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## A Study of the Multiple Intelligence of Secondary School Students of Mysore City

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### Abstract

Initial theories on Intelligence considered intelligence a single process. Later there were two schools of thought about intelligence. One of them believes that intelligence is not a single factor. There are various factors of intelligence. On the other hand, the other school of thought believes that intelligence is one general entity “g” and can be measured through IQ tests. The Multiple Intelligence theory of Gardner in 1983 proposes that individuals have several independent mental abilities that allow a person to solve problems, and create products that are valued within one’s culture. In other words, different types of intelligence are not related to each other. According to Howard Gardner there are 9 Multiple Intelligences as

- i). Verbal-linguistic intelligence and learning processes, focusing on speaking, reading, and writing;
- ii). Logical-mathematical intelligence, focusing on teaching of logic, mathematical processes, working with numbers, and sequencing;
- iii). Kinesthetic intelligence, focusing on drama, creative movement, dance, manipulatives, classroom games, physical education, and exercise;
- iv). Visual-spatial intelligence, focusing on pictorial representation, flow charts, visualization, board and card games, architecture and the visual arts
- v). Musical intelligence, focusing on singing, musical notation, curriculum songs, and musical instruments;
- vi). Interpersonal intelligence, focusing on positive interpersonal environments, conflict management, learning through service, appreciating differences, multiple perspectives, problem-solving, and multicultural education;
- vii). Intrapersonal intelligence, focusing on self-esteem, goal setting, thinking skills, emotional expression, and self-directed learning;
- viii). Naturalistic Intelligence and
- ix). Existential Intelligence.

The aim of the study was to investigate the Multiple Intelligences of secondary school students under two categories viz, the Levels of Multiple Intelligence and to identify the Dominant Multiple Intelligence possessed by secondary school students of Mysore city. The data collection was carried out using the Survey method with the tool Multiple Intelligence Inventory (Bhavisha Kapadia 2015) for a sample of 75 students from two sections of the 9<sup>th</sup> standard CBSE Schools of Mysore District, India. The data were analyses with frequency and percentage analysis, correlational percentage analyses. It was found that in 75 sample students, 65% of students possess Low Level of MI, 25% possess a Medium Level of MI and 10% possess a High Level of MI and among these same students, 41% of students possess Verbal-Linguistic Intelligence, 24% possess Logical-Mathematical Intelligence, 16% possess Visual-Spatial Intelligence, 13% possess Musical Intelligence and 5% possess Bodily-Kinesthetic Intelligence as their respective Dominant Multiple Intelligences. The findings imply that restricting educational programs to focusing on a preponderance of Linguistic and Mathematical Intelligences minimizes the importance of other forms of knowing, hence this study has a vast implication for the need to plan, to select teaching learning resources and developing teaching-learning environments for effective learning in the classrooms and execute strategies for creating open systems of education utilizing the Multiple Intelligence philosophy.

**Keywords:** Multiple intelligence, multiple intelligence inventory, level of multiple intelligence, dominant multiple intelligence

### Introduction

Intelligence is a construct that is made up of different cognitive abilities which is very difficult to explain. Initial theories on Intelligence considered Intelligence as a single process [1]. Later there were two schools of thought about intelligence. Intelligence is a topic which never fails to create debate. There are two schools of thought about intelligence. One of them believes that intelligence is not a single factor. In

1904, Spearman suggested theory of general intelligence as a two-factor theory and stated that general intelligence ‘g’ is correlated with specific abilities ‘s’ to some degree and they were responsible for overall performance on mental ability tests. Intelligence as comprising the mental abilities necessary for adaptation to, as well as selection and shaping of, any environmental context. According to this definition, although the behaviour that is labelled as intelligent may differ from 1

environmental context to another, the mental processes underlying this behaviour do not. An individual's ability to apply these processes may differ from 1 context to another, however. The abilities are applied to achieve external correspondence to the world and internal coherence among various knowledge and belief structures. The relevance of the definition for understanding current theories, and testing in the field of intelligence, as well as for understanding the role of intelligence in lifelong learning [2]. There are various factors of intelligence. On the other hand, the other school of thought believes that intelligence is one general entity "g" and can be measured through IQ tests [3]. For example, intelligence is directly related to the ability to learn. However, defining intelligence as just the ability to learn can be misleading. Gardner defines "Intelligence as a bio-psychological perspective to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" [5]. It is the capacity to learn, use and produce new solutions from what is learnt and the ability to think, reason, question, and draw conclusions.

