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Social and Emotional Skills of children with ASD: Assessment with Emotional Comprehension Test (TEC) in a Greek context and the role of ICTs

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Abstract. Children on the autism spectrum have significant difficulties in recognizing, understanding, and expressing emotions and consequently in their socialization [1], [2] [3] [4] [5] . To assess the ability to understand emotions, the following is used: The emotion comprehension test (Test of Emotional Comprehension, TEC) [6] in preschool children. In the present work, the TEC was administered to students with ASD and the results of the evaluation are analyzed and conclusions are drawn.

Keywords. Autism spectrum, Emotional Intelligence, TEC

1. Introduction

Autism Spectrum Disorder is a lifelong developmental disorder that "prevents" people from properly understanding what they see, hear, and generally feel, resulting in serious problems in their social relationships, communication, and behavior. [5]

In recent years there has been a growing interest in people on the autism spectrum to express and understand emotions as people with ASD have significant difficulties in recognizing, understanding, and expressing emotions [3]. They tend to avoid human faces and it is difficult to understand why facial features "move", and change, as a result, the inability to read emotions in the human face weakens their ability to communicate with those around them [7] and as reported by Researchers [5] can be trained in recognizing, expressing and understanding emotions with useful educational tools such as serious games. [8].

The exploitation of ICTs in education domain is very productive, successful, facilitates and improves the educational procedures via Mobiles [37-46], various ICTs applications [47-81], AI & STEM [82-95], and games [96-101]. Additionally the combination of ICTs with theories and models of metacognition, mindfulness, meditation and emotional intelligence cultivation [102-118] as well as with environmental factors and nutrition [34-36], accelerates and improves more over the educational practices and results.

More specifically, the use of ICT in the treatment-education of children in the autism spectrum [9] is a field of research as children with ASD enjoy playing digitally as they "engage" in virtual environments that are predictable and reassuring and are classified into

three main categories [10]: a) The iPods and iPads applications
b) The use of robots for children with ASD [11], [12], [13], [14]
c) The use of serious games: "Digital Educational Games (DEGS) are computer games that serve educational purposes [15] and offer new opportunities for communication / collaboration.

The use of serious games in DAF remains limited, and has received much criticism as:

- they have limited relevance to real interactive living conditions
- they target certain areas of education
- there is no reference to design and more intensive study is needed to
- their effectiveness and their generalization in everyday life
- in a larger sample of the population
- in a wider range of ASD categories [8]

Training people with ASD in the expression, understanding and recognition of emotions [5] through serious games, is considered feasible as they support skills training and favor interactions in different contexts and situations, some of which may seem similar. with real life, as evidenced by the positive results of research [8]

However, for the training of people with ASD in emotional intelligence and the creation of a personalized program, the ability to understand emotions is assessed *with tests such as The test of understanding emotions (Test of Emotional Comprehension, TEC)* [6] in preschool children of typical development.

In the present study, the TEC was administered to students with ASD, their emotional intelligence was assessed and the results are presented.

2. Autism Spectrum Disorder (ASD)

[5] Autism Spectrum Disorder is a serious, widespread developmental disorder that accompanies the individual throughout his life, affecting his perception, thinking, and behavior and is characterized by (a) significant difficulties in the development of socio-emotional and communication skills of the individual with their social environment and (b) limited, repetitive stereotypical interests and behaviors. [7], [8] According to the Official Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-V) [16] and the World Health Organization (WTO) [17] ICD-10 (International Classification of Diseases) [18] A person is diagnosed with ASD when behaviors listed in the above diagnostic manuals and the revised DSM-V version occur, defined by 2 criteria groups:

- a) social communication and
- b) stereotyped, repetitive behaviors, activities, and interests

It should be emphasized that people with ASD are extremely heterogeneous in their lack of social distress, as many children lack the motivation to interact, or avoid interaction, avoid touch and eye contact, while other people seek interaction but show a deficit in empathy and handicap in their emotional organization, making it difficult for them to communicate with those around them, and consequently difficulty in socializing and family problems.

