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## MULTIPLE INTELLIGENCES BASED TEACHING

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### ABSTRACT

**G**ardner's Multiple Intelligences Theory challenged traditional beliefs in the fields of education and cognitive science. According to a traditional definition, intelligence is a uniform cognitive capacity people are born with. This capacity can be easily measured by short-answer tests. According to Gardner, intelligence is:

§ The ability to create an effective product or offer a service that is valued in a culture.

§ A set of skills that make it possible for a person to solve problems in life.

§ The potential for finding or creating solutions for problems, which involves gathering new knowledge.

In addition, Gardner claims that:

§ All human beings possess all intelligences in varying amounts

§ Each person has a different intellectual composition

§ Each individual has nine intelligences (and maybe more to be discovered)



§ Multiple intelligences can be nurtured and strengthened, or ignored and weakened.

These intelligences are located in different areas of the brain and can either work independently or together. It also has biological and cultural foundations. Multiple Intelligences based Teaching can improve education by addressing the multiple intelligences of our students. Also if one is aware of his/her dominant intelligences, then it would help in making the Teaching –Learning process successful.

**KEYWORDS:** Intelligence, Multiple Intelligences based teaching, Teaching-Learning,

### INTRODUCTION :

#### Gardner's Theory of Multiple Intelligences

Howard Gardner has given a unique theory of intelligences called the "Theory of Multiple Intelligences" in his book in "Frames of mind" in 1983. The main features of the theory are:

1. Intelligence is not a single entity but there are many types of intelligences.
2. There are many types of intelligences such as Verbal/Linguistic, Logical/mathematical, Visual, Bodily/ Kinesthetic, Musical, Intrapersonal, Interpersonal, Naturalistic etc
3. Every child is intelligent and has all types of intelligences in more or less quantity. The intelligence present in more amounts is called Dominant Intelligence.
4. These multiple intelligences can be nurtured and strengthened, or ignored and weakened.

#### The Eight Intelligences

Gardner has defined eight

intelligences Linguistic, Logical /Mathematical, Spatial, Bodily Kinesthetic, Musical, Intrapersonal, Interpersonal and Naturalistic etc. The detailed explanation is as follows:

- 1) Verbal-Linguistic Intelligence: well-developed verbal skills and sensitivity to the sounds, meanings and rhythms of words.
- 2) Mathematical-Logical Intelligence: ability to think conceptually and abstractly, and capacity to discern logical or numerical patterns.
- 3) Visual-Spatial Intelligence: capacity to think in images and pictures, to visualize accurately and abstractly.
- 4) Musical Intelligence: ability to produce and appreciate rhythm, pitch and timber.
- 5) Bodily-Kinesthetic Intelligence: ability to control one's body movements and to handle objects skillfully.
- 6) Intrapersonal Intelligence: capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes.
- 7) Interpersonal Intelligence: capacity to detect and respond appropriately to the moods, motivations and desires of others.

**Naturalist Intelligence:** ability to recognize and categorize plants, animals and other objects in nature. E.g. organize field trips etc

### FOUNDATION OF MI THEORY

Any theory is based on some foundation. To provide MI theory a strong foundation, Gardner has provided certain criteria which are taken from different research areas like psychology, biological sciences, Developmental psychology, Logical analysis etc. It also shows relation to other major and recent ideas in the field of education. At this point it would be pertinent to see the theoretical basis and relation of MI with other ideas from different fields of study.

**The diagrammatical representation is as follow:**

Thus, while particular intelligences might be highly evolved in many people of one culture, those same intelligences might not be as developed in the individuals of another.

