



Multiple Intelligence Theory and Foreign Language Learning: A Brain-based Perspective

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ABSTRACT

Gardner's Multiple Intelligences theory is presented as a cognitive perspective on intelligence which has profound implications for education in general. More specifically, it has led to the application of eight of these frames to language teaching and learning. In this chapter, we will argue in favour of the application of MIT to the EFL classroom, using as support some of the major insights for language teaching from brain science.

KEYWORDS: foreign and second language learning, learning styles, Multiple Intelligences Theory, neuroscience and language learning, stimulus appraisal, motivation

INTRODUCTION

Howard Gardner's multiple intelligences theory (MIT) (1983, 1999) is an important contribution to cognitive science and constitutes a learner-based philosophy which is "an increasingly popular approach to characterizing the ways in which learners are unique and to developing instruction to respond to this uniqueness" (Richards & Rodgers, 2001: 123). MIT is a rationalist model that describes nine different intelligences. It has evolved in response to the need to reach a better

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understanding of how cognitive individual differences can be addressed and developed in the classroom. Gardner (1999) and his research associates identified the mathematical-logical, the verbal-linguistic, the musical-rhythmic, the bodily-kinaesthetic, the interpersonal, the intrapersonal, the visual-spatial, the naturalist and the existential intelligences. The following criteria have been used in MIT to identify an intelligence: it "entails the ability to solve problems", it involves a "biological proclivity", it has "an identifiable neurological core operation or set of operations" and it is "susceptible to encoding in a symbol system ... which captures and conveys important forms of information" (Gardner 1999: 15-16).

These different intelligences reflect a pluralistic panorama of learners' individual differences; they are understood as *personal tools* each individual possesses to make sense out of new information and to store it in such a way that it can be easily retrieved when needed for use. The different intelligences are of neutral value; none of them is considered superior to the others. In their basic form, they are present to some extent in everyone, although a person will generally be more talented in some than in others. Each of these frames is autonomous, changeable and trainable (Armstrong, 1999) and they interact to facilitate the solution of daily problems.

In this chapter, MIT in the EFL classroom will be considered as a framework that can help language teachers to give recognition to the holistic nature of learners and to address student diversity. It enables teachers to organize a variety of contexts that offer learners a variety of ways to engage meaning and strengthen memory pathways; it is a teacher-friendly tool for lesson planning that can increase the attractiveness of language learning tasks and therefore create favourable motivational conditions.

I. MULTIPLE INTELLIGENCES AND LEARNING

1.1. Learner diversity

Traditionally, whether in an explicit or implicit manner, many learning contexts have been organized and many teachers have taught as if all learners were the same. One of the most significant advances in education in the last decades of the twentieth century has come from a considerable amount of research done in the area of learning styles which recognizes that the students in our classrooms have greatly different learning profiles. Reid (1999: 301) lists some of the dimensions which have been investigated in the area of language learning; multiple intelligences, perceptual learning styles, field dependence/independence, analytic/global learning styles and reflective/impulsive learning styles. She mentions some of the benefits of increasing learners' awareness of their own learning styles: "higher interest and motivation in the learning process, increased student responsibility for their own learning, and greater classroom community. These are affective changes, and the changes have resulted in more effective learning" (Reid, 1999: 300).

Gardner's research has shown that human cognitive ability is pluralistic rather than

unitary and that learners of any subject will make greater progress if they have the opportunity to use their areas of strength to master the necessary material. He recommends that teachers use a wide variety of ways to deal with the subject because "genuine understanding is most likely to emerge and be apparent to others... if people possess a number of ways of representing knowledge of a concept or skill and can move readily back and forth among these forms" (Gardner, 1991: 13).

1.2. The holistic nature of learners

Gardner's cognitive model proposes that human beings are multidimensional subjects that need to develop not only their more cognitive capacities but also other abilities as, for example, the physical, artistic and spiritual. Traditionally, learning has often been considered only a cognitive activity, but if we take brain science into account, this consideration is inaccurate and educationally and socially problematic. As Rogers (1975: 40) affirmed, mainstream educational institutions "have focused so intently on the cognitive and have limited themselves so completely to 'educating from the neck up' that this narrowness is resulting in serious social consequences". Widening the focus, both humanistic psychology and MIT recognize that learning involves the physical and affective sides of the individual, as well as the cognitive.

Neurophysiologist Hannaford has studied the relationship between learning and the body, and she points to the benefits of taking the physical side of learners into account and incorporating movement in the classroom, including bringing a greater supply of oxygen to the brain and increasing the energy level of students. She summarizes one of the main reasons why movement and the body are important for learning:

Intelligence, which is too often considered to be merely a matter of analytical ability measured and valued in IQ points depends on more of the brain and the body than we generally realize. Physical movement, from earliest infancy and throughout our lives, plays an important role in the creation of nerve cell networks which are actually the essence of learning.

