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| RESEARCH ARTICLE

Incorporating Multiple Intelligences Theory in the Learning and Teaching Operation: Teacher's Guide

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| ABSTRACT

One of the challenges of 21st Century classrooms is the broad diversity of experiences, identities and intelligence students bring to class. Research in psychology and neurosciences has indicated that we should never treat students as essentially alike. Each brain is unique with a predominant intelligence, which plays a crucial role in learning. Gardner (1983) believes there are nine bits of intelligence: logical, linguistic, spatial, musical, kinesthetic, naturalist, intrapersonal, interpersonal, and existential. They constitute students' preferred channels of learning. Hence, the purpose behind this article is to help teachers plan their teaching operation according to this theory so that they can respond to class diversity and improve learners' performance. The implementation procedure consists of (1) understanding the essence of multiple intelligences theory, (2) showing teachers how to identify learners' multiple intelligences using the McKenzie MI Inventory, and (3) suggesting a variety of activities that cater for this intelligence, boost students' engagement, and develop the whole learner.

1. Introduction

Brain learning research has provided us with a plethora of reliable information on how we, as human beings, learn and how teachers should handle the teaching operation. Teachers and many schools around the world have revolutionized their teaching operation by implementing new recent findings provided by neuroscience and psychology. Multiple Intelligences theory (MIT) is one of them. Howard Gardner's (1983) work with multiple intelligences has offered insights for both teachers and learners. He explained that individuals have different bits of intelligence (at least nine) and, therefore, different aptitudes for learning. Thanks to him, MIT has conquered the teaching field, backed up the American 'No one left behind' education philosophy and strengthened the concept of individualized instruction. Unfortunately, the situation in Algeria is still at the back of the row despite the new nationwide implemented educational system. This system, which is hugging the so-called 'Competency-Based Approach', seems insufficient to make the Algerian learner an autonomous and self-reliant person capable of successfully confronting the unexpected. One of the main challenges in teaching lies in meeting the needs of a variety of learners, i.e., to provide each learner with 'the best shoe.' Unfortunately, a generic course is generally presented to the learners in the Algerian context, and a "one-size-fits-all" philosophy is imposed with little or no regard for individual differences and varied human intelligence. It appears to us that such a lack of regard for the individual's Multiple Intelligences has caused discomfort among learners, which, in turn, has hampered the learning development.

1.1 Aim of the paper
The main aims of this study are:

a) Making teachers, inspectors, textbook writers, and parents understand that individuals are unique and have their own preferred channels of learning called multiple intelligences.

b)   To show teachers how to identify and incorporate Multiple Intelligences Theory in EFL class using McKenzie MIT inventory.

c)   Using MI Theory as a guide to developing classroom activities that address the nine bits of intelligence and as a tool to help learners identify and better understand their own learning preferences.

1.2 Research Questions

The questions we attempt to answer so that teachers can accommodate students' intelligence and plan their teaching operation accordingly are:

1.   What is meant by Multiple Intelligences theory?
2.   How can we identify students' predominant intelligence?
3.   What are the characteristics of the performance objectives in an MI-based lesson?
4.   How can we promote effective applications of the MI Theory in EFL settings?

Teachers should respect learners' predominant intelligence and plan their teaching accordingly to accommodate these aptitudes.

2. The Theory of Multiple Intelligences: An Overview

2.1. Intelligence: The Conventional Meaning

In 1904, French authorities in Paris asked Alfred Binet, a famous psychologist and some of his colleagues to develop an instrument to measure students' performance to identify students who are "at-risk" for failure and hence, giving them much more attention. Binet's teamwork gave birth to the first intelligence test. This intelligence testing became widespread because it was said to objectively measure intelligence and reduce it to a single number called intelligent quotient (IQ).In 1983, almost 80 years after the IQ was developed, a Harvard psychologist named Howard Gardner from Harvard University challenged this common belief. He thought that the definition of intelligence was too parochial and proposed instead, nine basic bits of intelligence (Gardner 1993). According to Armstrong (2009), Gardner wanted to take intelligent human behavior beyond the IQ score.

