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“Questionnaire of parents' opinions on digital games in the education of children with autism spectrum disorder” in a Greek context

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Abstract. In recent years worldwide, the use of Information and Communication Technologies (ICT) contributes significantly to the learning process, especially for students with special needs, arguing that a special aspect of ICT in the digital game, as it can be a part from a means of entertainment and personal satisfaction of each student, an excellent tool for their education. Also, Research from the National Coalition for Parent Involvement in Education shares that "no matter their income or background, students with involved parents are more likely to have higher grades and test scores, attend school regularly, have better social skills, show improved behavior and adapt well to school.", especially in the specialty of people with autism. In the work that follows, parents' views on educating their children with ASD using a digital game are recorded.

Keywords. Parental Involvement, ASD, Special Education, Education, digital play

1. Introduction

The modern school aims to form complete people regardless of any element of differentiation, to cultivate and develop their abilities so that they are led to their completion. The provision of equal opportunities goes beyond equality of access to education within a school for all, regardless of any element of differentiation, special need, or characteristic related to national, cultural, or social identity. Communication and Information Technologies, especially for people with special needs [1] , open a new way for learning based on personal discovery and experience, with the consequence that they can change the nature of education as well as skills that students need to develop [2] . Gaming activities on the computer are a field of search and construction of a pleasant learning environment, which, in addition to the advantages of the pedagogical game, simultaneously provides a variety of authentic "connective elements of learning" in the virtual spaces of action, cognitive exploration, and problem-solving, together with useful tools and information for solving them [3].

The researchers [4] , emphasize that the active participation of parents in the diagnostic and therapeutic process of children with developmental disorders is considered by experts to be an important factor in the long-term struggle for the education of people with autism and according to relevant literature references, the benefits of parent training have been

demonstrated for decades. They highlight the positive effects of behavioral parent training programs for children with developmental disabilities, as research so far supports that parents can apply newly learned strategies to their children with ASD [5], [6].

In this paper, the results and their interpretation are presented, as obtained from the completion of a questionnaire regarding the views of parents on the education of their children with ASD. by using a digital game.

2. ASD - Autism

Pervasive developmental disorders are one of the major developmental disorders on the autism spectrum and lifelong developmental disorders. It accompanies the person throughout his life, affecting his perception, thinking, and behavior, and is characterized, among others, by significant deficits a) in social communication and b) in the social interaction of the person with those around him [7], [8], [9], preventing him from correctly understanding what he sees, hears and generally feels, as a result of which he faces serious problems in their social relations, communication and behavior. Autism can exist alone or in combination with other developmental disorders such as mental retardation, learning disabilities, epilepsy, deafness, blindness, etc., and shows great heterogeneity, that is, every child with autism is different. It manifests itself during the first 2 years of the child's life with basic primary disorders: excessive isolation, inability to establish social contacts, a peculiarity in communication, and need for the immutability of the environment in which he lives.

2.1. ICTs & Autism

Information and Communication Technologies are an integral tool of the educational process for modern educational systems. Technology helps the learning process to turn from passive to active because it can make each student more independent and autonomous. As for people with special educational needs, technology can largely replace elements of disadvantage or disability and bring the student closer to knowledge and social reality since it enables them to communicate with their environment and interact with this [10]. Computers give students with special needs what they need: step-by-step work. This strategy of breaking it down into small steps has proven to be a successful way of teaching, particularly to students with autism. A very basic factor that affects the correct use of the computer is the human presence. In the school, the teacher is the one who plans and chooses the tasks that the students will deal with on the computer, helps to understand the task, explains its educational goal, guides the process, and animates the students when necessary. Like any other educational activity, work on the computer must be individualized, i.e. based on the needs of the student and have a specific goal. [11]

2.1.1. Learning and digital play

In recent years, the educational sciences have turned their attention and have already recognized that play is a par excellence context for learning and socialization. Learning based on digital games (digital game-based learning) is one of the most modern directions appearing in educational technology as digital games as learning environments support new types of learning. The possibility of their utilization opens up an important field in the area of educational means and methods since it involves positive motivation of students and an increase in learning results pleasantly and attractively [12].

