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Emotional intelligence and learning, and the role of ICTs

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Abstract. The ability to understand one's feelings (emotional understanding) is an element and an important component of emotional intelligence. Understanding emotions are considered essential for the child's social and emotional functioning. This paper is a literature review of both the importance of socio-emotional learning in the child's life and emphasizes the role of parents and the school in its achievement.

Keywords. Emotional Intelligence (EQ), Socio-Emotional Learning (SEL), Types of Parents, Role of the school

1. Introduction

Social and emotional learning (SEL) refers to a wide range of skills that enable a person to achieve social competence [1], verbal and non-verbal attitudes and behaviors that can influence students' success in school and life in skills not measured by assessment tests such as critical thinking, emotion management, conflict resolution, decision making, and teamwork. Deficits in these skills make it difficult for individuals to integrate into both schools and society, and their education is a challenge for researchers and educators.

2. Definition of the ability to understand emotions

The ability to perceive the emotions of those around us (emotional understanding) and their understanding are important components in the development of emotional intelligence and consequently the social and emotional functioning of the child as well as the psychological adaptation of children to the wider environment.

There are many definitions of emotional intelligence (EQ): [2] define as emotional intelligence (emotional intelligence) the ability of a person to fully understand his own and others' emotions, to make subtle distinctions between various emotions, and finally take advantage of the present information, to guide his thoughts and actions in this way, while [3] emphasized that the ability to understand emotions is directly affected by the degree of acceptance of classmates in childhood age.

Scientists, [4], proved through research that children from 6 to 10 years old who showed behavioral problems had difficulty in understanding emotions, while others [5] emphasize that

younger children experience many and particularly intense emotions, for themselves, for others, and finally for what takes place in their environment.

Developmental psychologists point out that from the age of 6-7 months, infants can "read" their mother's expressions predicting how they are expected to feel about a situation. At the age of two, they realize that hitting someone feels bad, while on the contrary, a positive act feels good. Research through interviews has shown that young children can accurately assess the emotions of others [6].

"Emotions develop, and as they develop, they help structure and guide other aspects of development" [7]. The view that emotions play an important role in upgrading cognitive achievements of each level of development constitutes an ambitious goal of study by psychologists and educators. The ability to understand emotions concerns both the understanding of one's own emotions and the ability to perceive the emotions of others [8]' [9] emphasized that one aspect of emotional intelligence, "social intelligence", that is, our ability to understand others and act appropriately in human relationships, was also an aspect of a person's IQ [10] .

[11]" records a broad sphere of intelligence with 7 essential differences among which interpersonal intelligence and intrapersonal intelligence are distinguished. Interpersonal intelligence concerns the degree to which we can understand other people (motivations, emotions, "bridges" of cooperation) while intrapersonal intelligence is a skill that moves internally and concerns the ability to understand and manage our emotions as well as the deeper understanding of our desires and abilities; it is the ability to build a model of ourselves and to be able to act accordingly in our lives [10].

2.1. Factors affecting the ability to understand emotions

Age

Awareness of emotions plays an important role in people's daily life and social interactions. The researchers found that even from infancy children distinguish emotions, at the age of 4 months they are satisfied when an adult smiles at them, while at the age of 12 months they adopt the emotional expression of the one who takes care of them as a guide for their behavior [12], while at the age of 3 they are interested in the reasons that cause the emotions of others. [13]

The family

Family life is the initial school of emotional education where the child is taught how to understand and regulate his emotions, how others react to his emotions as well as how he perceives the emotions of others, i.e. the interaction relationships of the parents both among themselves them, as well as with the child, for parents to express and control their emotions and this is considered the main model of their children [10].

Emotional understanding skills are built during interactions between parents and children, emotions are at the center of social interactions, and the ability to understand emotions has as much to do with the degree of attachment of the child to the parents as to the expressiveness of the parents. Children who have expressive parents develop abilities to understand the emotional reactions of others and expressiveness is a basic skill for children's relationships with peers. Studies show that parents' emotional expressions directly influence their children's behavioral and declarative responses. Mothers with high levels of anxiety have children with particularly anxious behaviors. College students who participated in a related study report that those who come from expressive families also judged themselves as expressive while their classmates described them as expressive as well [14] .

The expressiveness of parents' and especially mothers' positive emotions in children affect the ability to understand emotions of preschool children and leads to the development of emotional knowledge while expressing negative emotions or discouraging the expression of emotions significantly affects emotional understanding.

Also, another factor related to emotional understanding is considered mothers' response to

children's emotions. [15] found that a mother's positive emotional response to her infant's positive emotions positively affects the ability to understand emotions, while on the contrary, a mother's negative response to positive emotions negatively affects emotional understanding.

Also, parental discussion about emotions is considered the main factor facilitating children's emotional understanding as argued by [15] and [16] proved that mother-toddler discussion about emotions (reasons, consequences) leads positively to emotional development/understanding of infants resulting in positive behaviors in their socialization.

The emotional context of the emotional conversation between mother and child, which concerns how mothers shape their own and their children's emotions in the middle of a conversation, is an important factor in the development of EQ.

A study by [17] demonstrated that weak positive emotional framing has a positive relationship with children's emotional understanding, this result is consistent with [18] study where it is argued that if the information is offered to children through emotional pathways, then the content of the information is neither received nor preserved.

The above findings are also supported by [19] where between neglectful and non-negligent mothers, he demonstrated that neglectful mothers respond less reinforcingly to their children's emotional expressions, talk less about feelings and express more negative emotions in proportion to non-negligent mothers. The result of this is the fact that emotionally neglected children show lower levels of emotional understanding, are more likely to show adjustment problems at school, violent behavior, and lack of acceptance by classmates such as passivity or anxiety.

2.2. Description according to Pons & Harris

According to [20], there are at least nine distinct components of emotional understanding that have been studied and designed to assess them in a picture book accompanied by specific stories in two versions: one for boys and one for girls, with corresponding friend cartoon figures.

The nine components, which are projected through the stories, are presented in a specific order of graded difficulty, and a two-stage process is followed.

During the first stage: the researcher in a neutral tone of voice tells the story while during the second stage: the researcher asks the child to answer some questions, 2 questions referring to negative emotions, 2 questions referring to positive emotions, and questions control.

The nine components are presented as follows:

Component I: Recognition

Children around the age of 3-4 begin to be able to recognize and name basic emotional expressions.

Component II: External causes

Around the age of 3-4, children begin to understand how an external cause affects the feelings of other children.

Component III: Desires

Around the age of 3-5 children begin to understand that people's emotional reactions depend on their desires and that two people can feel differently about the same situation because they have different desires.

Component IV: Beliefs

Between the ages of 4 and 6, children begin to understand that a person's beliefs, whether true or false, determine their emotional response to a given situation.

Component V: Souvenir (Reminder)

Between the ages of 3 and 6 children begin to understand the relationship between memory and emotion, understanding that the intensity of emotion decreases over time and that certain elements of the present situation may serve as reminders that will reactivate past emotions.

Component VI: Regulations (Managing Emotions)

Children call upon different strategies for emotional control as they grow older. Children ages 6 - 7 mostly refer to behavioral strategies, while older children ages 8 and up begin to recognize that psychological strategies (denial, distraction, etc.) may be more effective.

Component VII: Pretenses and Realities (Concealment).

Possibly, there may be a difference between the outward expression of emotion and the actual, true emotion they feel. Between about 4 and 6 years of age, children begin to understand this difference.

Component VIII: Mixed emotions

From the age of about 8, children begin to understand that a person can have multiple or even contradictory (ambiguous) emotional reactions to a given situation.

Component IX: Ethical Principles (Ethics)

From the age of about 8, children begin to understand that negative emotions are associated with a morally reprehensible act (eg, lying, stealing, not confessing.) while positive emotions are associated with a morally praiseworthy act (eg ., making a sacrifice, resisting temptation, confessing a deed.).

[20] Involved 100 children aged 3, 5, 7, 9, and 11 years who were studied in terms of all components.

The results showed that (1) children show a clear improvement in each component as they grow older, (2) three developmental phases are distinguished, each characterized by the appearance of three of the nine components, and (3) there is a correlation between the components in each phase and (4) there are hierarchical relationships between components from successive phases.