**Gardner's Theory of Multiple Intelligence:** According to Gardner's Theory of Multiple Intelligence [4], each human being is capable of seven relatively independent forms of information processing, with individuals differing from one another in the specific profile of intelligence that they exhibit. "It is not how smart you are; it is how you are smart..." Howard Gardner is the author of a contemporary theory of intelligence known as multiple intelligences (MI). This is completely opposed to the ideas of Cattell *et al* [6] that intelligence is one single entity. Gardner also stressed that intelligence is defined within the context of culture, so what is intelligent for one culture may not be so for another [5]. In *Frames of Mind: The Theory of Multiple Intelligences*, Gardner says "We are all intelligent it's just that our intelligence looks different from person to person" A classic multiple intelligences statement... We all have special skills and should be judged by them rather than in comparison to other people [7].

**Evidence for the Theory:** Gardner used case studies of famously talented individuals in different fields as evidence to support his theory. He also used examples such as Kim Peek as individuals with amazing talents in certain specific fields who lacked basic abilities in other areas. Another important piece of evidence for Gardner is the cross-cultural evidence that a variety of skills are celebrated by different cultures. Different cultures emphasize different bits of intelligence. For example, in his book, *Frames of Mind*, Gardner discusses the high spatial abilities of the Puluwat people of the Caroline Islands, who use these skills to navigate their canoes in the ocean. In that case, should we say that they are 'intelligent' or 'not intelligent'?

The Multiple Intelligences theory proposes that we have several independent mental abilities that allow a person to solve problems, and create products that are valued within one's culture. In other words, different types of intelligence are not related to each other. We can be good at one skill more likely than we are also good at other things. The theory of Multiple Intelligences postulates that Intelligence is only one, there are frames of mind indicating that every dominant intelligence is dynamic and can be improved.

According to Gardner's theory [4], a man has nine intelligences with varying levels. They are

### 1. Verbal-Linguistic Intelligence (VLI)

Verbal-Linguistic Intelligence refers to an individual's capacity to use language effectively as a means of expression and communication through the written or spoken word. is a type of intelligence that is related to language skills. Education systems around the world have been highly focused on lectures that address and develop verbal intelligence in students. It enables a person to practice language verbally or in a text efficiently and to achieve targeted objectives by using language [8].

**Characteristics of Persons Having VLI:** It is the ability to express thoughts with words and to understand what is described in words. People who have a high level of verbal intelligence have good composition and presentation skills.

**Career Choices for Persons Having VLI:** They are Writers, poets, politicians, Linguist, Copywriter, Editor, Journalist, Teachers, TV or Radio presenters, Speech Therapist, Public Speaker, orators, and comedians.

**Examples of Persons having VLI:** Famous People with High Verbal Intelligence are Maya Angelou, William Shakespeare, Dostoyevsky, Charles Dickens, Martin Luther King Jr, Virginia Woolf, Abraham Lincoln and Walt Whitman.

### 2. Logical-Mathematical Intelligence (LMI)

Logical-Mathematical Intelligence is the ability of a person to use numbers and symbols effectively, create abstract concepts, and apply good reasoning. It refers to an individual's ability to recognize relationships and patterns between concepts and things, to think logically, to calculate numbers, and to solve problems scientifically and systematically. A person can deal properly with mathematical, numerical and rational problems [9].

**Characteristics of Persons having LMI:** Those who have advanced mathematical intelligence are good at analytical thinking, putting pieces together, making deductions, and reasoning. Reasoning is part of their thinking process. Mathematical intelligence allows one to establish a cause-and-effect relationship and obtain concrete results by posing the right questions. They are good at strategy games. And, people who prove themselves in numeric professions have good mathematical intelligence.

**Career Choices for Persons having LMI:** They are Computer Programmer, System Analyst, Accounting Specialist, Finance and Investment Consultant, Mathematics Specialist, Statistician, Doctor, Economists, lawyer and scientist.

**Examples of Persons having LMI:** Famous People are Stephen Hawking, Isaac Newton, Albert Einstein, Mark Zuckerberg, Thomas Edison, Erwin Schrodinger, and John Dewey.