Games are characterized as active learning environments because they favor immediate reaction and provide high motivation, because they encourage the active participation of the

student, but also provide immediate feedback [13]. According to research [14], [15], the main features that make games attractive are divided into the following categories:

- individual motivations such as curiosity, challenge, imagination, and control exercised by the player and
- interpersonal motivations, such as cooperation, competition, and recognition.

Modern digital games are additionally characterized by elements such as the easy simulation of real-world situations and everyday life, but also their distinct ability to gain and maintain interest through mechanisms of rich interaction and balanced challenge. The use of digital games in the educational process promotes interactivity and de-escalation of tensions, promotes active educational models, and offers new possibilities for communication/collaboration.

Based on these findings, the use of digital games for learning purposes has now begun to be tested internationally, in a variety of situations, and at multiple levels of formal and informal education in both general and special education. [11]

2.1.1.1. Educational value of digital games

The educational value of digital games in Special Education lies in the fact that they offer: economy of attention and learning, an increase in satisfaction, persistence, personal involvement in the educational process, reduction of anxiety, an increase in the initiative, the value of participation and sense of inclusion in the society, development of socialization as well as the encouragement of students with reduced interest and motivation to learn. The use of digital games in the educational process promotes interactivity and de-escalation of tensions, promotes active educational models, and offers new possibilities for communication/collaboration.

The educational sciences have recognized that play is a learning and socialization context par excellence, egalitarian in differences, motivating through challenge, and non-punitive for mistakes. The game, therefore, displays virtues that are at the same time basic requirements of the integration approach for people with special needs. One of the most important advantages of digital games is their ability to adapt to the user's capabilities and time frame. The user thus avoids the feelings of anxiety, inadequacy, and boredom. Children in the game environment go at their own pace and control the outcome.

Special Education can benefit from the use of digital games as they offer the possibility of repetition, practice, learning of many thematic units, and adaptation to the needs of the user, depending on the mental and emotional capabilities of the student, and offer the separation of information into small sequential steps that can be digested by the user. Games are directly linked to areas of education for people with special educational needs and provide alternative teaching methods (visualized teaching materials), structured learning environment, fixed daily schedule, one-to-one teaching, and enriched learning activities focused on preferences and interests [11]. People with special learning abilities do not differ in the need for digital entertainment.

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effect relationships, the improvement of visual-perceptual skills, and motor development. Immediate reinforcement and lack of criticism make it easier for students to accept their mistakes and try harder next time.

It is worth emphasizing that the teacher should take care so that the use of the computer does not turn into an obsession, setting clear time limits and changing the order of use by other students. [11]

2.1.1. 2. Digital games and autism

Autism is one of the major developmental disorders of the autistic spectrum and a lifelong developmental disorder, a disability that prevents individuals from correctly understanding what they see, hear, and generally feel, resulting in serious problems in their social relationships, communication, and behavior.

As far as the field of Autism Special Education is concerned, the game is an important psycho-emotional and social need of every child because apart from being a means of entertainment and personal satisfaction for every student, it is an excellent tool for education and the development of his personality. The need to develop a play curriculum is inextricably linked to the nature of the autism disorder. The behavior of students with autism in play activities has special forms and is related to their special abilities. A student with autism may use some toys for sensory pleasure or engage repetitively with a toy. The biggest difficulty is often the lack of motivation and interest, either for solitary or parallel play. Also, symbolic play is particularly difficult for students with autism.