The results also showed that the general degree of understanding of emotions develops particularly clearly and smoothly from 3 to 11 years. Analyzing the findings, it was shown that the development of the 9 components of children's emotional understanding is distinguished in 3 periods of development and each of them is characterized by the presentation of a group of 3 components. The first period (around 5 years) includes the basic public aspects of emotions: External discourses, facial expressions, and events or objects that act as external presenters or warnings of the reactivated emotion. The second period (around 7 years) concerns the mental aspect of emotion: the connection between desires and beliefs and the difference between expressed and felt emotion. Still, the third period (from 9 to 11 years) includes the cognitive regulation of emotion and a finding that someone reacting to a situation experiences heterogeneous emotions, parallel or successfully conflicting emotions.

Another conclusion of the study is that the 9 components of emotional understanding have a hierarchical organization. The relations between the components of each group are always considered associative while the corresponding ones between the components from different groups are always considered inductive. In the beginning, children emphasize the external aspects of the emotion (group1), while the understanding of the external aspects is considered a basic condition to consolidate the psychological aspects of the emotion (group 2). Subsequently, the understanding of the aforementioned aspects is a prerequisite to consolidating the influence of the reflection of emotions (group 3) [20].

3. The emotion

Emotion is a complex subjective conscious experience: It is the combination of mental states, psychosomatic expressions, and biological reactions of the body.

A real feeling contains three elements:

- The element of biological stimulation/effects on the body e.g. increased heart rate.
- The cognitive element / justification - interpretation
- The behavioral element/expression - in the face, in the voice, in the posture of the body.

3.1. The types of emotions

According to [10], the basic emotions are joy, sadness, anger, surprise, fear, and disgust. Emotions are also divided into:

- positive (joy, sympathy, excitement, trust, admiration, happiness, pleasure, etc.) and negative (sadness, dislike, despair, agitation, misery, rage, hatred, anger, etc.)
- in "simple" ones that we use when addressing younger children such as the feeling of love, joy, fear, anger, jealousy, shame, and pleasure, and in more "complex" ones that we use when addressing older children and teenagers such as gratitude, euphoria, spite, flattery, fatigue, frustration, pain, boredom, betrayal, confusion, emotion, shock, etc.

There are also the biological emotions that are caused in the person and are related to biological functions such as thirst, hunger, and satiety.

3.2 The properties of emotions

Emotions differ in terms of:

- Intensity refers to the degree to which we feel an emotion, whether it is very loud, moderate, or minimal in intensity/.
- The quality / refers to the kind of mental state it also creates it is divided into two types, the positive and pleasant and the negative and unpleasant emotions that dominate the person's life/.

Their duration /refers to the time an emotion lasts, if it is positive and lasts for a long time there is a possibility that it will lead to a negative outcome such as boredom, fatigue due to saturation and repetition of the emotion, on the contrary, the same does not happen with the negative emotion. This in no way can lead to something positive, it can simply reduce its intensity.

3.3 Recognition of emotions

For children on the autism spectrum, emotions can appear suddenly with little warning as they are often unable to recognize the emotions they are experiencing. or associate it with

triggering their event but they can be trained to name the emotion, and associate it with a specific event [21] .

There are four steps of emotion recognition [21] :

1. Identifying the child's emotion
2. Connecting the emotion during the event
3. Validate the feeling that it's okay
4. Reassurance

3.4. Development of basic feelings

People learn to control their emotions and express them in a way that is acceptable to society, depending on the context in which they appear and the time. From an early age, children learn with the help of their parents, who describe their own and other people's feelings, to recognize feelings and ways of externalizing their feelings. With the recognition of emotions preceding their analysis and determination. Research has shown that the verbal variety in the performance of expressions determined the variety of children's emotions accordingly.

For the investigation of emotions, the method followed concerns the observation and discrimination of facial movements and contractions. 27 expression points have been identified on the face, eyebrows, forehead, eyes, nose, cheeks, and mouth. The various facial expression systems that have been developed sometimes share common points and sometimes differ. The basic principle is that emotions activate the nervous system and, by extension, cause facial muscles to contract.

[22] Was the first to establish that certain emotions are found in all cultures. Culture plays an important role in shaping emotions. Children learn an "emotion culture" about which emotions society allows to be expressed and which not. Thus a separation is made between egocentric and heterocentric emotions.

The four basic emotions that children display are joy, sadness, anger, and fear. In particular, joy is an emotion that manifests itself across the age spectrum. Expressions of joy (movements of facial muscles, lips, eyes, and sparkling eyes) are detected from infancy. Infant snickering occurs spontaneously and reflexively hours after birth. On the contrary, the first social smile is found in the close emotional bond of the mother and child. Later during the 3rd to 4th month, their joy is expressed in laughter. Laughter can be induced either by tactile stimuli (touch), visual stimuli (facial grimaces), by auditory stimuli (sounds). Thus a variety of stimuli can lead children to a pleasant mood.

Grief occurs as a consequence of physical symptoms of pain, rejection, disappointment from the lack of an object or person, and to a greater extent manifests as grief due to parental divorce, illness, or death of a loved one. Even the birth of a sibling can be experienced as sadness by the young child. Grief is to be expected in situations of loss. Prolonged sadness can inhibit a child's cognitive and social development. It is expressed by crying, wailing, sleep or eating disorders, and signs of attachment to an adult.

The emotion of anger is a negative emotion that is detected from infancy and manifests itself when they feel pain, are attacked, and have their wishes thwarted. Aggression is one of the ways of expressing anger. In infants, it is first expressed by crying and then at the age of 4 to 6 months by voices and sudden movements. Anger in the 2nd year reaches its greatest degree of manifestation. In the 3rd year, anger takes the form of aggression and retribution with words or actions. Negative emotions include the feeling of fear. Fear is the result of the insecurity they feel when someone or something threatens them. Fear leads the person to flee while anger leads to attack. Fear manifests itself in a variety of ways such as an anxious look, trembling,

screaming, approaching another person, etc. The causes are varied and depend on the intensity, unexpectedness, and danger of the stimuli. [23] Bowlby argued that fears have a biological basis. Already from the first months of their life, babies develop an intense fear of unknown faces. The negative emotions that possess it are evident such as rapid breathing, crying, tension, restlessness, and facial disgust. In infancy, they are mainly afraid of unknown faces, sudden, loud sounds, sudden movements, strong light, and shadows. In preschool, fears are of animals, fantasy stories, loneliness, the dark, dreams, ghosts, death, and beatings. During the school period, they fear aggression from other children, punishment at school, low grades, and failure. In adolescence, the fears mainly concern either natural phenomena (fires, disasters, earthquakes, etc.) or their social relationships with others or themselves. After all, it is the period of forming their identity. Dealing with fear in the family and developing a sense of trust, initiative and autonomy play an important role. Of course, overprotective or authoritarian parents aggravate and push children to develop phobic reactions.

4. Emotional learning

A set of emotions exist in man from the moment of his birth until death. Emotions differ according to the age of the person and corresponding emotional reactions are observed. The relationships between the emotional experience and the expression of emotions change according to his cognitive and motor development [24].

1. The development of self-awareness

A prerequisite for the development of a person's personality is the ability to perceive his image. The main parameters derived from this concept are self-awareness, self-esteem, and self-regulation.

2. Self-awareness

Analyzing the word we will see how it refers to the knowledge the child has about himself and presupposes an understanding of the wider environment in which he moves and develops. According to Selman, the development of self-awareness has an evolutionary course based on the age of the individual. In childhood, they can distinguish emotions and motives from someone's behavior. Stages are common in any cultural setting. Each person develops an internal shape of himself which is built by the person himself with the new information he acquires about himself each time. From the age of 2, children seem to know their basic characteristics of themselves.

