OPEN DOOR TO EVERY PUPIL

A model for a curriculum for qualification of pedagogical disciplines students at the universities

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of the European Union

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for a CURRICULUM for qualification
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Content

Preamble

This curriculum has been designed for students at the pedagogical departments – masters programs. The Curriculum could also be adapted for a training course for qualification of teachers at primary schools and kindergartens on how to use the MI methodology.

Duration: 60 class hours and out-of-class individual and team work.

Possible credits depend of the university regulations.

The Curriculum is designed to give knowledge and skills to students on how to teach children – intellectually, emotionally, and socially; on how children could form transferable skills in parallel with acquiring academic knowledge. The streamline of the Curriculum is to teach students – future teachers how to create equal environment for all learners (pupils) at primary school and kinder-gardens based on their individuality and how to create a flexible classroom.

The philosophy of the MI training concept is the understanding that everybody is intelligent but in a different way.

The Curriculum is intended as 15 interdisciplinary courses giving knowledge about: the evolution of the concepts of education and intelligence that resulted in the MI theory and its toolkits for practical usage, creating a flexible classroom which motivates learners to study and simultaneously forms their transferable skills, creating natural integration of the hyperactive children and the children with a syndrome of attention deficits with the other learners.

MI methodology is presented and interpreted in relation to the already well-known and practically implemented ones like: the Montessori Method, the Cooperative pedagogy by Celestin Freinet and Sylvain Connac.

Pedagogical methods:

1. Lectures.
2. An interactive approach
   (direct active participation of students and team interaction).
3. Individual work.
4. Seminars and workshops
5. Individual and team projects.
6. Individual and team tasks and presentations.
7. Demo and games.
8. Individual consultations and coaching.

As a result, students will acquire knowledge and competences about the personalization of learning through the use of MI methodology, to design their own practical techniques to

educate learners by developing their types of intelligence simultaneously and in cooperation; they will be able to create a system for evaluation. Students will develop skills for integrating practice in teaching, according to the theory of multiple intelligences, as well as to the modern trends in neuropedagogy.

Students will acquire competences to work as teachers, as evaluator developers in education, and as councilors.

The evaluation is based on the following components:

WHAT IS EVALUATED	EVALUATION INSTRUMENTS	% IN THE FINAL RATING
Participation and activities during the semester	Portfolio	25%
Individual and team work (task, project, etc.)	Results (analytical report, presentations, discussions, etc.)	25%
Actual content	Examination (oral, written, test type, etc.)	30%
Case from a real school practice	Analyze	20%

1

Introduction to understanding of intelligence: basic concepts: evolution. A revolution in the concept of intelligence.

ANNOTATION

The aim is to introduce the concept of intelligence and to trace its historical development and to reveal the prerequisites (preconditions) for the emergence of new approaches in education, based on today's achievements of neuropedagogy.

The task is to introduce to the students the concept of intelligence, its evolution and the emergence of various theories of intelligence; to argue why there is still no unified definition of intelligence; to discuss why intelligence is a subject of study in various scientific disciplines: cognitive psychology, neurophysiology, genetics, pedagogy and more recently – neuropedagogy, a science that seeks correspondence between structures in the brain and different types of intelligence.

The evolution of the concepts of the intelligence is presented based on the focus of discussions among researchers of intelligence from the 19th century to the present day, highlighting the importance of the development of research techniques and methods throughout the evolution of understanding human intelligence by using the prevailing scientific paradigms. A number of authors defend the hereditary nature of intelligence and its genetic conditioning (Sigmund Freud, Noam Chomsky, Francis Galton). Others argue that intelligence is entirely a function of social life, of education and of upbringing (Albert Bandura, Burus Frederick Skinner, John B. Watson, John Locke). Then there are some opinions that combine these factors, i.e. the genetic material with which a person is born is implemented to one degree or another by communication, education, family, lifestyle, i.e. determined by the influence of the environment (John Dewey, Edward Thorndike, Gilbert Godlip, Johnson and Edwards, Michael Meeney).

Nowadays there is no unified definition about "intelligence". Human intelligence is a subject of study in various scientific disciplines: cognitive psychology, neurophysiology, genetics, pedagogy and more recently – neuropedagogy.

Students will acquire knowledge about the emergence of the interest in the topic of intelligence and the creation of methods for its measurement and with ways to determine the rate of intelligence such as:

(1) The first steps for scientific testing of the intelligence have been made by the English aristocrat Sir Francis Galton (1822-1911) and have been documented in his book "Hereditary Gift". Galton has denied the idea of the existence of "natural equality" (i.e. that people are born

absolutely the same) and has established the thesis of the intelligence as a universal human characteristic in which the differences between the individuals are very weakly influenced by upbringing and are inherited entirely genetically. Galton is an empiricist and believes that the main source of knowledge are the senses, so a higher level of intelligence, according to him, is associated with more advanced sensory and motor abilities.

(2) Methods for assessing intelligence that put the cognitive functions of the individual at the center (Alfred Binet and Theophilus Simon in the early twentieth century) and the ability to solve complex problems became a component in measuring intelligence. The first metric scale for measuring intelligence was created, which later became the basic method of measuring the "IQ" until present days, created by Lewis Madison Thurman.

There will be a review of the crucial moments in the evolution of the theories of intelligence such as:

1. General Intelligence Theory (Two Factor Theory) – Charles Spearman has supported the idea for one type of intelligence. He has used a set of tests and has registered a positive correlation in the success of the subjects in different areas. On this basis, he has introduced the concept of "general intelligence" (g). "g" is the factor responsible for the relation between all cases of manifestation of intelligence. To explain existing discrepancies, he has also introduced the concept of "specific intelligence" (s).
2. Primary Mental Abilities Theory – Louis L. Turnstone in which intelligence is divided into seven different primary mental abilities: associative memory, numerical ability, perceptual speed, reasoning, spatial visualization, verbal comprehension, word fluency.
3. Triarchic Theory – Robert Sternberg has offered a different approach to determine intelligence and has derived new terms such as analytical intelligence, creative intelligence and practical intelligence.
4. Emotional intelligence – Daniel Goleman has presented his theory of emotional intelligence (EQ), which he has defined as the ability to perceive, to evaluate and to manage one's own emotions, to distinguish different emotions and to name and to define them correctly, and to use emotional information to guide thinking and behavior. According to him, the factors that determine EQ are: emotional self-awareness, self-regulation, motivation, empathy, social skills.
5. Multiple Intelligences Theory – Howard Gardner has created this theory in the 80s of the twentieth century. It distinguishes eight types of intelligence (linguistic, spatial, logical-mathematical, naturalist, bodily-kinesthetic, musical, intrapersonal, interpersonal). The key new point in the concept of intelligence is that all types of intelligence are equivalent and take part in the construction of the overall intellectual image of the individual. The type of intelligence is determined by the set of biological abilities of the individual to solve problems that are not directly related, i.e. a person can be very capable in one type and completely incapable in another type of intelligence. The combining and complementing of those types forms the intelligence spectrum of the individual, which support them during their whole life.

> The intelligence is a universal human characteristic in which the differences between the individuals are very weakly influenced by upbringing and are inherited entirely genetically.
>
> Sir Francis Galton (1822-1911)

The prerequisites (preconditions) for the emergence of new scientific areas, based on interdisciplinary collaborations that develop and complement the knowledge of intelligence and its methods of measurement, will be considered. According to recent neuropedagogical studies, it is clear that human intelligence cannot be measured by just one indicator such as the IQ. The IQ quotient is not able to reflect all the parameters of the intelligence. It reflects only logical, rational thinking, which actually is possessed by only 20% of individuals. The modern system of education focuses predominantly on the development of learners with high IQ. This means that other learners remain labeled "unintelligent", they feel unappreciated, unmotivated, and their interest and span of attention to the subjects taught are constantly declining. Multiple intelligence theory enables us to develop learners' abilities according to their individual intelligence profile so that all of them shall be in an equal environment in class.

As a result, students will acquire knowledge about intelligence, its evolution and its modern theories, its basic methods for measuring and determining the intelligence of the individual, the limitations and the scope for optimal application.

BIBLIOGRAPHY:

1. Coleman, Andrew (2008). A Dictionary of Psychology (3 ed.). Oxford University Press
2. Gardner, H. (1983). Frames of mind. New York: Basic Books.
3. Smith, M. K. (2002). Howard Gardner and multiple intelligences, the encyclopedia of informal education
4. Spearman, C. (2010). „The proof and measurement of association between two things". International Journal of Epidemiology
5. Thurstone, LL (1987). „Psychophysical analysis. by L. L. Thurstone, 1927" (PDF). The American Journal of Psychology.
6. Sternberg, R. J. (2012). „Chapter 6: The Triarchic Theory of Successful Intelligence". In Flanagan, D. P.
7. Philip Quinlan, Philip T. Quinlan, Ben Dyson. 2008. Cognitive Psychology. Publisher-Pearson/ Prentice Hall

2

Syndrome of school unification and how to avoid it

ANNOTATION

"Children know how to learn in more ways than we know how to teach them".
Ronald Edmonds (1991)

The aim of the lecture is to introduce students to a brief overview of the development of the educational approaches; to highlight the importance of equality of the teaching relating to individual differences to accept and memorize new information.

1. The Educational system as a conservative system – advantages and disadvantages

The philosophy of education – a study of the purpose, the process, the nature and the ideas of education.

2. Unified teaching model –

a model of the way in which people learn – how and when (newborn, childhood, aged…); a model of teaching forms and instructions; it is a synthesis of various existing theories that explain usually some, but not all, learning phenomena.

Three principles of learning:

- Learning is a product of working memory allocation;
- Working memory's capacity for allocation is affected by prior knowledge;
- Working memory allocation is directed by motivation.

Traditional (classical widespread) teaching approach:

Power relations in class: (Waller) –
(1) the teacher must have the power in the classroom and the teacher is the only one who

has power in the classroom.

(2) Every learner's action and every aspect of student learning have to be under the teacher's control; the teacher is accountable for the outputs.

(3) The teacher cannot share the power.

On grounds of this, it requires teachers to focus their attention mostly on how to keep their hold on power, and secondly to focus on the needs of the learners and on the process of learning.

Teaching approach:

the teacher is a person who gives information and new knowledge to the learners traditionally in the form of a lecture; the teaching approach treats children as identical individuals with the same mechanisms of learning with the only differences based on social and cultural roots.

Main principles for the traditional teaching approach:

- the teacher must have the power in the classroom;
- the learning process has to be under the absolute teacher's control;
- the teacher cannot share the power of the learning process.

Evaluation method:

lecture-and-recitation methods of instruction and testing.

Development and evolution of the classical teaching model:

The main directions of changes are based on the new understanding of learning and on the scientific results of the mechanisms of learning and memorization of the new knowledge of the individual.

- Power relations change from solo teacher's power to shared power between teacher and students; changing the model of the teacher's power to a model of respect and honor of the teacher.
- New approach for learning (teaching) – from *what* to *how* to be learned; from passive to active learning, teaching for understanding and a stimulating variation of interpretations.
- Evaluation methods: from recitation and detailed reproduction of texts, stories, facts, and concepts to creative interpretation and rearrangement of the information, expression of own ideas and decisions, discussions between learners. The so called "formative/forming" assessment allows an accurate assessment of the overall development and achievements of the learner – the emphasis is on what learners know and can do, rather than on their mistakes or weaknesses.

3. Some concepts of learning

Creation of a positive approach to traditional model of learning:

Components of learning process: enthusiasm and engagement /feeling and action/ emotional/motivational – action/behavioral dimensions;

Elements of encouraging enthusiasm for learning: interest, pleasure, motivation.

Elements of engagement in learning: attention, persistence, flexibility, self-regulation. (M. Hison, 2008)

Enthusiasm and engagement have intrinsic value – to develop academic and cognitive skills, and to develop emotional and social behavior.

Positive approach to learning and personality development.

The knowledge is given trough linguistic and logical-mathematical type of information.

The concept of the multiple intelligence (H. Gardner):

Main principle: the teaching process is adapted to the individual characteristics of the learners, which are determined by the specific abilities of the individuals. Each individual has their own domains of capabilities as multiple abilities that come in different packages, which Gardner has named "intelligences".

Main principles of the new alternative teaching approaches:

- the teacher's power is based on respect and admiration by the pupils;
- active learning with participation of pupils and learning by doing;
- the accent is on what pupils know and can do, rather than on their mistakes or weaknesses.

Each individual has 8 types of intelligence, developed to varying degrees according to their lifestyle and environment. Two of them are the Linguistic (L) and the Logical-mathematical (LM) type of intelligence that are in the framework of the classical programs for teaching in schools for years. So, learners in class are not on equal conditions concerning the ways of presenting new information and their inborn potential for a strong ability for learning.

Concept of the Montessori Method of education:

It is a child-centered educational approach based on scientific observations of children. The Montessori Method views the child as the one who is naturally eager for knowledge and capable of initiating learning in a supportive, thoughtfully prepared learning environment. It attempts to develop children physically, socially, emotionally and cognitively.

Concept of the emotional intelligence (D. Goleman):

Emotional intelligence (otherwise known as emotional quotient or EQ) is the ability to understand, to use, and to manage your own emotions in positive ways to relieve stress, to communicate effectively, to empathize with others, to overcome challenges and to defuse conflict.

According to Daniel Goleman, an American psychologist who helped to popularize emotional intelligence, there are five key elements to it: self-awareness; self-regulation; motivation; empathy; social skills.

Concept of the Cooperative pedagogy (Celestin Freinet):

The concept is based on the development of the creative work of the learners through cooperative learning. The principal idea is that school should reinforce the positive traits of a child's personality by giving the child possibilities for creative work. This can be achieved by using new teaching techniques such as "slip problems,"[1] a school journal, free text, printing text by students, and school-to-school correspondence.