The characteristics of people with autism about play highlight the educational need for inclusion of play in the individual educational program of each student [16] specifically states:

“ I like opening and closing the doors of some toy cars, and especially watching the wheels as I spin them around. I used to put one behind the other in a long line so it looked like they were in traffic, even though that wasn't my intention. I also used to put bricks in long rows. I had hundreds of plastic soldiers. I put them in a big glass jar and I loved spinning the jar and looking at the different colors and patterns.” [17], [18].

Regarding children with autism, the following levels of play teaching are suggested [19] : a) Solitary play, b) Parallel play, c) Companion play where what connects the two children is an activity rather than interaction and d) The cooperative game, in which the children's cooperation is necessary and each one has a specific role in the game. It is important to emphasize that this sequence of game stages is evolutionary and considered appropriate for students with autism, as the criterion for the transition from one stage to the next is the acceptance of the degree of social interaction of the students. Acquiring play skills is a goal implemented at the first level of instruction but extending them to a small social group is a teaching necessity.

The forms of play that can be used in children with autism are a) Functional play, where the student develops motor activities, participates in activities with cause-effect games, and gets familiar with the real use of objects.

b) The construction game in which the student, using a variety of materials, creates constructions based on a standard design.

c) Symbolic or pretend play, where the student uses objects to attribute individual properties and behaviors to them or learns to play roles. In Game with Rules, the student can participate in games based on rules. The game can also be used to develop problem-solving skills.

The main strategies for this purpose are the following [20] , [21] : a) Sabotage, b) Deliberate error, c) Omission and d) Choice.

The behavior of students with autism in play activities has special forms and is related to their special abilities. A student with autism may use some toys for sensory pleasure or engage repetitively with a toy. The biggest difficulty is often the lack of motivation and interest, either for solitary or parallel play. Digital games can meet the educational needs of students with autism as they offer a structured learning environment, a fixed daily schedule, one-to-one rather than group instruction, alternative teaching methods (visualized teaching materials), and enriched learning activities that focus on preferences and their interests.

3. Parents and education of people with ASD

The term "parental involvement" means the involvement of parents in regular, two-way, meaningful communication involving students' academic learning with the school. activities, including securing – etc. The family is a key factor in the physical and mental development of the child and the child-family relationship is two-way in terms of their development [22] and as scientists argue. Parents are "experts" on their children, as they " know" them best and can provide valuable and important information. to improve education and therapy - approach to the child[1] and their effective and useful contribution in dealing with the difficulties of autistic disorder [23]. Parents today are considered co-therapists [24] and in addition to providing the necessary information about the child's daily life, development, and progress, they actively participate in the treatment, support the therapeutic-educational process and play a leading role in the education of their children but also in supporting other parents of children with autism. However, for there to be a positive evolution, development, and improvement of their children in all areas, a necessary factor is " *quality cooperation with specialized health and education professionals who specialize in the field to ensure the development and quality of life of their child.*" [25]. as it is pointed out in a statement of the Ministry of Education and Science in Great Britain [26] ".... *Effectively addressing the needs of people with developmental disorders depends on the full involvement of parents ... The relationship between them and health and education professionals is crucial to the child's development. Parents need information and clear guidance to support professionals' efforts, and professionals cannot meet needs without parents' valuable knowledge of their child. ..*"

4. Method

With the above in mind, we created a questionnaire that captures parents' opinions about the use of digital games as learning tools for people with ASD.

The questionnaire was distributed to 20 parents of students with ASD, specifically at an in-school briefing for parent groups on the topic: "The digital game in the education of children with special educational needs - autism", held in a Special Education and Training unit (SMEAE) in Maroussi by the teacher: Chaidi Irene.

The questionnaire for recording-investigating the opinions of **parents** about digital games as tools in the education of children with ASD, is made up of closed-type questions, it consists of 6 sections and the design of the closed-type questions was based on a five-point Likert scale and the answer options of the scale are as follows: 1= yes, 2=no, 3 = neither, 4= other / state also 1= strongly disagree, 2= disagree, 3= undecided, 4= agree, 5= strongly agree.