### 3. Visual-Spatial Intelligence (VSI)

Visual-Spatial intelligence refers to the capability to think in images and orient oneself spatially. In addition, spatially intelligent people can graphically represent their visual and spatial ideas. Visual-spatial intelligence is a type of intelligence that is related to visuality. The visuality here is about vision, as well as visualization in the mind. It is one of the cognitive capacities that develop very early because human beings can see from the moment of birth [9].

**Characteristics of Persons having VSI:** Having a strong visual memory, imagining, and sizing the input are characteristics of the spatial learning style. People with spatial intelligence are good at graphic design, and they solve jigsaw puzzles swiftly. Visual intelligence is most clearly observed in artistic people because their visual intelligence is usually above average.

**Examples of persons having VSI:** Famous People Picasso, Frank Lloyd Wright and Leonardo DaVinci.

**Career Choices of persons having VSI:** Mechanical Engineer, Interior Designer, Photographer, Architect, Artist, Fashion Designer, Filmmaker, decorator, pilot, sailor, surveyor, inventor, guide.

#### 4. Musical-Rhythmic Intelligence (MRI)

Musical Rhythmic Intelligence is a type of intelligence, which is related to high sensitivity to sounds and music found in nature. A person can interpret, combine and manipulate sounds, it refers to the capacity to appreciate a variety of musical forms as well as being able to use music as a vehicle of expression. Children with musical intelligence generally also have an auditory learning style. Musically intelligent people are perceptive to elements of rhythm, melody, and pitch. This capability enables an individual to produce or compose music; comprehend sound, pitch and rhythm<sup>[9]</sup>.

**Characteristics of Persons with MRI:** People who have a high level of musical intelligence may sometimes play an instrument without any training. They can learn and play music by only listening to it and maximize their musical intelligence by using music apps for kids.

**Examples of Persons with MRI:** Famous People with High Musical Intelligence are Wolfgang Amadeus Mozart, Ludwig van Beethoven, Stevie Wonder, Paul McCartney, Marin Alsop, Cher, Mozart, Julie Andrews, Andrea Bocelli and Leonard Bernstein

**Career Choices for Persons with MRI** are Musician, Composer, Conductor, Piano Tuner, Music Therapist, Choral Director, Music Teacher, singer, musician, and composer.

#### 5. Bodily-Kinesthetic Intelligence (BKI)

Bodily-Kinesthetic Intelligence enables an individual to skillfully use different body organs in solving problems or to create valuable things. It also enables a person to use different equipment expertly. Kinesthetic Intelligence is a type of intelligence that is related to brain-body coordination and is also known as bodily-kinesthetic intelligence, which refers to the capacity of using one's own body skillfully as a means of expression or to work with one's body to create or manipulate objects<sup>[7]</sup>

**Characteristics of Persons with BKI:** People who have developed kinesthetic intelligence use their gestures and mimics well and they have good hand-eye coordination. Therefore, they are very good at telling their feelings and thoughts. Not just for daily conversation, they are also good at artistic compositions because of their balanced body-mind union. The mental and physical harmony of people with good bodily intelligence is immediately noticeable. They use their bodies quite artistically because they are good at performing their thoughts, which we can see in successful.

**Examples of Persons with BKI:** Famous People are David Copperfield, Michael Jordan, Tiger Woods, Jim Carrey, Charlie Chaplin, Harry Houdini, Bruce Lee, Julia Roberts, and Mikhail Baryshnikov.

**Career Choices for Persons with BKI:** They are Dancer, Actor, Mechanic, Athlete, Carpenter, Physical Therapist, dancer, sculptor, surgeon, mechanic, and craftsperson.

#### 6. Intra-Personal Intelligence (IPI)

Intra-personal Intelligence is the ability of a person to know oneself well and to make this knowledge useful. It refers to the capacity to accurately know one's self, including knowledge of one's strengths, motivations, goals, and feelings. To be capable of self-reflection and to be introverted and contemplative are also traits held by persons with Intrapersonal intelligence. This type of intelligence can help a person focus on planning and managing their life. It enables a person to realize his feelings, temperaments, weakness and strength, interests and emotions and use them well<sup>[9]</sup>.

**Characteristics of Persons with IPI:** Skill-goal correspondence is important for this type of intelligence. People with advanced intrapersonal intelligence have an almost perfect prediction of what they can do because they have high self-awareness. They are likely to achieve successful results from the work they started. Those who are capable of combining and interpreting their behaviour.