1 A widely used method for the teacher to summarize and monitor what learners really have learned during lessons.

Concept of Cooperation and collaboration (S. Connac)

The concept is based on various participations in team work between a cooperative mode of training and a collaborative one. The distinction between the cooperative and the collaborative means to distinguish between the relationships that each individual maintains with the members of the group, their responsibility for actions, their ability to influence the definition and the sequence of actions in order to achieve the objective assigned to the group.

Smart school and flexible class

It is a new culture of accountability of education, emerging as a global phenomenon. This is a kind of school where advanced equipment and technology are used to take up the process of education. The main idea is to provide the learners with a training experience which is learning by playing and in an active manner; learners are using digital technologies and other smart technologies; both learners and teachers have definite roles to play – the teacher is giving new knowledge and the learner is acquiring this new knowledge by playing; the classrooms is equipped with smart technologies. The main principle is the learner to learn and to accumulate experience parallel to playing.

The key tool for its implementation is the assessment of the outcomes of the learners concerning their functional literacy.

As a result of the lecture, the students will gain knowledge about the development of the teaching approaches, the main components of the learning process and their needs for change. They will acquire general knowledge about the advantages of the concept of MI to facilitate learning and to develop creativity.

BIBLIOGRAPHY

Marilon Nyson, 2008. Entusiastic and Engagement Learning, Publ. Teachers College, Columbia University

Shell Duane, et al. 2010. United Learning Model :How Motivational, Cognitive, and Neurobiological Sciences Inform Best teaching Practices, Springer,London,N.Y.

Manke, M. F., 1997. Classroom Power Relation : Understanding Student-Teacher Interaction, Publ. Lawrence Erlbaum Associate, Mahwah, New Jersey;

Teachers for 21 Century: Using Evaluation to Improve Teaching, 2013. OECD Publishing;

For Bulgarian version:

Основи на началната училищна педагогика, 2012, Стара Загора,

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Theory of Multiple Intelligence (MI) – H. Gardner (emergence and evolution)

ANNOTATION

1. Background and emergence of the concept of multiple intelligences: The concept of MI

The teacher is always faced with the question of how to make the learning process effective, which is directly related to their competencies and skills to present information in an accessible, a pleasant and a memorable way.

There are three main elements for effective learning – sense, pleasure and active participation of the learner.

Since the end of the XX century, the research in neuroscience has focused on a complex study on the learning process – a structured one, as a unity of: perception, understanding, assimilation, memorization and reproduction of the new knowledge. The transfer of these new scientific results to other scientific fields provoked development of new knowledge and the emergence of a new interpretation in the field of interdisciplinary processes.

The results of researches on the brain function have a direct link to the way of teaching. The assimilation and the application of these results by the teacher have raised three main questions: (1) which exactly are these studies in neuroscience that can contribute to the effectiveness of the teaching process; (2) how educational professionals should be introduced to the neuroscience concepts in an understandable form so as to provoke the emergence of new practices concerning the learning process and the new interrelations and communicational attitudes toward learners (students); and (3) how the know-how from the neuroscience should be reformulated in the field of pedagogy so that it can be used in the pedagogical practice.

H. Gardner has created a theory that is a bridge between the concepts and the results of a research in the field of neuroscience and an approach to learning – the theory of MI. He has formulated a new understanding of intelligence.

There are three main elements for effective learning – sense, pleasure and active participation of the learner.

The period of "translation" and reformulation of knowledge from the neurosciences to the techniques for practical usage in in pedago-

gy has taken about 20-25 years. The time could be split into two periods: since the creation of the theory of MI in 1983 and its official acceptance by the professional community in 1997. This has taken nearly 15 years. The next step – the operationalization of the theory and the creating of its practical tools has taken more than 10 years. The experimental introduction to the training practice in some selected schools and kinder gardens has started in 2016 in France.

2. Essence of H. Gardner's theory of multiple intelligence (MI)

MI is a set of competencies of the individual that allows them to solve the problems encountered in their life; an ability to create a real product and/or service, that is significant and valid for a given culture (environment); an ability to set tasks and to find solutions as well as to assimilate and to acquire new knowledge.

> Each individual can be intelligent in a different way. (H. Gardner)

Definition given by Gardner is: Intelligence is a "biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are in value in the culture' (H. Gardner, 1999)

Basic principles of MI theory:

1. Each individual has 8 types of intelligence, developed to varying degrees according to their lifestyle and environment;
2. Each type of intelligence can be developed throughout the life of the individual. However, the level of development that is achieved is different;
3. Each individual can be intelligent in a different way with one type of intelligence dominating;
4. All types of intelligences are in constant interaction.

Types of intelligence – 8 types described by Gardner:

Linguistic (L) (word smart) – the ability to perceive and analyze oral and written information, and to learn languages; the ability (orally and in writing) to achieve certain goals through languages; the ability to express oneself verbally as well as to create products in a text form.

Logical-mathematical (LM) – the ability to think logically, to perform mathematical calculations and to solve various mathematical tasks, to develop and prove logical problems, to solve abstract problems.

These two types of intelligence are the basis of the widespread and long-dominating classical educational programs.

The next three types of intelligence are related to the abilities in art.

(Visual)-Spatial (S) – the ability to notice, to recognize and to virtually change their parameters (shapes, colors, sounds), to "see" them in a wide range of the 3-dimensional space (e.g. navigators and pilots), as well as in narrow and limited spaces where sculptors, artists, architects, surgeons, chess players work; the ability to read and navigate well by road maps and plans.

Bodily-Kinesthetic (BK) ("body smart") – the ability to express oneself through their body or through their body parts, the ability to create precise expression forms of their problems and their relevant solutions by combining mind and body.

Musical (M) – the ability to perceive, to evaluate, and to compose music through rhythms, tones, and modulations. Gardner has placed it parallel to the linguistic intelligence, but he has defined it as "a talent".

Interpersonal (I+) ("people smart") – the ability to understand others and their intentions; the desired motivation which leads to the ability to work well with people, the ability to easily adapt to different social environments, to resolve conflicts and to regulate interpersonal relationships.

Intrapersonal (I-) ("self-smart") the ability to know and evaluate yourself, your qualities and to know how to apply them in a proper way in different life situations.

Later, H. Gardner has developed the theory of MI by adding a "new" type of intelligence, natural-scientific intelligence.

Naturalist (N) – the ability to perceive and to feel nature – the animate and the inanimate world; the ability to distinguish different representatives of the environment in detail by assessing them in relation to their positions and survival, the ability to engage in and to feel convenient in natural areas (biophilia), the ability to "transfer" recognizable natural sounds to sounds of professional and everyday life (to recognize if a particular car is in a good condition or not by its sound; to taste specific foods so as to determine if they are fit for use or not; to recognize the individual food ingredients, to recognize traces and clues). These individuals are gifted in recognizing natural patterns.

The important focus is an understanding to be achieved by students that intelligences work always in combination, and never in isolation.

Multiple intelligence theory offers a new educational environment which presents arguments to individuals' interests and abilities, targeted to develop each individual's different approach to the intelligence field which shall enhance learners' opportunities to learn.

3. Functions of the nervous system; structures, zones and neural networks of the brain associated with different types of intelligence

For the different types of intelligence, there is a relative division of the leading structures between the two hemispheres of the brain such as: the left hemisphere is dominant in the linguistic, the logical-mathematical, the bodily-kinesthetic and the naturalist intelligence; and the right one is dominant in the (visual)-spatial, the musical, the intrapersonal and the interpersonal intelligences. In the recent years, the studies on the neurons' networks and constellations, and their functional relations to different elements of the learning process, have rapidly increased. The recent studies of Olivier Houdé have made a step forward in clarifying these mechanisms.

4. Types of intelligence and learning style – two different concepts

Some of the broad discussions among professional are about the links and the interrelations between the concepts of MI and the style of learning, the cognitive style or the working style of the individual. The concept of the learning style denotes a general approach which the individual could apply equally to various tasks to be solved. The MI, in contrast reflects on the capacity of the individual for an ability to process treatment that is geared to a specific content of the world. The capacity of an individual to reflect and to accept the content would be according to his/her dominated type of intelligence: it could vary from the speech sound to the sound of music (melody sounds), from a natural object to an object created by man. According to Harvey Silver, the relationship between the learning style and the intelligence could be evidenced when an individual with a dominant and strong type of intelligence must decide how to use and apply it. E.g. an individual with a strong type of linguistic intelligence can decide whether to write poetry or screenplays, participate in debates, teach foreign languages, and so on. The decision on how to use the capacity of a given type of intelligence is determined by the preferred style of action of the individual.

As a result of the lecture, the students will acquire knowledge about the concept of MI and its development, the types of intelligence and their definitions, as well as their impact on the learning process. They will gain the most general idea of the subject of neuropedagogy and the brain structures related to different types of intelligence. Students will acquire knowledge on how to design sets of practical techniques for simulant development of some types of intelligence.

BIBLIOGRAPHY

Gardner, H., 1983. Frames of Mind, The Theory of Multiple Intelligence, N.Y.: Basic Books

Gardner, H., 1999. Intelligence Reframed: Multiple Intelligence for the 21 century, N.Y.: Publ. Basic Books.

Campbell, L., & Campbell, B. 1999. Multiple Intelligences and Student Achievement: Success Stories from Six Schools. Alexandria, VA.: Association for supervision and Curriculum Development.

Chojak, M. 2018. Neuropedagogy as a Scientific Discipline: Interdisciplinary Descripotion of the Theoretical Basis for the Development of the Research Field, in: International J. of Educational and Pedagogical Sciences, vol.12, No 8.

Connell, Daniel J., 2005. Brain-Based Strategies to Reach Every Learner, (© Scholastic.

Fidzgerald, R.D.,2006. Smart Teaching: using Brain Research and Data to Continuously Improve Learning, Publ.: ASQ Quality Press, Milwaukee, Wisconsin.

Fridman, I.,Grobgeld, E., Teichman-Weinberg, A., 2019. Imbuing Education with Brain Research Can Improve Teaching and Enhance Productive Learning, Psychology vol.10. pp 122-311.,

Houdé, O., 2015. Plusieurs intelligences détectées dans le cerveau, in magazine " Cerveau et Psycho", No 68, mars-avril,pp. 46-56.

4

Conditions for optimal memorization according to neuropedagogy

ANNOTATION

The lecture introduces students to modern concepts of neuro-pedagogy in the field of education. The aim is to present a modern view of the structure of the brain and to link this knowledge to the optimal conditions for memorization in accordance to neuro-pedagogy.

The task is to acquaint the students with the theory of Paul Mac Lean, according to which the human brain has developed in three successive stages, which meet the needs of the evolution of the individual. Three main phases of brain evolution are distinguished: reptilian, limbic and neocortex ones, according to the triune brain model.

The earliest structure of the brain evolution is the reptilian brain. This is the structure of the innate and the automatic reflexes associated with survival. This is the place controlling the basic needs (nutrition, sleep, regulation of bodily functions, respiration and temperature). Therefore, in order for information to move freely to an upper level of the brain, it is necessary to create an environment that brings about a sense of security and protection of the individual.

The limbic system is the emotional and the behavioral center in the brain and it plays important role for the motivation and the memory of the individuals. It secures the free transfer of information to the upper brain levels. In addition, a pleasant atmosphere is needed, which explains the importance of enjoying the pleasure of learning.

The neocortex is the most complex brain, which is also the youngest one in the process of evolution of the human species. This is the center of the intellectual memory, the learning and the speaking.

The four stages of the training are introduced and discussed in the light of the brain system functions, namely:

1. Presence of a project (giving the meaning to the task).
2. Perception.
3. Recollection.
4. Reproduction (Re-creation).

From a pedagogical point of view, it is revealed that the quality of learning is optimized and it depends on the presence of physical security, emotional stability and a sense of joy during learning, which leads to a positive attitude and a desire to study.

Students will learn to use the ATOLE program, (Jean-Philippe Lachaux), which aims to develop tools to teach learners how to concentrate. The program focuses on the cognitive functions of attention and distraction during the transfer of knowledge. Students will learn:

1. To make the learners understand the biological mechanisms of attention, with their effects and their limits;
2. To help them untangle the "ball of wool" (long and complex process) by teaching them to detect situations of attentional conflicts in the cerebral processes;
3. To show them how to compensate for the signs of distraction, particularly due to a better feeling of the automatisms of the perception-action.

Details on how to use the program could be found on: https://www.youtube.com/watch?v=eXVPITxda8o&t=202s and https://www.youtube.com/watch?v=Yn1YMTfbUqI.

Students will acquire knowledge about the various sensory channels (visual, auditory and kinesthetic) through which information is received by each learner. On this basis, they will learn how to diversify the content of the lesson to optimize the quality of perception by each learner.

The conclusion in the sense of pedagogy based on the topic is: for optimal conditions for memorization, there has to be created an environment in which the provided (presented, given) information flows smoothly through all the three levels of the human brain.

BIBLIOGRAPHY

1. Busan, Tony, 2010, Une tête bien faite, Eyrolles Edition
2. Dehaene Stanislas, 2019, La science au service de l'école, Odile Jacob – France
3. Sousa David A., 2004, Un cerveau pour apprendre – Chenélière – France
4. Daudelin Martine 2006, Apprendre à sa façon – Chenélière Education – France
5. Gagné Pierre-Paul, 2014, Mémo action et méta action – Chenélière Education – France
6. Gagné Pierre-Paul, 2004, Etre attentif une question de gestion – Chenélière Education – France
7. Côté Sonia, 2016, Favoriser l'attention par des stratégies sensorielles – Pirouette – France
8. de La Garanderie Antoine, 1994, Réussir, ça s'apprend – Bayard Culture – France
9. Lachaux J-Ph., 2016, Les petites bulles de l'attention – Odile Jacob – France
10. Lachaux J-Ph., 2020, L'attention ça s'apprend – Edition Midi/Canopé – France

SITOGRAPHIE

1. https://project.crnl.fr/atole/
2. ATOLE, premier programme d'éducation de l'attention à l'école- Jean-Philippe Lachaux (https://www.youtube.com/watch?v=eXVPITxda8o&t=202s
3. Changer la classe pour changer l'école – Vincent FAILLET (https://www.youtube.com/watch?v=Yn1YMTfbUqI))
4. http://rire.ctreq.qc.ca/2020/02/les-neurosciences-en-educationt-dt/
5. https://www.ddec06.fr/personnes-ressource/2018/01/10/attentifs-a-lecole-le-kit-atole-est-la/

5

Emotional intelligence in the structure of the multiple intelligences

ANNOTATION

In his *Frames of Mind* (Gardner, 2011) Gardner identifies what he refers to as personal intelligences, which are the interpersonal and the intrapersonal intelligences. These intelligences are the ones that have to do with the emotional intelligence (Fernández Rodríguez, 2013) in the MI theory. Even though we may find differences in what we consider today to be the emotional intelligence and what Gardner understands as interpersonal and intrapersonal intelligences, there is a clear bond between both of them.