Hannaford (1995: 96)

Similarly, there is strong neurobiological support for the importance of affect for learning. Neurobiologist Damasio (1994: xii), using evidence from studies of the brain, asserts that our emotional life is "an integral component of the machinery of reason"; and in his work on a brain-based model of language acquisition, Schumann (1994: 232) comments that "brain stem, limbic and frontolimbic areas, which comprise the stimulus appraisal system, emotionally modulate cognition such that, in the brain, emotion and cognition are distinguishable but inseparable. Therefore, from a neural perspective, affect is an integral part of cognition".

Neuroscience, then, points to the need to develop a holistic view of the classroom, taking the physical and affective dimensions of learners into account if their cognitive side is to function optimally. Within this perspective, the incorporation of MIT is an effective way to broaden both the goals and the range of tools at our disposal for teaching a foreign language.

1.3. Teachability of intelligences

Neuroscience explains that the human brain is a neurally distributed processor where neurons interact and knowledge depends on the connections or synapses of these units. A newborn has all the neurons he or she will have but only a small proportion of the synapses needed in adulthood. These are formed after birth and their creation is mainly driven by experience. Bransford, Brown and Cocking (1999) affirm that learning changes the physical structure of the brain, that learning organizes and reorganizes the brain and that different parts of the brain may be ready to learn at different times. Learning is the result of strengthening connections in the brain's neural network. The more a pattern is activated, the stronger the connections will become.

MIT is a dynamic construct that understands intelligences as tools that are changeable and trainable: "while traditional intelligence tests are based on the notion that the general faculty of intelligence is an inborn attribute that does not change over the time, the MIT asserts that there are skills universal to human species, related to the culture nurturing that domain and that develop according to experience, age and training" (Armstrong, Kennedy & Coggins, 2002: 11). Thus, Gardner's model of multiple intelligences is a reaction against a conservative and totally biologically driven view which would encourage students to see intelligence as fixed and which could therefore make putting out special effort to achieve academic goals seem not worthwhile. According to Williams and Burden (1997: 18), "this view states that people who are born more intelligent are much more likely to succeed at school or in any learning task than those who are born less intelligent. This often leads to the logically unjustifiable conclusion that anyone failing in school or having difficulty in learning must, therefore, lack intelligence". In conceptualizations such as Gardner's MIT theory or Sternberg's (1985) triarchic theory of intelligence we are freed from a static view of what it means to be intelligent and can come to see that "people *can become more intelligent* and that schools can (and should) play a part in this" (Williams & Burden, 1997: 20).

1.4. Motivation and stimulus appraisal

Universally considered vital for learning, motivation is a complex construct which depends to a great degree on the way we evaluate the multiple stimuli we receive in relation to a specific context. Schurnann (1997, 1999) describes how the system of neural mechanisms composed of the amygdala, the orbitofrontal cortex and the body proper supports the appraisal of stimuli coming into the brain from the senses. He establishes the close relationship between motivation research and stimulus appraisal: "it is reasonable to consider that motivation consists of various permutations and patterns of these stimulus appraisal dimensions" (Schurnann, 1999: 30). Schurnann's model incorporates the five dimensions of stimulus appraisal that Scherer (1984) postulates where an event is evaluated on the following: novelty, pleasantness, the relevance to the individual's needs and goals, the individual's ability to cope with the event, and the compatibility of the event with socio-cultural norms or with the individual's self concept. He

states that his purpose is "to explore how stimulus appraisals **generate** mental activity that enhances or inhibits learning", and he notes that in the research two important issues are "(a) that emotional reactions influence the attention and effort devoted to learning, and (b) that patterns of appraisal may **underlie** what has been considered motivation in SLA" (Schumann, 1997: 8).

The stimulus appraisal concept connects with and provides support for MIT at various points. Learning activities which are varied so that at least some of them relate to the learner's strengths will be more likely to be appraised positively because they will be more comfortable and thus more pleasant, they will be within the learner's coping ability, and they will certainly be more compatible with his or her self-concept. For example, learners with high visual-spatial intelligence who do an activity requiring them to draw pictures of four things that are important to them and then in the foreign language ask each other about their drawings would probably appraise the activity in a favourable way and therefore their motivation towards the activity and the context in which it is carried out would be increased.

1.5. Language aptitude

Good second language speakers are often considered to be talented people with special verbal abilities who possess more than one code to understand and acquire knowledge in order to use it in new situations. Various empirical studies (Gardner & Lambert, 1972; Skehan, 1982; Silva & White 2002) have investigated the relationship between IQ and the capacity for learning foreign languages but have found only a moderate level of correlation; therefore, Spearman's traditional static concept of intelligence' cannot be used as a predictor of successful language learning. Silva and White, psychologists of the U.S. Army Research Institute, studied the relation of cognitive aptitudes to success in foreign language learning of over 5000 students at American military academies and concluded that "future research should involve experimentation with alternative models not narrowly dependent on a general aptitude battery and static (as opposed to rate of change) performance data. Of particular interest would be alternative models that explicate the relation among a variety of predictors and individual differences in learning rates at different points in the language learning process" (Silva and White, 2002: 92).

