comes under high level of bodily-kinesthetic intelligence with (13.2%) those respondents comes under outstanding performance in Science. And the least percent of respondents is (0.4%) which comes under extremely high in bodily-kinesthetic and performance wise they are under excellent and very good in Science.

In the dimension Spatial the highest respondents comes under average level of spatial intelligence with (13.6%) those respondents comes under outstanding performance in Science. And the least percent of respondents is (0.4%) which comes under extremely high and above average in Spatial and performance wise they are under outstanding and fair in Science.

In the dimension Music the highest respondents comes under above average level of Music intelligence with (14.9%) those respondents comes under outstanding performance in Science. And the least percent of respondents is (0.4%) which comes under average in Music and performance wise they are fair in Science.

In the dimension Naturalistic the highest respondents comes under average level of Naturalistic intelligence with (14.9%) those respondents comes under outstanding performance in Science. And the least percent of respondents is (0.4%) which comes under extremely high, high and above average, in Naturalistic and performance wise they are under excellent, very good and fair in Science.

In the dimension Interpersonal the highest respondents comes under average level of Interpersonal intelligence with (17.1%) those respondents comes under very good performance in Science. And the least percent of respondents is (0.4%) which comes under extremely high in Interpersonal and performance wise they are under excellent, very good and good in Science.

In the dimension Intrapersonal the highest respondents comes under above average level of Intrapersonal intelligence with (14.5%) those respondents comes under excellent performance in Science. And the least percent of respondents is (0.4%) which comes under extremely high and high in Intrapersonal and performance wise they are under outstanding and fair in Science.

Okebukola (2009) conducted “a study on the reading ability of science students through study group and Multiple Intelligences .This explored appropriate pedagogical skills on student’s efficiencies in reading skills. The study revealed that there is significant difference in performance of the groups taught using Study groups and multiple Intelligences methods.”

TABLE IX

ASSOCIATION BETWEEN MULTIPLE INTELLIGENCE AND ACADEMIC PERFORMANCE BASED ON SOCIAL SCIENCE

Level of Multiple Intelligence		Academic Performance						Chi-square	Sig.
		Outstanding	Excellent	Very Good	Good	Fair			
		N%	N%	N%	N%	N%	Total		
Linguistic	Extremely high	1(0.4%0	0	0	0	0	1	15.345[a]	.499[ns]
	High	11(4.8%)	7(3.1%)	2(0.9%)	3(1.3%)	1(0.4%)	24		
	Above average	36(15.8%)	28(12.3%)	24(10.5%)	10(4.4%)	2(0.9%)	100		
	Average	34(14.9%)	19(8.3%)	25(11.0%)	19(8.3%)	0	97		
	Below average	1(0.4%)	3(1.3%)	1(0.4%)	1(0.4%)	0	6		
	low	0	0	0	0	0	0		
Logical	Extremely high	1(0.4%)	0	0	0	0	1	16.858[a]	.395[ns]
	High	11(4.8%)	4(1.8%)	5(2.2%)	2(0.9%)	1(0.4%)	23		
	Above average	41(18.0%)	33(14.5%)	19(8.3%)	14(6.1%)	1(0.4%)	108		
	Average	29(12.7%)	16(7.0%)	24(10.5%)	13(5.7%)	1(0.4%)	83		
	Below average	1(0.4%)	4(1.8%)	4(1.8%)	4(1.8%)	0	13		
	Low	0	0	0	0	0	0		
Bodily-Kinesthetic	Extremely high	0	0	2(0.9%)	2(0.9%)	0	4	29.985[a]	.070[ns]
	High	31(13.6%)	18(7.9%)	8(3.5%)	5(2.2%)	1(0.4%)	63		
	Above average	31(13.6%)	16(7.0%)	23(10.1%)	15(6.6%)	1(0.4%)	86		
	Average	20(8.8%)	22(9.6%)	19(8.3%)	9(3.9%)	1(0.4%)	71		
	Below average	0	1(0.4%)	0	2(0.9%)	0	3		
	Low	1(0.4%)	0	0	0	0	1		
Spatial	Extremely high	1(0.4%)	0	0	0	0	1	11.655[a]	.927[ns]
	High	8(3.5%)	8(3.5%)	5(2.2%)	4(1.8%0	1(0.4%)	26		
	Above average	35(15.4%)	20(8.8%)	19(8.3%)	14(6.1%)	0	88		
	Average	38(16.7%)	25(11.0%)	25(11.0%)	14(6.1%)	2(0.9%)	104		
	Below average	1(0.4%)	3(1.3%)	3(1.3%)	1(0.4%)	0	8		
	Low	0	1(0.4%)	0	0	0	1		
Music	Extremely high	0	0	0	0	0	0	16.562[a]	.167[ns]
	High	13(5.7%)	6(2.6%)	3(1.3%)	0	1(0.4%)	23		
	Above average	42(18.4%)	25(11.0%)	22(9.6%)	18(7.9%)	1(0.4%)	108		
	Average	25(11.0%)	21(9.2%)	25(11.0%)	11(4.8%)	1(0.4%)	83		
	Below average	3(1.3%)	5(2.2%)	2(0.9%)	4(1.8%)	0	14		
	Low	0	0	0	0	0	0		
Naturalistic	Extremely high	0	0	1(0.4%)	0	0	1	24.040[a]	.241[ns]
	High	3(1.3%)	4(1.8%)	1(0.4%)	1(0.4%)	1(0.4%)	10		
	Above average	42(18.4%)	24(10.5%)	15(6.6%)	18(7.9%)	1(0.4%)	100		
	Average	37(16.2%)	28(12.3%)	31(13.6%)	13(5.7%)	1(0.4%)	110		