The interpersonal intelligence is the "the social capacity which makes it possible to work effectively with others" and the intrapersonal one is the "introspective abilities which permit someone to be deeply aware of personal feelings and purposes" (Strom & Strom, 2003). Upon *Frames of Mind* publication in 1983, Gardner has included both intelligences in a single chapter (while the others have been explained in their own chapters). It was not until the 1990s, when the emotional intelligence started to get defined.

We can define the emotional intelligence as the ability to:

- Recognise, understand and manage our emotions.
- Recognise, understand and influence the emotions of others.

In practical terms, this means to be aware that emotions can drive our behaviour and impact people (positively and negatively), and to learn how to manage those emotions (both our own and other people's).

The emotional intelligence, which includes both the interpersonal and the intrapersonal intelligences, is the way we interact with the world, in which world our emotions are highly important since they are the tools that we have to establish relationships with others (Castaño & Tocoche, 2018). Our emotions include our personality traits such as self-discipline, compassion and altruism (Fernández-Berrocal, Extremera & Ramos, 2004) and without them we would not be able to adapt to society.

Emotional Intelligence is the ability to:

- Recognize, understand and manage our emotions
- Recognize, understand and influence the emotions of others

Successful case studies:

- During the "International Congress of Wellbeing and Emotional Intelligence" carried out in 2015 in Zaragoza (Spain), there were presented many success stories of the implementation of the emotional intelligence in the classroom. The complete contents presented in the Congress (Soler Nages, Aparicio Moreno, Díaz Chica, Escolano Pérez & Rodríguez Martínez, 2016) can be accessed through the Dialnet academic online platform.
- The *Training Course On Emotional Intelligence: The Experience of Emotional Intelligence in a Secondary Education Project* publication shares "the effectiveness of a program to develop emotional intelligence in secondary education" (Pozo-Rico, Sánchez Sánchez, Castejón Costa & Gilar Corbi, 2018).

Toolkits and resources:

- Projecting YOUth (Chapters 7, Interpersonal Intelligence, and 11, Intrapersonal Intelligence) offers theatre and drama activities to discover and work on the different types of multiple intelligences ("PY_manual_booklet_v3.pdf", n.d.) (This project was funded under the Erasmus+ programme).
- The *InEmotion* Toolkit ("Emotional Intelligence, educational tool for developing key competences", n.d.) offers educational tools that use the emotional intelligence to develop key competences. (This project was funded under the Erasmus+ programme).
- The *Emotional Intelligence in Youth Work* toolbox (Bortini, 2019) offers a theoretical and practical approach to emotional intelligence in the field of non-formal education. (This project was funded under the Erasmus+ programme).
- The *Kimochis* Programme (www.kimochis.fr) is an international pedagogical program for the development of the child's emotional competencies. The focus of the program is the connection between communication, emotion and behaviour. When children are able to communicate their emotions effectively, they acquire positive social skills that lead them to long-term friendships and help them to be successful in all areas of their lives.

There is a clear connection between the interpersonal and intrapersonal intelligences, outlined by Gardner in the MI theory with the emotional intelligence further developed. Moreover, the intrapersonal and interpersonal intelligences constitute the foundation of the concept of the emotional intelligence (Salovey & Mayer, 1990). Upon including multiple intelligences in education, and specifically the interpersonal and intrapersonal intelligences, the developments of the research of the emotional intelligence, as well as the tools and the practical means to include it in the classroom, present a necessary addition to Gardner's MI theory.

BIBLIOGRAPHY

Bortini, P. (2019). Emotional Intelligence in Youth Work. Retrieved 30 June 2020, from https://www.salto-youth.net/tools/toolbox/tool/emotional-intelligence-in-youth-work.2538/

Castaño, F., & Tocoche, Y. (2018). INTELIGENCIAS MÚLTIPLES Y COMPETENCIAS EMOCIONALES EN ESTUDIANTES UNIVERSITARIOS. Campo Abierto, 37, 33-55.

Emotional Intelligence, educational tool for developing key competences. Retrieved 30 June 2020, from https://ec.europa.eu/programmes/erasmus-plus/projects/eplus-project-details/#project/2018-1-ES01-KA204-050991

Fernández Rodríguez, M. (2013). La Inteligencia Emocional. Publicación Digital De Historia Y Ciencias Sociales, 377.

Fernández-Berrocal, P., Extremera, N. y Ramos, N.. (2004). Validity and reliability of the Spanish modified version of the trait meta-mood scale. Psychological Reports, 94, 751-755.

Gardner, H. (2011). Frames of mind. New York: BasicBooks.

Kimochis.fr. n.d. [online] Available at: <https://www.kimochis.fr/> [Accessed 1 February 2021].

Pozo-Rico, T., Sánchez Sánchez, B., Castejón Costa, J., & Gilar Corbi, R. (2018). Training Course On Emotional Intelligence: The Experience of Emotional Intelligence in a Secondary Education Project. Publicaciones, 48 (2), 235-255.

PY_manual_booklet_v3 Retrieved 30 June 2020,
from http://www.projectingyouth.eu/p/blog-page.html

Salovey, P., & Mayer, J. D.(1990). Emotional intelligence.Imagination, Cognition and Personality, 9(3), 185-211.

Soler Nages, J., Aparicio Moreno, L., Díaz Chica, O., Escolano Pérez, E., & Rodríguez Martínez, A. (2016). Inteligencia Emocional y Bienestar II reflexiones, experiencias profesionales e investigaciones. Zaragoza: Ediciones Universidad San Jorge.

Strom, P., & Strom, R. (2020). Interpersonal Intelligence Theory. Retrieved 29 June 2020,
from http://www.public.asu.edu/~rdstrom/IIITheory.html

6

Identification of a child's dominant type of intelligence

ANNOTATION

The new educational approach based on the multiple intelligences of the individual has been rapidly developing, since it has responded to the needs aiming at the quality improvement of the education and the individual potential development. Despite the focus on various efforts to change the attitude of the learners to the education and to create motivation for learning, the results achieved so far have not been satisfactory. The practical experience has necessitated the introduction of a completely new approach to take into account the social and cultural conditions. However, eventually the approach has mainly taken into account the different characteristics and abilities of the individual.

According to the theory of multiple intelligence, the way to determine the strengths of the individual or their dominant type of intelligences is by application of specific tests, developed according to the age of the learners. Each learner has to fulfil their test by their own.

A test adapted for children is given to the student in order to accumulate knowledge and skills to work with these tests.

The lecture gives knowledge what should the teacher do after the learners have fulfilled their tests.

- Depending on the test results, to ask the learners to identify two intelligences that are dominant in themselves.
- To ask each learner to write his/her name on a poster on the wall in the order that matches their dominant profile.
- To pay attention to the fact that each individual has their own strengths. To emphasize on the positive side that we are all intelligent but in different ways and that no form of intelligence is superior or better than another.
- With this activity the teacher can later make a board named "Share with others", aiming that learners can share with the others their own strengths, interests and dominant intelligences. The board that is conveniently displayed in an accessible place, could later help the teacher to highlight the experts of the different types of intelligences in the class.
- To ask the learners questions like:
  - What do you think about your multiple intelligence profile?

- Do you recognize it easily?
- Are you surprised by the results?
- How do you feel after this activity? Express your feelings.

During the lecture, it should be emphasized that the tests do not in any case reveal a comprehensive picture of the multiple intelligences of the learner. The tests are only indicative and their application is intended to facilitate the teacher in understanding the specific attitude of the learner and to get a general knowledge about the preferable leading form of intelligence of the learner. Gardner, like Montessori, relies on observation, which is the core of the behavioral understanding. MI theory considers the person a complete human being, full of feelings, emotions, and whose intelligence is not limited to a test result only. Therefore, the results of individual tests used to determine the dominant intelligence of the learners should be used informatively and should not be treated as an absolute given.

Students will learn to develop criteria for monitoring the learners, aimed at determining their profile. For more details, please refer to Topic 10 of the Curriculum.

As a result of the present lecture, the students will acquire knowledge about what tools to use in order to determine the dominant profile of intelligence. They will learn how to interpret the results of the tests and how to introduce these results to the learners, as well as to select the limitations and the scope of the optimal application of the tests.

BIBLIOGRAPHY

Hannafort C.Duranceau N., 2015, Connaitre son profil dominant — Chanelière Educations – France

Doré L.MichaudN., 2015, 55 stratégies pour mieux apprendre — Chanelière Educations – France

Daudelin Martine, 2006, Apprendre à sa façon — Chanelière Educations – France

Hourst B., 1997, Au bon plaisir d'apprendre — Edition du Mieux Apprendre – France

SITOGRAPHIE

http://www.frederic-chartier.com/tests/test_intelligences_dominantes_multiples.htm

http://www.wallonie-bruxelles-enseignement.be/docs/ERAS-IM_test_adultes.pdf

7

An individualized approach for memorization based on the child's dominant intelligence profile

ANNOTATION

The aim of the present lecture is to introduce the students to the individual strategies for learning and for easy memorization, following the dominant profile of intelligence, according to the Gardner's theory of the multiple intelligence. The advantage of this approach is that the teacher can talk to the parents of each child and can provide them with valuable information in order to help the child memorize and acquire knowledge at home. Regular communication between the teacher and the parents is a key point for improvement of the process of learning and the personality development of the child.

Each type of memory strategy includes:

- Description of the preferred learning model that is associated with each form of intelligence;
- Distinctive features;
- Competences;
- Ways to stimulate this profile in the child.

The task of the lecture is to acquaint the audience in detail with each learning strategy according to the dominant profile of the learner's intelligence.

The task of the lecture is to acquaint the students – future teachers in detail with each learning strategy according to the dominant profile of the learner's intelligence in class.

Ways of easy memorization and acquizition of knowledge according to the dominant intelligence profile in children[2]

LINGUISTIC (L)

They learn best by reading aloud; transcribing their notes; retelling a text with their own words; creating a questionnaire on a given plot; keeping a diary on new concepts; speaking to

2 More detailed practical usage of the technics see in Topic 10

themselves in their mind; enclosing (circling, highlighting), writing keywords; noting important ideas in a text box; describing their ideas to organize them; studying aloud; revising their lessons aloud in front of someone; using a dictaphone.

Distinctive features / characteristics:

Ability to use words efficiently; ability to read, to write and to express themselves correctly;

Competencies:

Spelling, vocabulary and grammar;

Ways to stimulate this profile in children:

Speak to them, demand their opinion and listen to them, supply them with books and tape records, make them write, read to you, tell stories, visit libraries and bookstores.

LOGICAL MATHEMATICAL (LM)

These individuals learn best by looking for models and abstract connections, by forming concepts and classifying them into groups; through graphs and statistics; by building and testing hypotheses; by analyzing data; by making diagrams and tables to synthesize the information; by finding connections between different concepts; by organizing a task via breaking it down into smaller subtasks.

Distinctive features / characteristics:

They handle numbers with ease; They have logical and rational thinking.

Competencies:

Abstract reasoning, calculating, mathematical operations, grouping by categories, presentation of hypotheses, construction of connections and logical models.

Ways to stimulate this profile in children:

Provide them with materials for experimentation, classification exercises, encourage them to calculate on their mind, to play logic, deductive and mathematical games, riddles, chess. Take them to museums and exhibitions.

SPATIAL (S)

These individuals learn best visually, through drawings and paintings; using colors, graphic symbols, diagrams, maps for organizing their ideas; highlighting and underlining the text; using videos, models and collages; using visual symbols.

Distinctive features / characteristics:

Ability to create pictures; visual and spatial sensation; three-dimensional thinking;

Competencies:

Visualization, orientation, sense of space, technical drawing, fine arts, sketching, drawing, modeling objects, imagination.

Ways to stimulate this profile in children:

Tell them stories that awaken the imagination. Read to them diagrams, maps and schemes.

Let them paint and color. Equip them with a camera, a telescope and a compass. Buy them a three-dimensional constructor. Play visualization games. Explore architectural sites, galleries, planetariums together.

MUSICAL (M)

They learn best through rhythm and melody, by singing what they need to learn; by reading in a rhythmic way; by turning important elements into music or rhythm; by finding musical analogues; by working on a musical background, by creating a music library; by making a symphony of words; by composing a song to learn a concept; by using intonation to facilitate memorization; by using music to change their mood and to create a work environment; by using rhythm to learn rules, definitions and concepts.

Distinctive features / characteristics:

Sense of melody and rhythm; musical memory; artistic sensitivity; auditory sensitivity;

Competencies:

Playing more than one musical instrument; singing, composing melodies;

Ways to stimulate this profile in children:

Studying on a musical background; taking music lessons, composing music; buying them musical discs and musical instruments; commenting on the lyrics of their favorite songs; taking them to opera and concerts; giving/ gifting them tape records and musical CDs.

BODILY-KINESTHETIC (BK)

They learn best by moving (example: counting when skipping rope); exploring by touching objects; using gestures and movements to better remember concepts and information; imagining themselves on stage and playing what they learn; raising their hand in class, winking, smiling to show that they have understood the information; doing exercises to relax; revising the material while playing ball with a friend.