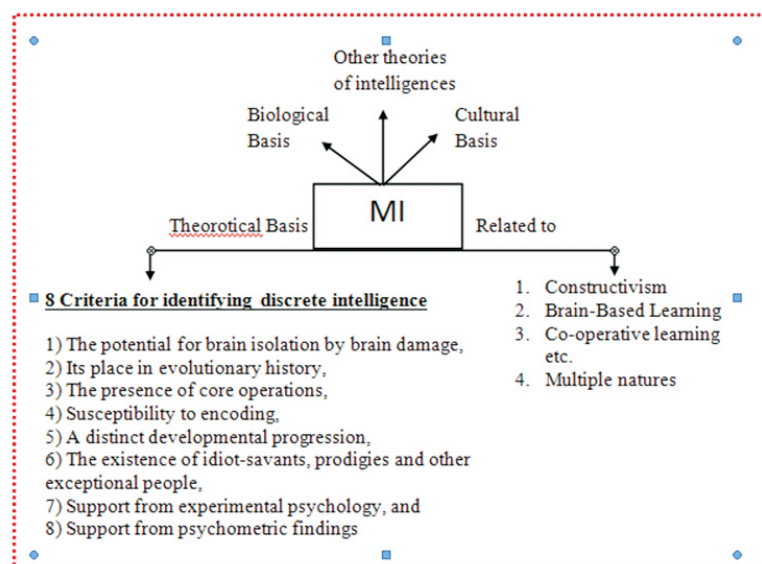


FIGURE 1.1 - MI, ITS THEORETICAL BASIS AND RELATION WITH OTHER FIELDS OF STUDY

If the ability meets the above prerequisites, it becomes candidate intelligence. Now it must fulfill the eight criteria. The 8 criteria are from different research areas i.e. Biological sciences, Logical analysis, developmental psychology, experimental psychology and psychometrics.

**They are:**

- 1) The potential for brain isolation by brain damage,
- 2) Its place in evolutionary history,
- 3) The presence of core operations,
- 4) Susceptibility to encoding,
- 5) A distinct developmental progression,
- 6) The existence of idiot-savants, prodigies and other exceptional people,
- 7) Support from experimental psychology, and
- 8) Support from psychometric findings

**1) The potential for brain isolation by brain damage:** - Every intelligence has a different but specific place in the brain and each intelligence can be dissociated from one another. This criterion has come forward from the work done in Neuropsychology by Gardner. He studied that a person whose brain or particular cognitive ability like speech is damaged was seen to have his other abilities intact.

E.g. 1) A person with lesion on Broca's Area (left frontal lobe) might have a small portion of his linguistic intelligence damaged, and thus experience great difficulty in speaking, reading and writing. Yet he might be able to sing, do math, dance, reflect on feelings and relate to others.

2) A person with a lesion in the temporal lobe of right hemisphere might have his musical capacities selectively impaired while frontal lobe lesions might primarily affect personal intelligences.

With this in view, Gardner says that there are eight relatively autonomous brain systems- a more sophisticated and upgraded version of the "right brain/left brain" model of learning. The following table shows the structures of brain for each intelligence.

**TABLE 1.1 PLACE OF EACH INTELLIGENCE IN THE BRAIN**

Intelligence	Neurological systems ( primary areas)
Linguistic	Left temporal and frontal lobes(Broca's/ wernicke's areas)
Logical/Mathematical	Left frontal and right parietal lobes
Spatial	Posterior regions of right hemisphere
Bodily/ Kinesthetic	Cerebellum, basal ganglia, motor cortex
Musical	Right temporal lobes
Interpersonal	Frontal lobe, temporal lobe (especially right hemisphere) limbic system
Intrapersonal	Frontal lobe, parietal lobes, limbic system
Naturalistic	Areas of left parietal lobe important for discriminating "living " from "non-living" things

**2) An evolutionary history and evolutionary plausibility:** - According to Gardner all the eight intelligences are seen in early human beings and other species of animals. In this respect when the evolutionary history is seen, it was found that early humans also had all these types of intelligences.

e.g. man used his spatial abilities during sea voyages and to prepare maps.

e.g. There are evidences of musical instruments from stone age period. Other species of animals showing musical intelligence is bird's songs.