3. Self-esteem

Self-esteem refers to parameters concerning the opinion that children have about themselves. As they grow older they begin to socialize with peers and observe other people's abilities as well as their own. This is how they estimate and evaluate their capabilities against the rest. Of course, self-esteem is the conclusion that a person reaches about himself. In short, self-esteem is about their abilities, weaknesses, emotional reactions, and positive and negative personality traits. As far as the school area is concerned, research has shown that girls base their school self-concept on the behavior they display in the classroom, while boys base their school performance on it. A high school self-concept has positive effects on the child's self-esteem. In this, of course, the teacher also plays a role and should adapt and respond to the developmental needs of the children according to their age.

The first to talk about self-concept was James, who distinguished two elements of the self, "I" and "I". Self-concept differs from self-esteem, the former refers to the cognitive side of self-awareness while the latter refers to the emotional side of the individual and the degree to which he evaluates himself. Self-concept is shaped evolutionarily as the child grows. The role

of the family, the school, the individual's cultural context, gender, and temperament play an important role in shaping self-concept [25].

4. Self-regulation

Thompson writes [26]: "Emotional regulation includes all intrinsic and extrinsic processes that contribute to the control, evaluation, and modification of reactions, and in particular their intensity and timing, to achieve individual goals. Emotional self-regulation is at the crossroads of expressiveness, understanding, and socialization' [26]. According to [27], there are many ways in which parents manage the regulation of children: (a) with direct orders and instructions, through a guiding role they try to convey to children the family and cultural norms regarding the acceptable or non-acceptable expression of emotions. In other words, there is often a suffocating cord of social oppression that prevents the free expression of emotions, (b) They suggest clear means of carrying out emotional regulation, and c. manage the information provided to children about potential emotional events. To minimize stress, they omit or discharge the information. Self-regulation equals control and correct expression of emotions, and their manifestation in the appropriate intensity, environment, and time. Self-regulation goes through a developmental process and requires demarcation from the family environment. Self-regulation refers to the child's ability to self-regulate his behavior depending on the circumstances. Self-regulation of behavior is a basic resource for the growth and development of children's personalities and this is because the existence of this characteristic gives stability and moral autonomy.

Self-control is therefore a basic condition of self-regulation and parents are the ones who initially control the child's behavior (external self-control) until he internalizes and develops self-regulation mechanisms (internal self-control).

Self-regulation in the first year is biologically determined. Infants use the reflexive mode of acting on stimuli without being aware of their actions. Later all their movements acquire a purpose and they try to comply with the dictates of other persons. In the third year, internal self-control becomes apparent when he acts and decides for himself alone [24].

4.1. Stages and strategies of emotional education

4.1.1. Stages

We can distinguish 5 stages [28] in the process of emotional education:

- awareness of the child's feelings,
- harnessing emotions as an opportunity for rapprochement, intimacy, and teaching;
- listening with empathy, recognizing negative emotional charges,
- help with verbal expression, identification, and rationalization of feelings,
- delimitation, examination of strategies to deal with the emotional crisis.

1. Awareness of emotions

It means that we recognize and express emotions and are sensitive to the manifestation of emotions in others. It depends partly on the cultural environment. The two sexes have similar inner emotional experiences since empirical research has not shown any significant difference. It also means awareness of different levels of emotional arousal [28]. It requires some degree of isolation, as well as time with ourselves. Children's emotions are often revealed through their imaginative play. Vigilant parents can hear their children's fears [28].

2. Harnessing emotions

Crises contain opportunities. Early diagnosis of emotions prevents their later escalation and explosive situations [28].

3. Listening with empathy

Empathy depends on the following factors: similarity to the 'victim', the focus of attention on the situation, the larger context, gender of the 'victim', individual emotional profile, emotional expressiveness, and positive interactions with peers [26]. Empathy is the cornerstone of emotional education. The key to empathy is the ability to decode the non-verbal elements of communication. Empathy is the ability to put yourself in another person's shoes. The empathic listener engages all of his senses and imagination. He restates what he hears calmly. It focuses on body language [28] .

4. Help with verbal expression of feelings

Through the verbal expression of feelings, the child can place an uncomfortable and unpleasant feeling within the framework of his everyday life, give it a logical existence, and understand that it is a natural and integral part of life. When we empathize and characterize an emotion, then we reveal our degree of understanding and shape, 'embody' the emotion and rationalize it. Speech often acts as a soothing and decongestant [28] .

5. Boundary

The demarcation lies in the following: a. setting boundaries: Children need to understand their misbehavior. Acceptance of the child's childhood by the parents is necessary. The method of removal from the stimulus (time-out) is particularly effective for establishing limits, as long as it is used correctly. Parents should keep in mind that children's dignity and self-esteem should not be affected. b. goal setting: we encourage the child to talk, express himself and think. c. thoughts on possible solutions: This can only be achieved through collaboration, through a brainstorming process. d. evaluating proposed solutions based on family values e. helping the child to choose a solution: When children choose a solution that does not work, then we help them discover what went wrong and look for alternative solutions [28].

4.2. Social and emotional learning



Figure 1: Social Emotional Learning (CASEL , 2013)

Social and emotional learning includes the processes of developing social and emotional skills in children. Social and emotional learning programming is based on the understanding that the best learning occurs in the context of supportive relationships that make learning challenging, engaging, and meaningful. Social and emotional skills are critical to becoming a good student, citizen, and worker, and many different risky behaviors (eg, drug use, violence, bullying) can be prevented or reduced over many years. This is best done through effective

classroom functioning, student engagement in positive activities inside and outside the classroom, and broad parent community involvement in program planning, implementation, and evaluation [29], [30], [31], [32].

Effective social and emotional learning begins in kindergarten and continues through high school. Casel has distinguished five interrelated sets of cognitive, behavioral, and emotional abilities. The definitions of the 5 sets are [33]:

Self-awareness: The ability to accurately recognize one's feelings and thoughts and their influence on behavior. This includes accurately assessing one's strengths and weaknesses and having a strong sense of confidence and optimism.

Self-regulation: The ability to regulate one's emotions, thoughts, and behaviors effectively in different situations. This includes managing stress, controlling reactions, being motivated, and working toward personal and academic goals.

Social Awareness: The ability to take perspective and empathize with others from different backgrounds and cultures, to understand social and moral norms of behavior, and to recognize and support family, school, and community resources.

Relationship Skills: The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. This includes communicating clearly, listening actively, cooperating, resisting inappropriate social pressure, negotiating conflict creatively, and getting and giving help when needed.

Responsible decisions: The ability to make constructive and respectful choices about personal behavior and social interactions based on an appreciation of moral standards, safety concerns, social norms, a realistic assessment of the consequences of various actions, and the well-being of the individual and others.

4.3. Emotional intelligence and parents

4.3.1. Parents as agents of emotional learning

Parents' reactions to all areas of the child's life, and especially to success and failure, largely lay the foundations of the child's socialization and shape meanings. They establish normative standards and help facilitate the interpretation of emotional states [26]. The parent-infant relationship is of primary importance. The presence or absence of the parent acts as a catalyst for the infant's emotional responses, as well as coping with the stranger, mediators between the infant and the environment, controlling the intensity of the hedonistic tone and internal stimulation so that they do not exceed tolerable limits. In case of excesses the parent consoles and balances and intervenes to de-escalate the tension and stabilize the behavioral organization of the infant. Through his familiar, stable, and reliable figure, the parent strengthens the stock of shared positive emotions and becomes their guardian [34].

The role of the parent in the early stages of internal arousal and emotion regulation is very important. Thus one often comes across the terms 'mutual regulation' or 'co-regulation' in the literature. The parent directs reciprocity and dyadic regulation, which the infant subsequently experiences [34].

During childhood, parents are the main providers of the child's education. The manifestation of their emotional states decreases as the child grows. In adolescence, emotional bonds with parents loosen, strongly developing initiative and decision-making. Relationships with parents change and internal conflicts appear [24]. The family acts in shaping the child's personality and self-awareness.

Acceptance and interest in the child's achievements shape his emotional world. Having positive feedback from the parents and acknowledging the child's successes or efforts is

valuable. The role of the parent in the emotional development of the child starts from the first years of his life. The infant's emotional interaction with those around him begins from the moment of his birth, with his mother since she is the first person he sees at that moment [24].

The role of the mother and the kindergarten teacher is equally important, these two persons can contribute in an appropriate way to his gradual independence and to taking initiative. Initially with the reduction of physical contact, the relaxation of his action frameworks, and with less contact with him [24].