Distinctive features / characteristics:

Rich physical culture, skilled in handling objects, agile;

Competencies:

Expressing emotions through the body; controlling their movements; communicating nonverbally; imitating gestures; dexterity, agility;

Ways to stimulate this profile in children:

Letting them play roles and improvise theatrically; making them take dancing lessons, any physical activity could be useful; providing them with intensive group activities; visiting amusement parks; enrolling them in a sports club, attending sporting events. Buy them modeling games. Provide them with physical work and the opportunity to repair and regulate various mechanisms.

INTERPERSONAL (I+)

Learning best with a friend or by explaining to others; through interaction with others;

interrogating or entering into discussion with others; in a public place (library);

Distinctive features / characteristics:

Ability to feel and interact with other people; Feeling and understanding the emotions of others;

Competencies:

Sensitivity to emotions, ability to work in a group, easily making friends, easily communicating, innate leader, sensitive to the emotional states of others, social type.

Ways to stimulate this profile in children:

Let them play team games and team sports. Give them the opportunity to share knowledge with others. Provide them with communication activity or participation in associations. Let them talk in a family environment. Let them participate in family and public events.

INTRAPERSONAL (I-)

They learn best by building their own rhythm and organizing their learning time on their own; by studying alone; by self-assessing themselves; by putting themselves in the place of a story character, imagining their emotions; by realizing their own strengths and weaknesses. They clearly imagine the results they want to achieve. They set goals and personal challenges. They can recognize the feelings and the emotions that control them and they can overcome internal obstacles. They have an inner positive attitude. They reward themselves for their success. They feel responsible for their own training/education. They keep a diary.

Distinctive features / characteristics:

Knowing and studying themselves. Abstract thinking. Reasoning, mental concentration and control over emotions.

Competencies:

They are motivated to achieve big goals; they have clear value system; they have self-confidence; they think and rethink; they are ethical;

Ways to stimulate this profile in children:

Encourage them to think about their thoughts and actions and to keep a personal diary. Don't stop them from playing alone. Take long walks in silence with them and meditate. Give them personal space.

NATURALIST (N)

Learning best by interacting with nature; practicing outdoor activities; making lists and organizing information; being in a pleasant place/location (in front of a window, in front of an aquarium, a place with plants or in front of paintings with landscapes); classifying the information to be memorized; holding a pet in theirs hands; talking to plants if no one is listening; trying to remember what they have learned while going to school or home.

Distinctive features / characteristics:

Ability to build a connection with nature; Strong environmental awareness; easily distinguish and classify plants, animals and minerals;

Competencies:

They recognize natural species. They classify them and find connections between different ecosystems. They pay attention to natural phenomena.

Ways to stimulate this profile in children:

They prefer to contact with nature and to observe living organisms. Equip them with research and explore equipment. Help them build an aquarium. Stimulate their environmental awareness. Allow them to have a pet. Take them to a zoo, to a natural history museum and to aquariums.

As a result of the present lecture, students will acquire knowledge about the need to implement different strategies for introducing the new information while keeping in mind that learners have different dominant profiles of intelligence. They already know how to determine these types of intelligence in learners. Here students will learn how to facilitate the process of memorization of the new information and thus to improve the learning process. They will be acquainted with some practical tools and the ways to use them in class.

BIBLIOGRAPHY

Dr Mc Grath Helen, 2007, Huit façons d'enseigner, d'apprendre et d'évaluer – Chenélière Education – France,

Murawski Wendy W., 2016, Les meilleurs pratiques pédagogiques au primaire – Chenelière Education – France

Apprendre aujourd'hui, réussir demain : premiers résultats de PISA, 2004 OCDE, Paris – France

Une approche neuroscientifique de l'apprentissage, Comprendre le cerveau : vers une nouvelle science de l'apprentissage, 2004, OCDE, page 69-77 – Paris – France

Boaz Alyse, 2015, 55 strategies pour mieux apprendre – Chenélière Education – France

SITOGRAPHIE

https://plaisir-d-apprendre.com/utiliser-les-intelligences-multiples-pour-mieux-apprendre/

http://didac-ressources.eu/wp-content/uploads/2017/09/a_ecoutepartie2.pdf-motivation.pdf

8

Cognitive and motivational mechanisms relating to learning and their activation during learning

ANNOTATION

The present lecture introduces students to the role of the cognitive skills in the school environment and the motivational function of the teacher. What follows next in the lecture is a definition of the term "cognitive skill" and a brief history of its origin. This lecture will present the works of Stanislas Dehaene who has provided four main factors for successful acquisition of knowledge: attention, active participation, feedback on the information and memorization of what has been learned.

1. Phase Attention

It is clarified that attention in accordance with the active engagement, the repetition and the memorization, lies in the core of learning. Out of the specified four phases, the attention is the basic one, because this is the ingress through which all information enters. In cognitive science, it corresponds to the set of mechanisms by which human brain selects information, structures it, and deepens it.[3] The learner's brain has the ability to select the most important and most useful information for the task, and to inhibit (stop) the rest of the information flow coming from the environment.

The attention system consists of three subsystems: vigilance, orientation and executive control. Emphasis is placed on the limitation functions of attention, bringing forward the idea of its filter, which includes the understanding that it is very difficult to realize two tasks simultaneously. There exists a phenomenon called "access restriction" (functionally identified as an activity in the prefrontal cortex of the brain). In fact, when we "juggle", we are not actually doing two things at once, but simply alternating one task to another, temporarily losing sight of the first one to the detriment of not receiving any signals from it. In the light of this phenomenon, the pedagogical challenge is how to properly direct the attention of the learners during the presentation of new information. The recommendations come down to shortening the "overdose" of the incoming information, the use of multiple illustrations, and the use of numerous colors, initially aimed at making the learning process more attractive.

3 Dehaene Stanislas, 2018, Apprendre !, Edition Odil Jacob, p.209,

2. Phase Active participation

The need for the active involvement of the learner in the learning process is clarified via the suggestion that a passive organism is not able to learn. The active brain is a learning brain. A passive man cannot learn. This lecture describes activity learning. According to Steve Masson, (a professor at the University of Quebec) this means rejecting passivity, engaging in the process, provoking curiosity, actively generating hypotheses and testing them.

The hierarchy of the "memory pyramid" will be discussed in parallel with the verbal self-assessment of the learners, which can be summarized as follows:

- I forget what I listen to.
- I remember what I listen to and observe to some extent.
- What I listen to, observe and I ask questions or discuss with others, I begin to understand.
- What I listen to, observe, discuss and do, allows me to acquire different knowledge and skills.
- What I teach others makes me an expert in the field.

3. Phase Error Feedback

Modern neuropedagogy researches include the knowledge that making mistakes is normal, inevitable, and however ... very useful. Provided that it really is, an actively noted by the teacher, the teacher should always help to correct the mistakes in a non-sectional way. Only in this case, the mistakes could have their usefulness function. The reflection of the stress on the process of learning and motivation will be discussed, as well as how to avoid that stress. Practical examples are discussed in the sense of the brain functions by repeating cycles of four consecutive stages: prognosis, feedback, correction, new prognosis. In terms of pedagogy, a mistake should be actively noted by the teacher, it should not be ignored, but it is important that the teacher helps the learner to correct it.

The task of the teacher is to work optimally in order to correct mistakes and transfer them into a positive element for the learning process; to keep motivation by using positive reinforcement and non-materialistic compensation – encouragement, foundation and most of all a benevolent approach to the learner, regardless of whether they are good or bad. In such conditions, the error becomes a source of learning.

4. Phase Consolidation of the acquired knowledge

Students learn how the brain gradually automatizes certain processes to leave room for new knowledge. In the beginning of the learning process, the prefrontal cortex is strongly mobilized by executive attention, and the culmination of the learning is to make the transition from the so-called explicit (gain information) to implicit (intentional) learning. Therefore, the brain is able to progressively move to automatization of the relevant knowledge and skills," freeing up space in the prefrontal cortex system", making it operational again and ready to process new information. The pedagogical conclusion derived is that the phenomenon of automation and consolidation is crucial in the acquisition of knowledge because it frees up resources at a higher level.

Students acquire general knowledge of the brain function as it gradually moves to the automation of certain processes whose task is to "free up and leave space/room" for the perception of new knowledge. In the beginning, the prefrontal cortex is strongly mobilized by the executive attention, and the culmination of learning is to make the transition from the so-called explicit (gaining information) to implicit (intentional) learning. If we can recall how we started to learn to drive a car, we will realize that in the beginning we have made a huge conscious effort to control the perception of the numerous signals in real time. We have got the feeling that our brain has been completely clogged with incoming information. Therefore, this is a typical example of what we call clear, unambiguous treatment: a situation or stage in which the prefrontal cortex is highly mobilized by the executive attention. The key to success in learning something is to make the transition from direct to indirect (automatic) data processing. Hence, it follows that the brain is able to progressively move to automation of the relevant knowledge and skills, freeing up space in the prefrontal cortex system, making it operational again and ready to process new information. An example of a child arranging cubes can be given. The solid tower or its collapse sends feedback to the child's brain about how suitable their decision has been.

The lecture explains the relationship between the four main pillars for learning which are: attention, active participation, error feedback of the acquired information, and consolidation of the acquired knowledge. The steps related to the functioning of the brain in moving to the automation of certain processes in order to "open" space for new knowledge are explained. The pedagogical conclusion is that feedback and repetition are essential for automation and memorization of a knowledge or skill.

BIBLIOGRAPHY

Cerveau et Psycho : Intelligences multiples No 68 – mars-avril 2015

Dehaene Stanislas, 2015. Conférence «Les intelligences multiples au cœur des apprentissages», pages 3-7

Dehaene Stanislas, 2018, Apprendre !, Edition Odil Jacob

Haurst Bruno, 2006, L'école des intelligences multiples, Hachette Education

Houdé Olivier, 2012, Neuropédagogie pour une pédagogie du cortex préfrontal – Revu, October, «Sciences humaines»

Houdé Olivier, 2018, L'école du cerveau – Edition Mardaga

Lachaux, Jean-Philippe, 2015, Le cerveau attentif, Edition Odil Jacob

Toscani Pascale, 2013, Apprendre avec les neurosciences – Chronique Sociale

SITOGRAPHIE

https://www.ddec06.fr/personnes-ressource/outils-pour-laccueil-au-quotidien/neurosciences-et-intelligences-multiples/

https://dumas.ccsd.cnrs.fr/dumas-01548215/document

http://www.oecd.org/fr/sites/learninginthe21stcenturyresearchinnovationandpolicyapprendreauxx-iesieclerechercheinnovationetpolitiques/40600705.pdf

9

Behavioural syndrome of the attention deficit with or without hyperactivity in children

ANNOTATION

1. General presentation of the topic – premises and understanding following the MI theory, what is important

After the successful completion of the module, students will have a better understanding of behaviours associated with the Attention Deficit Hyperactivity Disorder (ADHD), will be able to recognize children who might be struggling with the disorder, will be aware of other possible explanations of the symptoms and behaviours associated with ADHD, and will be in a position to help children with AHDH to do better in school using a strengths-based approach with Gardner's multiple intelligences (MI) education theory.

Approximately 5% of the school-age children are diagnosed with ADHD and subsequently, they experience social, emotional, executive, functional, academic, learning, and psychiatric difficulties[4] on a large scale. The feeling of being successful and socially active in school has been proved to follow an individual throughout one's life[5] and is associated with the feeling of success in adulthood, which shows the level of importance of the educational professionals' ability to create a positive school culture for all children.

2. Theoretical postulate of the topic – statements of the main thesis and hypothesis, description of the terms

Educational professionals have long contemplated the importance of the individual assessment of each learner (pupil) in class in order to achieve best success factors. Early educational philosophers such as John Dewey (1938) have emphasized on the importance of

4 Najafi, Mostafa & Akouchekian, Shahla & Ghaderi, Alireza & Mahaki, Behzad & Rezaei, Mariam. (2017). Multiple Intelligences Profiles of Children with Attention Deficit and Hyperactivity Disorder in Comparison with Nonattention Deficit and Hyperactivity Disorder. Advanced Biomedical Research. 6. 148. 10.4103/abr.abr_222_15.

5 https://pdfs.semanticscholar.org/0f2a/e27828b797da0d0e01ae199c3ebf9631aedb.pdf

identification and support of the best students' qualities setting the whole focus and purpose of education "to allow each individual to come into full possession of his/her personal power"[6].

Strengths-based education is learner-cantered with the primary goal of transforming students into confident, efficacious, genuine lifelong learners with a sense of purpose[7]. Individual learners' assessment allows teachers and educational professionals to decide on teaching choices, to revise ineffective techniques and methods, to set standards, to evaluate the progress and to motivate the performance.

A full learners' assessment system should not only focus on learning outputs and levels but also on identifying unique behaviours in learners comprising a class, that the teacher will need to address and manage throughout the academic year. In this process, the educational professional may be able to identify many underlying difficulties which cause symptoms and behaviours that maybe many times confused with bad manners or bad behaviour.

For example, difficulty in following classroom instructions could indicate hearing difficulties, language difficulties, attention difficulties, short-term memory difficulties or frustration in other, seemingly unrelated situations such as friendships or home life. A child who often seems worried or anxious could experience learning difficulties, sensory processing issues, worries from outside of school and so on. Until these different options have been explored and a full picture of a child or a young person's strengths and weaknesses, in terms of cognitive skills, relevant medical issues such as hearing and vision, and family support, motivation and engagement is considered, support is likely to be sub-optimal[8].

Each child's individual assessment does not need to be a long and difficult process. Well trained and experienced educators can make observations on the behaviours of a child that would lead to a decision on the strengths and weaknesses that the learner demonstrates. Also brief discussions with the parents can provide insight on the needs of each learner. The individual assessment is very important in order to connect a child's behaviour with its emotions and the learning outcome consequences.

One of the most frequent and complex disorders that education professionals come across, is the Attention deficit hyperactivity disorder (ADHD), which is a complex neurodevelopmental disorder that can affect a child's success at school, as well as their relationships. The symptoms of ADHD vary and are sometimes difficult to recognize. ADHD is generally diagnosed in children by the time they're teenagers, with the average age for moderate ADHD diagnosis being 7 years old.