	Below average	1(0.4%)	1(0.4%)	3(1.3%)	1(0.4%)	0	6		
	Low	0	0	1(0.4%)	0	0	1		
Interpersonal	Extremely high	0	0	2(0.9%)	1(0.4%)	0	3	**33.163[a]**	**.007****
	High	10(4.4%)	3(1.3%)	0	3(1.3%)	2(0.9%)	18		
	Above average	29(12.7%)	24(10.5%)	23(10.1%)	8(3.5%)	0	84		
	Average	43(18.9%)	26(11.4%)	25(11.0%)	20(8.8%)	1(0.4%)	115		
	Below average	1(0.4%)	4(1.8%)	2(0.9%)	1(0.4%)	0	8		
	Low	0	0	0	0	0	0		
Intrapersonal	Extremely high	1(0.4%)	1(0.4%)	1(0.4%)	0	0	3	22.231[a]	.136[ns]
	High	25(11.0%)	10(4.4%)	12(5.3%)	6(2.6%)	2(0.9%)	55		
	Above average	42(18.4%)	26(11.4%)	23(10.1%)	13(5.7%)	1(0.4%)	105		
	Average	14(6.1%)	16(7.0%)	16(7.0%)	14(6.1%)	0	60		
	Below average	1(0.4%)	4(1.8%)	0	0	0	5		
	Low	0	0	0	0	0	0		
Existential	Extremely high	1(0.4%)	1(0.4%)	0	0	0	2	14.325[a]	.280[ns]
	High	20(8.8%)	9(3.9%)	5(2.2%)	7(3.1%)	2(0.9%)	43		
	Above average	0	0	0	0	0	0		
	Average	62(27.2%)	45(19.7%)	46(20.2%)	26(11.4%)	1(0.4%)	180		
	Below average	0	2(0.9%)	1(0.4%)	0	0	3		
	low	0	0	0	0	0	0		

**** Significant at 1%level** **NS Not Significant**

Table IV Explains the association between Level of Multiple Intelligence and Social science of the students.

Accounting all the data dimension wise, Interpersonal is the only dimension to have 5% significant, which indicates that the interpersonal has a positive association with the social science. Why because interpersonal intelligence sharpens the students understanding and communication and it positively associates with the academic performance as subjects are for knowledge, learning, understanding and effectively interacting, and another main reason to get significant might be because the students are more social and the environment they live in encourages them throughout for everything. And the dimension has the highest respondents i.e. (18.9%) comes under average, performance wise and the least respondents is (0.4%) comes under extremely high and performance wise they are under outstanding, good and fair.

Looking at the table above, as per the dimensions, existential has the highest percentage i.e. (27.2%) which comes under average level and performance wise the respondent's majority comes under outstanding performance.

Now comes the least percentage of the respondents in dimension wise, linguistic (0.4%)comes under extremely high, performance wise it comes under outstanding in social science, followed by logical (0.4%) comes under extremely high level but performance wise the respondent is excellent, bodily-kinesthetic (0.4%) comes under low level but performance wise the respondent stands as outstanding, spatial (0.4%) comes under extremely high, high, below average and low level and performance wise the respondent stands as outstanding and excellent and then naturalistic (0.4%) one comes under extremely high and low level but performance wise stands at outstanding, excellent, good and fair. It shows that there's no significant association between level of multiple intelligence and social science.