3. ASD & Emotional Intelligence

3.1.1. Emotional Intelligence

The coexistence of rational and emotional intelligence are important components in an individual's life [5] as emotions, as an inner ethic, have the potential to guide us in making decisions, changes in behavior, facial expressions, and posture, and Scientists emphasize the importance of emotional intelligence in achieving personal goals, pointing out that personal

achievement of goals is coexistence - a combination of emotional intelligence and general intelligence.

[19] defines emotional intelligence as "the ability of one person to recognize, accurately evaluate, and discern the feelings of others, to understand them, to assimilate them into their minds, and to regulate both the negative and the negative." and positive emotions in himself and others.

While researchers Drigas & Papoutsis [20] argue in their research that the development of emotional intelligence is based on the 9-level model based on Gardner's interpersonal concepts and interpersonal concepts [21], [22] the Pyramid of Emotional Intelligence (9-level model) .

1. Emotional Unity
2. Overcoming
3. Homogeneity of Emotions, Realization
4. Social Skills, Specialization in Emotions
5. Social Awareness, Empathy, Distinction of Emotions
6. Self-management
7. Self-knowledge
8. Recognition of emotions, perception-expression of emotions
9. Emotional stimuli

Every person tries to reach the last level of the pyramid, while at each level important emotional, cognitive, and metacognitive skills are cultivated.

In recent years there has been talking of social and emotional learning (SEL) as an integral part of education and human development. SEL is the process by which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and empathize with others, establish and maintain supportive relationships, and make responsible and careful decisions [23]. Emotional intelligence is a skill that can be "learned" and developed. [24], [25] with the result that scientists measure and evaluate emotional intelligence with psychometric tools (scales or tests) scientifically or popularly. [26].

3b: Emotion and ASD: Expression-perception-understanding of emotions

Emotions are the first way of communication for children, as from the first weeks of their life they express their basic emotions, joy, sadness, anger, disgust, and surprise. [27] Researchers argue that in typically developing children, recognizing emotional facial expressions is an early development of social skills [4].

Researchers [28] argue that the ability to distinguish emotions in another person's facial expressions is considered essential for successful social interaction, and conversely, social interaction, through the experience of recognizing facial expressions, is equally essential for normal development. Facial *Emotion Recognition* (FER).

Many people with ASD who have deficits in social interaction have experienced FER damage. as first observed [1] defining autism as an "emotional contact disorder", emphasizing the social and emotional deficits of autism disorder, as a "congenital" inability of children to develop emotional contact with other people, a weakness that is still emphasized by scientists.

Also, the criteria for diagnosing people with ASD [16], [17], [18] are highlighted with deficiencies in the recognition and processing of emotions: " *deficits in the use of non-verbal behaviors, such as facial expression ...*" and "*lack of social or emotional reciprocity* ". These difficulties in using and responding to emotions correspond to two components: a) the

processing of emotions [29], [30], [31], and b) the production of an emotional state and its regulation [4].

People with ASD have a basic emotional disturbance without this meaning that these people do not have a lack of emotion or difficulty in reading the feelings of others and reflecting on their own, but they do have an emotional connection disorder. with perception and thinking, difficulties in understanding, managing emotions, and giving personal meaning, ie people with ASD can express their emotions, however, their emotional expressions are different but different from the emotional expressions of children of normal development [3].

4. Emotion comprehension test - TEC

4.1.1. Description of the Test

The Emotional Comprehension Test (TEC) by Francisco Pons & Paul Harris (2000), assesses the ability to understand emotions. To assess the ability to understand emotions in students with autism were given the test of understanding emotions [6], which is described in detail below and has already referred to the theoretical framework of the work.

According to [32] there are at least nine distinct components-components of understanding emotion that have been studied and for their evaluation, a book with cartoon characters accompanied by specific stories has been designed. The book was designed in two editions: one for boys and which includes cartoon boys and girls, which includes cartoon girls. The stories told by the researcher remain the same for both sexes, the same goes for the questions, they simply change the names of the protagonists depending on the gender of the child.