**Examples of Persons with IPI:** Famous People are Sigmund Freud, Eleanor Roosevelt, Socrates, Mahatma Gandhi, Anne Frank, Virginia Woolf, Aristotle, Bill Gates, and Plato

**Career Choices for Persons with IPI** are Author, Poet, Therapist, Philosopher, Religious Leader, Lawyer, Entrepreneur, Historian, Librarian, Psychologist

#### 7. Interpersonal-Social Intelligence (ISI)

Interpersonal-Social Intelligence is the ability of a person to analyze individual and social behaviour well and to communicate well. It refers to the capacity to communicate with and respond to other people appropriately and effectively. The ability to work cooperatively with others and understand their feelings. Those who have developed social intelligence are successful in understanding and even managing the feelings of other people. This capability enables an individual to recognize, appreciate, understand and manipulate the feelings of other persons<sup>[9]</sup>.

**Characteristics of Persons with ISI:** Politicians, trainers and similar professional groups that are good at addressing communities have advanced social intelligence. High social intelligence gives a person an advantage such as a wide social environment, and being loved and accepted.

**Examples of Persons with ISI:** Famous People are Bill Gates, Mother Theresa, Bill Clinton, Ronald Reagan, Oprah Winfrey

**Career Choices of Persons with ISI:** Politician, Manager, Counsellor, Public Relations Manager, administrator, Nurse, salesperson, religious leader, talk show host, etc.

#### 8. Naturalist Intelligence (NI)

Naturalistic intelligence refers to identifying and classifying the components that make up our environment. Natural intelligence is the ability to interpret nature and it is also called naturalistic intelligence. This intelligence would have been especially apt during the evolution of the human race in individuals who served as hunters, gatherers, and farmers. It enables an individual to comprehend natural phenomena and classify and recognize different living and non-living things based on their common and specific characteristic<sup>[9]</sup>.

**Characteristics of Persons with NI:** People who have advanced naturalistic intelligence are good at observing and examining living organisms and nature. It is no coincidence

that those who have good naturalistic intelligence are willing to follow animal and nature documentaries. Also, they tend to enjoy archaeology, mountaineering, tracking, documentary filming, botany, and geology fields.

**Examples of Persons with NI:** Charles Darwin, E.O. Wilson, Rachel Carson, Jacques Cousteau, John Muir, David Attenborough, and Jane Goodall.

**Career Choices for Persons with NI:** Farmers, Botanists, Environmentalists, Conservationists, Biologists

### 9. Existential Intelligence (EI)

Existential intelligence is another type of Intelligence that has been studied and added to the multiple intelligence theory. Existential Intelligence is the ability to make effective interpretations of abstract topics which are hard to process. The capability enables an individual to be sensitive to the bigger questions about human existence [7].

**Characteristics of Persons with EI:** Those who use their existential intelligence well are capable of interpreting, explaining, and presenting the concepts about human existence which are hard to process.

**Examples of Persons with EI:** Buddha, Socrates, Friedrich Nietzsche, Søren Kierkegaard, Jean-Paul Sartre, Simone de Beauvoir

**Career Choices for Persons with EI:** They are Meditation Instructors, Yoga Instructor, Physicist, Mathematician, Public Speaker, Philosopher.

### Need and Significance of the Study

One of the greatest strengths of Multiple Intelligence is its capacity to serve as a framework allowing teachers to explore their teaching styles and to assist them in making decisions about ways to structure teaching and learning experiences for students. Students need to experience learning that allows them to engage all of their intelligence, to explore their intelligence and how it can impact their learning, and they need to be offered a choice in how they learn and are assessed. Students are then more likely to experience a curriculum that is meaningful, personalised, and relevant.

Teachers can assist students in learning by maximising the development of all their Multiple Intelligences with instructional and assessment strategies, with a curriculum which will support all of the Intelligence. In the study by Yavich, Roman; Rotnitsky, Irina [12] under Multiple Intelligences and Success in School Studies reveals that the dominant intelligence that highly influences and measures achievement in the education system. Moreover, the amount of intelligence at the dominant levels can predict and indicate a student's success at school.

The core objective of this study was to determine the level of Multiple Intelligence and to identify the dominant Multiple Intelligence such as musical, bodily-kinesthetic, logical-mathematical, naturalistic, intrapersonal, existential, verbal-linguistic and interpersonal intelligence possessed by the students at the secondary level of Mysore City.