2.2. Gardner's Multiple Intelligences Theory

Originated by Gardner in 1983, the multiple intelligences theory (MI) asserts that intelligence consists of at least nine elements: logical, linguistic, spatial, musical, kinesthetic, naturalist, intrapersonal and interpersonal intelligence. The nine bits of intelligence, as quoted by Howard Gardner (1993), are:

2.2.1 Linguistic Intelligence

This intelligence touches on a student's competency to use the written or spoken language effectively as a means of communication through the word. Thomas Armstrong (2000) defines this intelligence as 'the capacity to use words effectively whether orally or in writing (e.g., as a storyteller, a poet, playwright, editor or journalist). Some famous examples of people who have a predominant linguistic intelligence include; Taha Hussein, Shakespeare, and others.

2.2.2 Logical-Mathematical Intelligence

This intelligence refers to those who can think logically, calculate numbers, and solve problems scientifically. Armstrong (2009, 6) defines this intelligence as 'the capacity to use numbers effectively (e.g., as a mathematician, tax accountant, or statistician) and to reason well (e.g., as a scientist, computer programmer, or logician)'. Some famous examples of people with this intelligence include; El Khawarismi and Albert Einstein.

2.2.3 Visual-Spatial Intelligence

According to Armstrong (2009.7), this intelligence is defined as 'the ability to perceive the visual-spatial world accurately' like guides and scouts. People who fall under this intelligence can clearly represent their visual ideas. People who possess this intelligence include architects, pilots, sailors, and guides. Some famous examples include; Ibn Battûta, Picasso and Leonardo DaVinci).

2.2.4 Musical or Rhythmic Intelligence

This intelligence refers to one's capacity to use music or rhythm as a vehicle of expression. People who are musically intelligent are perceptive to elements of rhythm, melody, and pitch. Armstrong (2009.7) defines this intelligence as ''the capacity to perceive, discriminate, transform and express musical forms''. According to him, one can possess a global and intuitive (top-down) understanding of music, analytical technical (bottom-up), or both. Music often helps people in this category to work hard and achieve better results—examples of people with this intelligence include; singers, musicians, and composers.

2.2.5 Bodily-Kinesthetic Intelligence

This intelligence refers to ''the expertise in using one's whole body to express ideas and feelings and facility in using one's hands to produce or transform things'' (Armstrong 2009). Always in Armstrong's mind, this intelligence includes specific physical skills such as 'coordination, balance, flexibility, and speed as well as tactile and haptic capacities'. In other words, Bodily-Kinesthetic Intelligence This intelligence 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. People in this category learn better when they are encouraged to do things and interact physically. Examples of this category include dancers, gymnasts and athletes.

2.2.6 Interpersonal Intelligence

This intelligence involves the capacity to effectively communicate with and respond to other people. It is the ability to understand others' feelings and work cooperatively with them. It does with interaction with others. People categorized here are usually extroverts. According to Armstrong (2009), Interpersonal intelligence is 'the ability to perceive and make distinctions in other people's mood, intentions, motivations, and feelings of feelings. This might include the ability to understand others' facial expressions and gestures; and how to respond appropriately to these cues. (Examples: include salespeople, politicians, and religious leaders)

2.2.7 Intrapersonal Intelligence

Intrapersonal intelligence refers to the capacity to accurately know oneself, including knowledge of one's own strengths, weaknesses and feelings. Intrapersonal people are introvert and capable of self-reflection. They are self-disciplined and possess the ability for both self-understanding and self-esteem. Armstrong (2009) defines this type of intelligence as 'self-knowledge and the ability to act adaptively on the basis of that knowledge'. Examples of this category include; philosophers, entrepreneurs, and therapists.

2.2.8 Naturalist Intelligence

People with Naturalist intelligence appreciate nature. Naturalist intelligence is said to focus on how people relate to their natural surroundings. According to it, people with a predominant naturalist intelligence have sensitivity to nature. They can and like growing plants, vegetables and fruit. They also have a natural liking for and understanding of animals (https://personalitymax.com/multiple-intelligences/naturalist/). Hobbies of the naturalist include outdoor activities such as walking, climbing and camping.

2.2.9 Existential Intelligence

According to Gardener (1999), existential intelligence is "exhibiting the proclivity to pose and ponder questions about life, death and ultimate realities". It is the ability to conceptualize and understand deeper the still unanswered questions about our being on earth, the meaning of life, soul and death'. People with this intelligence are often curious about the origin of life, the meaning of death and the truth about ultimate realities: Why are we here on this planet? What happens to us after death? Are there extraterrestrials? Do animals understand one another? Do ghosts or spirits exist? To our mind, this intelligence is closest in meaning to religious intelligence.