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

In the first stage: the researcher with a neutral tone of voice tells the story while in the second stage: the researcher asks the child to answer some questions, 2 questions that refer to negative emotions, 2 questions that refer to positive emotions, and questions control. The story is presented on a page folded-split in half. At the top of the page are the figure of the expressionless face and the object around which the story is woven, while at the bottom of the page there are 4 figures with different emotional expressions that are revealed when the researcher calls the child to answer.

At the beginning of each process, the researcher explains to the child the evaluation process and encourages him/her to participate in the process.

The nine components are as follows: **Component I: Recognition, Component II: External Causes, Component III: Desires, Component IV: Beliefs Component, V: Reminder, Component VI: Regulations (Emotion Management), Emotion II Realities (Hide), Component VIII: Mixed Emotions, Component IX: Ethical Principles (Ethics)**

The nine components are presented as follows:

Component I: Recognition

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

Component II: External causes

At around 3-4 years of age, children begin to understand how an external cause affects other children's emotions. Five consecutive stories are used to assess the understanding of emotions affected by external causes. Children are asked to understand how external causes affect the feelings of others.

Component III: Desires

At the age of about 3-5 years, children begin to understand that people's emotional reactions depend on their desires. So they understand that two people may feel different 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 false or true, determine their emotional response to a given situation. In this work, the researcher asks the child to convey an emotion to a protagonist.

Component V: Souvenir (Reminder)

Between the ages of 3 and 6, children begin to understand the relationship between memory and emotion. They understand that the intensity of the emotion decreases over time and that some elements of the present state can serve as reminders that will reactivate the emotions of the past.

Component VI: Regulations (Emotion Management)

Children invoke different strategies for emotional control as they grow older. Children are aged 6-7 are mostly referred to as behavioral strategies, while older children aged 8 and over are beginning to recognize that psychological strategies (denial, distraction, etc.) may be more effective. The component considered in this work is how the boy will regulate and control his emotions to drive away from himself the feeling of grief caused by the loss of the rabbit based on his experience.

Component VII: Pretexts and Realities (Hide).

Possibly, there may be a difference between the outward expression of the emotion and the real, true emotion they feel. Between the ages of 4 and 6, children begin to understand this difference. This work assesses this component if children understand that true emotion can be hidden and that expression of emotion is not always true.

Component VIII: Mixed Emotions

From the age of about 8 years, children begin to understand that a person may have multiple or even contradictory (ambiguous) emotional reactions to a given situation. Understanding mixed emotions are assessed with a scenario that is likely to cause ambivalence in the protagonist.

Component IX: Ethical Principles (Ethics)

From the age of about 8, children begin to understand that negative emotions are associated with a morally reprehensible acts (e.g., lying, stealing, not confessing.) While positive emotions are associated with a morally commendable act (e.g. ., making a sacrifice, resisting temptation, confessing an act.).

5. Method

5.1.1 .Sample of Children with Autism

The sample of the present study was selected by random sampling [33] and consists of 7 boys and 1 school-age girl with a diagnosis of ASD as found by Medical-pedagogical centers of public hospitals and KEDASY (Center for Differential Diagnosis and Support), based on the criteria of [16], [17], [18].

This sampling procedure serves the need of this research, to compile a clinical sample with very specific characteristics because according to the literature the results obtained from studies in which the method is used with methods of the indefinite probability of choice (non - probability sampling) and in particular by random sampling [33] are generalized to individuals with characteristics and traits similar to those of the research sample. Thus, following a reverse

course, we first define the population based on the characteristics of the sample, instead of first defining the population and then taking a random sample [33] .

All students attend the 1st Special Primary School of Maroussi, Public School Unit of Special Education and Training (SMEAE), and live with their physical families, which are of different social stratification and different educational level.

5.1.2 STUDENT PROFILE

A) Andrew and Makis are brothers. Andreas is a 6th-grade student and Makis is a 2nd-grade student. They live with their natural family of average financial stratification. The educational level of the family is mediocre (parents of high school graduates). They have accepted the disability of their children both themselves and the wider family environment. The children attend the afternoon at the Creative Employment Center of the Municipality where they live a program of creative activities (painting, gymnastics, music, theatrical play) and a therapeutic program with therapists: occupational therapy, speech therapy, and psychologist. The mother and grandmother are mainly engaged in educating students at home. Olga, their mother, participates in the experimental research team.