4.3.2 Types of emotional education. types of parents-family dynamics

There are two major categories of parents, depending on their skill in managing their children's emotions. It is the emotional mentors or educators who fail to cultivate emotional intelligence in children. The second group is subdivided into three categories: detached, critical or disapproving, and permissive or permissive. Detached parents ignore emotions and especially devalue the child's negative emotions. Critical parents embellish the child's expression negative s and punish or reprimand him for it. Finally, permissive parents do listen and empathize, but fail to guide and set boundaries for children [28].

1. The alienated parents

Distant parents use distractions to suppress the child's emotions, ridicule emotions, characterize them as irrational, fear the loss of emotional control, feel uncertainty and insecurity, downplay events, and postpone the solution of the problem to the future. These parents are often children of compulsive or indifferent parents [28].

2. The critical parents

Critical parents have a lot in common with detached parents. They see emotions as a sign of weakness, believe that children should be tough, want children to conform to authority, and avoid expressing negative emotions, which they see as counterproductive and meaningless. They regard the expression of sorrow as frivolity. Critical parents are insulting and demeaning. They turn charged emotional situations into a field of power display. -they have no self-control and believe that sorrow should not be wasted on superficial matters [28].

3. The permissive parents

Permissive or permissive parents comfort the child and do not try to solve the problem or teach the child how to approach and manage their feelings. They are confused, they find it difficult to break free from excessive love for their children. Permissive parents make efforts to soothe and soften the child's negative emotions [28].

4. Parents – emotional mentors

Emotional mentors spend time listening, are sensitive to the child's messages, offer guidance, and don't laugh. They resemble permissive parents but act as the children's guides in the emotional world. All emotions are useful. These parents do not hesitate to reveal their feelings. - they are not afraid of the apology. With this attitude of theirs, frictions and conflicts are mitigated. Emotional mentors help children name their feelings, allow them to experience their feelings, show respect, and also set boundaries [28].

5. Emotional intelligence and school

5.1. The school / teacher as a carrier of emotional learning

The modern findings of psychological and educational research point to the necessity for a shift in education that will be based equally on the socio-emotional sector, if not more, but in equal proportions with the intellectual. The basic core of such an education is the children's emotions, their development, and cultivation, the expression of creativity, and the cultivation

of interpersonal relationships. The above findings are not only based on modern research. great educators emphasized the importance of emotions, for example, Froebel encouraged children to externalize their emotions while Dewey considered that the emotional development of children is a key component of a democratic society and education [35]. Later, a special emphasis was placed on mental development, with the consequence that emotional development was pushed aside, which was emphasized again when open education programs began to be developed in the 70s. In today's era, preschool and school education programs place a lot of emphasis on emotional development, and this is because as it is now widely known, emotions affect the development of the individual but more specifically they affect learning, determine behavior and play a catalytic role in interpersonal relationships and the creation of the individual's self-image [28].

5.1.1. School and emotional intelligences

In particular, emotional education, i.e. emotional education and training, refers to the cultivation of all the abilities that make up emotional intelligence in the context of children's interactions in the family and at school. These are essential skills that can help the young person to progress and improve his interpersonal relationships so that he can cope with any difficulties that may arise in his daily life.

Regarding emotional intelligence development programs and their usefulness, we could say that the benefit obtained from them is great. According to [36], emotional intelligence is nowhere more strongly discussed than in school, which is a place where the goals for young people are always high and the opportunities for advancement are also many. Social and emotional learning can be carried out through the application of scientific methods and educational programs and in this way contribute to the completion of a new person who will apply in his personal and professional life everything that may prove useful to him in the future its evolution. According to [36], whose views are identical to those expressed by other scholars, [11], [38] success in adult life depends not only on academic ability, but also on intrapersonal, or practical intelligence, which refers to the abilities that high emotional intelligence entails.

Much of the results that social and emotional learning can have are related to dealing with students' problems related to either emotional disorders or poor communication with their peers, but also with parents, as well as with their teachers. These students' problems are often related to their low performance in school. This usually results in significant problems developing in these individuals, such as low self-esteem, bad attitude of the students towards the school institution, lack of social abilities and skills, inability to solve problems, refusal to take responsibility for learning, and various others. Moreover, the process of developing emotional intelligence reduces stress for individuals and organizations by reducing conflict, as well as increased stability and harmony.

In recent years, more and more educational programs emphasize emotional education and their main goals are: a) the understanding of the children's own emotions b) the emphasis on the emotional relationship between the teacher and the children c) the selection of activities that receive their suspicions the emotional needs of children d) the development of positive emotional states in the context of a healthy pedagogical framework.

5.1.2. Affecting factors

Along with the shift of both the programs and the attitudes of the educators towards emotional education, there are great variations in the views of the latter as to how much children can express their feelings and also be exposed to different events that cause them strong emotions. Some of the factors that can affect children's emotional development are listed below:

- a) The maturation of the brain and central nervous system

- b) Individual differences
- c) Gender
- d) Abnormal developmental conditions,
- e) Development in the remaining sectors
- f) The family environment and intra-family relationships
- h) The influences of the socio-cultural context as some contexts affect the expression of emotions.

5.2. The teacher's role

5.2.1 The emotional role of the teacher

Teachers are powerful and attractive agents of socialization. -they teach children new skills, direct their play, and form strong bonds with them. They send important explicit and implicit messages about the emotional world [26]. According to [39] respect, empathy and authenticity are the three basic elements of communicating with others. "The higher the levels of empathy, authenticity, and respect that the teacher provides to the students, the more they will learn."

Respect is given to someone when they are given time, undivided attention, talk without interruption, and are questioned and not judged. Empathy is expressed to someone when shared experiences are experienced, feelings are expressed and finally, authenticity is expressed to someone when feelings are shared, there is honesty, there is no pretend promise without being able to keep it, and there is consistency in what is said. These are some of the strategies that the teacher can follow in school. In the classroom, the development of students' listening skills is a valuable element for their emotional development.

Research has shown that teachers talk more in the classroom and students listen, rarely expressing their opinion or ideas. The skill of active listening is what the other person has to say is often the most important. Elements of this skill are the listener's participation in the other's speech with eye contact, body posture, and smiling or encouraging expressions to continue the conversation. Then reviewing, repeating, summarizing everything that was mentioned, and finally explaining points that the listener did not understand are important steps for more active participation. This practice can be followed in the context of the class between the students, between the teacher and the students, between colleagues, and also in the context of the family [40] .

This approach is catalyzed by the teacher's fervent relationship with the children as the teacher acts as a role model for the children, accepts their feelings, and encourages them to express them while at the same time encouraging them to understand their feelings, needs, and other children's interests The activities chosen by the educator encourage the toddlers to externalize emotional states and through their interaction with the rest of the group to gain self-confidence, confidence and a positive image of the rest of the class. the above does not mean of course that all the activities that take place are related to emotions, but the emphasis placed on them helps to more effectively apply this, for example, activities that seem to be related exclusively to the cognitive domain of this approach are connected to emotional experiences that are meaningful for children e.g. toddlers make up their own stories around topics that interest them or 'write' in their way how they feel at a given moment. Other possible activities that help to understand children's emotions are talking with children about events that can make them sad, angry, happy, or disappointed. Children can give up in different ways how they feel, e.g. by painting, through a doll, or by dramatizing something they feel or an event they experienced, each time taking on different roles so that they can experience the event in a multifaceted way and 'put themselves in the shoes of others. Other possible activities are for the

children to engage in constructions related to feelings or to listen to stories related to them. for all the above, the game is a basic means for children to express themselves and through which they feel pleasure and satisfaction.

Another very important part of this approach is that you carry out the evaluation of the program and the children in a positive atmosphere, which reduces anxiety and fear and on the other hand increases positive emotions and their willingness to learn. In addition to the cognitive field, the emotional development of infants is also assessed through continuous observation and by collecting information from the children's families and the wider socio-cultural environment

A necessary condition to achieve all of the above is the creation of an emotionally safe environment for infants. for something like this to happen, there must be stability in the environment, both in terms of the objects and in terms of the flow of the program. Also, the school environment must inspire confidence in the children and reflect acceptance, i.e. include photos of the infants and their families object about what socio-cultural context and be arranged in such a way as to respond to the needs and interests of the children. All of the above contribute to creating positive feelings about the school space while activating the motivation for learning.

