

THE APPLICATION OF THERAPY BY THE ABA MACHINE AS A USE IN THE AUTISTIC: LEARNING POSSIBILITIES WITH MATHEMATICAL GAMES

A APLICAÇÃO DA TERAPIA PELA MÁQUINA ABA COMO USO NO AUTÍSTICO: POSSIBILIDADES DE APRENDIZAGEM COM JOGOS MATEMÁTICOS

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ABSTRACT: Knowing how to include these young people is still the biggest challenge facing the education system. Faced with the need for continuous, specific, and good quality knowledge to promote an egalitarian education, children with ASD can have a satisfactory development based on consistent and inclusive educational policies that deal with the teacher as a mediator in this teaching and learning process, to the necessary mappings and treatments. The present research has as a general objective: To understand the ABA tool as a teaching tool, and having as specific objectives: To describe the multiple possibilities of learning from mathematical games using the ABA methodology with the mathematical resources existing in the classroom and to characterize the effective ways of the games and their function of inclusive socialization. The work was developed in the form of bibliographic research, based on the discussion of authors who discuss the theme. Speaking of the ABA tool implies understanding the connotation that is given to the theme in all segments of society in a positive character for student development.

Keywords: ABA Method. Inclusion. Mathematical Games.

RESUMO: Saber incluir esses jovens ainda é o maior desafio que o sistema educacional enfrenta. Diante da necessidade de um conhecimento contínuo, específico e de boa qualidade para promover uma educação igualitária, crianças com TEA, podem ter um desenvolvimento satisfatório partindo de políticas educacionais consistentes e inclusivas que tratam desde o professor como mediador nesse processo de ensino e aprendizagem, aos mapeamentos e tratamentos necessários. A presente pesquisa tem como objetivo geral: Entender a ferramenta ABA como ferramenta de ensino, e tendo como objetivos específicos: Descrever as múltiplas possibilidades de aprender com jogos matemáticos utilizando a metodologia ABA com os recursos matemáticos existente na sala de aula e caracterizar as efetivas formas os jogos e a sua função de socialização inclusiva. O trabalho foi desenvolvido sob forma de pesquisa bibliográfica, com base na discussão de autores que discutem a temática. Falar da ferramenta ABA implica entender a conotação que é dada ao tema em todos os segmentos da sociedade em caráter positivo para o desenvolvimento do aluno.

Palavras-chave: Método ABA. Inclusão. Jogos Matemáticos.

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1. INTRODUCTION

The human being is a social being who executes and participates in his process of development in the historical, ideological and cultural perspective within the context in which he is inserted. And, it is not one of the most significant places for their training as a citizen, guiding their learning process in a welcoming and inclusive way, for those who have some kind of limitation even with a large deficit of cognitive development.

As soon as, one of the most striking processes, from the point of view of relations between human beings is the school and its compilations, in a more comprehensive way to patients with Autism Spectrum Disorder (ASD).

According to (PAHO, 2017) for every 160 children in the world, one has ASD, and even in the face of their condition, their learning process tends to be satisfactory, depending on the interventional and procedural perspective worked in the first years of life, until adulthood.

Knowing how to include these young people is still the biggest challenge facing the education system. Faced with the need for continuous, specific and good quality knowledge to promote an egalitarian education, children with ASD can have a satisfactory development part of consistent and inclusive educational policies that deal with the teacher as mediator in this teaching and learning process, to the necessary mappings and treatments.

The first step would be to involve the child, young or adolescent with specific and specific needs, in activities that collaborate significantly in their development process: physical, cognitive and motor, since they do not differ from others with normal development with regard to their possibilities of learning.

Within this perspective KLIN, (2019), says that:

[...] Within autistic disorder it is possible to observe permanent impairments in social interaction, alteration of communication, limited or stereotyped patterns of behaviors and interests, language deficits. These features usually appear around the age of three. (Page 94)

[...] In addition to having a diagnosis of Autistic Disorder, it is necessary that the person fits some behavioral criteria, including: Qualitative impairment in social interactions, impaired communication, stereotyped and repetitive use of language, difficulty to enter into imaginative games, restricted or repetitive patterns of behavior, interest and activities, difficulty in breaking routine (pag.95).

The inclusion of students with special educational needs depends not only on good practice, or excellent teacher training, but on the whole set that act harmoniously, for the sake of a common good: quality in teaching being public or private egalitarian for all, including not only students considered "normal", but those who need a care or rather saying a proposal for inclusion that the enable the development to see itself within its cognitive conditions its capabilities.

By using ABA (*Applied Behavior Analysis*) therapy as an approach to behavioral intervention in the treatment of autism symptoms, the child develops knowledge that generates autonomy.