As a summary to these bits of intelligence, we suggest the following 'Eight ways of learning' table designed by Armstrong (2000), which summarizes the students' intelligence, their way of thinking, likes, and needs:

Table 1. Eight Ways of Learning

Learners highly	Think	Love	Need
Linguistic	in words	reading, writing, telling stories, playing. Word games etc.	book, stapes, writing tools, paper, diaries, dialogue, debate, stories discussion
Logical-Mathematical	by reasoning	experimenting, questioning, puzzles, calculating	materials to experiment with science, manipulatives, trips to science museums
Spatial	in images, maps and pictures	Designing, drawing, visualizing,	Art, video, movies, slides, imagination games, mazes, puzzles, illustrated books, trips to art museums
Bodily-Kinesthetic	Through somatic sensations	Dancing, running, Jumping, building, touching, gesturing	Roleplay, drama, movement, Things to build, sports and physical games, tactile

			experiences, hands-on learning
Musical	via rhythm, music and melodies	Singing, whistling, humming, tapping feet and hands, listening	Sing-along time trips to concerts, music playing at home and school, musical instruments
Interpersonal	by bouncing ideas off other people	leading, organizing, relating, manipulating, mediating, partying	friends, group games, social gatherings, community events, clubs, mentors/apprenticeships
Intrapersonal	in relation to their needs, feelings and Goals	setting goals, meditating, dreaming, planning, reflecting	secret places, time alone, self-paced projects, choices
Naturalist	through nature	Playing with pets, gardening, gating nature, raising animals, caring for planet earth	access to nature, interacting with animals, tools for investigating nature

3. Identifying Learners' Multiple Intelligences

According to Armstrong (2009), the best way to assess students' multiple intelligences is through "a realistic appraisal of learners' performance in the many kinds of tasks, activities, and experiences associated with each intelligence". For this purpose, he suggested an MI inventory that can assist anyone in identifying her/his multiple intelligences. This inventory can be found in his book titled 'Multiple Intelligences in the Classroom' (Armstrong 2009).

Another inventory we found very useful is 'McKenzie Multiple Intelligences (M.I.) Survey (Appendix One). This inventory was designed by Walter McKenzie in 1999. It enables us to assess our multiple intelligences in an easy way. Thanks to this survey, people can diagnose their intelligence and find their predominant one. It consists of nine sections; each comprises ten (10) questions. To avoid student intelligence identification while answering the questions, all the 90 questions appear in a mixed-up way. A"1" is to be placed on the appropriate line of each question. In other words, students have to complete each section by placing a "1" next to each statement they feel accurately describes them. After answering all the 90 questions, students have to refer to the scoring instructions included in the survey to know their predominant intelligence(s).

It is worth mentioning that nowadays, thanks to technology, we can scan the human brain and identify one's intelligence in a more reliable way. Thanks to a functional magnetic resonance imaging scanner (fMRI), we can see the nine bits of intelligence and even measure them.

4. Adapting Teaching to Multiple Intelligences Theory

As discussed above, all learners have different bits of intelligence and hence require appropriate strategies. Multiple intelligences theory offers instructors a variety of techniques that match the needs of these people. Below, there are some learning activities designed to support h MI theory. They are adapted from 'Scholastic.com':

https://www.scholastic.com/teachers/articles/teaching-content/clip-save-checklist-learning-activities-connect-multiple-intelligences/

4.1. Learning Activities for the Verbal-Linguistic Intelligence

Verbal-linguistic students use words to argue, persuade, and express their thoughts. The activities that suit them include:

- doing crossword puzzles with lexical items
- playing games that involve letters and language
- writing short stories as a classroom project
- writing articles for the school magazine
- writing a letter to friends around the world
- writing about local issues
- using digital resources and computers to reach electronic libraries, publishing, word games etc.
- writing and entering their original poems in international poetry contests
- listening to audio-books

- Imitating good speakers
- Telling a story to classmates
- Participating in class debates and presentations.