5.2.2 Methods of data collection of children's emotional state

Teachers should first find out if the students express their emotions, what makes them happy, what makes them unhappy, how they deal with negative emotions, what makes them anxious, how they feel when they come to school, and what their relationships with their classmates are like, etc. .a.

The search for answers to all these questions is carried out after a discussion with the students. This discussion in itself with the teacher is a difficult process for the child and this is because it presupposes sympathy and trust on the part of the teacher. That is why the use of additional methods to collect information about the emotions of the children in the class is necessary. Questionnaires can be used as an alternative method of data collection, but they cannot accurately reflect children's emotional states.

Projective methods in turn can discover children's feelings. Through the projective techniques, help is given to discover his innermost feelings, not with words but by withdrawing or imaginary play. The most well-known projective techniques are the Rorschach test, the Drawing Techniques, the TAT (Thematic Apperception Test), the CAT test, and the Family Relations Test [41] .

The emotional state can also be done using psychometric scales such as Children's Depression Inventory - CDI, State-Trait Anxiety Inventory for Children - STAIC, and Rosenberg Self-Esteem Scale. Of course, to carry out all these tests an experienced school psychologist is required and they cannot be done by anyone without the necessary knowledge and training on them.

In the projection-type activities, the children are asked to complete a drawing, the dialogue

between the faces-dialogue with "bubbles", to choose a photographic material-photo storm, to play the name game, the short lecture, the course of life, the continuum of values, thus approaching their emotional reactions. This work is done in small groups or with the whole class. Through role play-simulation, brainstorming, and all of the above, children's emotional development is promoted in the classroom [40]. Conditions for implementing emotional learning programs.

According to [42] , for a program to be effective certain conditions should be present:

- The program should be based on theories about children's development and the results of research data.
- The teacher should teach the children the application of the skills they learn in their daily life.
- To develop links between the tripartite school-students-parents.
- To adapt to the cultural and developmental level of the students.
- The program promotes the all-around development of the child, through its integration with the existing curriculum.
- The teacher should promote positive interactions.
- To extend the learning of skills in a family and community context.
- To have a complete timetable, with organizational support and policy.
- To provide support, practice, and feedback to staff.
- Pursue the continuous evaluation of the program [41].

6. Conclusions

It is evident from the above that the results of implementing SEL programs positively influence children to gain self-awareness, self-esteem for themselves show maturity, balanced social and emotional development, taking initiative, emotional autonomy from parents, and the development of relationships with other persons. Moreover SEL implementation programs can take many benefits by the incorporation of digital technologies in education domain which is very productive and successful, facilitates and improves the educational procedures via Mobiles [48-57], various ICTs applications [58-90], AI & STEM [91-102], and games [103-108]. Additionally the combination of ICTs with theories and models of metacognition, mindfulness, meditation and emotional intelligence cultivation [109-132] as well as with environmental factors and nutrition [44-47], accelerates and improves more over the educational practices and results especially for SEL programs.

References

- [1] Spence, SH (2003). Social Skills Training with Children and Young People: Theory, Evidence, and Practice. *Child and Adolescent Mental Health*, 8, 84-96. <http://dx.doi.org/10.1111/1475-3588.00051>
- [2] Salovey, P., & Mayer, JD (1990). Emotional intelligence. *Imagination, Cognition, and Personality*, 9(3), 185-211.
- [3] Cassidy, J. & Parke, RD (1991) Children's emotional understanding and peer relations. Symposium presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA
- [4] Goleman, D. (1998) *THE emotional intelligence*. Athena: Greek Letters.
- [5] Cook, ET, Greenberg, MT, & Kusche, CA (1994). The relationships between emotional understanding, intellectual functioning, and disruptive behavior problems in elementary school-aged children. *Journal of Abnormal Child Psychology*, 22, 205 – 219.
- [6] Lewis, M. & Saarni, C. (Eds.), (1985). *The socialization of emotions*. New York: Plenum Press.
- [7] Cole & Cole , (2001). Cole, M., & Cole, S. (2002). *Children's development*. Athens: Typothito-Giorgos Dardanos.
- [8] Fischer, KW, Shaver, PR & Carnochan, P. (1990) How emotions develop and how they organize development. *Cognition and Emotion*, issue 4, 81-127.

- [8] Abe, JA & Izard, CE (1999). The developmental tensions of emotions: An analysis in terms of differential emotions theory. *Cognition and emotions*, 3, 523-549.
- [9] Thorndike, E. _ L. _ (1920). *Intelligence and its uses*. Harper's Magazine, 140, 227-235.
- [10] Goleman, D. (1998) *THE emotional intelligence*. Athena: Greek Letters.
- [11] Gardner, H. (1983). *Frames of Mind. The theory of multiple intelligences*. New York: Basic Books.
- [12] Rieffe, C., Meerum Terwogt, M. & Cowan, R. (2005) Children's Understanding of Mental States as Causes of Emotions. *Infant and Child Development*, 14, 259-272.
- [13] Dunn, J. (1988) *The Beginnings of Social Understanding*. Blackwell: Oxford.
- [14] Cassidy, J., Parke, R., Butkovsky, L. & Braungart, J. (1992) Family-Peer Connections: The Roles of Emotional Expressiveness within the Family and Children's Understanding of Emotions. *Child development*, 63, 603-618.
- [15] Denham, S., Zoller, D. & Couchoud, EA (1994) Socialization of preschoolers' emotional understanding. *Developmental Psychology*, 30, 928-936.
- [16] Denham, S (1987) Preschoolers mother's Expression of and Coping with Emotion. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Baltimore, MD.
- [17] Colwell, M & Hart, S (2006) Emotion framing: does it relate that children's emotional knowledge and social behavior? *Early Child Development and Care*, Vol.176,6: 591-603.
- [18] Hoffman, ML (1986) Affect, cognition and motivation in RM Sorrentino & ET Higgins (Eds.) *Handbook of motivation and cognition: foundations of social behavior* (New York, Guilford Press), 244-250.
- [19] Edwards, A. Shipman, K. & Brown, A. (2005) The Socialization of Emotional Understanding: A Comparison of Neglectful and Nonneglectful Mothers and Their Children. *Child Maltreatment*, Vol.10, No. 3:293-304.
- [20] Francisco Pons, Paul L Harris & Marc de Rosnay (2004): Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization, *European Journal of Developmental Psychology*, 1:2, 127-152 To link to this article: [HTTP://dx.doi.org/10.1080/17405620344000022](http://dx.doi.org/10.1080/17405620344000022)
- [21] Kassotaki, A. (2015). *Developing empathy*. Athena.
- [22] Darwin, C. (1965). *The expression of the emotions in man and animals*. Chicago: University of Chicago Press.
- [23] Bowlby, J. (1982). *Attachment and loss (Vol I). Attachment (2 nd ed.)*. New York: Basic Books.
- [24] Kakavoulis, K. A. (1997). *Emotional development and education*. Athens: Kakavoulis.
- [25] Hatzichristou, G. X. (2004). *Mental health and learning promotion program, Social and emotional education at school. Preschool and first school age (grades 1-7)*. Athens: Typothito-Giorgos Dardanos.
- [26] Denham, SA (1998). *Emotional development in young children*. New York: Guilford Press.
- [27] Thompson, RA (Ed.). (1990). *Socioemotional development (Vol. 36)*. U of Nebraska Press.
- [28] Gottman, J. (2011). *Children's emotional intelligence. How to raise children with emotional intelligence. A practical guide for parents*. Edited by H. Hatzichristou. Athens: Pedio.