Although most individuals are capable of learning a second language to some degree of competence, some learners are better equipped for the second language learning task than others. In Gardner's scheme, the verbal-linguistic intelligence does not make direct reference to second language learning. However, there seems to be a very plausible link as people with a high verbal-linguistic intelligence are those that tend to think in words (Nolen 2003) and that have the ability to use language effectively both orally and in writing (Christison and Kennedy, 1999), that is to say, those who have a high level of sensitivity to sounds or phonology, sentence structure or syntax, meaning or semantics and illocutionary force or pragmatics (Armstrong, 1999).

Skehan (1998) reviewed empirical research done on language aptitude, and defined this human capacity as a triarchic concept based on "auditory ability, linguistic ability and memory

ability" (p.201). This last subcomponent, memory ability, is of central importance to the understanding of the language learning process, though it still reflects a narrow perspective on what it means to *speak a language*, as it is not a solely question of retrieving verbal material based on systemic knowledge of the language but also of connecting it with contextual and schematic knowledge, as no interaction is context-free (Anderson & Lynch 1988). Skehan's revision of the three abilities of a sample of outstanding second language Learners shows that they do not seem to have *exceptional intelligence and cognitive ability* (1998: 212). In fact, the subject studied by Smith & Tsimpli (1995) did not score more than 107 in the traditional intelligence tests. As a general conclusion, Skehan (1998) affirms that exceptional foreign language learners are those that in a relatively short period of time (about three years) become fluent speakers, and exhibit a highly developed memory ability, that is to say, learners who are very good at assimilating large quantities of new material and at retrieving it while interacting. Skehan (1998) emphasizes that language performance is memory and accessibility dependent; in classroom language learning MIT can provide a basis for developing more effective communicators in the target language by helping learners to connect with the learning activities and to activate linguistic information stored in memory.

1.6. Personal meaningfulness and engaging memory pathways

Functionalists and constructivists agree that meaning is the starting point for language learning. As a clinical psychologist, Kelly (1955) stressed the natural urge in human beings to make sense of their world. This has important implications for language learning. Discussing Kelly's work, Williams and Burden (1997: 27-28) point out that

each person's individual construction of the world will depend upon their previous experiences, which will also influence how they anticipate what will happen in the future... Worthwhile learning does not entail the reception of ready-made facts. but must involve the building of new personal meaning and understanding.

It has very often been stated that meaningful learning fosters students' attentiveness. Jensen (1998) explains that meaning occurs in many areas of the brain and he distinguishes between *reference* and *sense meaning*, also called surface and deeply felt meaning. He includes relevance, emotional connection, pattern-making and context as central elements to create a meaningful message. As no interaction is context-free, to memorize any verbal information appropriately, its correspondent context has to be stored as well, and this context needs to interact with the learner's knowledge of the world. It is in the interaction of all these different elements that meaningful learning emerges. According to Caine and Caine (1994:47), meaningful learning "refers to storage of items that have so many connections, and are of such quality, that they can be accessed appropriately in unexpected contexts".

Research shows that memory is not a unitary construct and that different areas of the

brain participate in the encoding and retrieving tasks (Brown, Bransford, Ferrara & Campione, 1983; Bransford, Brown & Cocking, 1999). The description of different types of memory and the procedures of the learning process that contribute to the durability of memory and later effectiveness of recall have been the focus of numerous studies. For instance, Medina (1990) showed that primary students improved their rate of vocabulary recall significantly when they were exposed to stories accompanied by musical and visual stimuli.

With MIT applied in the language classroom, teachers are better able to tap into the areas of personal meaningfulness of their students since they are recognizing the differences inherent in the students and putting individuals with their different ways of learning where they belong, back at the centre of the learning process.

Language learning can be supported by bringing in the musical, visual-spatial, bodily-kinaesthetic, interpersonal, intrapersonal, mathematical and naturalistic abilities as they constitute distinct frames for working on the same linguistic content. Not only does this variety of presentations allow students to learn in their own best ways, it also helps to reduce boredom as language learning requires frequent circling back over the same material if learning is to be sustained. Schumann (1997: 32) claims that "sustained deep learning (SDL) is controlled by stimulus appraisal. This learning is characterized as sustained because an extended period of time (often several years) is required to achieve it; it is characterized as deep because, when it is complete, the learner is seen as proficient or expert". Schumann points out that in the SLA process proficiency, achieving sustained deep learning, varies across individuals who may have similar learning opportunities, with the variation seemingly depending on goals, preferences and talents of the learners. Unlike walking and speaking a first language, learned by innate mechanisms by all people in normal circumstances, the development of skills such as speaking a foreign language requires SDL, which "is never inevitable and therefore is highly dependent on affect, emotion, and motivation" (Schumann, 1997: 35). It seems reasonable to assume that a MIT approach to language teaching might reduce this variation in proficiency by tapping into the different talents of learners and thus providing them with both greater desire and more effective tools to make progress in the language learning process.

II. FRAMES FOR LANGUAGE TEACHING

Language learning tasks can be developed around different types of intelligences. For instance, an activity such as that of writing the lyrics of a song implies the use of linguistic and musical intelligences. In a role-play where learners may need to express their feelings while being considerate of the feelings of others, linguistic, intrapersonal and interpersonal talents are needed. In a task where learners need to mime the title of a film for others to guess, the bodily-kinaesthetic and interpersonal abilities are brought into play. MIT is an excellent tool to enable teachers to plan attractive ways to provide learners with language learning practice.