4.2 Learning Activities for Logical-Mathematical Intelligence

Logical-mathematical learners often prefer working with numbers and reasoning.. They have a well-developed ability to reason. They like doing cause and effect tasks. Hence, teachers should provide them with activities that involve them in:

- playing math games like dominoes, chess, checkers,
- searching for patterns in the classroom, school, outdoors, and home
- conducting experiments to demonstrate science concepts
- using math and science software which reinforces math skills,
- using science tool kits for science programs
- designing alphabetic and numeric codes
- making up analogies

4.3 Learning Activities for Spatial Intelligence

Students with spatial intelligence process information in pictures and images. They rely much on their visual receptive skills. Their motor skills enable them to make artistic designed projects. They prefer:

- taking photographs for assignments and classroom activities
- taking pictures for the school magazine, or science homework
- making objects from clay to represent concepts
- using flow charts, visual maps, Venn diagrams to connect new material to known information
- acting out using puppets to reinforce concepts and information acquired in class
- making use of maps to study geographical locations
- illustrating poems for the class poetry by drawing

4.4 Learning Activities for Musical Intelligence

Musical students process information through sound and rhythm. They possess a superior ability to compose and perform music. Activities that sustain their interest are:

- writing songs and music about topics dealt with in class
- supporting original poems with background music, and then performing them for the class
- incorporating poems they have written with melodies they already know
- listening to the music of different styles
- using rhythm and clapping to memorize facts or other content-area information
- listening to CDs that teach concepts like the alphabet, parts of speech, and even pronunciation.

4.5. Learning Activities for Bodily-Kinesthetic Intelligence

Bodily-kinesthetic students perceive the world through touch and movement. Their bodies and their minds perfectly connect with one another. Suitable activities for these learners include:

- role-playing, skits, or simulations
- performing scenes from books or important historical events
- playing games like Twister and Simon Says
- using charades to act out characters in a book, vocabulary words, animals, etc.
- playing scavenger hunts, searching for items related to a given theme
- building objects using cubes and blocks to represent concepts from content-area lessons
- using computers motion-simulation games and hands-on construction kits

4.6 Learning Activities for Interpersonal Intelligence

Students with predominant interpersonal intelligence have a natural ability to interact with and get along with others effectively. They can be good leaders. They know how to negotiate to persuade others. They like:

- designing and completing projects in groups
- working in pairs
- interviewing people with knowledge about important events
- tutoring classmates

4.7 Learning Activities for Intrapersonal Intelligence

Intrapersonal intelligence students are usually aware of their feelings, thought, and goals. To process and create, these learners need to be alone in a quiet environment, far from others. Teachers should set them to:

- write reflective papers on content-area topics
- write essays from the perspective of historical figures
- write goals for the future and plan ways to achieve them
- use software that allows them to work alone,
- keep journals or logs throughout the academic year
- Making a notebook for their poems and reflections

4.8 Learning Activities for Naturalistic Intelligence

These people love nature and want to protect it. Students with strong naturalistic intelligence easily recognize plants, animals, and rocks. Their preferred activities are the ones which:

- care for classroom plants and animals
- classify natural objects, such as leaves and rocks
- research and protect animal habitats
- explore natural surroundings
- participate in playground clean-ups, tidiness and beautification projects

4.9 Learning Activities for Existential Intelligence

As seen before, this intelligence encourages the learner to think philosophically to understand the purpose behind our own existence on Earth and related topics. People under this category are often spiritual. K, Melissa. (2020, February 11). Suggested the following activities for existential students:

5. discussing values of societies
6. discussing sayings by prophets and great philosophers
7. setting learners to discuss any topic from their own and different points of view
8. linking the class to the outside world
9. providing learners with overviews to satisfy their need to see the big picture
10. having learners create lessons to teach their classmates, like presentations

Along with the above multiple intelligences typology of activities that cater for Gardner's nine ways of knowing, performance objectives should be SMART and carefully expressed. Ellen Weber (2005) suggested that several critical elements typically do characterize clear performance objectives:

1. Objectives are measurable.
2. Objectives state observable learner performances.
3. Objectives outline conditions under which behaviours occur.
4. Objectives are stated with prescribed learner performances in mind.
5. Objectives are written with an action verb such as; list, compare, illustrate.
6. Objectives describe the minimum expectations for all students.
7. Objectives are stated in as few words as possible.
8. Objectives begin with "The learner will...."

9. Each objective describes one performance only.
10. Objectives will be followed by specific, appropriate assessment activities.

5. Conclusion

Multiple Intelligences theory has become a crucial element of brain learning. It has opened new horizons to educators. Thanks to it, instructors can use a variety of techniques to cater to their students' intelligence and respond to their preferred channels of learning. Teachers should adapt their instruction to MI theory and ensure that their objectives and activities accommodate and stimulate all learners' bits of intelligence while planning their lessons. When students learn with their innate strengths, they become fully engaged, and their results are bound to be excellent.

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