- [29] Bond, L. A., & Carmola-Hauf, A. M. (2004). Taking stock and putting stock in primary prevention: Characteristics of effective programs. *The Journal of Primary Prevention*, 24 (3), 199-221.
- [30] Hawkins, J. D., Smith, B. H., & Catalano, R. F. (2004). Social development and social and emotional learning. In J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg (Eds.), *Building academic success on social and emotional learning: What does the research say?* (pp. 135-150). New York: Teachers College Press.
- [31] Nation, M., Crusto, C., Wandersman, A., Kämpfer, K. L., Seybolt, D., Morrissey-Kane, E., & Davino, K. (2003). What works in prevention: Principles of effective prevention practice. *American Psychologist*, 50, 449-456.
- [32] Weare, K., & Nind, M. (2011). Mental health promotion and problem prevention in schools: What does the evidence say? *Health Promotion International*, 26 (s1), s29-s69.
- [33] CASEL: Collaborative for Academic, Social, and Emotional Learning. (2013). *CASEL Guide: Effective Social and Emotional Learning Programs Preschool and Elementary School Edition* Chicago, IL: Author. <https://casel.org/fundamentals-of-sel/>
- [34] Sroufe, LA (1995). *Emotional development: The organization of emotional life in the early years*. New York, NY: Cambridge University Press.
- [35] Doliopoulou, E. (2004 2). *Modern trends in preschool? Education*. Athens:
- [36] Typothito-Giorgos Dardanos.
- [37] Gibbs, N. (1995). (October 2). The EQ factor, *Time*, 60-68.
- [38] Goleman, D. _ (1995). *Emotional Intelligence*. Athens: Greek Letters.
- [39] Sternberg & Wagner, 1986) Wagner, RK, Sternberg, RJ Tacit knowledge in managerial success. *J Bus Psychol* 1, 301–312 (1987). <https://doi.org/10.1007/BF01018140>
- [40] Rogers, C. (1983). *Freedom to learn for the 80s*. Columbus: Merrill.
- [41] Weare, K., & Gray, G. (2000). *The promotion of mental and emotional health in school*. World Health Organization Europe Office. Athens: Greek Letters.
- [42] Syngollitou, E. (2008). Projective techniques: their use in the psychodiagnostic assessment of children and adolescents in the context of the school communit. In D. S.
- [43] Weissberg, RP, Resnik, H., Payton, J., & O'Brien, MU (2003). *Evaluating Social and Emotional Learning Programs*. educational leadership, 46-50.
- [44] Stavridou Th., Driga, A.M., Drigas, A.S., *Blood Markers in Detection of Autism* ,*International Journal of Recent Contributions from Engineering Science & IT (IJES)* 9(2):79-86. 2021.
- [45] Zavitsanou, A., & Drigas, A. (2021). *Nutrition in mental and physical health*. *Technium Soc. Sci. J.*, 23, 67.
- [46] Driga, A.M., Drigas, A.S. “Climate Change 101: How Everyday Activities Contribute to the Ever-Growing Issue”, *International Journal of Recent Contributions from Engineering, Science & IT*, vol. 7(1), pp. 22-31, 2019. <https://doi.org/10.3991/ijes.v7i1.10031>
- [47] Driga, A.M., and Drigas, A.S. “ADHD in the Early Years: Pre-Natal and Early Causes and Alternative Ways of Dealing.” *International Journal of Online and Biomedical Engineering (IJOE)*, vol. 15, no. 13, 2019, p. 95., doi:10.3991/ijoe.v15i13.11203
- [48] Vlachou J. and Drigas, A. S., “Mobile technology for students and adults with Autistic Spectrum Disorders (ASD),” *International Journal of Interactive Mobile Technologies*, vol. 11(1), pp. 4-17, 2017
- [49] Papoutsis C., Drigas, A. S., and C. Skianis, “Mobile Applications to Improve Emotional Intelligence in Autism – A Review,” *Int. J. Interact. Mob. Technol. (iJIM)*; Vol 12, No 6, 2018

- [50] Karabatzaki, Z., Stathopoulou, A., Kokkalia, G., Dimitriou, E., Loukeri, P., Economou A., & Drigas, A. (2018). Mobile Application Tools for Students in Secondary Education. An Evaluation Study. *International Journal of Interactive Mobile Technologies (iJIM)*, 12(2), 142-161
- [51] Drigas, A. S., and Angelidakis P., 'Mobile Applications within Education: An Overview of Application Paradigms in Specific Categories', *International Journal of Interactive Mobile Technologies (iJIM)*, vol. 11, no. 4, p. 17, May 2017. <https://doi.org/10.3991/ijim.v11i4.6589>
- [52] Stathopoulou A., Loukeris D., Karabatzaki Z., Politi E., Salapata Y., and Drigas, A. S., "Evaluation of Mobile Apps Effectiveness in Children with Autism Social Training via Digital Social Stories," *Int. J. Interact. Mob. Technol. (iJIM)*; Vol 14, No 03, 2020
- [53] Stathopoulou, et al Mobile assessment procedures for mental health and literacy skills in education. *International Journal of Interactive Mobile Technologies*, 12(3), 21-37, 2018,
- [54] Drigas, A., Kokkalia, G. & Lytras, M. D. (2015). Mobile and Multimedia Learning in Preschool Education. *J. Mobile Multimedia*, 11(1/2), 119–133.
- [55] Stathopoulou, A., Karabatzaki, Z., Kokkalia, G., Dimitriou, E., Loukeri, P.I., Economou, A., and Drigas, A. (2018). Mobile assessment procedures for mental health and literacy skills in education. *International Journal of Interactive Mobile Technologies (iJIM)*, 12(3):21-37. <https://doi.org/10.3991/ijim.v12i3.8038>
- [56] Drigas, A.S., Ioannidou, R.E., Kokkalia, G. and Lytras, M. (2014), "ICTs, mobile learning and social media to enhance learning for attention difficulties", *Journal of Universal Computer Science*, Vol. 20 No. 10, pp. 1499-1510.
- [57] Kokkalia G. K. and Drigas, A. S., "Mobile learning for special preschool education," *International Journal of Interactive Mobile Technologies*, vol. 10 (1), pp. 60-67, 2016
- [58] Pappas, M.A.; Papoutsis, C.; Drigas, A.S. Policies, Practices, and Attitudes toward Inclusive Education: The Case of Greece. *Soc. Sci.* 2018, 7, 90.
- [59] Drigas, A. S., & Ioannidou, R. E. (2011, September). ICTs in special education: A review. In *World Summit on Knowledge Society* (pp. 357-364). Springer, Berlin, Heidelberg.
- [60] Drigas, A. S., J.Vrettaros, L.Stavrou, D.Kouremenos, E-learning Environment for Deaf people in the E-Commerce and New Technologies Sector, *WSEAS Transactions on Information Science and Applications*, Issue 5, Volume 1, November 2004.
- [61] Drigas, A.S., Vrettaros, J. and Kouremenos, D. (2004a) 'Teleeducation and e-learning services for teaching English as a second language to deaf people, whose first language is the sign language', *WSEAS Transactions on Information Science and Applications*, Vol. 1, No. 3, pp.834–842.
- [62] Drigas, A., Koukianakis, L., Papagerasimou, Y., Towards an ICT-based psychology: Epsychology, *Computers in Human Behavior*, 2011, 27:1416–1423. <https://doi.org/10.1016/j.chb.2010.07.045>
- [63] Charami, F., & Drigas, A. (2014). ICTs in English Learning and Teaching. *International Journal of Engineering and Science*. Vol. 2(4):4-10. DOI: 10.3991/ijes.v2i4.4016
- [64] Drigas A.S., Kouremenos D (2005) An e-learning system for the deaf people. In: *WSEAS transaction on advances in engineering education*, vol 2, issue 1, pp 20–24
- [65] Drigas A., Pappas M, and Lytras M., "Emerging technologies for ict based education for dyscalculia: Implications for computer engineering education," *International Journal of Engineering Education*, vol. 32, no. 4, pp. 1604–1610, 2016.
- [66] Drigas, A. & Kokkalia, G. 2017. ICTs and Special Education in Kindergarten. *International Journal of Emerging Technologies in Learning* 9 (4), 35–42.