Within this cognitive model, "language is not seen as limited to a 'linguistics' perspective

but encompasses all aspects of communication" (Richards and Rodgers 2001: 117). The MIT instructional perspective proposes that language learning, that is to say, developing learners' verbal linguistic intelligence in a foreign/second language, can be favoured by using a variety of learning tasks which call upon diverse intelligences. The teacher offers a choice of tasks, not to teach to specific intelligences but to give learners the opportunity of apprehending information in their preferred way, as well as to promote the development of their other intelligences. We will now consider briefly how the verbal linguistic intelligence involved in foreign/second language learning can be supported by the other intelligence frameworks developed by Gardner.

11.1. The musical-rhythmic frame

The musical-rhythmic intelligence has to do with the ability to perceive and appreciate rhythm, pitch and melody. The use of music in the language classroom is not new. In Suggestopedia, for example, the teacher tunes her voice to the classical/baroque music during the concert session. This tuning affects language in several ways: pauses between thought groups become more obvious, musical rhythm causes a slowing down in speech production and musical melody guides the teacher's pitch variation. Research done on the effects of music in the classroom (Wood cited in Campbell, 1997; Lozanov, 1988) shows that students who had received musical education or those that had been frequently exposed to classical/baroque music had higher academic results. Rauscher, Shaw and Ky (1997) point to the effect of listening to music on the development of learners' spatial/temporal intelligence. Music also has physical effects such as the adaptation of breathing to the musical rhythms, the impact on muscular energy and psychological effects as seen in its ability to induce a certain type of mood (Benenson, 1995). In general, it can be affirmed that the development of musical intelligence in the second language classroom can have benefits such as helping students to concentrate and connect with their inner self, stimulating creative processes, cutting out the black noise, that is to say, eliminating distracting sounds from in or outside the classroom, and, above all, fostering a relaxed but motivating and productive classroom atmosphere.

11.2. The visual-spatial frame

Our visual-spatial intelligence is the ability we have to perceive all the elements (form, shape, line, space, colour) necessary to create a mental image of something. Mental images are present in thought and have a strong influence on reasoning (Arnold, 1999). Visual elements are especially useful for providing comprehensible and meaningful input for second language learners. Research on language comprehension has pointed very conclusively to the importance of imagery. In L1 reading comprehension, for example, it has been found that the concreteness of a text (its ability to evoke images) is a better predictor of comprehension than familiarity with the context of the text (Sadoski, Goetz & Avila, 1995) and that interest in reading is related to imagery (Long, Winograd & Bridge, 1989). Paivio's influential dual coding theory posits that we have two processing systems, a verbal system for language items and a non-verbal system

for images (Paivio 1986). It is basically through our imagery system that we access knowledge of the nonlinguistic world. Affective reactions are nonverbal and would seem to connect to nonverbal cognitive processes such as imagery. Given this, "it can be inferred that [there exists] a significant relationship between text concreteness (i.e., its imagery-evoking value) and affective responses such as reader interest, and that interest would accompany, or possibly mediate, concreteness as a predictor of comprehension and recall" (Sadoski, Goetz & Fritz, 1993: 281). The connection of words with experience and with emotional responses gives words their meaning. The more connections between images and words in the target language, the better.

It is easy to activate the visual-spatial intelligence. Words are, in a sense, glued to images. For example, telling students "not to think of a pink pig" will immediately bring this image to mind. Asking learners to remember their most enjoyable experience or to imagine a trip they would like to take or their ideal house can be a stimulus for different types of activities in the language classroom. In work with reading comprehension when mental images are used systematically they become a very useful learning strategy, due to the fact that visualizing while trying to understand a text is crucial for meaning making (Tomlinson, 1998).

Many students also find that visual teaching aids such as charts, pictures, drawings, slides, posters, and videos enhance their coping ability in the second language because they facilitate information retrieval.

11.3. The logical-mathematical frame

Our logical-mathematical intelligence gives us the ability to use numbers effectively and to understand the underlying principles of a causal system. Mathematicians and scientists, whose work involves recognizing patterns and explaining the physical universe, have this capacity highly developed. In the classroom reasoning strategies, an important aspect of the logical-mathematical intelligence, can be taught; and Armstrong (1999:99) recommends several tactics that can be used at different phases of problem solving: "find analogies; separate the various parts of a problem; propose a possible solution and then work backward; describe the characteristics that a solution should have; assume the opposite of what you are trying to prove, generalize (proceed from a given set of conditions to a larger set that contains the given one) or specialize (move from a given set of conditions to a smaller set)".

In the language classroom problem-solving tasks are useful as learners focus mainly on meaning, but through constant rereading of the text to solve the problem, they acquire a familiarity with the vocabulary and structures used.