Reference should be made to section E of the questionnaire as it is part of the questionnaire created by Ms. Christou Ioanna, for the **PROJECT INNOVATION OF EDUCATIONAL SPECIALIZATION - SPECIAL EDUCATIONAL STAFF AND**

PRODUCTION OF EDUCATIONAL MATERIALS FOR MILD INTELLECTUAL RETARDATION (<http://www.media.uoa.gr/epinoisi>) [27]

The structure of the questionnaire is summarized in detail in the table below:

PARENT QUESTIONNAIRE
ABOUT ITS USE OF DIGITAL GAME
IN THE EDUCATION OF CHILDREN
WITH SPECIAL EDUCATIONAL NEEDS-AUTISM

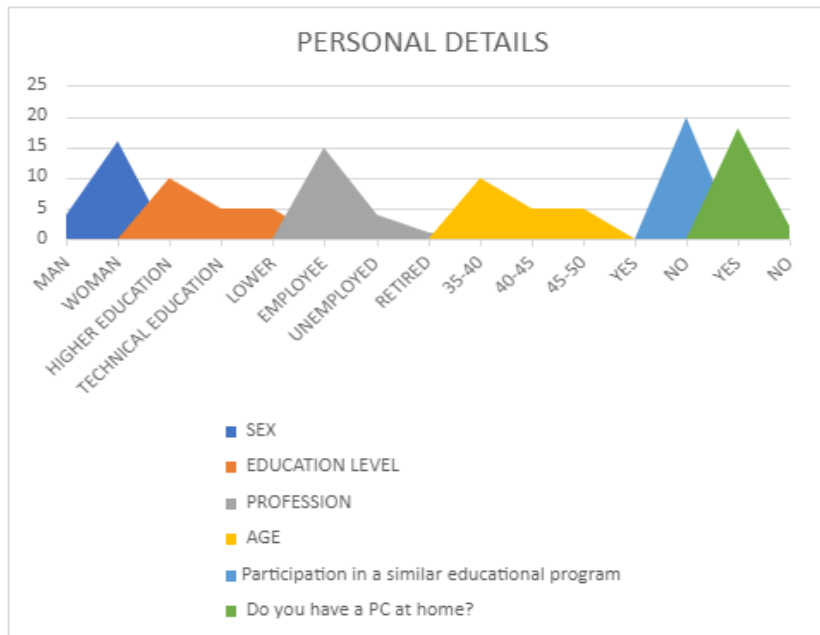
PARTS	QUESTIONS
A: PERSONAL INFORMATION Biographical information of the respondent - demographic information	6 questions
B: VIEWS ON COMPUTER USE	6 questions
C: VIEWS OF COMPUTER USE BY PEOPLE WITH SPECIAL EDUCATIONAL NEEDS	7 questions
D: INFORMATION ON CHILDREN'S BEHAVIOR RELATING TO COMPUTER USE	16 questions
Q: OPINIONS ON THE USE OF DIGITAL MEDIA – DIGITAL GAMES IN LEARNING	18 questions
F: OPINIONS ON AWARENESS AND PARTICIPATION IN AWARENESS PROGRAMS	5 questions

It was completed by the 20 parents of students with ASD attending the 1st Special Primary School of Maroussi, Public School Unit of Special Education and Training (SMEAE).