In short, we can say that man is seen to have developed his intelligence with the help of different experiences. MI theory also has historical context.

a) In earlier times, some intelligence like Naturalistic and bodily kinesthetic are found to have been more important than they are today e.g. hunting and harvesting crops respectively etc.

b) Similarly certain intelligences like visual/spatial may become important in future as now a days greater number of people receive the information through films, videotapes, television CD-ROM technology.

c) Today, there is a growing need for persons having naturalistic intelligence i.e. to help protect the endangered ecosystem.

**3) The presence of core operations:** - As computer program requires a set of operations to function, each intelligence has a set of core operations that helps to perform various activities specific to that intelligence.

e.g. the core components for linguistic intelligence is - syntax, phonology, semantics, pragmatics etc.

e.g. the core components for Bodily-kinesthetic intelligence - control of one's own body, control in handling objects etc.

**TABLE 1.2 CORE OPERATIONS INVOLVED IN ALL TYPES OF INTELLIGENCES**

Intelligence	Core Operations
Linguistic	syntax, phonology, semantics, pragmatics etc
Musical	pitch, rhythm, timbre
Logical-mathematical	number, categorization, relations
Spatial	accurate mental visualization, mental transformation of images
Bodily-kinesthetic	control of one's own body, control in handling objects
Interpersonal	awareness of others' feelings, emotions, goals, motivations
Intrapersonal	awareness of one's own feelings, emotions, goals, motivations
Naturalist	recognition and classification of objects in the environment

**4) Susceptibility to encoding in symbol system:** - A person is intelligent, if he has the capacity to use symbols. Every intelligence in the list given by Gardner shows the existence of its own unique symbol or notational system. Man has developed such symbol system to convey the information accurately and systematically and this can be seen from various written or spoken languages, mathematical systems, logical equations, maps, charts drawing etc.

Following table shows examples of symbol systems for all eight intelligences

**TABLE 1.3 SYMBOLS SYSTEMS FOR ALL INTELLIGENCES**

Intelligence	Symbol systems
Linguistic	Phonetic languages e.g. English, French, Spanish
Logical/Mathematical	Computer languages e.g. Basic
Spatial	Graphic languages used by architects, engineers and designers.
Bodily/ Kinesthetic	Sign languages e.g. Braille
Musical	Musical notational systems
Interpersonal	Social cues e.g. gestures and facial expressions
Intrapersonal	Symbols of self e.g. in dreams and art work
Naturalistic	Species classification system e.g. Linnaeus habitat maps

**5) A distinct developmental progression:** - This criterion is taken from developmental psychology. According to Gardner, intelligences are activated when participated in some kind of culturally valued activity. Development of Individual in that particular activity follows its own pattern. Each intelligence based activity has its own time of arising in his early childhood (raw state) and his own time of peaking (expert state) in his lifetime. It may rapidly progress or decline as one gets older. Hence, the person who wants to be mathematician or surgeon has to spend years studying and sharpening their mathematical abilities and then reach to an expert state.

**6) Existence of idiot-savants, prodigies and other exceptional people,**

Savants are the individuals who show or exhibit superior abilities in part of one intelligence and their other abilities operate at low levels. In some people we see single intelligences operating at high levels e.g. Lata mangeskar show superior ability in singing. The existence of these savants, prodigies indicates that these abilities function neurologically independent from other kinds of intelligences.

**7) Support from experimental psychology**

From psychological point of view, one can witness intelligences working in isolation from one another. E.g. a person masters specific skill such as reading, but fail to transfer it to other areas such as mathematics.

In case of cognitive abilities such as memory, perception or attention, individuals can possess selective abilities. E.g. one may have superior ability for words but not for identification of face. Some may have acute perception of musical sounds but not verbal sounds.

This means that each of these cognitive abilities are intelligence specific i.e. people can demonstrate different levels of proficiency across the eight intelligences in cognitive area.