Signs of ADHD vary and are complex in nature ranging from self-focused behaviour, interrupting, having trouble in waiting ones turn, emotional turmoil, fidgeting, problems playing quietly, leaving unfinished tasks, lack of focus, excessive mistakes especially when the tasks require extended mental focus, daydreaming, difficulty in getting organized and being forgetful[9]. These signs are common for all children, a fact that makes the diagnosis of ADHD extremely difficult for educational professionals. In order for the educational professionals to

6 https://doi.org/10.1002/abc.21174

7 https://www.radford.act.edu.au/news-and-events/latest-news-and-achievements/article/?id=a-strengths-based-approach-to-education-and-parenting

8 Julia Carroll, Louise Bradley, Hayley Crawford, Penny Hannant, Helen Johnson & Angela Thompson, July 2017, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/628630/DfE_SEN_Support_REA_Report.pdf

9 https://www.nhs.uk/conditions/attention-deficit-hyperactivity-disorder-adhd/symptoms/

distinguish between ADHD and other behavioural issues, they need to be able to determine whether the behaviour could be normal, borderline, or clinical as to be able to assist the student appropriately. There are two key elements: selective attention, or the ability to focus on relevant information, and sustained attention, or the ability to maintain focus over time.

ADHD is divided into three different types that are inattentive type, hyperactive-impulsive type and combination type, where each type of ADHD is tied to one or more characteristics in the following ways[10]:

- Inattention: getting distracted, having poor concentration and organizational skills.
- Impulsivity: interrupting, taking risks.
- Hyperactivity: never seeming to slow down, talking and fidgeting, difficulties staying on a task.

Most people, with or without ADHD, experience some degree of inattentive or impulsive behaviour. But it's more severe in people with ADHD. The behaviour occurs more often and interferes with how one functions at home, at school, at work, and in social situations.

Children with ADHD have been treated with a deficits-based response of interventions, focusing on what makes them unsuccessful in school, in relationships, and in social situations, rather than identifying and teaching to their strengths. In addition, the three subtypes of ADHD, inattentive (IT), hyperactive (HT), and combined (CT) while identified with some differing symptoms, are rarely treated with differentiated interventions[11]. Also it is worth noting that purely cognitive theory does not apply well when addressed to children with ADHD as they cannot be convinced of the need to change his behaviour however behavioral therapy is very useful[12].

Utilizing Gardner's multiple intelligences (MI) theory, there is a pattern of strengths, just as there is a pattern of deficits among individuals with ADHD, thus shifting to a more strengths-based perspective when applying study results to interventions, possibly impacting individual, academic, and social success, that will be the main learning output of Chapter 10.

3. Practical understanding and toolkits for implementation during a training/learning process

A. Assessment of ADHD and MI

Although modern education theory provides many approaches to how to assess AHDH and MI to learnerss, there are no specific or definitive tests. Instead, this assessment is a process that takes several steps and involves gathering a lot of information from multiple sources that require personal interest and effort on behalf of the teacher and the educational professional. There are some practical tools that can assist in this effort without, however, giving decisive results.

10 https://www.hopkinsmedicine.org/health/conditions-and-diseases/adhdadd

11 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3724232/

12 Taking Charge of ADHD: The Complete Authoritative Guide for Parents. Revised Edition. Russell A. Barkley, PhD Guilford Press. New York NY. 2000

At this point, students of pedagogy should comprehend that the assessment is not suggested for the diagnosis of ADHD or the establishment of the personality type based on MI, but to allow the educational professional in the future to better understand behaviours shown by the learners and thus decide the best educational methods for each specific individual.

Tools that can assist the educational professional in the assessment are mentioned below:

1. MIDAS. Use of Multiple Intelligences Developmental Assessment Scale (MIDAS) for the measurement of the Predominant intelligence types. The MIDAS is a self-report measure of intellectual disposition and may be completed by either the child or a parent. Classroom materials are available that can be used to enhance study skills, self-knowledge, instructional approaches, curriculum planning and career development. There are five versions of MIDAS according to different age groups and the tool provides an overall estimate of a person's intellectual disposition in each of the eight categories identified by Gardner. MIDAS results are given back to the person in a useful way to help him plan his educational career, focusing the attention on their areas of strengths and possibilities.
2. Social Behaviour Mapping[13] is a treatment framework developed by Michelle Garcia Winner as part of her Social Thinking methodology. This technique for explicitly teaching social skills has been successful in helping children and adults, particularly those on the spectrum, to understand behavioural expectations and how their behaviour appears to others.

B. Alternative Teaching Approaches Recommended for Students with signs of ADHD

1. Collaborative Learning/ Peer Tutoring. In recent years, schools have made more extensive use of techniques such as collaborative learning or peer tutoring in order to support mixed ability teaching. These approaches can be very helpful for students with SEND, as well as for typical students[14]
2. Daily report card system that sets positive behavioural goals and rewards to reinforce the behaviour when they meet those goals.
3. Exercise interventions. One possible mechanism for a relationship between movement and performance is that children with ADHD use movement to self-regulate alertness[15]. A recent meta-analysis found that aerobic exercise had a moderate to large effect on attention, hyperactivity, impulsivity, anxiety, executive function and social difficulties, and that yoga was found to reduce the core symptoms of ADHD (Cerrillo-Urbina et al., 2015).
4. Reinforcement of the Intrinsic vs Extrinsic Motivation. It is important to highlighting the intrinsic value of the tasks rather than focusing on exam results or external rewards.
5. Self-Monitoring. Self-monitoring requires the learner to first recognise the occurrence of a targeted behaviour (e.g. daydreaming) and then make positive changes to modify that behaviour. The majority of self-monitoring interventions play audio cues (beeps, chimes or recorded phrases) at timed intervals during the lesson to prompt learners to monitor and check if they are focused and on-task.

13 https://www.scholarchip.com/social-behavior-mapping/

14 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/628630/DfE_SEN_Support_REA_Report.pdf

15 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4675699/

6. Headphones have been found to be a useful intervention for learners with attentional difficulties as they help block out distractions to keep the learner focused and on-task.
7. "RAPID" Cognitive-Behavioural Therapy Program for Inattentive Children is an evidence-based UK intervention that is delivered in UK schools to children with attention problems, which is suitable for secondary school-age learners. It also teaches learners techniques to improve self-regulation skills, emotional control, social-perspective taking, listening skills, problem-solving skills, and an awareness of how thinking and emotions affect their behaviour.
8. Mindfulness has also been used to improve attention and increase on-task behaviour, but here the evidence for its effectiveness is less strong.

C. Main conclusions (important ideas from the content, questions that get answers, etc.)

Learning Outcomes:

1. Understanding the importance of an individual learner assessment as well as strengths/ weaknesses/ behaviours identification
2. Understanding the signs and behaviours of ADHD in learners and be able to distinguish between inattentive and hyperactive-impulsive behaviours.
3. Evaluating multiple intelligence profiles of children with ADHD in comparison with non-ADHD.
4. Understanding how multiple intelligence education method leads to improved social, emotional, and academic success for the learners with ADHD with a more strengths-based approach.
5. Use of tools and good practices using MI theory with learners with ADHD.

Reinforced skills:

1. Search, analyse and compose data and information.
2. Adaptation to new situations.
3. Production of new research ideas.
4. Work in an interdisciplinary environment.
5. Promoting free creative productive and inductive thinking.

BIBLIOGRAPHY

Books

The ADHD Book of Lists: A Practical Guide for Helping Children and Teens with Attention Deficit Disorders, 2nd Edition, Sandra F. Rief, 4 June 2015 (Chapter 1, Chapter 2, Chapter 7)

A Little Guide for Teachers: Supporting Behaviour in the Classroom, Fintan O'Regan, SAGE, Oct 31, 2020 (All Chapters)

Student Mental Health, A Guide For Teachers, School and District Leaders, School Psychologists and Nurses, Social Workers, Counselors, and Parents, William Dikel, Norton Professional Books, 2nd ed. edition (December 17, 2019), (Part I Introduction, Part II Chapter 4, Part IV Chapter 16, Part V)

Successfully Teaching and Managing Children with ADHD: A Resource for SENCOs and Teachers. O'Regan, Fintan, Routledge 2nd Edition 2019 (Chapter 1, Chapter 2, Chapter 3, Chapter 4)

Taking Charge of ADHD: The Complete Authoritative Guide for Parents. Revised Edition. Russell A. Barkley, PhD Guilford Press. New York NY. 2000

Articles

Mettler, Kathleen, «ADHD and Multiple Intelligences: Does a Pattern Exist?» (2015). Walden Dissertations and Doctoral Studies. 1227.

https://scholarworks.waldenu.edu/dissertations/1227

Shane J Lopez & Michelle C Louis (2009) The Principles of Strengths-Based Lopez, Shane & Louis, Michelle. (2009). The Principles of Strengths-Based Education. Journal of College and Character. 10. 10.2202/1940-1639.1041.

https://www.researchgate.net/publication/252465857_The_Principles_of_Strengths-Based_Education

Proulx-Schirduan, Victoria & Shearer, Branton & Case, Karen. (2009). Mindful Education for ADHD Students: Differentiating Curriculum and Instruction Using Multiple Intelligences. Teachers College Press. https://www.researchgate.net/publication/234729155_Mindful_Education_for_ADHD_Students_Differentiating_Curriculum_and_Instruction_Using_Multiple_Intelligences

Niekerk, Surika. (2020). Multiple intelligence profiles of learners with attention-deficit/hyperactivity disorder (ADHD) / by Surika van Niekerk. https://www.researchgate.net/publication/45696196_Multiple_intelligence_profiles_of_learners_with_attention-deficithyperactivity_disorder_ADHD_by_Surika_van_Niekerk

Bordei, Sanda. (2015). MIDAS-- AN USEFUL TOOL FOR CAREER COUNSELING. Journal of Innovation in Psychology, Education and Didactics. 19. 217-224.

10

Possibilities for integration of some practices based on the multiple intelligence methodology and the toolkits stimulating a child's interest to the teaching topic and the facilitation of its memorization

ANNOTATION

The application of the Theory of Multiple Intelligence in pedagogy is a powerful tool for working with learners. The lecture emphasizes on the need for good assimilation of the MI theory, and makes a brief revision of the basic concepts once again. Students acquire knowledge on the ways to use good teaching strategies based on multiple intelligence. (See Appendix) It is good to know that the pedagogical techniques presented in this way are not permanently defined. However, they should be periodically updated to ensure that the learning outcomes will be achieved at the end of the course.

The new moment in the lecture is that the students acquire practical skills on how to transform any new topic presentation by using the multiple intelligence principles. They acquire the ability to present their argument and to choose an adequate pedagogical technique oriented to finding solutions for presenting new knowledge in class in a way comfortable for learners with different intelligence profiles. Students learn how to develop a plot that would allow learners with different intelligence profiles to be involved in an equal way in the same activity.

Children who are diagnosed with ADHD subsequently experience social, emotional, executive function, academic, learning, and psychiatric difficulties on a large scale.

Today, pupils shall develop specific skills and specific knowledge that not only gives them a chance to understand problems and find solutions, but to explore and to evaluate information, to apply it and to communicate their knowledge/findings with the other members of the team.

Signs of ADHD vary and are complex in nature that common for all children, fact that makes the diagnosis of ADHD extremely difficult for education professionals.

There are a couple of fundamentals in the teaching approach which teachers should implement through the process:

1. Learning happens in an authentic and practical context; organizing the learning in a sequence that shifts gradually from concrete to abstract; adjusting the learning process for various abilities, considering the intelligence profiles; integrating the outdoor environment as an integral component of the learning process, and also focusing on both the cognitive and the emotional aspects of learning.

2. To be aware of the inadequacy of learners' individual differences, needs, perspectives, and lack of proficiency and to develop these differences in the learning environment and to apply them to contemporary teaching activities – these fundamentals depend on the teachers. Teachers, taking into account learners' learning styles and individual speeds, and also their development levels, may use appropriate learning materials and methods providing a variety of individual and collaborative learning environments.

3. In this context, multiple intelligence theory offers a new educational environment which presents arguments to individuals› interests and abilities, targeted to develop each individual›s different approach to the intelligence field which shall enhance learners' opportunities to learn.

That is why, the lecture suggests the following toolbox and space development consisting of various areas which will give pupils the freedom to develop different intelligences and learn as it suits their profile best in order to develop their most dominant intelligence type. (APPENDIX 1).

The feeling of being successful and socially active in school has been proven to follow an individual throughout one's life and is associated with the feeling of success in adulthood, which shows the level of importance for educational professionals' ability to create a positive school culture for all children.

BIBLIOGRAPHY

Roussel M., 2007, Les intelligences multiples dès la maternelle p.121 – Chenielier Education – France

Daudelin Martine, 2006, Apprendre à sa façon, p. 17 – Chenielier Education – France

Paterson Kathy, 2012, Trois minute pour susciter l'intérêt des élèves – Cheniélière Education – France

Quellet. Lisette, 2010, Un enseignant qui outillé des élèves motivés – Cheniélière Education – France

Deak Joann, 2010, Ton fantastique cerveau élastique – Piroette Edition – France

Berthoz, Sylvie, 2011, La face cachée des émotions – Le Pommier Edition – France

Akkuzu Nalan, Akcay. Husamettin, 2011, The design of a learning environment based on the theory of multiple intelligence and the study its effectiveness on the achievements, attitudes and retention of students, Dokuz Eylul University – Buca Education Faculty, Izmir, Turkey,

Rands Melissa L., Gansemer Ann M. 2017, Topf, The Room Itself Is Active: How Classroom Design Impacts Student Engagement, Iowa State University

Appendix 1

Form/ Type of MI	CHARACTERISTIC OF THE MULTIPLE INTELLIGENCE		PEDAGOGICAL TECHNIQUES	SPECIFIC ACTIVITIES FOR DEVELOPMENT OF THE DOMINANT INTELLIGENCE
LINGUISTIC (L)	Comfortable with words	Pupils have the capacity to speak, to tell, to invent and to listen to stories. They write clearly and understandably. They feel well when speaking in front of a group; they realize the function of the words and their impact on the listener. They learn and recall new words easily. Sensitivity to words and sentence structure.	Stories and narratives using a more complex vocabulary; Records; Humor; Exchange in a group, using words to recreate a picture;	Listening; Writing; Reading; Puppets; Encouraging the use of extravagant words and expressions, engaging in debates and oral presentations. Showing how poetry can be a conduit of feelings.
SPATIAL (S)	Comfortable with images and paintings	Pupils have the capacity to cover/view the visual space with great accuracy and to react accordingly to this perception. They have the ability to recreate color pictures and shapes innate in their imagination. Ability to accurately reproduce various aspects of the world around them.	Visualizations; Use of colors, creation of diagrams, maps – reading routes, schematic organization of ideas; Modelling/ Models; Metaphors;	Fine art techniques; Computer; Project work in three-dimension form; Teaching techniques for creating maps for organizing ideas and drawing mazes, techniques for expressing knowledge through drawing, constructions with different materials, plastic materials, creating models, sketches of clothes, scenes describing a certain period that has been studied.