5. Results - evaluation

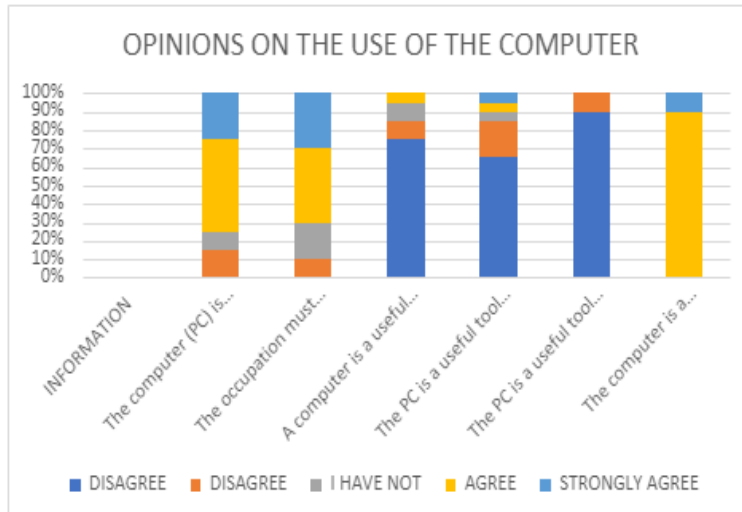
Analyzing the results of the answers of the participating parents to the questionnaire entitled "**QUESTIONNAIRE OF PARENTS' OPINIONS ON DIGITAL GAMES IN THE EDUCATION OF CHILDREN WITH AUTISTIC SPECTRUM DISORDER** " in a **Greek context**, it is clear that parents consider their involvement in the socio-emotional education of their children with ASD is beneficial.

A: PERSONAL INFORMATION



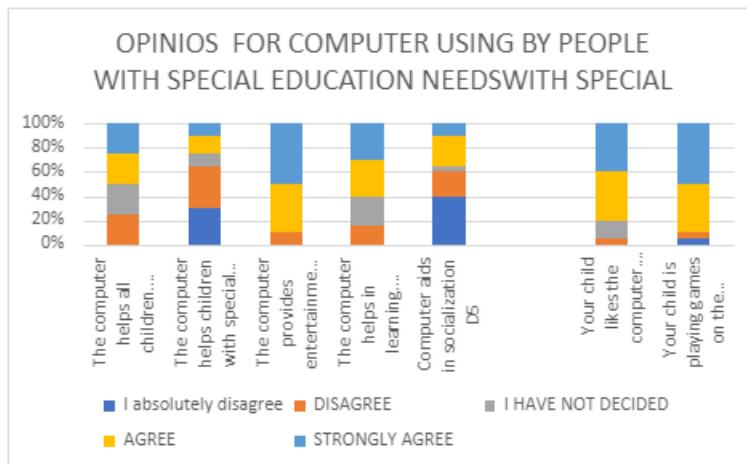
20 parents took part in the survey: 16 women and 4 men, the majority of the workers with higher education, in the age group of 35-40 years, declare that they have not taken part in a similar information program and have a PC at home.

B.: OPINIONS ON THE USE OF THE COMPUTER



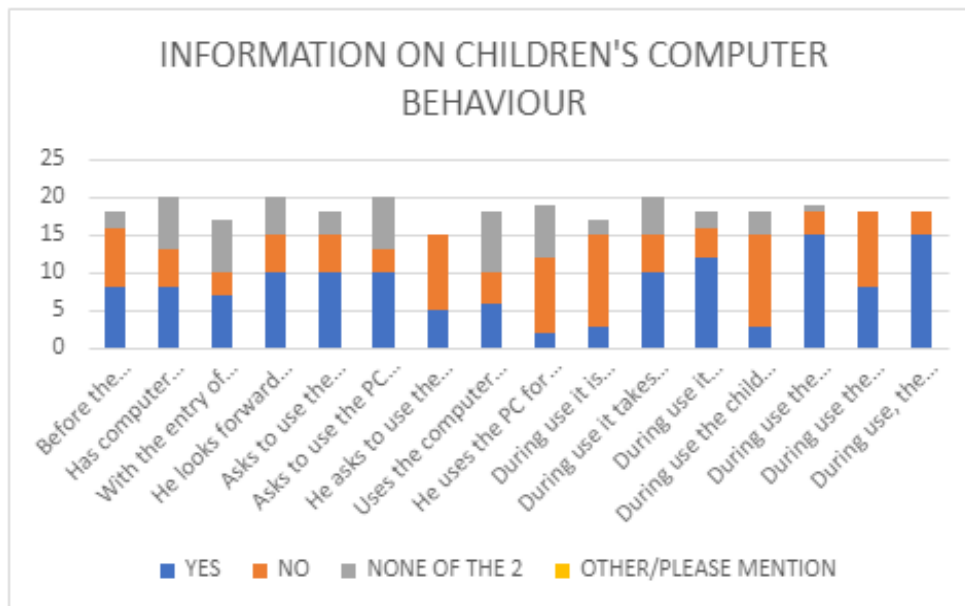
In the 2nd part of the questionnaire, parents are asked to record their opinions regarding the use of the PC, it is worth noting that the majority of parents consider that the PC is necessary at home as a tool for the multifaceted information of individuals and not only individually in professional sections, in personal information and entertainment.