Aba is based on the perspective around the three pillars:

[...] The Analysis of Applied Behavior is defined with an applied science and is one of the three pillars of Behavior Analysis, the other two being philosophy, called Radical Behaviorism, based on Skinner's work, and the area of basic research development, the Experimental Behavior Analysis. (DUARTE, SILVA AND VELLOSO, 2018 p. 09)

[..] These three pillars are interdependent and all have their relevance to Behavior Analysis. Without taking into account the philosophical assumptions and the results of experimental research, it is not possible to develop applied research and develop technique for intervention (p. 16).

Therefore, it is understood that the child alone does not characterize his learning as a teaching-learning method, because they do not aim for a final result, becoming only a spontaneous action, because, when the same interacts and is stimulated, it does not bother with obtaining knowledge or with the evolution of its proposed physical and mental commitment.

In this context, the question of this research arises: Does the application of therapy by the ABA method as a use in the autistic generate learning possibilities with the use of mathematical games?

The interest related to the theme researched came from the restlessness and observation of the tools used by teachers with students from the public and private network in which the ABA method in which it is most often never used, and which could significantly improve the development of these students, including mathematical games as a tool for a better meaningful and satisfactory use.

The present research has as general objective: To understand the ABA tool as a teaching tool, and having as specific objectives: D to write the multiple possibilities of learning from mathematical games using the ABA methodology with the existing

mathematical resources in the classroom and characterize the effective ways the games and their function of inclusive socialisation.

Speaking of the ABA tool implies understanding the connotation that is given to the theme in all segments of society in a positive character for student development. In view of this assumption the question: What are the learning possibilities of the student adopting therapy by the ABA method associating with mathematical games?

Thus, the importance of working on the theme is justified with the objective of the importance and differentiated and necessary look, in view of the changes of society and innovations with new methodologies and to investigate, through the literature review, the mathematical games in the process of inclusion of autistic people in public and private schools.

2. BRIEF HISTORY ON SPECIAL EDUCATION IN BRAZIL AND THE ABA METODO

We have never heard so much about special education, or inclusion, however, in the face of such phenomena, various approaches are directed to these individuals, from which their most diverse meanings related to their potentialities are gained. In Brazil countless people are born with autism, that is, people with ASD are more present in our lives than we can imagine.

In Autism it is possible to observe permanent impairments in social interaction, alteration of communication, limited or stereotyped patterns of behaviors and interests, language deficits, linear capacities of compromised laterality and other concepts still investigated, which always seek to decipher the causes and consequences of ASD.

Autism spectrum disorder (ASD), is a variety of neural-type mental disorder with development characterized by generalized abnormality of social interaction, and very restricted to behavior with possible tendencies to repetitive behaviors, with uncertain causes, attributed to risk factors ranging from: have older parents, family members with autism and certain genetic conditions that would trigger autism in the most diverse degrees.

This is the most diverse approaches are seen and used both for inclusive education, in order to welcome everyone, and for the best method to be worked on in a given context. In the perspective, mediation and care for autistic people, we highlight

the therapies, methods, strategies, resources and behavioral analyses that may be beneficial to students and patients who need follow-up favoring their motor, psychic and sensory development in view of their limitations a linearity of feeling included.

In this perspective Luft (2020) states that:

Inclusion is the act or effect of including one's inclusion, that is, being part of something, is to be inserted. On the other hand, special education is characterized as an inclusion movement that seeks to overcome the exclusion of people with disabilities favoring the individual to overcome their limitations, having a positive perspective for their development within their conditions. (Page 26)

As soon as we refer to remember exclusion, or simply the different that is not part of a certain medium, or the partner problems that are present in Brazilian society. The historical milestone in special education in Brazil can be described with the creation inspired by the European experience of the institute of the blind boys, (present-day Benjamin Constant Institute) in 1854, and the institute of the deaf (Current National Institute of Deaf Education) in 1857 (Mazzotta, 2005). Pioneers in differentiated education (Special), and pioneer in the revolution of communication and development of people with special needs according to its functionality.

With the Republic of Brazil, proclaimed in 1889, some authors identify education considered special and that in fact should be, with contradictory terms the reality that some students had, in 1990 during the 4th Brazilian Congress of Medicine and Surgery, in Rio de Janeiro, Carlos Eiras presented his Monograph entitled "The Education of Medical-Pedagogical Treatment of Idiots", which at the time was about the pedagogical needs of intellectual disabilities (PEREIRA, 1993), and their limitations as a determinant factor for their non-development, and the creation of new studies that came to be seen as promising, in the question of teaching strategies and methods for these individuals.

