



Proposal for the implementation of a behavioral intervention program for students with autism spectrum disorder in educational institutions

Marcos Vinicius Bueno de Moraes

Specialist in ABA – Applied Behavior Analysis.

Institution: Universidad Tecnológica Federal do Paraná, Londrina - PR

RESUMO

As the ABA method, behavioral intervention programs have shown a relevant impact on the lives of students and people with Autism Spectrum Disorder. If expanded to educational institutions, the use of this technique can improve the performance of these students in all areas of knowledge. Therefore, this article presents a proposal to implement a behavioral intervention program for autistic students in educational institutions. Based on a bibliographic review in the Google Scholar database, the research is carried out deepening the ABA method, the application of behavioral interventions in Christian educational institutions, and some guidelines are suggested for formalizing a department or sector within the institution, focusing on people with disabilities. The proposal presented lists some functions and activities that this institution sector should perform. In addition, it is proposed to carry out scientific projects, partnerships with research centers and private institutions, and training programs to obtain resources for the creation and maintenance of this department.

Keywords: ABA Method, Inclusion, ASD, Disabilities People.

1 INTRODUCTION

There are many policies for the inclusion of people with disabilities in today's society, without much clear information on how it should work. The United Nations (UN) itself, based on sustainable goal Number 8 (Decent work and economic growth) had as its theme for World Autism Awareness Day (April 2) 2021 the inclusion of autistic people in the post-pandemic workplace (UN, 2022). However, there is no clarity on how this process of insertion and adaptation of people with autism in the work environment works or would work.

The popularization of the National Policy on Special Education from the Perspective of Inclusive Education (BRASIL, 2008) increased the number of students with Autism Spectrum Disorder (ASD) in schools in our country. In general, this document ensures the inclusion of students with ASD in the regular school system, receiving specialized educational care (NUNES; AZEVEDO; SCHIMIDT, 2013), in addition to guaranteeing the right to education, in accordance with article 27 of the Brazilian Law for the Inclusion of Persons with Disabilities (BRASIL, 2015). However, given the general treatment of the law that aims to support a generality of disabled people, Santanna and Gomes (2019) highlight the difficulty of its efficient application to students with ASD. In addition, there is a great difficulty in interpreting the word inclusion, which many understand as just abrupt insertion of students, without the correct adaptation of the



place for autistic students, including the difficulty of the professionals themselves in the area of teaching and psychology (MORAIS, 2022).

Considering the important role of the school in the lives of students with ASD, also in a post-pandemic period such as COVID-19, it is important to understand how the ABA (Applied Behavior Analysis) method (*Applied Behavioral Analysis*) could help to facilitate the process of including these students in mainstream education. The ABA method has had very promising results within the family environment (ZACHOR *et al.*, 2007), which can be extended to the school environment through the continuous training of teachers in basic and higher education institutions (MAKRYHIANNI *et al.*, 2018). In addition, from the central point of view of Christian education, students with ASD have obtained positive results in the academic sphere, as teachers demonstrate passion and charisma in the educational process. Hall (2019) presents comments from Christian school teachers and their relationships with students with ASD, with emphasis on:

"... He showed me, this is the least I have to offer and I'm giving it to you; What an honor to be chosen. I don't have a lot of compliments. I don't have a lot of trophies, I don't have a lot of people knocking on my door... You swallow your pride and you learn what it's like to serve and actually watch these kids fight and no one really understands your struggle or your determination... (Jillian, interview, December 12, 2018)." (HALL, 2019, p. 178).

Thus, the general objective of this article is to establish a proposal for the implementation of behavioral interventions for autistic students in the educational environment of Christian educational institutions. To this end, the following specific objectives will be carried out: to understand the ABA method and its importance in the development of students with ASD; investigate the use of behavioral intervention, focusing on the ABA method, in the school environment of Christian institutions for different areas of knowledge and levels of education; and finally, to propose an educational management model for people with disabilities, with a focus on ASD, to promote the use of the ABA method and behavioral intervention for the entire school community.