C: VIEWS OF COMPUTER USE BY PEOPLE WITH SPECIAL EDUCATIONAL NEEDS



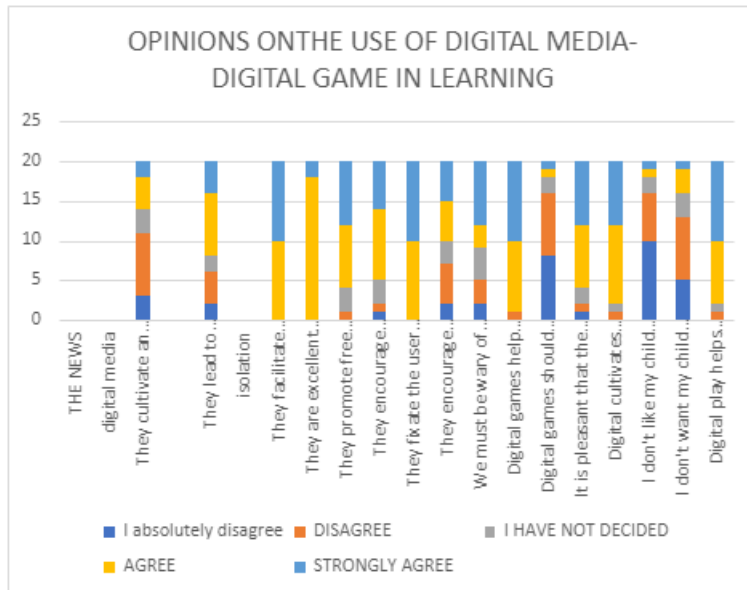
Parents' responses related to the use of computers by people with special needs, the majority believe that computer use does not help children with special needs to socialize, but they think that it helps them to have fun and learn and claim that their children like playing computer games.

D. INFORMATION ABOUT CHILDREN'S COMPUTER USING BEHAVIOR



The results of domain D of the questionnaire are very important findings as they concern the behavior of the person with ASD concerning the use of the PC by the person himself. Parents emphasize that their communication with their children has not changed with the existence of the computer. The child uses computers not only when he is stressed or has nothing else to do or is doing his homework BUT also when he is calm. The child uses the computer both for work and for fun. However, they emphasize that when the person with ASD does their homework, they do not work alone but also need the support of their parent. Also, parents point out that when the child uses the computer, he is not particularly talkative, he is not passive, and he takes initiative and expresses his feelings!