B) Hercules, a 5th-grade student, is the 1st child of a family of five. His two twin boys are of normal development and attend the 1st Grade of a Private General Education School. Hercules's parents have high education and a very good financial surface. Hercules is the favorite child of the family and he has been accepted by both his parents and siblings as well as the wider family environment. Both private therapists and his parents are involved in his education. Sophia, his mother, participates in the experimental research team

C) Panagiotis, a 5th-grade student, is the first child of a family of five with a low socio-economic level. The parents have a low level of education and have been diagnosed with mental retardation themselves. Panagiotis's two brothers, a girl, and a boy live together but for some months their sister lives with her father and Panagiotis's parents' best man. Panagiotis's brothers, although his sister has a formal development, and his brother is slightly mentally ill. The grandmother has taken care of the family. Panagiotis's education is provided exclusively by the social services of the municipality where he resides.

D) Leonardo, a fourth-grade student, is a child of economic immigrants from Albania. His sister is a student at the National Technical University of Athens. The educational level of the parents is mediocre, and their financial level is very good. Leonardo is the favorite child of the family, they have accepted his disability, and they treat him with excessive love. He has traveled to America twice for medical diagnoses. His education is provided privately by therapists and mainly by his parents, his mother, and his sister. Flutour, his mother, is part of the research team.

E) George, a 5th-grade student, is the 2nd child of a family of four with a good financial surface and a higher level of education. His brother is a high school student of formal development. George has been accepted by his family and the wider environment. His training is provided privately by therapists and mainly by the parents.

F) Nikos, a 2nd-grade student, is the first child of a family of four with a higher educational level and a very good financial surface. Nikos's sister is a child of normal development and attends the pre-infant level in a private Kindergarten. Nikos's education has been undertaken by private therapists from the age of the first diagnosis and the mother attends a Creative Employment Program (KDAP) in the Municipality where she resides. The wider family environment of the father and the father himself find it difficult to accept his uniqueness of Nikolas. Lamprini, his mother, participates in the experimental research team.

G) Maria, a 6th-grade student, is an only child. She lives with her mother and her father (her mother's second husband). Maria's biological father has rejected her and has no contact with her at all. He lives permanently in Thessaloniki and does not seek contact with her. The family loves her dearly and has accepted her. The parents are of great financial standing and have a higher education. Maria's training has been undertaken by specialist therapists from the very first moment of diagnosis.

Table 1: The demographic data of the STUDENTS of the participants are presented in detail .

STUDENT PROFILE			
a / a	NAME	AGE (years, months)	SCHOOL CLASS
1.	Andrew	13 years old	6th-grade
2.	Hercules	12 years 5 months	5th-grade
3.	Panayiotis	11 years 10 months	5th-grade
4.	Leonardo	10 years 3 months	4th-grade
5.	Makis	10 years old	2nd-grade
6.	George	12 years 1 month	5th-grade
7.	Nikos	10 years 3 months	2nd-grade
8.	Mary	13 years 2 months	6th-grade

All the children attended an individual psychotherapy program on an individual level with private therapists at home or in a private center or in a Center for Creative Employment (KDAP) of the Municipality in which they live.

6. Evaluation – Results

Students have been diagnosed with Autism Spectrum Disorder based on the criteria of the 5th Edition of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Society (DSM_5 · APA, 2013), the general Medical-pedagogical centers of public hospitals, and KEDDY (Center for Differential Diagnosis and Support). Before the start of this study, the general intelligence of each participant was assessed through the Greek version of WISC-III, and the severity of autism symptoms through the Childhood Autism Assessment Scale. Student's ability to understand emotions was also assessed with the " *Emotional Comprehension Test*" (*Test of Emotional Comprehension, TEC*) by Francisco Pons & Paul Harris (2000), for the assessment of the ability to understand emotions in preschool children before the start of the research, after the intervention for teaching the learning of emotions and their expression.