11.4. The bodily-kinaesthetic frame

This intelligence refers to the ability to use the body to express oneself, to handle physical objects dexterously. According to the ancient Roman saying, *mens sana in corpore sano*; working on this intelligence not only affects health and fitness but also is important for

cultivating the powers of the mind. In many classrooms, students sit in rows for hours and are asked to pay attention to verbal input. The human need for movement is totally overlooked and therefore, its potential value for creating higher energy levels and maintaining attention is greatly reduced. Phenix explains the importance of movement in every human activity:

To be alive is to be able to respond-to be moved and to move. All perceptions of the surrounding world are accompanied by motor reactions. Every experience, whether primarily of feeling, thought, or volition, engages the whole person, including the interconnected system of muscles, nerves, bones, tissues, organs, and internal secretions. No instrument is as elaborative, sensitive, and innately responsive as the human body. This is why the arts of movement are so important for the expression and perception of human meaning.

Phenix (1964: 165)

The use of role-plays, drama, games, project work, shadow puppets, and many activities related to group dynamics directly address the bodily-kinaesthetic intelligence in the language classroom.

Non-verbal aspects of communication are also very relevant in language teaching. For example, gestures are movements of the body used to communicate an idea, intention or feeling. Speech-independent gestures (emblems) or autonomous gestures are nonverbal acts that can replace speech or help to organize the flow and rhythm of interaction and to maintain attention by adding emphasis (Knapp & Hall, 1992). Gestures are culture-bound and need to be taught in the second language classroom. The use of video-recorded interactions to observe kinesic behaviour is an option proposed by Kellerman (1992) to improve listening comprehension skills.

11.5. The interpersonal frame

The ability to understand other people, to work cooperatively and to communicate effectively is part of the interpersonal intelligence and strongly connected to learning a second language. Language learning is a social process which has as a main goal the development of communicative competence (Hymes 1971, Canale and Swain 1980). The interpersonal intelligence is connected to the ability to harmonize with others, to understand their perspectives and opinions, but also to convince others in order to achieve personal objectives.

Social constructivism in education stresses the importance of interaction of the participants in the learning situation. Vygotsky (1978) emphasized that learning is mediated or shaped and influenced by social interaction; as Domyei & Murphey (2003, 86) explain, "from a Vygotskian constructivist point of view, learning happens *intermentally* first, between minds in interaction, and only later becomes one's own learning, *intramentally*".

Cooperative Learning is a method which helps to develop this intelligence in the language classroom (Casal, 2002). Using a series of specific structures which foment positive interdependence, students in small groups interact and cooperate to carry out different tasks. This socializing approach to language learning in the classroom leads to the development of verbal

negotiation strategies to convince others or even to understand the others' point of view. Crandall (1999: 226) points out how it is useful in competitive societies "where it can help foster the development of social skills needed to interact and communicate equitably with diverse groups of people".

Within the interpersonal frame we can incorporate "active listening" strategies² which contribute to establish rapport in a communicative situation. Active listening is directly related to empathy, which has been defined as the process of "putting yourself into someone else's shoes"; it helps students to recognise that their way is not the only way and possibly not even the best way (Arnold and Brown, 1999). Empathy developed through group activities helps to create a relaxed classroom atmosphere where learners can feel more self-confident and willing to speak in the target language (Díaz, 2002).

11.6. The intrapersonal frame

The intrapersonal intelligence gives us the capacity to understand the internal aspects of the self and to practise self-discipline. It can be related to studies about metacognitive knowledge and language learning, where metacognition refers to knowledge about oneself, about the language and about the procedures or strategies to be used for certain types of tasks (Wenden 1987). Knowing personal capacities and limitations in order to optimize personal performance is precisely one of the milestones of learning styles research applied to language learning (Christison, 1999; Reid, 1995, 1998) and learning style assessment is a useful tool for language learners to "identify their preferred learning styles and stretch those styles by examining and practicing various learning strategies" (Reid, 1995: IX). As an important part of learning how to learn, metacognition not only takes in knowledge of our mental processes but also involves "knowledge of factors relating to the self, and the way in which these affect the use of cognitive process. Thus an awareness of one's personality, feelings, motivation and attitudes and learning style at any particular moment would be included within such a concept of metacognitive awareness" (Williams and Burden, 1997: 155).

Self-discipline is based on three metacognitive abilities: that of the perception of personal emotions, the ability to control them and the talent for motivating the self (Goleman, 1995). Identifying personal emotions and reflecting upon what is causing them constitutes the first step to learn self-control. In psychological and educational literature, the efforts to guide thoughts, feelings, and actions toward the attainment of one's goals has been studied by self-regulation theories (Bandura, 1997; Zimmermann, 2000) which affirm that motivational, cognitive, and performance outcomes are influenced by goal orientation.

Language learning tasks such as asking learners to think of the colour, size, texture which best expresses their feelings, or the use of a questionnaire that helps them to be aware of their "self-talk" or reading activities where students develop their attitudes towards a problem (Robles, 2002) are examples of how to work on the intrapersonal intelligence in the language classroom.