Form/ Type of MI	CHARACTERISTIC OF THE MULTIPLE INTELLIGENCE		PEDAGOGICAL TECHNIQUES	SPECIFIC ACTIVITIES FOR DEVELOPMENT OF THE DOMINANT INTELLIGENCE
MUSICAL (M)	Comfortable with music	Pupils like to listen to music and to be surrounded by sounds. They like to perform music, to play musical instruments. They often like to hum and sing. Sensitivity to the sounds that surround them, they can reproduce harmonious sounds. They like dancing.	Music on the background; Rhythm, songs, rap, voice variations, imitation of different sounds; Motivation to compose or play skillfully known musical works;	Listening to music; Lectures on music; Songs and dances, rewriting the words of a song to describe a concept, encouraging the application of music during games, creating sound effects, teaching social sciences to countries around the world associated with their national music or training in different areas.
LOGICAL MATHEMATICAL (LM)	Comfortable with numbers	Pupils have the ability to use numbers efficiently and to think logically. They like to think abstractly and to solve complex problems. They create schemes and imaginary models for understanding and memorizing concepts, they use mathematics as a tool to study the reality. They like order, their room is tidy, and they make experiments, they cook according to recipes, they are resourceful and they are able to find a quick solution to a problem.	Use of John Venn's logic diagrams to compare and to discover the common and the different. Use of graphic materials, posters and timeline techniques. Explanations related to the practical use of certain objects. Requiring the student to find the logical parts and arrange them in sequence. Learning to structure through techniques for: ranking, categorization, segmentation, synthetic tables, analogues.	Working with numbers and solving problems, analyzing situations, showing how things work, getting them used to accuracy and consistent thinking when solving a problem. Finding short and clear answers to a given problem.

Form/ Type of MI	CHARACTERISTIC OF THE MULTIPLE INTELLIGENCE		PEDAGOGICAL TECHNIQUES	SPECIFIC ACTIVITIES FOR DEVELOPMENT OF THE DOMINANT INTELLIGENCE
BODILY-KINESTHETIC (BK)	With their own body	Pupils move a lot, do sports, and take physical risks. They have the ability to express themselves through their body. They possess the ability to express thoughts and feelings through gestures. They have developed a sense of body coordination and dexterity. They dance, play, imitate gestures. Pupils like touching objects while looking at them. They are patient in handling small items.	Application of tactile games and activities that require movement. Theater, mime, role, dance, explanation of a concept through gestures. Application of Brain Gym, for the development of physical and artistic abilities.	Mechanical toy games, acrobatic performances, sports competitions; Outdoor games; Creation of the so-called „saynetes“, i.e. short comic sketches with a small number of characters, training in carpentry or wooden constructions, sewing, making various objects;
NATURALIST (N)	Comfortable with nature	Pupils spend a lot of time outside, and have the capacity to distinguish different living organisms. They observe the environment and are sensitive to changes in it. They are able to recognize and classify numerous animal and plant species.	The use of the nature as a classroom, growing plants and animals in a classroom under the guidance of the teacher, making practical experiments, creating an area for nature observation in the school yard in the breaks. Making pedagogical excursions in nature.	Assigning a project to collect plants, animals, minerals, to listen to natural sounds and to explain and systematize them according to certain criteria, to observe and keep notes on natural phenomena, to classify elements of flora and fauna.

Form/ Type of MI	CHARACTERISTIC OF THE MULTIPLE INTELLIGENCE		PEDAGOGICAL TECHNIQUES	SPECIFIC ACTIVITIES FOR DEVELOPMENT OF THE DOMINANT INTELLIGENCE
INTERPERSONAL (I+)	Comfortable amongst others	Ability to notice and distinguish nuances in the mood, the motivation, the intentions, the desires and the feelings of others. Often this is manifested in the behavior of cooperation, support and striving to work in a team. These, by nature, are people born for leaders who facilitate the tasks of others. They love public gatherings and are often part of an organizing committee. They often invite their friends at home and are able to share their favorite activities or toys with others.	Applying the cooperative pedagogy of Freinet, a cooperative approach to learning in group, offering opportunities for learning in pairs between students, organizing sessions of "brainstorms" to solve a problem, creating situations in which students can observe each other and exchange and share their impressions.	Prerequisites are created for building many personal contacts; Conditions are created for the manifestation of skills for reaching consensus, Jim Howden's 1, 2, 3 techniques are applied, conflict resolution, etc. puppets are used to play out problematic interpersonal situations.
INTRAPERSONAL (I-)	Comfortable by themselves	Ability to understand their own feelings in order to get to know themselves and others better, in order to adapt their behavior. Ability to structure emotions, which will serve as a guide in behavior towards themselves and others. Pupils like to be left alone. They know what gives them pleasure, they know their strengths and know which weaknesses they need to correct. Pupils have the skills to set goals and achieve them.	They allow the student to work at their own pace, create a space for solitude or allow students to work outside the classroom in another room, help students formulate and guide the achievement of their personal goals, encourage them to keep a diary.	Creating a space for reflection, for getting to know and naming one's own emotions, showing techniques for this purpose. Encouraging learners to use their metacognitive skills in learning. Giving knowledge about their way of thinking and building cognitive strategies. Creating workshops, which develop the ability of learners to reflect on their own cognitive experiences and to regulate them, in the way of "thinking about thinking".

11

New design and reorganization of the physical space in the classroom facilitating the application of the new pedagogical teaching method

ANNOTATION

General overview, goal and structure

The general aim of this lecture is to discuss and present the importance which the physical space – the classroom, has in the learning experience not only for the children but also for the teachers. It is describe techniques and tools which enable teachers to use and apply the MI methodology in the classroom and a way to keep the process creative and inspiring.

Theoretical part

In order to address the above stated needs and paths for developing knowledge and understanding of the process of teaching, the environment plays an important role in the educational and the learning process.

The physical space, once underrated and narrated in a way that the teacher delivers all the knowledge, limited interaction between the students and almost non-existing possibilities for round discussions, must be addressed in a way, which unlocks the potential for learning and teaching.

In relation to the Gardner's MI theory and the new way of learning, in the new innovative classroom space, teachers and pupils should have the possibilities to interact, to learn and to teach together in various ways and set-ups. As the MI theory argues, there are various ways in which children can receive and understand knowledge. To name a few: learning from the teacher (presentation-lesson mode), learning alone, learning in teams, learning by moving/playing, learning by doing/experimenting, and learning in mixed-age groups.

Bonwell and Eison (1991) have defined active learning as any learning strategy that involves "students doing things, and thinking about the things they are doing" (p. 2). The characteristics of the active learning strategies in-

> Characteristics of active learning strategies include: pupils are involved in more than listening, are encouraged to share thoughts and values, and are asked to engage in higher order thinking such as analysis and synthesis rather than memorization".

clude: the learners are involved in more than listening, they are encouraged to share thoughts and values, and are asked to engage in higher order thinking such as analysis and synthesis rather than memorization (Bonwell & Eison). Instructional strategies that promote active learning include small group discussion, peer questioning, cooperative learning, problem-based learning, simulations, and case-study teaching, among others (Barkley, 2010; Prince, 2004).

Teachers' practical guide

There are various segments which are connected with the design and the reorganization of the physical space and which support the possibilities for improvising these innovative methods. Some of the easiest tools are as follows: movable chairs and tables – learners have the freedom to arrange the space in a suitable way for their needs. Learners can improvise working by gathering and experiencing the process as fun and free. Furthermore, the effect of open learning spaces, flexible seating and writing surfaces, the integration of technological learning tools and multimedia, lighting, and the overall learning environment. The process of learning can be delivered in various ways such as: a lecture, a presentation, an experimentation, a challenge, a discussion and an exploration.

All of these possible enhancements illustrate how classroom changes can positively support the teaching practices by enhancing learner engagement in the learning process.

Time to transform academic knowledge into a practical product ready for implementation is a long process engaging large specter of professionals. Social innovation is the longest lasting. It takes 25 years from the creation of MI theory by H. Gardner to the development of a practical set of tools for its application and to become a using teaching approach.

Teachers should be aware that in such an environment learners may lose focus easily and look distracted but in reality involving them through such an approach assures that you will not have learners who are present only physically but not with their mind and interest. Perhaps the biggest fear, which every single teacher has, is to lose control over the group and the process. However, the true learning comes when the process remains raw and learners not only enjoy it but also take responsibility for their own development.

Classroom design which unlocks holistic teaching-learning approaches for teachers and children

Open Space Affords Movement and Interaction;

Move the position of the teacher from front to middle of the classroom process;

The teacher takes the role of facilitating the process as a mentor;

Shared knowledge between children and mutual learning (children who know more and understand better teach their classmates);

Tools which enable assessing for understanding and presenting;

Tools which enable visualization of thinking;

Areas which unlock the practical experimentation and the learning-by-doing method.

Flexibility and openness are key attributes in promoting a community of learners, and they allow learners to learn holistically by encouraging the pupil engagement in learning. Removing the spatial barrier between the faculty and the learner space is an important classroom attribute that promotes learner-faculty interaction and a place where learners feel that they are the co-constructors of knowledge.

Today, the classroom of the future should give each learner the opportunity to experience the learning process in a way most suitable for a child's needs and paths of learning. Areas in which learners can interact with technology, can submerge themselves in the process of practical experimentation and can explore the different roles in a team, are just a few of the main goals that an innovative learning space which applies the MIT methodology, must take into account.

BIBLIOGRAPHY

1. Nalan Akkuzu, Husamettin Akcay., (2011), The design of a learning environment based on the theory of multiple intelligence and the study its effectiveness on the achievements, attitudes and retention of students, Dokuz Eylul University, Buca Education Faculty, Izmir, Turkey
2. Gardner H., (1999), Intelligence Reframed: Multiple Intelligences for the 21st century, Basic Books, New York
3. H. Gardner., (1993), New York, Basic Books, A Division of HarperCollins Publishers
4. Melissa L. Rands, Ann M. Gansemer-Topf., (2017), The Room Itself Is Active: How Classroom Design Impacts Student Engagement, Iowa State University
5. Charles C Bonwell, James A. Eison,. (1991), Active Learning: Creating Excitement in the Classroom, George Washington Univ., Washington, DC, School of Education and Human Development

12

Setting up a concept-based sheet for student evaluation, according to the educational criteria, based on MI

ANNOTATION

The present lecture aims to give the university students information about the ways of assessing knowledge (new information) that is already given to the learners based on the concept of multiple intelligences. The emphasis is on new and different tools for assessing the acquired knowledge.

It is a well-known fact that learners (pupils) do not master the taught material at the same speed and in the same way, which requires different choice of assessment tools. For example, a purely "linguistic" assessment/grade can be catastrophic for a learner with less developed linguistic intelligence. H. Gardner emphasizes that "the normative standard tests measure only a part of each person's skill set." The already obtained theoretical and practical knowledge about MI can serve as a springboard/kick starter developing a personal assessment system based on different forms of intelligence. This new assessment approach will not completely replace the existing standard tests. The idea is to create a variety of assessment tools by selecting ones that better take into account the individual intelligence profile of the learner.

The different forms and means of assessment of pupils by the teacher are presented, such as: concept maps (mind mapping), portfolio and different types of homework (different from classically validated homework), which cover the eight types of multiple intelligence.

Mind Mapping (Tony Buzan)

The principle and the rules for building the map for organizing ideas are presented. Mind mapping activates both hemispheres of the brain simultaneously. The left hemisphere – to search for keywords and the right hemisphere – to search for a set of symbols that visually illustrate the idea and put it in words. This is a multifunctional tool that allows schematizing already acquired knowledge on a given plot, to make a summary or plan. Mind mapping helps for better memorization of the material/knowledge. Furthermore, mapping helps thought organization. In his book "Art and Visual Perception", Rudolf Arnheim has written that every idea, no matter how much an abstract one, corresponds to a visual picture in our consciousness. According to the author, the mind processes information coming from visual pictures more easily than from words, because in the evolution of mankind, pictures preceded speech. The advantages of (such) a map, which allows for a large amount of information to be simultaneously presented on

a sheet of paper or on a computer, and the thought to be structured on the basis of an associative thinking, refracted through (the) various forms of multiple intelligences, are highlighted. The present lecture also provides information on the existing computer programs such as: Inspiration, Kidspiration, and Mind Manager.

The construction of a conceptual and panoramic map is considered an extended version of the organizational map. This type of map provides greater opportunities for evaluation. For example, a concept can be represented graphically as a huge wall in which many doors, containing specific information, open. Such a map stimulates the creativity and the individual skills of the pupils, which have taken on the role of researchers and use their strengths to illustrate an idea or concept. A grade and assessment through this method reflects the pupil's actual skills more accurately. There is also an option in which the pupil can choose the method by which to be assessed. (See Appendix) According to R. Tousignant and D. Morissette, 2004, the assessment of the knowledge contains two characteristics: complexity and conceptualization. Taking into consideration these parameters makes it possible to assess skills, such as creating an original song, writing various lyrics, implementing projects of a spatial-visual nature, staging a play, etc.