In the dimension Linguistic the highest respondents comes under above average level of linguistic intelligence with (15.8%) those respondents comes under outstanding performance in social science. And the least percent of respondents is (0.4%) which comes under both extremely high and high in linguistic and performance wise they are under fair in social science.

In the dimension Logical the highest respondents comes under above average level of logical intelligence with (18%) those respondents comes under outstanding performance in social science. And the least percent of respondents is (0.4%) which comes under extremely high, high, above average and average in logical and performance wise they are under outstanding and fair in Social science.

In the dimension bodily-kinesthetic the highest respondents comes under high and above average level of bodily-kinesthetic intelligence with (13.6%) those respondents comes under outstanding performance in Social science. And the least percent of respondents is (0.4%) which comes under high, above average and average performance wise they are under fair in social science.

In the dimension Spatial the highest respondents comes under average level of spatial intelligence with (16.7%) those respondents comes under outstanding performance in Social

science Science. And the least percent of respondents is (0.4%) which comes under extremely high in Spatial and performance wise they are under outstanding in Social science.

In the dimension Music the highest respondents comes under above average level of Music intelligence with (18.4%) those respondents comes under outstanding performance in Social science. And the least percent of respondents is (0.4%) which comes under high, above average and average in Music and performance wise they are fair in Social science. And none of the respondents comes under extremely high and low in Music.

In the dimension Naturalistic the highest respondents comes under above average level of Naturalistic intelligence with (18.4%) those respondents comes under outstanding performance in English. And the least percent of respondents is (0.4%) which comes under extremely high, high, above average and average in Naturalistic and performance wise they are under very good, good and fair in Social science.

In the dimension Intrapersonal the highest respondents comes under above average level of Intrapersonal intelligence with (18.4%) those respondents comes under outstanding performance in English. And the least percent of respondents is (0.4%) which comes under extremely high and average in Intrapersonal and performance wise they are under outstanding, good and fair in Social science.

In the dimension Existential the highest respondents comes under average level of Existential intelligence with (20.2%) those respondents comes under very good performance in Social science. And the least percent of respondents is (0.4%) which comes under extremely high and average in Existential and performance wise they are under outstanding, excellent and fair in Social Science.

E. Correlation between Multiple intelligence and Academic Performance

TABLE X
CORRELATION BETWEEN MULTIPLE INTELLIGENCE AND ACADEMIC PERFORMANCE

		LI	LO	BO	SPA	MUS	NA	INTE.	INTRA	EXIS	Tamil	Eng	Math	Science	Social
LI.	Co.ef	1.000	.177**	.187**	.083	.196**	.170*	.265**	.333**	333**	.150*	.108	-.047	.053	.095
	Sig.		.008	.005	.210	.003	.010	<.001	<.001	<.001	.023	.105	.476	.430	.152
LO.	Co.ef		1.000	.326**	.441**	.355**	.493**	.327**	.306**	.354**	.042	.112	.200**	.152*	.115
	Sig.			<.001	<.001	<.001.	<.001	<.001	<.001	<.001	.525	.093	.002	.022	.082
BO.	Co.ef			1.000	.283**	.287**	.358**	.253**	.362**	.352**	.071	.075	-.010	.099	.125
	Sig.				<.001	<.001	<.001	<.001	<.001	<.001	.283	.257	.882	.136	.060
SPA.	Co.ef				1.000	.273**	.802**	.391**	.270**	.371**	-.020	.136*	.028	.061	.023
	Sig.					<.001	<.001	<.001	<.001	<.001	.764	.040	.674	.362	.727
MUS.	Co.ef					1.000	.762**	.368**	.350**	.412**	.115	.051	.095	.069	.106
	Sig.						<.001	<.001	<.001	<.001	.083	.442	.154	.302	.111
NA.	Co.ef						1.000	.455**	.384**	.478**	.057	.137*	.094	.091	.086
	Sig.							<.001	<.001	<.001	.388	.038	.157	.170	.197
INTER.	Co.ef							1.000	.436**	.826**	.063	.115	.048	.057	.045
	Sig.								<.001	<.001	.345	.083	.470	.391	.500
INTRA.	Co.ef								1.000	.848**	.067	.188**	.038	.209**	.117
	Sig.									<.001	.311	.004	.564	.001	.077
EXIS	Co.ef									1.000	.074	.176**	.045	.158*	.099
	Sig.										.265	.008	.501	.017	.138
Tamil	Co.ef										1.000	.421**	.328**	.484**	.466**
	Sig.											<.001	<.001	<.001	<.001
English	Co.ef											1.000	.344**	.522**	.537**
	Sig.												<.001	<.001	<.001
Math	Co.ef												1.000	.527**	.370**
	Sig.													<.001	<.001
Science	Co.ef													1.000	.598**
	Sig.														<.001
Social	Co.ef														1.000
	Sig.														.
Total															228