E: OPINIONS ON THE USE OF DIGITAL MEDIA – DIGITAL GAMES IN LEARNING



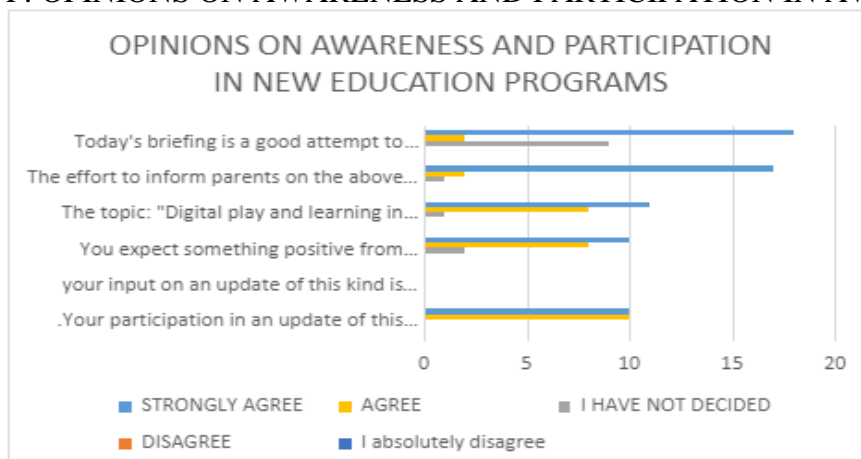
The questions of the 5th part of the questionnaire are divided into 2 categories:

- A) Questions 1 to 8 refer to the use of digital media in general and
- B) questions 9 to 18 refer to the use of the digital game.

Regarding the first part: parents believe that digital media lead to isolation as they fixate the user on the screen "stealing" their free time. However, they consider that they facilitate communication, information, information and encourage creativity and free expression.

Regarding the second part: parents consider games to be beneficial as they offer to learn through fun to the child, cultivate memory and observation, and help the development and expression of emotions, but they expressed caution with digital games because they think they can be dangerous without parental supervision.

F: OPINIONS ON AWARENESS AND PARTICIPATION IN AWARENESS PROGRAMS



In the last area of questions regarding the parents' point of view regarding their participation and information in new educational programs, almost all parents consider their participation in educational programs such as "Digital games in the education of people with ASD" important and would like more information.

6. Conclusions - suggestions

The incorporation of digital technologies in education domain is very productive, successful, facilitates and improves the educational procedures via Mobiles [32-41], various ICTs applications [42-74], AI & STEM [75-85], and games [86-91]. Additionally the combination of ICTs with theories and models of metacognition, mindfulness, meditation and emotional intelligence cultivation [92-114] as well as with environmental factors and nutrition [28-31], accelerates and improves more over the educational practices and results.

Moreover evaluating the results of the evaluation of the questionnaire, the following is carried out: parents consider that the use of the PC as an educational tool helps people with special needs in communication, in their education. Digital games are a learning and fun tool for people with ASD but parents and children need more information about their benefits.

There is a need for more information, participation, and training of parents in the use of educational games, learning, and fun, in games with a serious purpose (serious games).

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"APPENDIX A"

QUESTIONNAIRE

The questionnaire was distributed to parents of students with ASD and specifically in an in-school information session for parent groups on the topic: "The digital game in the education of children with special educational needs - autism", held at the 1st Special School of Amarousiou, by the teacher: Irene Chaidi.

Reference should be made to section E of the questionnaire as it is part of the questionnaire created by Ms. Christou Ioanna, for the **INNOVATION PROJECT SPECIALIZATION OF TEACHERS – SPECIAL TEACHING STAFF AND PRODUCTION EDUCATIONAL MATERIAL FOR MILD MENTAL RETARDATION**

(<http://www.media.uoa.gr/epinoisi>)

1. **PARENT QUESTIONNAIRE ON THE USE OF A DIGITAL GAME IN THE EDUCATION OF CHILDREN WITH SPECIAL EDUCATIONAL NEEDS-AUTISM**

A) PERSONAL DETAILS:

(Mark your choice with " ✓ ")	
1. Sex:	
Man <input style="width: 50px; height: 20px;" type="checkbox"/>	Woman <input style="width: 50px; height: 20px;" type="checkbox"/>
2. Education Level: (note)	

3. Employee: Unemployed: Retired:

4. Age :

35-40years 40-45 years 45-50 years

5. Participation in a similar educational program :

YES NO

If yes, (note)

.....