Students are introduced to the creation of a portfolio as a form of assessment. This is a folder with A4 sheets, which has been divided into eight sections, each of which bears the name of a form of intelligence. Students are free to decide in which section to classify the different documents. The lecture includes introduction to specific examples of documenting the eight types of intelligence in a portfolio. For example, in the section of naturalist (N) intelligence, there are classified: diagrams for comparing animals or plants, observation slips, herbariums and collections, a diary, photos of natural phenomena. In the section of spatial (S) intelligence, there are classified: photos of projects, 3D models, diagrams, schemes, sketches, photos of collages, drawings, video tapes of projects.

Homework as a form of assessment

The essence is to give the task without specifying how to solve it so that the learner should have complete freedom to find the solution. The requirement is that the task is set specifically and is related to the studied topic and the learning material. The new type of homework differs from the traditional one in the aspect that that it can be presented in a different way and form on the learner's choice, dictated by their inner feeling and associated with their dominant form of intelligence. This gives freedom to the learner's imagination. Thus, their strengths come forward; the pleasure of the work is stimulated by increasing their self-confidence.

The present lecture gives information about the established positive practices of application of the theory of MI for assessment of acquired knowledge, according to the experience of Martine Daudelin. According to her practice, the eight forms of intelligence are a subject to the weekly homework. For example, if math diagrams are studied, the author suggests homework devoted to research, with the results presented in the form of a diagram. (Logical-mathematical (LM) and interpersonal (I+) intelligence are used). If you are working on a literary text provided in the native language program/classes, the learners are asked to write a story to tell to the pupils in the lower grades (Linguistic intelligence (L)). If a grammar rule is studied during the week, the suggestion is to explain it in the form of a song composed by the learners (Musical intelligence (M)), etc. What is specific about the organization of this type of homework is that they are presented on a certain day of the week, which is reserved for the presentation of the

homework related to the multiple intelligence. Each learner (pupil) reviews what others have done and writes their comments on a specially designed form. All comments should be positive and constructive. The presentation of the homework can be oral or written. Then everyone votes (secretly or openly) to choose 5 finalists and one winner. This type of homework is accepted with great enthusiasm by the learners, motivates them to seek information and thus to acquire new knowledge.

The present lecture introduces the students to a system for assessing the acquired knowledge, based on the theory of multiple intelligence. It also presents the ways to use various practical techniques such as organizational mappings of ideas and their variety – concept (mind) maps, portfolio and homework, for the purpose of assessing the knowledge acquired by the student.

BIBLIOGRAPHY

Daudelin, Martine, 2006, Apprendre à sa façon p. 90-95 – Chenelière Education – France

Toussignant R. Morissett D., 2004 Le principe de la mesure et de l'évaluation de l'apprentissage –, Gaëtan Morin Edition – France

Michael M. Michael G. 1995, Mind mapping – Abridged Edition – England

Buzan Tony, 1996, Dessine-moi intelligence – Edition d'organisation, Paris, – France

Margulies Nancy, 2005, Carte d'organisation d'idées – Chenélière Education – France

Dore Louse, Michaud Nathalie, 2005, Le portfolio – évaluer pour apprendre –Chenelière Education – France

Margulies N., 2005, Cartes d'organisation d'idées – Chenélière Education – France

SITOGRAPHIE

https://sites.google.com/site/ideesash/difficulte-scolaire/intelligences-multiples

https://www.isexl.com/pourquoi-comment-utiliser-portfolio-enseignement/

https://web.cslaurentides.qc.ca › carteorganisation d'idée

Pupils Evaluation Sheet

Name : ..... Date : .....

I choose my own evaluation method

To show my knowledge about.....*(theme, subject)*, I would like to:

- ☐ Write a text
- ☐ Make a collage
- ☐ Make an album
- ☐ Build a model
- ☐ Create a group project
- ☐ Make a statistical table
- ☐ Make a diaporama
- ☐ Publish a newspaper
- ☐ Do an interview
- ☐ Draw a poster
- ☐ Create a discography on a topic
- ☐ Other:
- ☐ Make an oral presentation
- ☐ Create a simulation
- ☐ Make a series of sketches or diagrams
- ☐ Make an experiment
- ☐ Participate in a debate or discussion
- ☐ Create a diagram for organizing ideas
- ☐ Create a video
- ☐ Compose a musical play
- ☐ Write a song or "rap" on a topic
- ☐ Teach another student
- ☐ Make a choreography

Brief description of what I intend to do:

Student's signature: ..... Teacher's signature: .....

Source : Apprendre à sa façon – Martine Daudelin, Chenelière Education, 2006, p. 125

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Cooperative pedagogy by Celestin Freinet Introduction

ANNOTATION

Characteristics of Freinet's pedagogy:

The main principles and differences of the concept of Freinet are presented, such as: the student is in the center of the learning process according to the cooperative pedagogy, the systematic and direct control by the teacher is replaced by indirect, the competitive element is reduced to cooperation, etc. The main goal/aim is discussed – the child to become autonomous through training, responsible for their actions and open to cooperation and change.

What is cooperation? Principles and practices in the classroom

- To cooperate literally means to work together.
- Cooperation is defined as a set of situations in which people act, create or learn together.
- Cooperation is the key to better success for all by "doing, living and learning together".
- To act, live and learn by cooperating means – to act, live and learn with others, from others and for others, and not alone against others

Development of the concept of cooperation – Sylvain CONNAC through the prism of the democracy within the school.

According to Sylvain CONNAC, a professor at Paul Valerie University in Montpellier: Cooperation means (1) mutual assistance and group practices (symmetrical forms) and (2) assistance and training (asymmetrical forms). Defines the specifics of two terms that are often mixed: collaboration, that is, when students work on the same project: "I do something with the other because I find it an advantage for myself" and cooperation, in which the partners are completely dependent "I do something with the other and for the other, because I feel satisfaction with the idea of the satisfaction of the other."

Why cooperate at school?

- Cooperation at school means experimenting with social rules and principles that have "value" far beyond the classroom and school.
- School cooperation practices protect values such as cooperation and solidarity (based on the similarity factor) by promoting a better school climate in the classroom.
- The practices of cooperation are a possible pedagogical tool for personalizing the training, they facilitate the use of collective didactic situations, as well as the development of individualized work. This way, cooperation creates conditions for better success for all.
- Argumentations and debates as a result of cooperative practices contribute to the formation of an ability to evaluate the rationality of each participant.

Sylvain CONNAC lists the positive effects associated with cooperative practices in the classroom:

- assertiveness
- putting knowledge into words
- solidarity
- empathy
- responsibility
- cognitive reinforcement

Therefore, collaboration / cooperation makes it possible to place students who have difficulty in a working group with supportive resources and thus encourage their success.

Why does the theory of multiple intelligences resonate with the values of cooperation?

MI theory shows that all individuals are intelligent; intelligence is manifested through many different forms. Skills related to and derived from forms of intelligence are needed when working in a group, in a team or to perform a common task.

Each student will be able to define these intelligences using a questionnaire, and we can then experiment with carrying out a task with a group of students with homogeneous abilities and a group of students with heterogeneous abilities. During the debriefing, we will highlight the precautions concerning Howard Gardner's theory. MI theory is successful in assessing diversity and explains preferences for different learning styles (visual, auditory, and kinesthetic), but neuroscience research is still in the process of elucidating the specific functional mechanisms of MI theory (see of d'André Tricot).

The lecture shows how the application of the theory of MI is complemented by the cooperative pedagogy of C. Freinet, who assigns an active role to the student in the educational process, where the teacher does not dominate the class, but is placed at his level. Students will be introduced to the basics of cooperative pedagogy. They will also gain knowledge on how to form the student's social competence (autonomy, responsibility, openness to the world), which

has a value far beyond the classroom and school. Various cooperative teaching strategies are revealed and the benefits are highlighted in detail (strong motivation, self-belief, desire to progress).

An example protocol for planning and application of cooperative pedagogy in the preparation of a lesson is attached. (Appendix)

BIBLIOGRAPHY

1. Staquet Christian, 2003, Accueillir les élèves, une rentrée réussie et positive, Éd. Chronique Sociale, Lyon, 1999, 2003
2. Staquet Christian, 2007, Une classe qui coopère, Ed. Chronique Sociale, Lyon
3. Connac Sylvain, La personnalisation des apprentissages, agir face à l'hétérogénéité à l'école et au collège, ESF 2012 Issy-les-Moulineaux, p. 44.
4. Connac Sylvain, 2009, Apprendre avec les pédagogies coopératives. Démarches et outils pour l'école. Paris, ESF éditeur, collection pédagogies
5. Connac Sylvain, 2010, Enseigner sans exclure; la pédagogie du colibri, Paris ESF Coll. Pédagogies
6. Sander Emmanuel, Gros Hippolyte, Gvozdic Katarina et Scheibling Calliste, Sève, avec la collaboration d'Évelyne Clément, ESPE de l'académie de Versailles sous la direction d'André Tricot
7. Gros Hippolyte, Gvozdic Katarina, Sander Emmanuel, Scheibling-Sève Calliste, 2018, Les neurosciences en éducation, Collection Mythes et Réalités RETZ, sous la direction d'André Tricot

SITOGRAPHY

1. MEMENTO: agir sur le climat de classe et d'établissement par la coopération entre élèves
   https://www.reseau-canope.fr/climatscolaire/uploads/tx_cndpclimatsco/memento_pour_la_cooperation_entre_eleves.pdf
2. La théorie des Intelligences multiples – https://www.fondation-lamap.org/fr/page/56092/que-peut-on-dire-de-lideedintelligences-multiples-et-de-son-application-en-classe
3. Baptiste Jacomino – http://www.cahiers-pedagogiques.com/Freinet-et-la-cooperation
4. Pour aller plus loin – https://www.cahiers-pedagogiques.com/Bibliographie-sitographie-8454

Appendix

Protocol for Planning and Implementing Cooperative Pedagogy

1. Target values

Pleasure ☐
Commitment ☐
Taking risks ☐
Untried ☐
Confidence ☐
Openness to others ☐

2. Type of teams

Stable team ☐
Informal team ☐
Team of expert's ☐
Croup – Class ☐

Number of members per team

Two ☐ Three ☐ Four ☐

How to train the teams?

.....

.....

.....

3. Interdependence

Goal ☐
Resources ☐
Task ☐
Role ☐

4. Cooperative Skills

Speak in a low voice ☐
Thank your teammate ☐
Reword what was said ☐
Asking for help ☐
Listen carefully ☐
Login to the task ☐
Share ☐
Speak in turn ☐
Other .....

5. Critical reflection

Introspection and

a. self-evaluation ☐
b. Me towards the other ☐
c. Joint evaluation ☐

6. Roles of the teacher

a. Observe

One team ☐
The class ☐

b. Intervene

c. Giving Feedback :

To the team ☐
To the class ☐

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Montessori's pedagogical methodology applied to Gardner's Multiple Intelligences theory

ANNOTATION

Presentation

Maria Montessori and H. Gardner both challenged the general views of their respective eras about intelligence and potential, coming to similar conclusions but with some differences. Montessori and Gardner share some viewpoints regarding education and development, but their works differ. Understanding common points and differences between their approaches is essential to understand the practical experiences that connect Montessori's curriculum areas to Gardner's eight intelligences and their core operations.

Theoretical postulates

There are some common points and differences in Montessori and Gardner's opinions:

Common points. Both Montessori and Gardner have made observations of their own about the development of people – long-time observations and both focused on typical situations and individually targeted on special needs. The common idea is that each individual is unique and there is no one like the other, and that each one demonstrates their qualities in early childhood. Moreover, the idea that interacting with nature and the form of bringing-up play an important role in the development of people and in the development of their abilities. Montessori observed the "natural tendencies" of human beings; Gardner argues that human talents have a genetic basis, both consider human development as a consequence of the ongoing and dynamic interaction of genetic and environmental factors. In addition, Montessori has created child-appropriate sensory experiences that combine intelligence combinations and intelligence-making activities to fit most of the basic processes of the eight intelligences described by Gardner.

Differences. Montessori has focused specifically on the education of children and her concerns about the needs of children lead her to build a school and develop teaching methods: she built her approach and methodology on her work with children and teachers. Gardner's work is based on theory, observation (of adults) and research rather than practice. He created an intelligence theory, he did not offer a new educational approach but a new perspective for people

who work with children to better recognize and evaluate them. Montessori's philosophy, theory and methodology include all aspects of human potential, such as character, moral development and spiritual growth. Although Gardner considers character, morality and spiritual issues in his work, they are not considered part of the multiple intelligence theory because they do not meet the criteria of intelligence.