TABLE X explains the correlation between Multiple Intelligence and the Academic performance. While observing table, it is realized from the co-efficient values of linguistic with Tamil (.023) is significantly 5% and a positive relationship, English (.105) it's not significant; in mathematics (.476) it's negative and no significant, science (.430) it's not significant and in social science (.152) it's not significant as well. It means that linguistic has a positive increase in Tamil performance of the respondents and higher the linguistic level, higher the performance in Tamil.

Looking at the co-efficient of logical with Tamil (.525) it's not significant, with English (.093) it's not significant, mathematics (.002) it's significantly 1% and a positive relation, science (.022) 5% significant and a positive relation and in social science it's not significant. It shows that logical intelligence has a positive relation with mathematics and science with significantly 1% and 5%. This means that logical has a positive correlation with mathematics and science that increases their performance.

In the bodily-kinesthetic the relation with Tamil, English, science and social science is not significant and with mathematics (.882) it's negative and not significant. This showed that the bodily-kinesthetic has no positive correlation with all the subjects.

The spatial intelligence relation with English (.040) is 5% significant and positive; with Tamil (.764) it's negative and not significant; with mathematics, science and social science it's not significant. This says that spatial correlates positively except with English with 5%.

Music's relationships with all the subjects are not significant. It shows that music doesn't correlates with Tamil, English, Mathematics, Science and Social science. So, that indicates that music has no positive correlation with all the subject areas.

In Naturalistic intelligence the relationship with English (.038) is 5% significant and positive. For Tamil, Mathematics, Science and Social Science it's not significant. Which means naturalistic only has a positive relationship with English significantly at 5% level in it because like naturalistic allows us to relate to the environment, English as its universally spoken language, it helps us connect socially with people.

The Interpersonal intelligence relationships with all the subjects are not significant. This indicates that interpersonal doesn't correlates with Tamil, English, Mathematics, Science and Social science.

The Intrapersonal intelligence with English (.004) and Science (.001) were significantly 1% and positive because intrapersonal is all about understanding a concept and interacting effectively, which is much needed in science and English, it's understood by most of the people. The remaining subjects i.e. Tamil, Mathematics, social science were not significant and doesn't correlate with intrapersonal.

Existential relationship with English (.008) is 1% significant and 5% significant in science (.017) which show's a positive correlation with existential. And the remaining subjects Tamil, Mathematics and Social Science are not significant.

If we look at the overall data, English is at the peak to have a positive relationship with all the nine dimensions and just opposite to that social science has no positive relationship with all the nine dimensions.

This is a descriptive research of correlation that aims to reveal how the correlation between multiple intelligences and the science learning attitude of students. The sample consisted of 32 students in one class, VII 4. Sampling technique is simple random sampling, by drawing one class which was made of a sample. The results of the study indicate no correlation between multiple intelligences and the science learning attitude of students with a value of r = 0,28, the coefficient of the t-count was 1,70 smaller than the t-table of 2,04, so it can be concluded that there is not significant correlation between multiple intelligences and the science learning attitude of students but there are some intelligences that have a relationship with the value of learning attitude science of students in class VII 4 of SMPN 33 Padang. Narada Hana (2019).