- [67] Drigas A., and Koukianakis L., A Modular Environment for E-learning and E-psychology Applications, WSEAS Transactions on Information Science and Application, Vol. 3, 2004, pp. 2062-2067.
- [68] Drigas, A., Leliopoulos, P.: Business to consumer (B2C) e-commerce decade evolution. *Int. J. Knowl. Soc. Res. (IJKSR)* 4(4), 1–10 (2013)
- [69] Pappas M, Drigas A, Papagerasimou Y, Dimitriou H, Katsanou N, Papakonstantinou S, et al. Female Entrepreneurship and Employability in the Digital Era: The Case of Greece. *Journal of Open Innovation: Technology, Market, and Complexity*. 2018; 4(2): 1.
- [70] Papanastasiou G., Drigas, A. S., Skianis Ch., M. Lytras & E. Papanastasiou, “Patient-Centric ICTs based Healthcare for students with learning, physical and/or sensory disabilities,” *Telemat Inform*, vol. 35, no. 4, pp. 654–664, 2018. <https://doi.org/10.1016/j.tele.2017.09.002>
- [71] Drigas, A., & Kontopoulou, M. T. L. (2016). ICTs based Physics Learning. *International Journal of Engineering Pedagogy (iJEP)*, 6(3), 53-59. <https://doi.org/10.3991/ijep.v6i3.5899>
- [72] Papanastasiou, G., Drigas, A., Skianis, C., and Lytras, M. (2020). Brain computer interface based applications for training and rehabilitation of students with neurodevelopmental disorders. A literature review. *Heliyon* 6:e04250. doi: 10.1016/j.heliyon.2020.e04250
- [73] Drigas, A. S., John Vrettaras, and Dimitris Kouremenos, 2005. “An e-learning management system for the deaf people,” *AIKED '05: Proceedings of the Fourth WSEAS International Conference on Artificial Intelligence, Knowledge Engineering Data Bases*, article number 28.
- [74] Pappas, M., Demertzi, E., Papagerasimou, Y., Koukianakis, L., Kouremenos, D., Loukidis, I. and Drigas, A. 2018. E-Learning for deaf adults from a user-centered perspective. *Education Sciences* 8(206): 3-15.
- [75] Marios A. Pappas, Eleftheria Demertzi, Yannis Papagerasimou, Lefteris Koukianakis, Nikitas Voukelatos, and Drigas, A. S., 2019. Cognitive Based E-Learning Design for Older Adults. *Social Sciences* 8, 1 (Jan. 2019), 6. <https://doi.org/10.3390/socsci801000>
- [76] Drigas, A. S., Leyteris Koukianakis: Government online: An e-government platform to improve public administration operations and services delivery to the citizen. *WSKS (1)*, volume 5736 de *Lecture Notes in Computer Science*, 523–532. Springer, 2009.
- [77] Theodorou, P.; Drigas, A. ICTs and Music in Generic Learning Disabilities. *Int. J. Emerg. Technol. Learn.* 2017, 12, 101–110
- [78] Drigas, A., Kokkalia, G., & Lytras, M. D. (2015). ICT and collaborative co-learning in preschool children who face memory difficulties. *Computers in Human Behavior*, 51, 645–651. <https://doi.org/10.1016/j.chb.2015.01.019>
- [79] Pappas, M.A., & Drigas, A.S. (2015). ICT based screening tools and etiology of dyscalculia. *International Journal of Engineering Pedagogy*, 3, 61-66.
- [80] Drigas, A., & Kostas, I. (2014). On Line and other ICTs Applications for teaching math in Special Education. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 2(4), pp-46. <http://dx.doi.org/10.3991/ijes.v2i4.4204>
- [81] Alexopoulou, A, Batsou, A, Drigas, A. (2019). Resilience and academic underachievement in gifted students: causes, consequences and strategic methods of prevention and intervention. *International Journal of Online and Biomedical Engineering (iJOE)*, vol. 15, no. 14, pp. 78.
- [82] Pappas, M. A., & Drigas, A. S. (2015). ICT Based Screening Tools and Etiology of Dyscalculia. *International Journal of Engineering Pedagogy*, 5(3)

- [83] Drigas, A. & Ioannidou, R. E. (2013). Special education and ICT's. *International Journal of Emerging Technologies in Learning* 8(2), 41– 47.
- [84] Drigas, A., & Papanastasiou, G. (2014). Interactive White Boards in Preschool and Primary Education. *International Journal of Online and Biomedical Engineering (iJOE)*, 10(4), 46–51. <https://doi.org/10.3991/ijoe.v10i4.3754>
- [85] Drigas, A. S. and Politi-Georgousi, S. (2019). Icts as a distinct detection approach for dyslexia screening: A contemporary view. *International Journal of Online and Biomedical Engineering (iJOE)*, 15(13):46–60.
- [86] Lizeta N. Bakola, Nikolaos D. Rizos, Drigas, A. S., “ICTs for Emotional and Social Skills Development for Children with ADHD and ASD Co-existence”*International Journal of Emerging Technologies in Learning (iJET)*, <https://doi.org/10.3991/ijet.v14i05.9430>
- [87] Kontostavlou, E.Z., & Drigas, A.S. (2019). The Use of Information and Communications Technology (ICT) in Gifted Students. *International Journal of Recent Contributions from Engineering, Science and IT*, 7(2), 60-67. doi:10.3991/ijes.v7i2.10815
- [88] Drigas, A. S., and Vlachou J. A., “Information and communication technologies (ICTs) and autistic spectrum disorders (ASD),” *Int. J. Recent Contrib. Eng. Sci. IT (iJES)*, vol. 4, no. 1, p. 4, 2016. <https://doi.org/10.3991/ijes.v4i1.5352>
- [89] Drigas, A. S., Koukianakis, L, Papagerasimou, Y. (2006) “An elearning environment for nontraditional students with sight disabilities.”, *Frontiers in Education Conference*, 36th Annual. IEEE, p. 23-27.
- [90] Drigas A., and Koukianakis L. An open distance learning e-system to support SMEs e-enterprising. In proceeding of 5th WSEAS Internationalconference on Artificial intelligence, knowledge engineering, data bases (AIKED 2006). Spain
- [91] Kefalis C and Drigas A. (2019) Web Based and Online Applications in STEM Education. *International Journal of Engineering Pedagogy (iJEP)* 9, 4 (2019), 76–85.<https://doi.org/10.3991/ijep.v9i4.10691>
- [92] Drigas, A. S., Rodi-Eleni Ioannidou, A Review on Artificial Intelligence in Special Education, *Information Systems, Elearning, and Knowledge Management Research Communications in Computer and Information Science Volume 278*, pp 385-391, 2013 http://dx.doi.org/10.1007/978-3-642-35879-1_46
- [93] Drigas, A., Vrettaros, J.: An Intelligent Tool for Building e-Learning Content-Material Using Natural Language in Digital Libraries. *WSEAS Transactions on Information Science and Applications* 5(1) (2004) 1197–1205
- [94] Drigas, A.S., Vrettaros, J., Koukianakis, L.G. and Glentzes, J.G. (2005). A Virtual Lab and e-learning system for renewable energy sources. *Int. Conf. on Educational Tech.*
- [95] Drigas AS, Argyri K, Vrettaros J (2009) Decade review (1999-2009): artificial intelligence techniques in student modeling. In: *World Summit on Knowledge Society*. Springer, pp 552–564
- [96] Vrettaros, J., Tagoulis, A., Giannopoulou, N., & Drigas, A. (2009). An empirical study on the use of Web 2.0 by Greek adult instructors in educational procedures. *World Summit on Knowledge System (WSKS)*, 49, 164-170. http://dx.doi.org/10.1007/978-3-642-04757-2_18
- [97] Drigas, A., Dourou, A. (2013). A Review on ICTs, E-Learning and Artificial Intelligence for Dyslexic's Assistance. *iJet*, 8(4), 63-67.
- [98] Drigas, A. S., Ioannidou,E.R., (2012), Artificial intelligence in special education: A decade review, *International Journal of Engineering Education*, vol. 28, no. 6.
- [99] Drigas, A. S., and Leliopoulos, Panagiotis, The Use of Big Data in Education, *International Journal of Computer Science Issues*, Vol. 11, Issue 5, 2014, 58-63

