ICT Learning Methodologies for Children with ADHD

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ABSTRACT

ADHD is an attention deficit disorder, impulsivity and hyperactivity due to several functional disputes; these anatomical brain inconsistencies can be genetic and / or environmental that hinders the lifestyle of the child and his environment. Within the educational field, teachers can not distinguish the attitude of a child with ADHD from one without disorders, especially in the preschool stage, which motivates to look for teaching alternatives among them we have information and communication technologies – ICT, which allow to evaluate, diagnose, enrich and strengthen the learning of children with or without ADHD through an educational software on a mobile, a computer and/or whiteboard; increasing attention, concentration, creativity, security, decreasing aggressiveness, developing positive behaviors gradually, their self-esteem improves, they feel motivated and they create solutions to their internal conflicts progressively in such a way that their community learning guarantees the development of new social skills such as respect, solidarity, empathy and identifies the emotions of other people allowing a positive incorporation into their daily lives, especially in the school environment.

Keywords: ADHD, ICT, Learning, Education

INTRODUCTION

Attention deficit, impulsivity and hyperactivity disorder, ADHD, is a functional deficit, they do not coordinate anatomical activities with the brain causing inconsistencies in behavior (Aguilar Aguilar, 2012) this disorder when failing neuro executive control causes in the child a negative behavior, his response to any conflict is antisocial (Bravo Decimavilla, 2019). ADHD can be generated by genetic, hereditary and socio-environmental factors; it is considered genetic factors due to premature birth, malnutrition, low birth weight, received abuse at the time of gestation, was born in a precarious situation, received a blow to his head at the time of birth; hereditary factors: there is the possibility of 80% when one of the parents has ADHD, 50% when the parents suffer from any other disorder such as autism - ASD, Down Syndrome, Schizophrenia, among others and socio-environmental factors it is believed that it is during pregnancy the mother suffered abuse, did not eat well, took drugs or alcohol, frequented or lives in contaminated places a

lot of smoke, brass by paint contact with lead, you manufacture without its due control of machinery that damages the environment, etc (González Sacoto & Villalta Contreras, 2017; Rabito-Alcon & Correas-Lauffer, 2014; Ureña Morales, 2007).

In addition, ADHD can appear in any cycle of life whether baby, child, adolescent, youth or adult due to a traumatic brain accident and is difficult to detect, especially during childhood; is confused with other disorders or coexists with several of them; the symptoms of ADHD generally confuse it with difficulty in learning, conduct disorder, ASD, among others; same that hinder oral and body expression, its concentration is variant from moment to selective, language is deficient, low school performance (Ramos, 2015; Villa-gómez Puebla, 2018). Below you can classify the ADHD into the following general groups:

- ADHD with hyperactivity and impulsivity: restless, noisy, energetic, excessive restlessness, does not respect turns, interrupts any action, exaggerated movement.
- INATTENT: forgetful, carefree, bad memory, clueless, passive, bored in any activity he is doing, he is absent, he lives in his world.
- Mixed or combined ADHD: Sudden changes in state, from restlessness to immobility, mental health in danger, impetuous, thoughtless behavior
- ADHD with difficulty of executive function: coexistence with other disorders, difficulty managing the information captured by the senses, non-verbal learning disabilities, conflicting behavior.

According to the types of ADHD, it can be observed that the symptoms of ADHD are similar to the attitude of children under and equal to 6 years; which makes it difficult for both parents and teachers to detect this disorder (Aperte Pérez, 2017; Ormazábal-Goicoechea, 2013); for which it seeks to intervene with playful treatments, innovative in learning regardless of whether or not infants suffer from a disorder, in this case ADHD, which ICT facilitates us in a natural, community way, without distinction; ICT strengthens the teacher's methodology by increasing the collective learning of the child, theory and practice go hand in hand, that is, it is a learning of learning by doing, manipulating, experiencing more than a learning by listening (Cortés et al., 2017; Maarín González, 2018).

INFORMATION AND COMMUNICATION TECHNOLOGIES – ICT

Information and communication technologies – ICT is the processing of information through technology improving the quality of teaching and learning by visual, auditory, and tactile means in real time, reducing the gap between knowing and doing (Maarín González, 2018) "facilitating self-paced learning, meeting their personal needs, relationships and decreasing digital illiteracy" (Cortés et al., 2017). ICT strengthen the family-school relationship, interact home and teachers, it is a community learning without distinction that evaluates, diagnoses, reinforces, regulates, and enriches the learning process decreasing deficiencies of all participants regardless of their condition, which improves self-esteem, increases security and control of their behavior (Fernández-Menor, 2021; González Viera, 2021).

Table 1. Objectives, methodology and results with ICT in the learning of children with ADHD.