In the initial evaluation session, Andreas was 13 years old while His overall IQ was calculated at 42 points based on the Greek version of WISC-III, which places him at a moderate level of mental retardation. From the administration of the Child Autism Assessment Scale, it emerged that Andreas has mild autism. In terms of the ability to understand emotions, Andreas was assessed with *the test of understanding emotions* "(*Test of Emotional Comprehension, TEC*) by Francisco Pons & Paul Harris (2000). Specifically, did Andreas manage to complete the evaluation process? in 28 minutes and answer the individual questions for the understanding of the components by collecting a total score of 12 points in the 23 questions of the Test. Andreas a) understood the component of recognizing emotions, memories, pretexts, and reality (concealment) and mixed emotions and b) had difficulty understanding: emotions caused by external causes, desires, beliefs, regulations (management), and ethical principles.

Hercules' general intelligence index was calculated at 40 points based on the Greek version of WISC-III, which places him at a moderate level of mental retardation while his chronological age was 12 years and 5 months. From the administration of the Child Autism Assessment Scale, it emerged that Hercules has moderate autism. In terms of the ability to understand emotions, Andreas was assessed with *the test of understanding emotions* "(*Test of Emotional Comprehension, TEC*)" by Francisco Pons & Paul Harris (2000). Specifically, did Hercules manage to complete the evaluation process? in 30 minutes and answer the individual questions for the understanding of the components by collecting a total score of 12 points in the 23 questions of the Test. Hercules a) understood the component of recognizing emotions and moral principles, b) had difficulty understanding: the emotions caused by external causes, desires, beliefs, regulations (emotion management) of memories, pretexts, and reality (Apocrypha) and mixed emotions.

Panagiotis' general IQ was calculated at 50 points, based on the Greek version of WISC-III, which puts him on the border between the level of moderate and mild mental retardation, and his chronological age was 11 years and 10 months. From the administration of the Child Autism Assessment Scale, it emerged that Panagiotis has mild autism. Regarding the ability to understand emotions, Panagiotis was evaluated with *the test of understanding emotions* "(*Test of Emotional Comprehension, TEC*)" by Francisco Pons & Paul Harris (2000). Specifically, did Panagiotis manage to complete the evaluation process! in 20 minutes and answer the individual questions for the understanding of the components by collecting a total score of 23 points in the 23 questions of the Test. Panagiotis understood all nine components, although in some components he had to think "hard" to decide why he was hesitant about "should" and "want".

Leonardo's overall IQ was estimated at 50, based on the Greek version of WISC-III, which puts him on the verge of moderate to mild mental retardation, and was 10 years and 3 months old. From the administration of the Child Autism Assessment Scale, it emerged that Leonardo has moderate autism. In terms of the ability to understand emotions, Leonardo was assessed with *the test of understanding emotions* "(*Test of Emotional Comprehension, TEC*)" by Francisco Pons & Paul Harris (2000). In particular, Leonardo managed to complete only part of the evaluation process in 20 minutes. He seemed anxious and uncooperative. Only the first part of the evaluation related to the first component was completed: the recognition of emotions and the correct answer to all the individual questions.

Makis's general IQ was estimated at 41 points, based on the Greek version of WISC-III, which places him at a moderate level of mental retardation with a chronological age of 10 years. From the administration of the Child Autism Assessment Scale, it emerged that Makis has mild autism. In terms of the ability to understand emotions, Makis was assessed with *the test of understanding emotions* "(*Test of Emotional Comprehension, TEC*)" by Francisco Pons & Paul Harris (2000). Specifically, did Makis manage to complete the evaluation process? in 30 minutes and answer the individual questions for the understanding of the components by collecting a total score of 10 points in the 23 questions of the Test. Makis a) understood the component: of recognizing emotions and feelings caused by external causes, b) had difficulty understanding: desires, beliefs, regulations (emotion management), memories, pretexts, and reality (concealment), of mixed emotions and moral principles.