11.7. The naturalist frame

The ability to discriminate among numerous species of flora and fauna, enjoyment of the natural world and ecological sensitivity are characteristics of the naturalist intelligence, one of the two intelligences³ which Gardner (1999) included after his original formulation but which have not yet been developed extensively in the classroom. Activities such as brainstorming on how to contaminate less, or describing the process of recycling paper or tasks involving direct field observation and classification of the vegetal and animal world relate to the naturalist intelligence. Semantic maps relating to nature can be created to develop learners' lexical knowledge. Tasks that develop sensitivity towards the natural world can be incorporated; for example, learners can describe a scene in nature that they are familiar with or that they imagine.

III. CONCLUSION

In the second language classroom it is possible to motivate learners by activating multiple ways of meaning-making through the use of tasks relating to the different intelligences. Providing a variety of language activities that stimulate the different *tools* or intelligences proposed by Gardner (1999) makes it possible to engage multiple memory pathways necessary to produce *sustained deep learning* (Schumann 1997).

It is not a question of addressing all the individual MI profiles of each learner in every language class but of offering a balanced approach where different "windows on the same concept" (Gardner, 1993:204) are incorporated. As Schumann (1999) explains, one of the dimensions along which stimulus appraisals are made — and motivation is determined — is coping potential. Learners' belief about their ability to participate successfully in a language task can be influenced by the way teachers present material to their students and the steps followed to involve them in language learning influence. MIT framework is a useful tool for planning language learning tasks which insure that students can cope in the presence of challenge. When learners see what they *can* do, this has a positive effect on their self-esteem and can lead to enhancing success in language learning.

The possibilities of MIT improving academic results in different disciplines such as foreign language teaching have been discussed in many forums. Beyond this, however, ideally learning in any classroom will involve personal development and growth in all human dimensions. For this reason, in today's language classroom it is not enough solely to promote linguistic competence or even communicative competence. Gardner (1993:12) explains the social advantages inherent in the application of his theory:

It is of the utmost importance that we recognize and nurture all the varied human intelligences, and all of the combinations of intelligences. We are all so different largely because we all have different combinations of intelligences. If we recognize this, I think we will have at least a better chance of dealing appropriately with the many problems that we face in the world. If we can mobilize the spectrum of human abilities, not only will people feel better about

themselves and more competent; it is even possible that they will also feel more engaged and better able to join the rest of the world community in working for the broader good.

Society is demanding citizens who have developed multilingual knowing-how-to-listen and how-to-talk abilities, who are capable of setting and achieving personal goals, who know how to search for information necessary to continue learning beyond the classroom, who know how to work cooperatively — in general, citizens who are efficient and who know how to solve multiple problems in any given context, and using MIT in the language classroom can help to promote these goals.

NOTES

1. There are several theories of intelligences, but their explanation is beyond the scope of this paper. One that is widely known and used is Spearman's general intelligence (1904) that considers intelligence as a unitary construct (the g factor) based on linguistic, mathematical and spatial abilities. Other theories of intelligences are Thurstone's primary mental abilities (1938), Cattell and Horn's fluid and crystallized intelligences (1966), Gardner's multiple intelligences (1983, 1999) and Sternberg's triarchic theory of intelligence (1985, 1988).

2. Ehrman (1996: 32-35) describes some of the main aspects of active listening (body language, back channelling, paraphrasing, summarizing, etc.) and stresses the importance of not breaking the flow of the speaker's words and not interrupting to give advice.

3. The other one is the existential, or spiritual intelligence. This intelligence is not to be considered as less important, but it is beyond the scope of this chapter, as it is less amenable to development in the classroom. Gardner's theory is not understood as a closed paradigm, and other intelligences could be identified in the future, if they meet the basic criteria used to classify an intelligence.

REFERENCES

- Anderson, A. & T. Lynch. (1988). *Listening*. Oxford: Oxford University Press.
- Arrnstrong, T. (1999). *Seven kinds of smart: Identifying and developing your multiple intelligences*. New York: Penguin Putnam Inc.
- Annstrong, T.A., Kennedy, T.J. & Coggins, P. (2002). Summarizing concepts about teacher education, learning and neuroscience. *Northwest Passage: NWATE Journal of Education Practices*, 2: 1, 9-13.