ICT Objectives	Methodology	Tools	Results
Motivation	Attractive programs, graphics, illustrations	**MeMotiva** program Viso auditory spatial with 3 levels of difficulty. **LIM, MEMORAMA, IMPROVE YOUR MEMORY SILHOUETTES OA:** 50 levels each with 5 phases **Look and focus more, the magic of Ate.net's lyrics** (Cortés et al., 2017; González Viera, 2021).	Improves literacy learning, increases reading speed, working memory, decreases impulsivity and behavior
Creativity	theatre, music, painting, dancing, sports	**Edilim,** interactive books and 42 additional activities, **FROM ITBOOK: Stories coupled** to your daily life, **Play with Lalo de Edicinco, Change Dyslexia Dytective for Samsung** contains linguistic and attention games with artificial intelligence, **Learn to read with Pipo** de Cibal multimedia, **Learn with Zapo, GoConqr, Simon** electronic board game with colored square, **Turtle technique:** decreases impulsivity. **Attention exercise of recercar labs:** free application **Mandalapps:** creating mandalas for nonverbal expression (Narciso Linares et al., 2014; Soto et al., 2017).	Improves attention, auto control, recognizes the emotions of another person, develops socio-communicative attitudes such as: senses and perception, motor skills and proprioception, overcoming fears and phobias. Simulate and create solutions to situations presented to them
Recreational	Games, exercises, dynamic activities	**CPAT** (Computerized Progressive attentional Training): it has 3 games, and you can opt for mobile, computer or digital whiteboard **AVOKIDDO:** interacts with 3 susceptible **animals, dygseggxia, Jigsaw Planet** puzzle created by the child from the images he draws **Click 3.0:** alphabet soup, crossword puzzles, puzzle text activities, associations **The short-term memory checkers Memory:** find the pair of tokens, **Celebreti Edu:** learning by playing, **Kahoot:** questions and answers (Karolys Cordovez, 2016; Margulis, 2007).	Improves language, communication, increases concentration, vocabulary, memory, promptly detects dyslexia Helps fine psychomotricity Student interaction
Stimulation	Rewards for your achievements, no mistakes count	**TEC-IMAT** evaluates errors of omission, reaction time to successes and commission errors, **Voice Dream** is based on an auditory stimulus	Improvement: memory Motricity Concentration Conduct

Table 1. Continued.

ICT Objectives	Methodology	Tools	Results
		Follow me: animated sequences with auditory stimuli, **Learn to read with Silbo of the PNTIC,** **RPG** (Role Playing Game), **MMo** (Massive Multiplayer Online) y **Simuladores** (Unicef, 2018).	Reading
Progressive competition	Increase the degree of difficulty of what is taught	**Leoncio and the Lost Vowels** is a video game. Media **education in** ADHD. **DiTres:** 3 programs - DiTex (reading) -Dilect (writing) - DiDoc (mixed) **Rayman,** **The Treasure of the Mathematical Whirlpool, Gremlings in my Mirror, Amazing Brain:** 6 mini-games of logic, memory, calculation, languages, all with progressive difficulty increase, **TDHA Kids TRAINER:** 10-minute daily cognitive training (Maarín González, 2018; Ramos-Galarza & Perez-Salas, 2017).	Improves writing, reading, verbal fluency, mathematical logic, in general improves your learning, It allows them to manage their temperament and helps any learning deficits.
Autonomy	Schedules	**First then Visual Schedule Activities proposed by Anna Costa** **Alex learns to order:** 4 speed levels **Genially:** infographics or questions (Fernández-Menor, 2021).	Reinforces perseverance, respects shift, organizes, completes its activities, decreases restlessness improves concentration and attention
Assistance	Support in homework tasks	**Robot Atent@** a robotic assistant focused on children with TDAH. (Berrezueta-Guzman, Pau, et al., 2020; Berrezueta-Guzman, Pau, et al., 2021; Dolón-Poza et al., 2020; López-Pérez et al., 2020)	Assists to the child with ADHD during the development of his/her homework by a robotic assistant incorporated in a smart home environment. This robot has a previous application also in trauma prevention in children of 3-6 years old.
Self-esteem	Meditation Activities that help control and security	**EMIC** that analyzes impulsivity and reflexivity **L and C:** reading and comprehension **TARLAN** (simulates Tio game to improve social problem salving of ADHD children) is a video game **Ombudsman's Blog** **The TDHA and You page** **Mindfulness:** practice relaxation, tranquility, and security (Paredes Pino, 2006).	Improve behavior, understand each situation, and control your response Improve communication, cooperate, respect shifts, positive behavior, develop sensitivity, empathy.

Also, ICTs allow to organize the information according to their capacity and allows them to exhaustively highlight the important concepts in a novel way through the use of the iPad with uPAD program and iAnnotatePDF anchored to a digital whiteboard, a computer and / or digital tools for an interactive projection (Narciso Linares et al., 2014; Soto et al., 2017). There are several application of ICT in the field of education in children such as (Berrezueta-Guzman, Serpa-Andrade, et al., 2020) presents a didactic robot to teach children how to prevent trauma accidents in primary school and (Berrezueta-Guzman, Robles-Bykbaev, et al., 2021) present a literature review of robotic technologies as ADHD care strategies. Below is a summary of objectives, methodology and results obtained when implementing ICT in the learning of children with ADHD (See table 1).

CONCLUSION

In conclusion, the methodology of learning with ICT in children with ADHD evaluates, diagnoses, strengthens, regulates and enriches community learning, that is, regardless of whether the student suffers FROM ADHD or any special educational need allowing to increase motor skills, improve communication, identify their emotions and others, develop their creativity, simulate and create responses or solutions to any activity of daily life, to respect, solidarity, increases their security and control, overcomes their fears, strengthens their self-esteem. With ICT interacts home-school, family, school, specialists, therapist through technology will be integrated improving their lifestyle

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