- [100] Anagnostopoulou, P., Alexandropoulou, V., Lorentzou, G., Lykothanasi, A., Ntaountaki, P., & Drigas, A. (2020). Artificial intelligence in autism assessment. *International Journal of Emerging Technologies in Learning*, 15(6), 95-107. <https://doi.org/10.3991/ijet.v15i06.11231>
- [101] Pappas, M., & Drigas, A. (2016). Incorporation of artificial intelligence tutoring techniques in mathematics. *International Journal of Engineering Pedagogy*, 6(4), 12–16. <https://doi.org/10.3991/ijep.v6i4.6063>
- [102] Chaidi E, Kefalis C, Papagerasimou Y, Drigas (2021) A Educational robotics in Primary Education. A case in Greece. *Research, Society and Development* 10 (9)
- [103] Papanastasiou, G. P., Drigas, A. S., & Skianis, C. (2017). Serious games in preschool and primary education: Benefits and impacts on curriculum course syllabus. *International Journal of Emerging Technologies in Learning*, 12(1), 44–56. <https://doi.org/10.3991/ijet.v12i01.6065>
- [104] Kokkalia, G., Drigas, A., Economou, A., Roussos, P., & Choli, S. (2017). The use of serious games in preschool education. *International Journal of Emerging Technologies in Learning*, 12(11), 15-27. <https://doi.org/10.3991/ijet.v12i11.6991>
- [105] Drigas, A. S., and Pappas M.A. "On line and other Game-Based Learning for Mathematics." *International Journal of Online Engineering (iJOE)* 11.4, 62-67, 2015 <https://doi.org/10.3991/ijoe.v11i4.4742>
- [106] Papanastasiou, G., Drigas, A., Skianis, C., & Lytras, M. D. (2017). Serious games in K-12 education: Benefits and impacts on students with attention, memory and developmental disabilities. *Program*, 51(4), 424-440. <https://doi.org/10.1108/prog-02-2016-0020>
- [107] Drigas, A. S., & Kokkalia, G. K. (2014). ICTs in Kindergarten. *International Journal of Emerging Technologies in Learning*, 9(2). <https://doi.org/10.3991/ijet.v9i2.3278>
- [108] Kokkalia, G., Drigas, A., & Economou, A. (2016). The role of games in special preschool education. *International Journal of Emerging Technologies in Learning (iJET)*, 11(12), 30-35.
- [109] Drigas, A., & Mitsea, E. (2020). The 8 Pillars of Metacognition. *International Journal of Emerging Technologies in Learning (iJET)*, 15(21), 162-178. <https://doi.org/10.3991/ijet.v15i21.14907>
- [110] Drigas, A., & Papoutsi, C. (2019). Emotional intelligence as an important asset for HR in organizations: Leaders and employees. *International Journal of Advanced Corporate Learning*, 12(1). <https://doi.org/10.3991/ijac.v12i1.9637>
- [111] Drigas, A. S., and M. Pappas, "The Consciousness-Intelligence-Knowledge Pyramid: An 8x8 Layer Model," *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, vol. 5, no.3, pp 14-25, 2017. <https://doi.org/10.3991/ijes.v5i3.7680>
- [112] Mitsea, E., & Drigas, A. (2019). A journey into the metacognitive learning strategies. *International Journal of Online & Biomedical Engineering*, 15(14). <https://doi.org/10.3991/ijoe.v15i14.11379>
- [113] Drigas A, Karyotaki M (2017) Attentional control and other executive functions. *Int J Emerg Technol Learn iJET* 12(03):219–233
- [114] Drigas A, Karyotaki M 2014. Learning Tools and Application for Cognitive Improvement. *International Journal of Engineering Pedagogy*, 4(3): 71-77. From (Retrieved on 13 May 2016)
- [115] Drigas, A., & Mitsea, E. (2021). 8 Pillars X 8 Layers Model of Metacognition: Educational Strategies, Exercises & Trainings. *International Journal of Online & Biomedical Engineering*, 17(8). <https://doi.org/10.3991/ijoe.v17i08.23563>

- [116] Drigas A., Papoutsi C. (2020). The Need for Emotional Intelligence Training Education in Critical and Stressful Situations: The Case of COVID-19. *Int. J. Recent Contrib. Eng. Sci. IT* 8 (3), 20–35. [10.3991/ijes.v8i3.17235](https://doi.org/10.3991/ijes.v8i3.17235)
- [117] Drigas, A., & Mitsea, E. (2020). The Triangle of Spiritual Intelligence, Metacognition and Consciousness. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 8(1), 4-23. <https://doi.org/10.3991/ijes.v8i1.12503>
- [118] Kokkalia, G., Drigas, A. Economou, A., & Roussos, P. (2019). School readiness from kindergarten to primary school. *International Journal of Emerging Technologies in Learning*, 14(11), 4-18.
- [119] Drigas, A., & Mitsea, E. (2021). Metacognition, stress-relaxation balance & related hormones. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 9(1), 4–16. <https://doi.org/10.3991/ijes.v9i1.19623>
- [120] Pappas M, Drigas A. Computerized Training for Neuroplasticity and Cognitive Improvement. *International Journal of Engineering Pedagogy*. 2019;. (4):50-62
- [121] Papoutsi, C. and Drigas, A. (2017) Empathy and Mobile Applications. *International Journal of Interactive Mobile Technologies* 11. 57. <https://doi.org/10.3991/ijim.v11i3.6385>
- [122] Papoutsi, C. & Drigas, A. (2016). Games for Empathy for Social Impact. *International Journal of Engineering Pedagogy* 6(4), 36-40.
- [123] Karyotaki, M., & Drigas, A. (2015). Online and other ICT Applications for Cognitive Training and Assessment. *International Journal of Online and Biomedical Engineering*. 11(2), 36-42.
- [124] Papoutsi, C., Drigas, A., & Skianis, C. (2019). Emotional intelligence as an important asset for HR in organizations: Attitudes and working variables. *International Journal of Advanced Corporate Learning*, 12(2), 21–35. <https://doi.org/10.3991/ijac.v12i2.9620>
- [125] Chaidi I. and Drigas, A. S., “Autism, Expression, and Understanding of Emotions: Literature Review,” *Int. J. Online Biomed. Eng.*, vol. 16, no. 02, pp. 94–111, 2020. <https://doi.org/10.3991/ijoe.v16i02.11991>
- [126] Chaidi I., Drigas, A. C Karagiannidis Autistic people's family and emotional intelligence *Technium Soc. Sci. J.* 26, 194
- [127] Drigas, A. S., & Karyotaki, M. (2019). A Layered Model of Human Consciousness. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 7(3), 41-50. <https://doi.org/10.3991/ijes.v7i3.11117>
- [128] Drigas, A. S., Karyotaki, M., & Skianis, C. (2018). An Integrated Approach to Neurodevelopment, Neuroplasticity and Cognitive Improvement. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 6(3), 4-18.
- [129] Karyotaki M. and Drigas, A. S., “Latest trends in problem solving assessment,” *International Journal of Recent contributions from Engineering, Science & IT (iJES)*, vol. 4, no. 2, 2016. [Online serial]. Available: <https://online-journals.org/index.php/ijes/article/view/5800/>. [Accessed Aug. 21, 2019]. <https://doi.org/10.3991/ijes.v4i2.5800>
- [130] Mitsea E., Drigas, A. S., and Mantas P., “Soft Skills & Metacognition as Inclusion Amplifiers in the 21st Century,” *Int. J. Online Biomed. Eng. IJOE*, vol. 17, no. 04, Art. no. 04, Apr. 2021. <https://doi.org/10.3991/ijoe.v17i04.20567>
- [131] Angelopoulou, E. Drigas, A. (2021). Working Memory, Attention and their Relationship: A theoretical Overview. *Research. Society and Development*, 10(5), 1-8. <https://doi.org/10.33448/rsd-v10i5.15288>
- [132] Tourimpampa, A., Drigas, A., Economou, A., & Roussos, P. (2018). Perception and text comprehension. It's a matter of perception! *International Journal of Emerging Technologies*

in Learning (iJET). Retrieved from <https://online-journals.org/index.php/ijet/article/view/7909/5051>