### Objectives of the Study:

The following were the objectives of the study;

- To find out the levels of Multiple Intelligences processed by secondary school students.
- To determine the dominant Multiple Intelligences possessed by secondary school students.

### Research Questions

The following research questions were framed for the study:

- Is there any difference in levels of Multiple Intelligences processed by secondary school students?
- Which are the dominant Multiple Intelligences possessed by secondary school students?

### Methodology

Methodology is a logical, systematic plan to resolve a research problem. A methodology details a researcher's approach to the research to ensure reliable, valid results that address their aims and objectives. It encompasses what data they're going to collect and where from, as well as how it's being collected and analyzed.

**Method/Design of the Study:** To find secondary school students' level of multiple intelligences and their dominant Multiple Intelligence, Normative survey design was used by the researcher.

**Population and Sample:** The Population for the study is considered as the students of Secondary Schools of Mysore District which includes students studying in all the CBSE Secondary Schools of Mysore district in Karnataka. A total of 75 students from a CBSE-affiliated school in the Mysore districts of Karnataka, India was the sample for the study.

**Tool for the Study:** The tool used for data collection was the Multiple Intelligence Inventory by Bhavisha Kapadia in 2014 [13]. The *Multiple Intelligence Inventory (MII)* has been designed for use by students in the age group of 12 to 16 years. And it serves as a tool for secondary school students only. It is intended to check the students' Multiple Intelligence in three categories-High, Medium and Low. It checks the dominant MI from the eight components of MI as defined by Gardner's eight Multiple intelligence such as, logical, musical, linguistic, visual, interpersonal, naturalistic and intrapersonal, it does not check the ninth Existential Intelligence from Multiple Intelligences.

### Data Collection & Data Analysis

Before the collection of data from respondents, the researcher sought permission from the heads of the institutions through a letter of request duly signed by the Head of the Institute. The letter carried the research title and purpose of the data collection and the researcher also provided surety that the collected data will not be used for any other purpose. The objectives of data collection were also clarified to the respondents. The on-the-spot willingness of the respondents was sought. Descriptive Statistics, and Percentage analysis w.r.t MI levels and Dominant MI were analysed by the researcher.

### Results and Discussions

The data obtained on descriptive analysis of the scores on Multiple Intelligence Inventory are provided in Table 1

**Table 1:** Descriptive Analysis of Multiple Intelligence of Sample Secondary School Students

Group	N	Mean	Median	Mode	Range	SD	Variance	Skewness	Kurtosis
Sample	75	38.08	39.00	36.00	42	8.826	77.912	-0.184	-0.347

Table 1 represents descriptive statistics for a sample of 75, 9<sup>th</sup> standard secondary school students score on the Multiple Intelligence Inventory with the mean 38.08, median 39.0, mode 36.0, standard deviation 8.826, Variance 77.92, skewness -0.184 and kurtosis -0.347, which reveals, the sample is negatively skewed, kurtosis value is also negative, curve is Platy Kurtotic, curve is heavily tailed, the left tail will be longer, and scores are concentrated on the Right side of the mean value. The same is graphically represented in Fig 1 of Histogram with Normal Probability Curve.

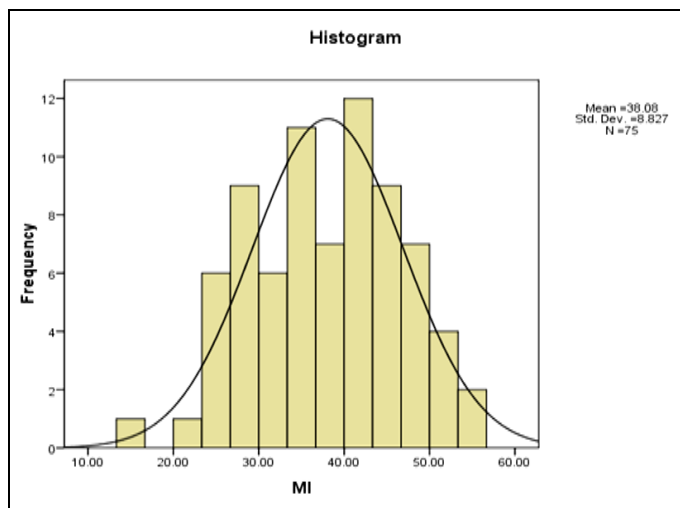


Fig 1: Histogram for Multiple Intelligence of Sample Secondary School Students of Mysore City.