- Arnold, J. & H. D. Brown (1999). A map of the terrain. In J. Arnold (Ed.) *Affect in language learning* (pp. 1-24). Cambridge: Cambridge University Press.
- Arnold, J. (1999). *Visualization: Language learning with the mind's eye*. In J. Arnold (Ed.), *Affect in language learning* (pp. 260-278). Cambridge: Cambridge University Press.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman
- Benenzón, R. (1995). *Manual de musicoterapia*. Barcelona: Paidós.
- Bransford, J. D., Brown, A.L. & Cocking, R. R. (1999). (Eds.) *How people learn: Brain, mind, experience, and school*. Washington, D.C.: Committee on Developments in the Science of Learning. National Research Council.
- Brown, A.L., J.D. Bransford, R.A. Ferrara, & J.C. Campione (1983). Learning, remembering, and understanding. In J.H. Flavell & E.M. Markman, (Eds.) *Handbook of child psychology: Vol. 3 Cognitive development* (4th ed.), (pp. 78-166). New York: Wiley.
- Caine, R. & G. Caine. (1994). *Making connections: Teaching at the human brain*. Menlo Park, CA: Addison-Wesley.
- Campbell, D. (1997). *The Mozart effect*. New York: Quill
- Canale, M. & M. Swain (1980), "Theoretical bases of communicative approaches to second language teaching and testing", *Applied Linguistics*, 1:1-47.
- Casal Madinabeitia, S. (2002). El desarrollo de la inteligencia interpersonal mediante las técnicas del aprendizaje cooperativo. In M.C. Fonseca (Ed.) *Inteligencias múltiples, múltiples formas de enseñar inglés* (pp. 157-176). Sevilla: Mergablum
- Carroll, J. B. (1991). Cognitive abilities in foreign language aptitude: then and now. In T. Parry & C. Stansfield (Eds.) *Language aptitude reconsidered*. (pp. 11-29). Englewood Cliffs, NJ: Prentice Hall.
- Chastain, K. (1988). *Developing second-language skills. Theory and practice*. San Diego: Harcourt Brace Jovanovich.
- Christison, M.A. (1996). Teaching and learning languages through inultiple intelligences. *TESOL Journal*, 6 (1), 10-14.
- Christison, M.A. (1998). Applying Multiple Intelligences Theory in pre-service and in-service TEFL education programs. *English Teaching Forum*, April-June: 3-13.

- Christison, M.A. (1999a). *A guidebook for applying multiple intelligences theory in the ESL/EFL classroom*. Burlingame, CA: Alta Book Center.
- Christison, M.A. (1999b). Multiple intelligences. *ESL Magazine*, 2 (5), 10-13.
- Christison, M.A & D. Kennedy. (1999). Multiple intelligences: Theory and practice in adult ESL. *National Clearinghouse for ESL Literacy Education Washington DC*, (ERIC Digest ED441350).
- Crandall, J. (1999). Cooperative language learning and affective factors. In J. Arnold (Ed.) *Affect in language learning* (pp. 226-245). Cambridge: Cambridge University Press.
- Damasio, A. (1994). *Descartes' error.: Emotion, reason and the human brain*. New York: G. P. Putnam's Sons.
- Díaz Pinto, E. (2002). La metodología humanística en la ESO y el desarrollo de las inteligencias múltiples. En M.C. Fonseca (ed.). *Inteligencias múltiples. Múltiples formas de enseñar inglés* (pp. 95-114). Sevilla: Mergablum.
- Dornyei, Z. & T. Murphy. (2003). *Group dynamics in the language classroom*. Cambridge: Cambridge University Press.
- Ehrman, M. (1996). *Understanding second language learning difficulties*. Thousand Oaks, CA: Sage.
- Fasko, D. (2001). An analysis of multiple intelligences theory and its use with the gifted and talented. *Roeper Review*, Vol. 23 (3), 126-131.
- Fonseca Mora, M. C. (2001). La enseñanza de aspectos afectivos en el ámbito universitario. *Revista de Enseñanza Universitaria*. Nº Extraordinario: Perspectivas actuales en la metodología de la enseñanza de del inglés en las universidades andaluzas. A. Bruton y F. J. Lorenzo. (Eds.), 83-96.
- Fonseca Mora, M. C. (2002). (ed.). *Inteligencias múltiples, múltiples formas de enseñar inglés*. Sevilla: Mergablum.
- Gardner, H. (1983). *Frames of mind. The theory of multiple intelligences*. New York. Basic Books.
- Gardner, H. (1991). *The unschooled mind: How children think, and how schools should teach*. New York: Basic Books.
- Gardner, H. (1993). *Frames of the mind: The theory of multiple intelligences 10th Anniversary Edition*. New York: Basic Books.
- Gardner, H. (1997). *Extraordinary minds: Portraits of exceptional individuals and an examination of our*

- extraordinariness*. New York: Basic Books.
- Gardner, H. (1999a). *Intelligence reframed. Multiple intelligences for the 21st century*. New York: Basic Books.
- Gardner, H. (1999b). Are there additional intelligences? The case for naturalist, spiritual, and existential intelligences. In J. Kane (Ed.), *Education, information and transformation* (pp. 111-131). Englewood Cliffs, NJ: Prentice Hall.
- Gardner, R. & W. E. Lambert. (1972). *Attitudes and motivation in second language learning*. Rowley: Newbury House Publishers.
- Goleman, D. (1995). *Emotional intelligence*. London: Blumshury.
- Hadfield, J. & C. Hadfield. (1998). Renewable sources. *English Teaching Professional* 9,11
- Hannaford, C. (1995). *Smart moves: Why learning is not all in your head*. Arlington, VA: Great Ocean Publishers.
- Hymes, D. (1971). *On communicative competence*. Philadelphia: University of Pennsylvania Press.
- Ioup, G., Boustagni, E., El Tigi, M. & M. Moselle. (1994). Re-examining the critical period hypothesis: a case study of successful SLA in a naturalistic environment. *Studies in Second Language Acquisition* 16: 73-98.
- Jensen, E. (1995). *Brain-based learning*. San Diego: The Brain Store.
- Jensen, E. (1998). *Teaching with the brain in mind*. Virginia: ASCD.
- Kelly, G. (1955). *The psychology of personal constructs*. New York: Norton.
- Kellerman, S. (1992). 'I see what you mean': The role of kinesic behaviour in listening, and implications for foreign and second language learning. *Applied Linguistics* 13,3: 239-258
- Knapp, M.L. & J.A. Hall. (1992) (3rd.edition). *Nonverbal communication in human interaction*. San Diego: Harcourt Brace College Publishers.
- Long, S. A, P. A. Winograd & C. A. Bridge. (1989). The effects of reader and text characteristics on reports of imagery during and after reading. *Reading Research Quarterly*, 24, 125-138.
- Lozanov, G. & E. Gateva. (1988). *The foreign language teacher's Suggestopedic manual*. New York: Gordon and Breach.