As said by Gilman (2001), each intelligence has capacity to express itself in particular settings. This should be able to measure with the help of experimental psychology. It could be possible to measure as to what extent the two acts are related or different from one another. Hence, a person cannot perform the two acts like solving crossword puzzle and conversation because both the acts require the same type of intelligence i.e. linguistic intelligence. On the contrary, a person can do walking and conversation at the same time because two different i.e. Bodily Kinesthetic and Linguistic intelligences are involved.

**8) Support from psychometric findings:** - Logical-mathematical and linguistic intelligence can be measured with the help of IQ tests. The measurement of other intelligences cannot be denied.

### BIOLOGICAL BASIS OF INTELLIGENCE

There is also a biological and cultural basis for the multiple intelligences. Neurobiological research indicates that learning is an outcome of the modifications in the synaptic connections between cells. Primary elements of different types of learning are found in particular areas of the brain. Thus, various types of learning results in synaptic connections in different areas of the brain.

For example, injury to the Broca's area of the brain will result in the loss of one's ability to verbally communicate using proper syntax. Nevertheless, this injury will not remove the patient's understanding of correct grammar and word usage.

### CULTURAL BASIS OF INTELLIGENCE

In addition to biology, culture also plays a large role in the development of the intelligences. All societies value different types of intelligences. The cultural value placed upon the ability to perform certain tasks provides the motivation to become skilled in those areas. Thus, while particular intelligences might be highly evolved in many people of one culture, those same intelligences might not be as developed in the individuals of another.

### CONSTRUCTIVISM AND MI

Constructivism is a theory about how people learn. It says that people construct their own knowledge i.e. they understand the world through their experiences. It is related to MI in the following ways:

- According to Johnson P. A., students need interaction with the physical world and with their peers to stimulate meaning-making. This view is related with the interpersonal intelligence of MI theory.
- Constructivist classroom uses many techniques in the teaching process and they are:
  - 1) prompt students to formulate their own questions (inquiry)
  - 2) allow multiple interpretations and expressions of learning (multiple intelligences)
  - 3) encourage group work and the use of peers as resources (collaborative learning)

Students have their own framework for understanding the world and MI sheds light on different ways students can understand and interpret the world.

### CO-OPERATIVE LEARNING AND MI

In cooperative learning, students work together in small groups on a structured activity. They are individually accountable for their work, and the work of the group as a whole is also assessed. Cooperative groups work face-to-face and learn to work as a team.

Some types of cooperative learning techniques have been developed in concert with the theory of Multiple Intelligences. In small groups, students can share their strengths and weaknesses and use the group activities to develop a variety of their intelligences. This technique is related with Interpersonal Intelligence of MI theory.

(Educational Broadcasting Corporation, 2004)

### Brain based learning and MI

Based on brain researches, some learning principles are derived.

- Every brain is unique.
- Learning is dependent on physiology of the person.
- At a time, brain carries out many processes.

There are multiple intelligences which operate from different parts of brain. For a qualitative

learning to take place, a person should be exposed to meaningful activities stimulating brain.

### CONCLUSION :-

Howard Gardner has given a unique theory of intelligences called the "Theory of Multiple Intelligences" in his book in "Frames of mind" in 1983. Intelligence is not a single entity but there are many types of intelligences. Every child is intelligent and has all types of intelligences in more or less quantity. The intelligence present in more amounts is called Dominant Intelligence. Gardner has defined eight intelligences Linguistic, Logical /Mathematical, Spatial, Bodily Kinesthetic, Musical, Intrapersonal, Interpersonal and Naturalistic etc. Gardner has given the reference of strong foundation to his theory which provides the proofs in practical life situations. Also the theory finds its relation to other trends in the field of education like Constructivism, Co-operative learning Brain –Based learning etc. So, if implemented in actual classroom setting may smoothen the Teaching Learning process.

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