Practical understanding

There is a direct correlation between the Gardner's theory of the Multiple Intelligences and the founding principles of the Montessori's method of education. The table below is a brief overview of the Montessori curriculum areas that indicates how each of the materials encompasses at least one type of intelligence and several core operations. For example, the practical life area exercises combine the use of bodily-kinesthetic and spatial intelligences. The sensorial exercises include many of the intelligences, such as bodily-kinesthetic, spatial, logical-mathematical, naturalist, linguistic and interpersonal, if children are working together. Language exercises utilize bodily-kinesthetic, spatial, linguistic and interpersonal intelligences, and mathematics. Nature and social studies engage naturalist, bodily-kinesthetic, logical-mathematical, spatial, interpersonal and linguistic intelligences. Art, gymnastics, and music involve bodily-kinesthetic, logical-mathematical, spatial, and musical intelligences. In particular, regarding interpersonal intelligence, many Montessori activities and exercises support the development of independence, decision-making, self-control, mastery and discovery. She has recognized that each child needs to function in a social

Area/Exercise	*Intelligences*	*Area/Exercise*
Practical Life	Bodily-kinesthetic	Object handling
Pouring	Spatial	Mental visualization
Buttoning		
Sweeping		
Sensorial	Bodily-kinesthetic	Object handling
Touch: Geo. Solids	Spatial	Mental visualization
	Logical-mathematical	Relations
		Classification
		Semantics
Visual: Solid insets	Bodily-kinesthetic	Object handling
Cylinder boxes	Spatial	Mental visualization
(2-3 children)	Logical-mathematical	Relations
	Linguistic	Semantics
	Interpersonal	Awareness of intentions of others
Auditory:	Musical	Pitch
Set of Bells	Interpersonal	Awareness of feelings
(2-3 children)		of others
Smell:	Naturalist	Recognition
Smelling Boxes		Classification
Language		
Sandpaper Letters	Bodily-kinesthetic	Object handling
Movable Alphabet	Spatial	Mental visualization
	Linguistic	Phonology
Objects with words	Bodily-kinesthetic	Object handling
on cards	Linguistic	Mental visualization
(2-3 children)		Phonology
		Semantics
	Interpersonal	Awareness of desires & intentions of others
Mathematics		
Sandpaper Numerals	Bodily-kinesthetic	Object handling
	Spatial	Mental visualization
	Naturalist	Recognition
Number Rods	Bodily-kinesthetic	Object handling
	Spatial	Mental visualization
	Logical-mathematical	Relations
Golden beads	Bodily-kinesthetic	Object handling
	Spatial	Mental visualization
	Logical-mathematical	Number relations
		Calculations
		Classification

Core Operations	*Intelligences*	*Core Operations*
Nature		
Planting a garden	Bodily-kinesthetic	Bodily motions
		Object handling
	Spatial	Mental visualizations
	Logical-mathematical	Patterns
	Naturalist	Recognition
		Classification
	Interpersonal	Awareness of desires of others
Caring for animals	Naturalist	Classification
in the classroom	Bodily-kinesthetic	Object handling
	Linguistic	Semantics
	Spatial	
	Naturalist	
Social Studies		
Land & water forms	Bodily-kinesthetic	Mental visualization
	Linguistic	Recognition
		Classification
	Spatial	Object handling
		Semantics
Puzzle maps	Bodily-kinesthetic	Mental visualization
	Naturalist	Mental manipulation
	Linguistic	Object handling
		Classification
		Semantics
Gymnastics		
Marching	Bodily-kinesthetic	Control of movement
	Musical	Rhythm
Broad Jump	Bodily-kinesthetic	Control of motions
	Logical-mathematical	Number
	Spatial	Mental visualization
Art		
Clay Construction	Bodily-kinesthetic	Object handling
Free Drawing	Spatial	Mental visualization
		Mental transformation
Music		
Set of Bells	Musical	Pitch
	Bodily-kinesthetic	Object handling
Singing	Musical	Pitch
		Rhythm

world and in community with others. Children educated through Montessori's method learned to respect each other, help and teach one another and share and enjoy games, activities and music: these practices and activities encompass aspects of what Gardner calls interpersonal intelligence.

Worldwide, there are few practical experiences in the adaptation of Montessori's classrooms activities to Gardner's theory:

- The Preschool Education Program used by the Ministry of the National Education (MEB 2013) in Turkey. Within this programme, there is a correspondence between the achievements and indicators set up and the Montessori activities and Gardner's multiple intelligence areas;
- A combination between the two theories has been made by the Great Man Dalian International Kindergarten in Dalian, China;
- The Australian Montessori educators have the opportunity of blending the Montessori's method, the theory of the Multiple Intelligences and the EYLF for educating young children due to the contact points and similarities among these theories.

There are also some toolkits and resources:

- MOMA project, co-funded by the Lifelong Learning Programme of the European Union, explored the historical experience of the Montessori-Hallgarten schools, including a didactical approach based on participative learning. The approach foresees the possibility to involve the adults in the learning process introducing their life experience in the didactical background and involving them as teachers. The project produced a Manual including also teaching materials and didactic exercises, as well as the results of the application of the MOMA model at European level (see the references);
- An interesting experience conducted in the Daily Center "Fenice" (Pesaro city, Italy) that helps young people (aged 17+) with drug addiction. During this project, the youngsters, their parents and social workers participated in 10 workshops devoted to the intelligences as formulated by Gardner. The experience illustrated how practical activities as discussions about the intelligences can help both the parents and the social workers in the rehabilitation procedures.

Conclusions: The connections between the Montessori's method and the Gardner's theory of the Multiple Intelligences have been explored from a theoretical point of view by a number of authors (Vardin, 2003). At the same time, the application of a combination of these theories in a real didactic environment is not so common, even if some interesting experiences at theoretical level have been carried out, especially in the framework of some European co-funded projects. At the same time, there are few piloting experiences that exploit the results gained by Gardner for situations other than strictly didactical ones, such as helping and boosting the rehabilitation process of youngsters in drug addiction.

Through this chapter students will acquire knowledge about the Montessori Pedagogical Method and its relationship with the Gardner's theory of MI. Students will:

- Learn how children can be protagonists of their psychological, social, and physical development;
- Learn how to set a positive and responsive relationship with children inspired by the different pedagogical methods;

- Be able to evaluate and integrate elements of the different approaches in the teaching activity.

BIBLIOGRAPHY

Boldrini, F. "Montessori Method for orienting and motivating adults – A model for the application of the method in Adult Education", available here https://www.ch-e.eu/files/content/downloads/Presse/MOMA%20MANUAL.pdf

Bomprezzi, M. "Howard Gardner's Theory of Multiple Intelligence to support the work of the social worker", 2017, available here (only in Italian language) https://u-pad.unimc.it/retrieve/handle/11393/238046/38206/1%20%20-%20%20TESI%20BOMPREZZI.pdf

Vardin, P. A. (2003). Montessori and Gardner's Theory of Multiple Intelligences. Montessori and Other Approaches, available here http://docshare02.docshare.tips/files/14257/142578412.pdf

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Strategy for presentation and implementation of a new training technology (methodology, technics, new paradigm of knowledge) among professional community

ANNOTATION

Innovation is a hard work. If innovations were easy, people wouldn't be talking so much about them.

1. Definition and Determination

Invention and innovation – differences and connectivity

Main actors in the innovation process: an inventor, early adopters, an organizational leader, a policy maker

a) What is new knowledge, emergency of a new paradigm, initiation and development of new technologies; new methodology for teaching and training – Montessori, cooperative Freinet, MI, etc.

b) Recognition of the needs for improvement of the action, the environment, and more effective results and ways for achieving it;

c) New knowledge and skills that users of the new technologies have to acquire;

d) Is there a new institutional organization needed or not;

e) How long it takes for a theoretical scientific result to be transferred into products ready to be used in practice (practical tools) – some examples:

H. Garder's theory of MI has needed almost 25 years.

The period of translation and reformulation of knowledge from neurosciences to techniques in pedagogy has taken about 20-25 years, and since 1983 – the year of the first publication of the theory of MI, and its acceptance by the professional community have taken nearly 15 years (1997).

Next step – the operationalization of the theory and the creation of its practical tools have taken more than 10 years. Experimental introduction to the training practice in selected schools and kinder gardens has started in two schools in France under the monitoring of the Ministry of the Education (Expérimentation à l'école maternelle des Hauldres (2007-2010) and the Expérimentation en l'école élémentaire "Pasteur de Melun") The experiment needs a minimum of

3-year time to prove the practical tools. Today the test for the identification of the dominating types of intelligence could be made on-line by everyone who is interested in the career section of the (https://www.jobbank.gc.ca/career-planning/quizzes) – a website supported by the Canadian Government.

2. Steps to introduce a new technology to the professional community:

- Presenting the advantages and the disadvantages – at individual and organizational levels, the challenges, the advantages, the goals;
- Describing the key points like – the risks, the additional resources, the needed additional experiences of the users, the social value added;
- Presenting the economic and the social impacts of the ideas and the innovative changes depend on the diffusion and the uptake of the related innovations;
- Description of the implementation steps;
- Engaging and involving a policy-decision administration to create a policy for the implementation of the innovation.

3. Main innovation obstacles:

- On individual level (the way people act) – they arise from one-to-one interaction in which some undesirable traits of the person result in an interrupted potential success of the innovation.
- On organizational level (strategy, organizational culture) – a lack of managerial style and a lack of knowledge about management, a lack of trust to innovators, losing the innovative engine of the organization.
- External factors: barriers to protect intellectual assets concerning legislation and tax policy, regulations, different aspects of government policy. (J. D. Lindsay, et al.)

4. Barriers against the innovation (innovative activities) (EUROSTAT) that could be the outcome:

Barriers based on the reasons to innovate;

Barriers based on the existing resources to innovate (financial, human, environment in the classroom…);

Barriers based on new knowledge and skills of users (teachers);

Barriers based on policy makers and the logistics of the training process.

Presenting a formula – Bechhard Harris equation, to meet the resistance of the associates and to increase the chances of success.

5. MI theory as an innovating approach

How to structure the advantages of the MI teaching methodology and its relations to the already known and used pedagogical approaches, so as to present it to the professional community;

Difficulties to be accepted and overcome by users: lack of knowledge and skills, lack of handbooks for practical usage, lack of time to restructure and adapt the plan of education, lack of equipment in the classroom, etc.

The lecture provides information and knowledge on how students could analyze and evaluate the readiness of the professional community and on how to find the ways to present a new product and a new service in an effective way.

BIBLIOGRAPHY

Lindsay I.D., et al., 2009. Conquering Innovation Fatigue: Overcoming the barriers to Personal and Corporate Success, Publ.: WILEY, Hoboken, New Jersey

Pieper, Thorsten, 2018. User Innovation Barriers' Impact on User- Developed Products, Empirical Investigation on User Innovation Process, Publ. Springer Gabler, TU Hamburg

Bechhard, R., Harris, R. 1987. Organizational transitions: managing complex change,

Pearson FT Press

Appendix

Barriers against the innovation (EUROSTAT)

Institution with no compelling reason to innovate;

Institution which has considered innovating, but which poses big barriers to it;

Institution for which previous innovations were a highly important reason to not innovate;

Institution for which the lack of good ideas was a highly important reason to not innovate;

Institution for which the lack of internal finance was a highly important barrier to not innovate;

Institution for which the costs were a highly important reason to not innovate;

Institution for which the lack of skilled employees within the enterprise was a highly important barrier to innovate;

Institution for which the lack of collaboration partners was a highly important barrier to innovate;

Institution for which the difficulties in obtaining government grants or subsidies were a highly important barrier to innovate;

Institution for which the uncertain market demand was a highly important barrier to innovate;

Institution for which too big market competition was a highly important barrier to innovate;

Institution for which the legislation/regulation was a highly excessive burden to innovate;

Institution for which the lack of consistency across the EU in terms of legislation/regulation was a highly important barrier to innovate.

# # #

Reason for not introducing innovations in logistics: No compelling reason.

Reason for not introducing innovations in logistics: Faced technical obstacles.

Institution, which has introduced innovations in logistics by reason of the introduction, and the level of importance of the reason:

Institution for which to improve enterprise's performance was a highly important reason to introduce innovations in logistics;

Institution for which to respond to cost pressures was a highly important reason to introduce innovations in logistics;

Institution for which to respond to existing or forthcoming regulatory provisions was a highly important reason to introduce innovations in logistics.

Hampering factor for innovation activities:

- Innovation costs are too high;
- Lack of skilled employees within the enterprise (schools);

Product innovative enterprises, which have introduced new or significantly improved products:

Institution which has introduced at least one “world first” product innovation;

Institution, which has developed goods (services, innovating process) innovation in cooperation with other enterprises or institutions;

Institution, which has developed goods innovation by adapting or modifying goods originally developed by other enterprises or institutions.

Project consortium

GIS-TC Foundation is a non-profit independent public non-governmental organization based in Sofia (Bulgaria) with mission to stimulate transfer knowledge form academic institutes to SMEs and vice versa since 2000 year. Today GIS-TC is a network of 29 Centers for knowledge transfer that is initiating and stimulating the innovation in different areas: natural, social and engineering research and development. As an Erasmus+ project coordinator GIS-TC works for innovation in educational sector like presenting innovative alternative educational methodologies to public schools and gives new knowledge and skills to teachers to ensure the achieving of better functional literacy of pupils and increasing the quality of education.

Athens Network of Collaborating Experts (ANCE) is a non-governmental, non-profit organization based in Athens, Greece. It was established in 1996 by a group of Greek experts in international development cooperation and technical assistance and today has succeeded to create an extensive network of collaborators and volunteers for the promotion of sustainable development and the support of vulnerable social groups in the European Union and the developing countries.

DEFOIN – Desarrollo para la formación e inserción SL (Training for Develop and Integration) was born in 2009 with the idea of promoting the Training for Employment and Insertion of employed and unemployed workers. Today DEFOIN is a training center with a large experience in the design, implementation, development and evaluation of training programs at national, regional and local level.

Fondazione Hallgarten Franchetti Centro Studi Villa Montesca, Città di Castello, Italy.
Experimental workshop for pilot projects on new didactic methods and pedagogic perspectives addressed to various educational levels and to support students with special needs. Among its objective the Foundation promotes a democratic space of education and supports the educational inclusion of students with special, personal and social needs. The Foundation enhances the European cooperation in the fields of education, audio-visuals and culture, building on the valorisation of diversity.

J&MSynergie is a profit company. Its main mission is related to development innovative alternative pedagogical methods, training and communication with adolescents, as well as implementation of specific methodologies related to multiple intelligence theory.

Technokrati – is an educational centre useing the natural state of children's mind – creativity, curiosity, imagination and transforms that into real practical knowledge. Working with children and youth aged 7 to 16 by focusing on practical workshops in science (renewable (green) energy) and technology (robotics, programming, 3D and etc.). The programs also cover non-technical topics such as: teamwork, self awareness, taking responsibility and critical thinking. Overcoming the chasm between children and technology happens in a friendly atmosphere where wrong questions do not exist.

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