- Medina, S. L. (1990). The effects of music upon second language vocabulary acquisition. Paper presented in TESOL, San Francisco, California.
- Nolen, J. L. (2003). Multiple intelligences in the classroom. *Education*; Vol. 124 (1), 115-120.
- Paivio, A. (1986). *Mental representations: A Dual Coding approach*. New York: Oxford University Press.
- Phenix, P. (1964). *Realms of meaning: a prospective through retrospective*. New York: McGraw Hill.
- Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92(3), 544-555.
- Rauscher, F. H., G. L. Shaw & K. N. Ky. (1997). Listening to Mozart enhances spatial/temporal reasoning. *Neurological research*, 19: 208.
- Reid, J. (Ed). (1995). *Learning styles in the ESL/EFL classroom*. Boston: Heinle & Heinle.
- Reid, J. (Ed). (1998). *Understanding learning styles in the second language classroom*. Upper Saddle River, NJ: Prentice Hall Regents.
- Reid, J. (1999). Affect in the classroom: problems, politics, and pragmatics. In J. Arnold (Ed.) *Affect in language learning* (pp. 297-306). Cambridge: Cambridge University Press.
- Richards, J. & T. Rodgers. (2001). *Approaches and methods in language teaching*. Cambridge: Cambridge University Press.
- Robles, A. (2002). La inteligencia emocional en el aula de inglés. In M.C. Fonseca (Ed). *Inteligencias múltiples, Múltiples formas de enseñar inglés* (pp 157-176). Sevilla: Mergablum
- Rogers, C. (1975). Bringing together ideas and feelings in learning. In D. Read & S. Simon (Eds.) *Humanistic education sourcebook* (pp.40-41). Englewood Cliffs, NJ: Prentice Hall,.
- Russell, P. (1979). *The brain book*. London: Routledge and Keagan.
- Sadoski, M., Goetz, E. T., & Avila, E. (1995). Concreteness effects on text recall: Dual coding or context availability? *Reading Research Quarterly*, 30,278-288.
- Sadoski, M, E. Goetz & J. Fritz (1993). Concreteness effects in text recall: Dual coding or context availability? *Reading Research Quarterly*, 30, 278-288.
- Schachter, D.L. (1997). Neuroimaging of Memory and Consciousness. Paper presented at the

Symposium: Recent Advances in Research on Human Memory, National Academy of Sciences. Washington, DC.

- Scherer, K. R. (1984). Emotion as a multi-component process: A model and some cross-cultural data. In P. Schaver (Ed.) *Review of personality and social psychology: Vol. 5, Emotions, relationships and health* (pp. 37-63). Beverly Hills, CA: Sage.
- Schumann, J. (1994). Where is cognition? *Studies in Second Language Acquisition* 16, 231-42.
- Schumann, J. (1997). *The neurobiology of affect in language*. Boston: Blackwell.
- Schumann, J. (1999). A perspective on affect. In J. Arnold (Ed.) *Affect in language learning* (pp. 28-41). Cambridge: Cambridge University Press.
- Smith, N. & X. Tsimpli. (1995). *The mind of a savant*. Oxford: Blackwell.
- Skehan, P. (1998). *A cognitive approach to language learning*. Oxford: Oxford University Press
- Sternberg, R. (1985). *Beyond IQ: A triarchic theory of human intelligence*. Cambridge: Cambridge University Press.
- Tanner, R. (2001). Teaching intelligently. *English Teaching Professional*. 20: 40-41.
- Taylor, H. M. (1981). Learning to listen to English. *TESOL Quarterly*, 12: 285-295.
- Tomlinson, B. (Ed.) (1998). *Materials development in language teaching*. Cambridge: Cambridge University Press.
- Vygotsky, L. (1978). *Mind in society*. Cambridge, Mass.: MIT Press.
- Wenden, A. (1987). Metacognition: an expanded view of the cognitive abilities of L2 learners. *Language Learning*, 37 (4), 593-597.
- Williams, M. & R. Burden. (1997). *Psychology for language teachers*. Cambridge: Cambridge University Press.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). San Diego: Academic Press.