6. Do you have a PC at home?

Yes No

B: OPINIONS ON THE USE OF THE COMPUTER

	PERSONAL INFORMATION	DISAGREE ABSOLUTELY	DISAGREE	I HAVE NOT DECIDE	AGREE	STRONGLY AGREE
B1	Computer (PC) is essential at home.					
B2	The occupation must be done systematically.					
B3	A computer is a useful tool for entertainment only.					

B4	A computer is a useful tool for business purposes only.					
B5	The PC is a useful tool for personal information only.					
B6	A computer is a useful tool for a multifaceted update.					

C: VIEWS OF COMPUTER USE BY PEOPLE WITH SPECIAL EDUCATIONAL NEEDS

C	STUDENT INFORMATION	I ABSOLUTELY disagree	DISAGREE	I HAVE NOT DECIDED	AGREE	STRONGLY AGREE
C1	The computer helps all children.					
C2	The computer helps children with special needs.					
C3	The computer provides entertainment.					
C4	The computer helps in learning.					
C5	The computer helps to socialization					

C6	Your child likes the computer.					
C7	Your child is playing games on the computer.					

D: INFORMATION ON CHILDREN'S BEHAVIOR RELATING TO COMPUTER USE

D	BEHAVIOR	YES	NO	NONE OF THE 2	OTHER/REFER
D1	Before the existence of the computer, did you have "good" communication with your child?				
D2	Has computer access affected your child's behavior?				
D3	With the entry of the PC into the home, has your communication with it improved?				
D4	He looks forward to using the computer every day.				
D5	Asks to use the computer when stressed.				
D6	Asks to use the PC when it's quiet.				
D7	He asks to use the PC when he has nothing else to do.				
D8	Uses the computer for entertainment.				
D9	He uses the PC for his work only.				
D10	During use it is talkative. (does he have reactions?)				
D11	During use it takes initiative.				
D12	During use, it expresses its feelings.				
D13	During use the child is passive.				
D14	During use, the child is verbally active.				
D15	During use, the child works alone.				

D16	During use, the child needs the support of the parent.				
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E: OPINIONS ON THE USE OF DIGITAL MEDIA – DIGITAL GAMES IN LEARNING

E	DO YOU BELIEVE THAT THE NEWS digital media	I absolutely disagree	DISAGREE	I HAVE NOT DECIDED	AGREE	STRONGLY AGREE
E1	They cultivate an individualistic spirit.					
E2	They lead to isolation.					
E3	They facilitate communication.					
E4	They are excellent means of information information.					
E5	They promote free expression.					
E6	They encourage creativity.					
E7	They fixate the user in front of the screen, occupying more and more of his free time.					
E8	They encourage initiative.					
E9	We must be wary of the digital game.					
E10	Digital games help children become familiar with new technologies.					
E11	Digital games should be avoided because					

	they create obsessions.					
E12	It is pleasant that the child can occupy himself quietly at home, playing on his computer.					
E13	The digital ones games cultivate memory and observation.					
E14	I don't like my child playing digital games.					
E15	I don't want my child to waste his free time playing digital games.					
E16	Digital play helps develop and express emotions.					
E17	The relaxation offered to the child by the digital game is beneficial.					
E18	Without her proper supervision, all games (digital and non) are dangerous.					

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F: OPINIONS ON AWARENESS AND PARTICIPATION IN AWARENESS PROGRAMS

F	EXPECTATIONS FROM TODAY'S UPDATE	I absolutely disagree	DISAGREE	I HAVE NOT DECIDED	AGREE	STRONGLY AGREE
F1	The participation your input on an update of this kind is important.					
F2	You expect something positive from today's update.					
F3	The topic: "Digital play and learning in Special Education" are interesting.					
F4	The effort to inform parents of the above matter must be continued.					
F5	Today's briefing is a good attempt to inform about the learning through digital games of children with special needs and the use of PC by children.					

Thanks for your participation!