George's overall IQ was calculated at 48 points, based on the Greek version of WISC-III, which places him at a moderate level of mental retardation, while his chronological age was 12 years and 1 month. From the administration of the Child Autism Assessment Scale, it emerged that George has mild autism. In terms of the ability to understand emotions, George

was assessed with *the test of understanding emotions "(Test of Emotional Comprehension, TEC)* by Francisco Pons & Paul Harris (2000). Specifically, did George manage to complete the evaluation process? in 30 minutes and answer the individual questions for the understanding of the components by collecting a total score of 13 points on the 23 questions of the Test. George a) understood the component of recognizing emotions, memories, mixed emotions, and beliefs b) had difficulty understanding: emotions caused by external causes, desires, regulations (emotion management) of appearances and reality (by), and ethical principles.

Nikos was 10 years and 3 months old, while his general IQ was estimated at 38 points, based on the Greek version of WISC-III, which puts him at a moderate level of mental retardation. From the administration of the Child Autism Assessment Scale, it emerged that Nikos shows marginally moderate to severe autism. In terms of the ability to understand emotions, Nikos was evaluated with *the test of understanding emotions "(Test of Emotional Comprehension, TEC)* by Francisco Pons & Paul Harris (2000). Specifically, Nikos managed to complete only part of the evaluation process in 20 minutes. He seemed anxious and uncooperative. Only the first part of the evaluation related to the first component was completed: the recognition of emotions and the correct answer to all the individual questions.

Maria was 13 years and 2 months old, while her general IQ was estimated at 40 points, based on the Greek version of WISC-III, which puts him at a moderate level of mental retardation. From the administration of the Child Autism Assessment Scale, it emerged that Maria has moderate autism. In terms of the ability to understand emotions, Maria was assessed with *the test of understanding emotions "(Test of Emotional Comprehension, TEC)* by Francisco Pons & Paul Harris (2000). Specifically, did Maria manage to complete the evaluation process? in 45 minutes and answer the individual questions for the understanding of the components by collecting a total score of 10 points on the 23 questions of the Test. Maria a) understood the component of recognizing emotions and feelings caused by external causes, b) had difficulty understanding: desires, beliefs, rules (emotion management) of memories, pretexts, and reality (concealment), mixed emotions, and moral principles.

Table 2: *Characteristics of students after assessment*

NAME	CHRONOLOGICAL AGE (years, months)	IQ	DIAGNOSIS	SCORE: TEC	COMMUNICATION
<i>Andrew</i>	<i>13years</i>	<i>42</i>	<i>ASD with Moderate Mental Retardation</i>	<i>12/23</i>	<i>GOOD SPEECH</i>
<i>Herkules</i>	<i>12years 5 months</i>	<i>40</i>	<i>ASD with Moderate Mental Retardation</i>	<i>12/23</i>	<i>SIMPLE SPEECH (SUBJECT-VERB – OBJECT)</i>
<i>Panagiotis</i>	<i>11years 10 months</i>	<i>50</i>	<i>ASD with Moderate Mental Retardation</i>	<i>23/23</i>	<i>EXCELLENT SPEECH/ COMMUNICATION</i>
<i>Leonardo</i>	<i>10 years 3 months</i>	<i>50</i>	<i>ASD with Moderate</i>	<i>6/23</i>	<i>SPIRITUAL SPEECH</i>

			<i>Mental Retardation</i>		
<i>Makis</i>	<i>10 years</i>	<i>41</i>	<i>ASD with Moderate Mental Retardation</i>	<i>10/23</i>	<i>GOOD SPEECH</i>
<i>George</i>	<i>12 years 1 month</i>	<i>48</i>	<i>ASD with Moderate Mental Retardation</i>	<i>19/23</i>	<i>VERY GOOD SPEECH</i>
<i>Nikos</i>	<i>10 years 3months</i>	<i>38</i>	<i>ASD with Moderate Mental Retardation</i>	<i>6/23</i>	<i>COMMUNICATION THROUGH SIGNS</i>
<i>Maria</i>	<i>12 years 2months</i>	<i>40</i>	<i>ASD with Moderate Mental Retardation</i>	<i>10/23</i>	<i>GOOD SPEECH</i>