SUMMARY AND CONCLUSION

V. SUMMARY AND CONCLUSION

As its said twenty-first century is the century of knowledge, smart students, with profound knowledge in academic field. It has become the necessity for the students of secondary level to prepare them in all educational areas for their upcoming higher challenges in life. Howard Gardner (1983) developed the theory of Multiple Intelligences that states that people have different intelligences and learn in different ways. Humans have nine intelligences: Verbal-Linguistic Intelligence, Logical Mathematical Intelligence, Visual-Spatial Intelligence, Bodily Kinesthetic Intelligence, Musical/Rhythmic Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence, Naturalistic Intelligence and Existential Intelligence. The Multiple Intelligences Theory states that it is to the benefit of both the student and the instructor if the student's intelligence can be identified. Identifying a student's intelligence allows the instructor to select appropriate activities for the student in the classroom and guide their learning journey more effectively. Academic achievement is related to the acquisition of principles and generalizations and the capacity to perform efficiently on certain manipulations, objectives, symbols, and ideas. It is the competence of students shown in school subjects for which they have taken instructions.

The study of related researches helped the investigator to know the previous work carried out for MI. The review of related researches helped the investigator to understand that by using the MI approach, there is an increase in the achievement of various subjects, enhancement in motivation, attitude, confidence, and smartness about education and social felid. Multiple Intelligence approach has focused attention on child-centered education and pedagogy.

For the present study, 280 secondary students comprising of 99 females and 129 males, and were selected from various schools under Coimbatore district, Tamil Nadu. And the sample was collected using the simple random sampling method. To investigate the multiple intelligence and academic performance of secondary school students, the researcher used multiple intelligence scale developed by Surbi Agarwal and Dr. Suraksha Palinventory. For the second questionnaire, the academic performance scale was used to access the performance of the students and along with the questions of general information of the selected respondents. For the main analysis, chi square test and correlation test was done to predict the association and relation of the selected variables.

The key finding of the study

A. General profile of the selected respondents.

i. Personal information of the respondents

- The major contributor of the study was seventeen year old (33.8%), and the least was fourteen year old (15.8%).
- Male were in majority by (56.6%) and Female with (43.3%).
- The majority are of class 10^{th} with (72.4%) and the least are of class 8 with (11%).
- The majority comes from rural area with (54.8%) and the least are from urban with (45.2%).
- Most of the children (46.9%) were from joint family and nuclear family equally and the remaining was of single family.

ii. Personal information of respondent's parent's

- Most of the fathers (27.2%) were graduates and less (8.3%) were illiterate.
- A higher percentage (36%) of fathers were businessman and non-government employee and the labour (.4%) being the least number.
- Most of the mothers (22.4%) were higher secondary and the least (12.3%) were illiterate.
- A higher percentage (62.3%) were housewife and the labour (.4%) being the least number.

B. Level of Multiple Intelligence

- In the linguistic the majorities (43.9%) were of above average level and the least (.4%) were of extremely high level.
- In logical the majorities (47.4%) were of above average and the least (.4%) were of extremely high level.
- In bodily-kinesthetic the majorities (37.7%) were of above average level and the least (.4%) were of low level.
- In spatial the majorities (45.6%) were of average level and the least (.4%) were of extremely high and also low level.

- In musical the majorities (47.4%) were of above average and the least (6.1%) were of below average level.
- In naturalistic the majorities (48.2%) were of average level and the least (.4%) were of extremely high and low level.
- In interpersonal the majorities (50.4%) were of average level and the least (1.3%) were of extremely high level.
- In intrapersonal the majorities (46.1%) were of above average level and the least (1.3%) were of extremely high level.
- In existential the majorities (46.1%) were of above average level and the least (1.3%) were of below average level.

C. Academic performance of secondary school students

- In Tamil the majority of students (31.1%) were outstanding performance and the least (1.3%) were fair performance.
- In English the majority of students (35.5%) were very good performance and the least (.4%) were fair performance.
- In Mathematics the majority of students (30.3%) were very good performance wise and the least (3.9%) were fair performance.
- In Science the majority students (31.1%) were outstanding performance wise and the least (1.3%) were fair performance.
- In Social Science the majority students (36.4%) were outstanding performance wise and the least (1.3%) were fair performance.

D. Association between Multiple Intelligence and Academic Performance of Secondary school students.

- The domains linguistic, logical, bodily-kinesthetic, spatial, musical, naturalistic, interpersonal, intrapersonal and existential has no significant association with Tamil
- The domains linguistic, logical, bodily-kinesthetic, spatial, musical, naturalistic, interpersonal, intrapersonal and existential has no significant association with English.
- The domains linguistic, logical, bodily-kinesthetic, spatial, musical, naturalistic, interpersonal, intrapersonal and existential has no significant association with Mathematics.