**Analysis of Levels of Multiple Intelligence of Sample Students**

The data obtained on analysis of the Levels of Multiple Intelligence are provided in Table 2

Table 2: Levels of Multiple Intelligence of Sample Students

Level	Low MI		Medium MI		High MI		Total	
	N	%	N	%	N	%	N	%
Total Sample	49	65%	19	25%	07	10%	75	100%

The secondary school students' MI Level of Mysore City is categorized into three categories: Low, Medium and High. Out of 75 sample students, 49 students (65%) possess Low Level of MI, 19 (25%) students possess a Medium Level of MI Level and 7 (10%) students possess High MI Level. The same is represented in graph 2.

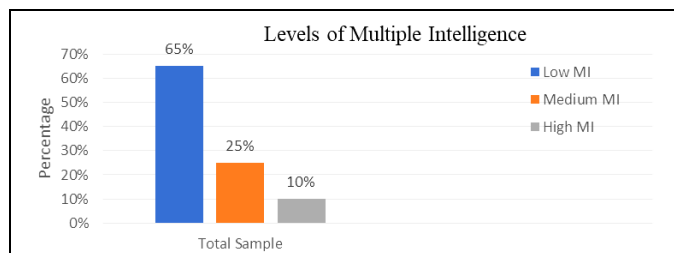


Fig 2: Bar graph for Levels of Multiple Intelligence of sample students

**Analysis of Dominant Multiple Intelligence Possessed by Sample Students**

The data obtained on analysis of the Dominant Multiple Intelligence are provided in Table 3

Table 3: Dominant Multiple Intelligence Possessed by Sample Secondary School Students

Dominant MI	Verbal-Linguistic Intelligence		Logical-Mathematical Intelligence		Visual-Spatial Intelligence		Musical Intelligence		Bodily-Kinesthetic Intelligence		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Total Sample	31	41%	18	24%	12	16%	10	13%	04	05%	75	100

Secondary school students individually possess specific Intelligence out of 9 Multiple Intelligence as their Dominant Multiple Intelligence. A total sample of 75 students comprises 31 (41%) students possess Verbal-Linguistic Intelligence, 18 (24%) students possess Logical-Mathematical Intelligence, 12 (16%) students possess Visual-Spatial Intelligence, 10 (13%) students possess Musical Intelligence and 4 (5%) students possess Bodily-Kinesthetic Intelligence as their respective Dominant Multiple Intelligences. The same is graphically represented in Graph 3.

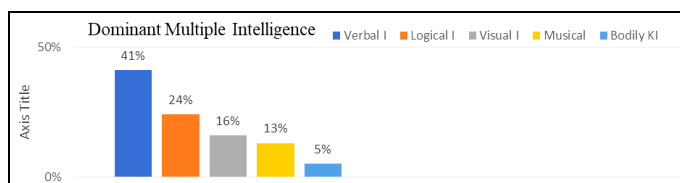


Fig 3: Bar graph for Dominant Multiple Intelligence of Sample Students

**Discussions**

The findings of the study revealed that out of 75 sample students, 65% possess a Low Level of MI, 25% possess a Medium Level of MI and 10% students possess a High Level

of MI. Further, the percentage of the same sample of students possessing dominant intelligence is 41% of students possess Verbal-Linguistic Intelligence, 24% possess Logical-Mathematical Intelligence, 16% possess Visual-Spatial Intelligence, 13% possess Musical Intelligence and 5% possess Bodily-Kinesthetic Intelligence, leaving behind the remaining four Intelligences as Interpersonal, Intrapersonal, Naturalistic and Existential out of Nine Multiple Intelligence given by Howard Gardner. Findings imply that the dominant intelligence that highly influences and measures achievement in the education system. Moreover, the amount of intelligence at the dominant levels can predict and indicate a student's success at school, which is along the same lines as the study by Yavich, Roman; Rotnitsky, Irina under Multiple Intelligences and Success in School Studies. Further restricting educational programs to focusing on a preponderance of linguistic and mathematical intelligence minimizes the importance of other forms of knowing, MI presents strategies for creating open systems of education utilizing the Multiple Intelligence philosophy and these results give us an understanding that the different types of MI may not be that well implemented among Secondary school students.

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