2.1 THE ABA METHOD

Even though in an embryonic way, today the attributions of the ABA methodology have gained strength from the knowledge of the population in seeking help to new possibilities according to the didactics to be employed with patients and students who thus had ASD, or, as functional therapy in favor of its full and satisfactory development of which it is understood that autonomy is the main way to include its individuals included.

But what is the functionality of the ABA method? In the school environment, the existing strategies are emphasized in a simple and didactic way so that health and education professionals can appropriate and seek to help cope with the behaviors problems that happen in the learning process of students with ASD.

Aba has several strategies and approaches, forming a vast basis for identifying behaviors based on disorders, and showing great effectiveness in teaching new behaviors and skills in various fields of knowledge and areas.

To understand these behavioral needs, and see how they are selected, it is understood that the environment and observation of the context behind a given conduct will make a total difference throughout the inclusive process.

Thus, the environment will interfere in the action of the individual, and the consequence will be a reinforcer, or not, for a particular practice to be repeated. This movement and called Functional Analysis that applied effectively will bring great results.

Inclusion can be a double-edged sword. It may be something wonderful for everyone's growth, but it can be a cause for suffering for many if it is not well structured and ready to meet the basic needs of the whole process whether inclusive or therapeutic. (MINETO, 2008, p.98).

For this, the right to remain of the individual in school, is established through the Statute of the Child and Adolescent - ECA, regulated by Law No. 8,069, of July 13, 1990, which encompasses the right to equality and permanence as attributes for the permanence in school and the entire inclusive process.

Art. 53. The child and adolescents have the right to education, aiming at the full development of their person, preparation for the exercise of citizenship and qualification for work, assuring them: I - equal conditions for access and permanence in school; II - right to be respected by their educators; (ECA, 1990, Chapter IV).

Therefore, from this law, people with autism have several rights guaranteed by the constitution, one of which is the right to access regular school and, if necessary, attend specialized educational Care - ESA, and therapies that include ABA, functional analysis, psychotherapy and other resources that allow their stay in school and social life that the individual is inserted.

According to Hora (2018, p. 72) "support may be visual, electronic, calendars, daily activity panels, images of what you have to do before and after, social stories for larger students, structured and adapted activities".

Another important document in the defense of rights is the Statute of the Person with Disabilities, Law 13.146, of July 6, 2015, where he instituted the Brazilian Law of Inclusion of the Person with Disabilities enabling new eyes.

POSSIBILITIES TO LEARN FROM MATHEMATICAL GAMES LEARNING THROUGH ERROR

Since ancient times the word error, frightens any human being. Who isn't afraid to take a wrong step in the middle of mined terrain, or fall off their bike when they are taking the first rides of their lives? There are cases that a mistake can be fatal, or simply give you a step to learning people who can develop their skills with games.

It is noteworthy that the error in education in general, if not corrected correctly, can cause serious damage. Knowing that when school and society value only the right, it is right to say that the individual in error has not built any learning.

[...] The teacher is primarily responsible for paying constant attention to verify the error, remembering that the right can camouflage the error. It is important to diagnose how the error occurred. In this phase, it is essential to listen to the student, to talk in order to unseed his/her thinking and his/her motives.

[...] After the diagnosis, it is advisable to propose the student one or more situations with which he can perceive the incoherence of his answers or positions. Helping the student discover new alternatives, we can expect him to rephrase his concepts, correct the error, and thus evolve. (LORENZATO, 2010, p.50).

In a few years, some schools have already adopted a new concept in question of error, thus eliminating the fear of making mistakes in children, leaving it to evolve with the necessary autonomy to develop it.

The error in a new conception is considered a key piece of the teaching and learning process. It is up to the teacher to express respect to the student, because he does not err because he wants to, but because he seeks easier and faster alternatives.

THE S JOGOS AND ITS FUNCTION OF INCLUSIVE SOCIALIZATION

The games stimulate reasoning, memorization, strategy and logic. It is a true social and interactional learning. Knowing that their strategies, organization and stimulation can be interpreted as a joke, it is worth mentioning that such games are

passed from generation to generation, such as: tops, marbles, kite, doll, cars, yellow, chess, lady, bingo, shuttlecock, yo-yo, wireless phone.

Each of them offers different learnings to its players in addition to full fun. Therefore, the objective of ABA is to expand the behavioral repertoire, acquisition of social skills, repertoires, verbal behavior, increase in their autonomy to perform their activities with greater precision and necessary support.

Thus, having a minimization of disruptive behaviors that facilitates social interaction, where for each case there is a specific approach to develop teaching with the support of mathematical games favoring their learning and enabling the possibilities to be worked with the child individually according to a planning that allows their systemic approaches.