- ❖ The domain Existential have a significant association with science at 1% level, whereas no significant association was found between linguistic, logical, bodily-kinesthetic, spatial, music, naturalistic, interpersonal, intrapersonal and Science.
- ❖ The domain interpersonal have a significant association with social science at 1% level, whereas no significant association was found between linguistic, logical, bodily-kinesthetic, spatial, music, naturalistic, intrapersonal, existential and Social Science.

E. Correlation between Multiple intelligence and Academic Performance.

- ❖ Linguistic with Tamil have positive correlation by significantly 1% and 5% respectively. Whereas with Math there's negatively not significant and with the remaining subjects English, Science and Social science have no correlation.
- ❖ Logical with mathematics have positive correlation by significantly 5% and science by 1% significant. Whereas with Tamil, English and Social there's no significant correlation.
- ❖ Bodily-kinesthetic with Math has negatively no significant and the other remaining subjects Tamil, English, Science and Social Science are not significant.
- ❖ Spatial with English has positive correlation by 5% significant and with Tamil its negatively not significant and the remaining subject's mathematics, science and social science has no significant correlation.
- ❖ Musical with Tamil, English, Mathematics, Science and Social Science has no significant correlation.
- ❖ Naturalistic with English has a positive correlation by 5% significant and between the other remaining subjects Tamil, mathematics, science and social science naturalistic has no significant correlation.
- ❖ Interpersonal with Tamil, English, Mathematics, Science and Social Science has no significant correlation.
- ❖ Intrapersonal with English and Science has a positive correlation by 1% significant respectively and the remaining subjects Tamil, Mathematics and Social science has no significant correlation.
- ❖ Existential with has significant 1% positive correlation with English and significantly 5% positive correlation with Science and no significant correlation between Tamil, Mathematic and Social Science.

Conclusion

To conclude, school is a foundation where children development in educational area is the prior and goes hand in hand with other developmental areas such as sports, music, and etc. School children are at a peak of learning and exploring environment and their multiple intelligence help them shape a chance to succeed learning. Also parent plays a vital role by observing and knowing their children field of expertise and encouraging them in it which strengthens their level of intelligence even more. According to Howard Gardner multiple intelligences has nine dimensions as Linguistic, Logical, Bodily Kinesthetic, Musical, Interpersonal, Intrapersonal, Naturalistic and Existential Intelligence. Not every children will be good in all the nine intelligence, different children will have different area of intelligence they are good at, like some might be very good in Music than some might be poor in it but might be very good in linguistic intelligence. The study recommends a large sample study to check the level of Multiple Intelligence in children by analyzing their academic performance and to understand why they are lacking back in some intelligence, so that it can be addressed at the national level. Identification of the level of Multiple Intelligence and the academic performance in children, where they lack is important so that early intervention can be taken so that they don't face problems in future or in their further higher studies. In this study the majority of students fall as not significant and except for the dimension naturalistic and existential falls as significant.

Implications:-

- The school syllabus and curriculum should be designed and structured so that the teachers can include components of Multiple Intelligence in their instructional process
- Provide special training programs for the students to develop components of Multiple Intelligence.
- Through the use of Multiple Intelligences activities, each individual can study in their own way.
- Teacher should pay greater attention while choosing the method for instruction. In a class there exist different types of learner, like auditory, visual and kinesthetic. Teacher should give instruction by considering these learners.

- To improve academic performance, teachers should incorporate the activities related to components of Multiple Intelligences for all subjects.
- Identification of the Multiple Intelligences preference will be useful for a teacher to design everyday classroom activities.

Recommendation:

- Similar studies can be conducted at other levels like primary, high Secondary etc.
- Modifications can be done for the standardization of the tool.
- Similar study can be conducted by considering the psycho, social correlates related to Multiple Intelligences.
- Conducting a factor analysis study in different dimensions of multiple intelligences in different school subjects with different cognitive ability measures.
- Developing and testing a series of models of teaching based on the theory of multiple intelligences on different school subjects and at different standards.

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ANNEXURE

Date- 07.03.2022

From

PRINCIPAL
LISIEUX MATRICULATION
HIGHER SECONDARY SCHOOL
SAIBABA COLONY
COIMBATORE - 641 011

To

Sakelu Chikro

II- M.Sc., Human Development

Department of Human Development

Avinashilingam Institute for Home Science and Higher Education for Women

Coimbatore- 43

Respected Madam/Sir

Sub- Granting Permission for data collection regarding

Warm greetings. This is to bring to your notice that I, the Principal, Lisieux Matriculation HSS, Coimbatore, permits **Sakelu Chikro,** pursuing her II M.sc in the Department of Human Development, to collect the data for her Research study on **(Multiple Intelligence and Academic Performance of Secondary School Students)** from our esteemed School.