Table 3: DETAILED PRESENTATION OF THE RESULTS

RECOMMENDATIONS	TOTAL	ANDREAS	HERAKLES	PANAGIOTIS	LEONARDO	MAKIS	GIORGOS	NIKOS	MARIA
RECOGNITION	1	YES	YES	YES	YES	YES	YES	YES	YES
EXTERNAL CAUSES	3/8	NO	NO	YES	NO	YES	NO	NO	YES
DESIRE	1/8	NO	NO	YES	NO	NO	NO	NO	NO
BELIEFS	1/4	NO	NO	YES	NO	NO	YES	NO	NO
MEMORY (REMINDER)	3/8	YES	NO	YES	NO	NO	YES	NO	NO
REGULATIONS (EMOTION MANAGEMENT)	1/8	NO	NO	YES	NO	NO	NO	NO	NO
FORMS AND FACTS (HIDE)	1/4	YES	NO	YES	NO	NO	NO	NO	NO
MIXED EMOTIONS	3/8	YES	NO	YES	NO	NO	YES	NO	NO
ETHICAL PRINCIPLES (ETHICS)	1/4	NO	YES	YES	NO	NO	NO	NO	NO

7. Conclusions - Perspectives Conclusions- Perspectives

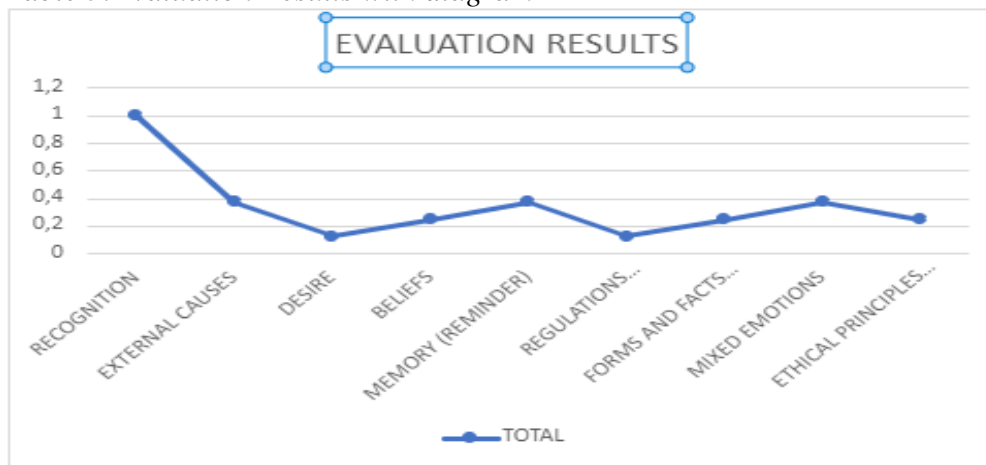
Studying the results of the evaluation of students with ASD in understanding emotions with *the Test of Emotional Comprehension, TEC*) by Francisco Pons & Paul Harris (2000) observed the following:

Table 4: Evaluation Results overall

EVALUATION RESULTS overall		
a / a	RECOMMENDATIONS	TOTAL STUDENTS
I	Recognition	8
II	External causes	3

III	Wishes	1
IV	Beliefs	2
V	Souvenir (Reminder)	3
VI	Regulations (Emotion management)	1
VII	Pretends and Realities (Hide)	2
VII	Mixed emotions	3
IX	Ethical Principles (Ethics)	2

Table 5: Evaluation Results with diagram



Results in terms of their completion by students:

- A) Only one student with ASD completed the TEC,
- B) 2 students completed only the 1st component: **Recognition**
- C) 3 students only 2 components: 2: **Recognition and External causes:**
1: **Recognition and Ethical Principles (Ethics)**
- D) 2 students 4 components:

1st: **Recognition, Souvenir (Reminder), Pretends and Realities (Hide)**
2nd: **Recognition, Beliefs, Souvenir (Reminder), Mixed Emotions**

Studying the evaluation results of students with ASD with the TEC found that people with ASD have deficiencies in understanding, expressing, and recognizing emotions. It is obvious that they recognized the basic emotions, but they had difficulties with the complex emotions. Perhaps training them with appropriate digital material such as creating a serious game based on the 9 components of the TEC would be a useful tool project in social-emotional learning.

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