[...] individualized planning, periodically evaluated and revised, which considers the student at the current level of skills, knowledge and development, chronological age, level of schooling already achieved and educational objectives of any short, medium and long term (MASCARO 2018, p. 14).

In a sense, its practice stimulates socialization, for example, when there are rules in the game it is of paramount importance that the player respects the limits, thus assimilating his rights, which assures him ECA (Statute of the Child and Adolescent) in Article 15, Law No. 8,069/ July 1990, cited earlier that reports: The child and adolescent have the right to freedom, respect and dignity.

When playing the player has the freedom, the choice of how to make the play, the free will of strategy, with an objective look at victory. At the same time, he exercises respect for his neighbor and practices his dignity, inclusion and aggregates knowledge, provided that mediated in a constructivist way for all players.

When playing the child develops his logical pensamento becomes more accurate, his potential for participation, cooperation, mutual respect, interaction, empathy and criticism. What the child learns in this matter, it leads to his future life.

STIMULATOR INTELLIGENCE IN LOGIC-MATHEMATICS IN ABA METHODOLOGY

How can we stimulate the logical mathematician in special children? What teacher hasn't come across this question yet? What could we say about the logical mathematician? Piaget (1971), in his research, states that play and games are fundamental pieces for logical-mathematical stimulation in children.

However, what cannot be required is that only the teacher (a) of the classroom is responsible for promoting a quality school inclusion, because this duty is of the entire student body of the school, including in its PPP (Political Pedagogical Project), all possibilities of an inclusion that favors the student or patient with special needs.

Aba provides a vast set of resources that should be used to make up an individualized intervention, with behavioral strategies to teach behaviors such as: sitting, imitating, eye contact, waiting for your turn, pointing – prerequisites for literacy and primarily socialization.

The game covers a cognitive, social and physical activity. Piaget also points out that stimuli are awakened through games that present a set of quantities and the perception of the large and small, the high and low, the largest and smallest, the wide and narrow, the thin and thick, the front and the back, the whole and half, the long and short. When stimulated, they can manipulate quantities from zero to ten and understand the number and their respective quantities.

Children from six to twelve years old already understand the operating systems. The ease of calculation is the most appropriate way to obtain logical-mathematical intelligence. This competence is not only for literate people, but for those who are illiterate, as without any discrimination, the mason who perceives geometry when seeing the plan of a house. In the middle of the six years, the matematization of the day to day of the child can be more comprehensive, of the type, makes compared sings with the sizes of objects, the thickness, the distance.

For a better understanding, the use of concrete materials is fundamental, because thus there will be a supreme understanding, either to recognize the amount of numerals, mathematical operations and/or geometry.

Around the age of seven the child already dominates, although timidly and progressively, the operative groupings and thus discovers the ability of classification, serialization and relationship. This possibility opens the doors of logical-mathematical intelligence to the use of numbering systems, but children still cannot reason by simple verbal proposition, requiring concrete elements that allow them to manipulate and make these relationships. There's the big time to use the games. (Celso Antunes, 2007, p. 73).

What characterizes logical-mathematical intelligence is the ease of people who have it on a large scale, to solve problem situations, making numbers and logical reasoning something that particularly pleases them?

They are people characterized by taste and competence in the interpretation and categorization of facts and information, in calculus, in logical reasoning and in the search for explanation for everything. They feel challenged in the face of problems involving reasoning, which they seek to solve in a methodical and persistent way. They have fun solving the puzzles of magazines and newspapers.

The objective of behavioral intervention is to bring the development of children with autism to that of a typical child, through intensive and systematic teaching of the behaviors that the child with autism is not yet able to perform and that leave the development of the child in arrears (GOMES and SILVEIRA, 2016 p. 26).

This type of intelligence develops from an early age, when still children, sometimes because they are gifted and/or motivated and the right way to stimulate them.

The practice of various games is a playful way of developing logical-mathematical intelligence. By way of example we can mention the Game of the Rooster, the Four in line, the Chess and the Sudoku. These are different games, with varying degrees of difficulty, used to stimulate young adults, giving them new resolution skills, concentration and a noticeable look.

THE GAMES AND NATIONAL CURRICULAR PARAMETERS (PCN'S)

The National Curriculum Parameters (PCN's) were created to provide benefits to the student. They are restructured according to the needs of the student. PcN's are quality references for the primary and secondary education of the country prepared by the federal government.

They aim at improvements in national education, in view of a pedagogical project in function of the student's citizenship and a school in which teaching/learning becomes interesting and favors it in all educational aspects.