Thanking you,

Sincerely

7/3/22

PRINCIPAL
LISIEUX MATRICULATION
HIGHER SECONDARY SCHOOL
SAIBABA COLONY
COIMBATORE - 641 011

INSTITUTIONAL HUMAN ETHICS COMMITTEE

Avinashilingam

Institute for Home Science and Higher Education for Women
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956) Re-accredited with 'A++' Grade by NAAC.Recognised by UGC Under Section 12 B
Coimbatore-641 043, Tamil Nadu, India

Chairman
Dr.SudhaRamalingam
Director-Research & Innovation,
Professor-Community Medicine,
PSG Institute of Medical Sciences & Research, Coimbatore

Member Secretary
Dr.S.UmaMageshwari
Professor and Head,
Department of Food Service Management & Dietetics

Members
Mr.K.Arunmoli (Legal Expert)
Dr.Subhashini K. Sripathi
Dr.A.Saraswathy (Medical Officer)
Ms.D.Kavitha
Dr.A.R.SudamaniRamasamy
Dr.G.Victoria Naomi
Dr. Judith Justin
Dr.AnithaSubash

26th Febraury 2022

To
Ms.Sakelu Chikro
Department of Human Development
Avinashilingam Institute for Home Science and
Higher Education for Women
Coimbatore – 641 043

Dear Sakelu Chikro,

Ref: Your proposal No. IHEC/21-22/HD-15 entitled "Multiple Intelligence (MI) and Academic Performance (AP) of Secondary School Students" submitted for approval of IHEC on 23.11.2021.

The Institutional Human Ethics Committee of our University hereby grants approval to your research proposal No. IHEC/21-22/HD-15 entitled "Multiple Intelligence (MI) and Academic Performance (AP) of Secondary School Students" submitted by you. The Approval number for the same is AUW/IHEC/HD-21-22/XPD-15.

We wish you all the best in your research endeavours.

Regards,

V. Uma Mageshwari
Dr.S.Uma Mageshwari
Member Secretary

Institutional Human Ethics Committee

ANNEXURE

Annexure I: Questionnaire to elicit General information

1. Name of the respondent:
2. Age:
3. Gender: Male ☐ Female ☐
4. Class studying:
5. Area of residence: Urban ☐ Rural ☐
6. Family background:
   a) Type of the family:
      Joint family ☐ Nuclear family ☐ Single family ☐
   b) Father's education:
      Illiterate ☐ Primary ☐
      High school ☐ higher secondary ☐
      Graduate ☐ Postgraduate ☐
   c) Father's occupation:
      Government employee ☐ Non-government employee ☐
      Businessman ☐ Other, specify
   d) Mother's education:
      Illiterate ☐ Primary ☐
      High school ☐ higher secondary ☐
      Graduate ☐ Postgraduate ☐
   e) Mother's occupation:
      Government employee ☐ Non-government employee ☐
      Businessman ☐ Housewife ☐
      Other specify

Annexure II: Multiple Intelligence Scale

Sl.no.	Statements	Always	Mostly	Often	Rarely	Never
1.	Don't you prefer such vocabularies which may help in effective communication?					
2.	Is it easier for you to complete mathematical operations?					
3.	Do you take interest in playing physical games?					
4.	Don't use your leisure time in drawing three-dimensional images?					
5.	Do you recognize music patterns after hearing them?					
6.	Do you have interest in plant and animal species of the world?					
7.	Don't you love to express your good feeling on face?					
8.	Do you understand yourself very well?					
9.	Does life put many challenges on you?					
10.	Do public speakers impress you very much?					
11.	Don't you keep yourself busy in calculations and quantification?					
12.	Do you prefer yoga exercises?					
13.	Is it easier for you to point out the pattern and shape as soon as you look at the pictorial theme?					
14.	Don't you enjoy playing a musical instrument yourself?					