A set of innovative proposals that cover educational principles that aims to intensify pedagogical content in an attractive and effective way, thus seen the national curriculum parameters.

They have the purpose of creating new links between teaching and society, characterizing a transformation of objectives, content and didactics of teaching.

In relation to playing, the PCN's defend the idea that the game provides better school development, provided that rich experiences are offered between children and games.

Gambling is a natural activity of the development of basic psychological processes: it supposes a doing without external and imposed obligation, although it demands requirement, norms and control (PCN's: 2001 p. 40).

Also according to the principles of the PCN's, through the games, educators can observe the performance of the children together and of each one in particular, thus acquiring a better view in relation to the process of their development and their ability to relate.

[..] Games are an interesting way of proposing problems, because they allow them to be presented in an attractive way and favor creativity in the development of resolution strategies and search for solutions.

[...] It provides the simulation of problem situations that require live and immediate solutions, which stimulates the planning of actions; they enable the construction of a positive attitude towards errors, since situations happen quickly and can be corrected in a natural way, during the action, without leaving negative marks. (PCN's, 2001).

Finally, we can observe that according to the PCN's children need to be supported in their spontaneous initiatives and encouraged to play, diversifying activities. "Gambling is a cultural phenomenon with multiple manifestations and meanings, which vary according to season, culture and context. What characterizes a gambling situation is the initiative of the child, his intention and curiosity. " (Mathematical Education Magazine, 2001). The game should be interesting and challenging, prompting the student to participate, taking into account their stage of mental and physical development.

Therefore, through the games the student obtains a significant school performance. And this is a concept that characterizes the national curriculum parameters, where it proposes teaching methods that stimulate the curiosity of students.

METHODOLOGY

The work was developed in the form of bibliographical research following the study script as follows: Escolha of the theme; preliminary bibliographic survey; formulation of the problem; preparation of the interim plan on the subject; search for

sources; reading of the material; registration; logical organization of the subject; writing of the text.

The bibliographic research is done from the survey of theoretical references already analyzed, and published by written and electronic means, such as books, scientific articles, web pages.

Any scientific work begins with a bibliographic research, which allows the researcher to know what has already been studied about it. There is, however, scientific research based on bibliographic research, seeking theoretical references with the objective of collecting information or previous knowledge about the problem about which the answer is sought. (GERHARDT, SILVEIRA, 2009, p. 32).

According to Gil (2007, p. 44), the most characteristic examples of this type of research are about investigations on ideologies or those that propose to analyze the various positions about a problem.

FINAL CONSIDERATIONS

The teacher is considered the determining agent of the transformation and construction of the citizen, so that his student is adequately prepared to guide access to information and knowledge, aiming at strategies that are easy to understand and that is precarious for an inclusive education.

Thus, the procedural evaluation of their advances, perspectives and longings should be dialogued with the strategies used throughout their life, and it is a necessity that the phase of discovery, identification and understanding of some aspects related to living with autism and the environment in which it is inserted is.

The with ABA method once identified as the intervention possibility, punctuated by the weaknesses and points of attention of the evaluation, I was able to remove, based on these data, to start with the planning associated with the procedural strategies, in which it will be to outline small objectives in the short term.

. Our perspective on our research is seen as something to be constructed through the difficulties of the teaching and learning process that we still find in our exclusionary society.

Games can take effective action against learning difficulties for students with special needs, helping them to stimulate their skills from the perspective of their influence, logic, and difficulties.

Considering the games, as a valuable pedagogical instrument, we believe in their performance and use, which will intervene, enrich and assist in overcoming any difficulties in school life. Taking theory to practice we realized that games stimulated learning. The perception and respect for the other was gradually conquered.

The inclusion of students with special educational needs depends not only on good practice, or excellent teacher training, but on the whole set that act harmoniously, for the sake of a common good: quality in teaching, egalitarian for all, including not only students considered as "normal", but those who need a care or rather saying a proposal for inclusion that enable them to design see themselves within their cognitive conditions their potentialities.

With everything, it was verified the paramount importance of applying the ABA method in Early Childhood Education because they bring benefits because it works in positive behavioral effort, reducing frustrations, ensuring students a learning without errors can help in motivation and pleasure to learn.

By using play, the child develops knowledge that generates autonomy. Therefore, it is understood that the child alone does not characterize the game as a teaching-learning method, because they do not aim for a final result, becoming only a spontaneous action, because, when the child plays, she does not bother with obtaining knowledge or with the evolution of her physical and mental performance. But what has to be valued is the development and execution of play and play, the way in which the child engages and imposes himself in the face of the proposed situations.

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