15.	Are you fascinated by changes in weather, changing leaves in the fall, the sound of wind and the warm sun?					
16.	Do you find person to person communication more effective as it grows out of personal interaction?					
17.	Are your life values, beliefs and emotions not important to you?					
18.	Are you aware of your strengths and weaknesses?					
19.	Is reading books your hobby?					
20.	Do you prefer to analyse problems logically?					
21.	Don't you enjoy playing cricket?					
22.	Are you driven to understand anatomical structure of a human being?					
23.	Can you manipulate musical pattern yourself?					
24.	Does collection of flowers and leaves not give you pleasure?					
25.	Do you love to make friends?					
26.	Do you have a hobby of reading philosophical books?					
27.	Don't you strive for self-fulfilment?					
28.	Is it not enthusiastic for you to participate in debates and extempore?					
29.	Is it very interesting for you to read about mathematicians?					

30.	Does performing gymnastics attract you?					
31.	Can't you represent or draw all the images which are there in your mind?					
32.	Do you try not to miss musical concerts, whenever they are organized in you town?					
33.	Does the study of species of different animals attract you?					
34.	Don't you like to work in a team as a good team member?					
35.	Are you inspired by the autobiographies of great people?					
36.	Do you prefer to study such courses which study humans and their behaviour?					
37.	Is reading novels your passion?					
38.	Don't you want to become a computer programmer?					
39.	Do you play football and volleyball?					
40.	Do you like to use coloured markers while working on charts or drawings?					
41.	Aren't you skilled at mimicking sound and language patterns of others?					
42.	Are Geography and Biology your favourite subjects?					
43.	Are you sensitive to other people's feelings and ideas?					
44.	Don't you possess a strong sense of identity and					

	purpose?					
45.	Do you very often anticipate the events that are likely to happen in future?					
46.	Do you like to write stories, poems, jokes etc, for your school magazine?					
47.	Do you compromise with unsystematic way of doing things?					
48.	If you get an opportunity to choose a profession, wouldn't you like to be an actor or a dancer?					
49.	Can you easily understand 3D geometry and menstuation in mathematics?					
50.	Do you always look for an opportunity to make music as your career?					
51.	Aren't you always curious to know about the evolution of mountains, rivers and their deltas?					
52.	Do you try to convince others with your quantum and quality of ideas and thoughts?					
53.	Is psychology a subject of your choice?					
54.	Don't you like people having virtues like truth, beauty and goodness?					
55.	Do you miss an opportunity to learn a new language?					
56.	Do you prefer definite answers in discussion?					
57.	Would you like to become a sports coach as a career option?					

58.	Isn't photography your passion?					
59.	Do you respect poets, musicians and popular composers?					
60.	Is it a thrilling experience for you to study different types of storms, waves and seas?					
61.	Don't you take any interest in conflict resolution of people?					
62.	Do you feel yourself internally motivated and determined?					
63.	Do cultural peculiarities of different cultures attract you?					
64.	Are you highly influenced by those people who speak effective language?					
65.	Don't you prefer such friends who are logical and national thinkers?					
66.	Do you have a lot of physical energy?					
67.	Are you fast in identifying and describing objects, shapes, colours etc.?					
68.	Doesn't music enhance your sense of spirituality?					
69.	Is it passionate for you to draw photograph and videotaping of natural phenomenon?					
70.	Do you have an effective skill of persuading people?					
71.	Aren't you able to access yourself?					
72.	Do meditation and relaxation give you insight to					

	change your attitude towards any problem?					
73.	Do you use one new word everybody in you dialogue with your friends?					
74.	Do you take interest in making mathematical models?					
75.	Don't you prefer swimming to keep yourself physically fit?					
76.	Do you gather a big quantum of knowledge through shapes, patterns, designs and images?					
77.	Can you make a parody, if the melody of some music appeals you?					
78.	Don't you want to become a botanist?					
79.	Is it entertaining as well as challenging for you to organize an event?					
80.	Do you exercise creative wisdom and insight for taking decisions?					
81.	Aren't you very much concerned about yourself images?					
82.	Is it tough for you to remember and reproduce your favourite poetry?					
83.	Do you try to understand the underlined principle of a theory or a phenomenon?					
84.	Do you want to become a famous athlete?					
85.	Don't images and patterns of what you want to learn automatically come in your mind?					
86.	Can you easily recognize different musical					

	instruments used in a song?					
87.	Do you love to go to botanical garden or national parks?					
88.	Don't people call you a philosopher?					
89.	Do not you leave the work in between when you once start doing it?					
90.	Do you strive for self realization?					

Annexure III: Academic Performances

Subjects	Marks obtained
Tamil	
English	
Mathematics	
Science	
Social Science	