This work is an exploratory research, with a bibliographic search in the Google Scholar database through keywords, in English. The following terms were used for research: "autism ABA therapy", "ABA Applied school", "*ABA Applied STEM*" and "*ABA Christian School*" which mean – in free translation – "autism therapy ABA", "ABA applied school" and "ABA applied Science, Technology, Engineering and Mathematics" and "*ABA Christian School*", respectively. The search was conducted on February 28, 2022, returning approximately 33700, 242000, 103000, and 49,900 items for each topic, respectively. Documents with titles most related to the theme of work in the areas of education, psychology and social sciences were selected, without focusing on a specific author. However, priority was given to more recent articles, seeking the state-of-the-art of the subject. Chapter 2 presents a general context about the ABA method, from its



definition to the efficacy promoted to individuals with ASD. In chapter 3, an analysis of the role of behavioral intervention in school is presented. In this chapter, we present some results that include Christian educational institutions at all academic levels, from preschool to university. In chapter 4, a proposal is presented for the implementation of a specific sector in the institutes, focusing on people with disabilities, with suggestions and guidelines that aim to facilitate the process of inclusion of students with ASD in the institutions. Finally, in chapter 5 we have the conclusions of the work carried out.

2 THE ABA METHOD

The method of Applied Behavior Analysis (ABA) is a science that was established in the early second half of the twentieth century as an evaluation and selection of changes in human behavior based on the conditioning principles stipulated by Skinner (1953). Basically, the operating condition of ABA can be defined as a process in which environment and behavior interact to form the behavioral repertoire of an organism or individual. Baer, Wolf and Risley (1968) define the ABA method in three primary characteristics (applied, behavioral and analytical), and another four secondary characteristics (technological, systematically conceptual, effective and demonstrating generality).

Matson (2009), using the works of Watson (1919), says that the beginning of the use of the application of the ABA method dates from the beginning of civilization itself, since the history of psychology begins "from the existence of two individuals living close to each other so that the behavior of one influences the behavior of the other" (WATSON, 1919, p. 2). Its application to people with ASD can best be described from the beginnings of experimental psychology (MATSON, 2009).

The popularization of the ABA method can be attributed to the work of Skinner (1904-1990; LABRADOR, 2004), who received a PhD in Psychology from Harvard University in 1931, and who discovered important principles of operant conditioning, which involves the use of reward and punishment as a type of learning. This applied to complex human behavior: desired behaviors are positively reinforced, while unwanted behaviors are negatively reinforced.

Morris, Smith and Altus (2005, p. 6) define ABA as the field of applied behavior analysis developed from Skinner's operating principles in the 50s and 60s, and which is characterized as: (1) a science of understanding human behavior; (2) as a technology to help people achieve the desired change in behavior; (3) Application of ABA are more common with children and adults with severe disabilities.

As a science, which has one or more application methods, we must understand the role, importance, and impact of each step of the ABA method. Anderson and Romanczyk (1999) describe the common programmatic elements of the ABA method for children with autism, understanding that behavior is seen as the result of a complex mix of variables that include the individual's strengths and limitations, physical status, history, and social-environmental environment. In addition, the authors highlight the multiple



learning context that the ABA method can present for children and young people with ASD, encouraging its use in the family environment, in the involvement with parents and in the natural context of learning, seeking independence and learning new skills (SMITH et al., 1997).

One of the characteristics of autism is the difficulty of mastering communication. In general, children with autism have disabilities in several language domains, and it is necessary to establish priorities in the application of the intervention. Goldstein (2002) points out that behavioral techniques aimed at improving communication end up affecting other important components in the treatment of ASD, such as social interaction. The author also highlights the importance of parent and classroom training in communication intervention for treatment effectiveness. This interaction with parents and family members has also been confirmed more recently, especially in the aspects that favor interventions in home-based programs (GRINDLE *et al.*, 2009). Jensen e Sinclair (2002) demonstrate that behavioral intervention and the ABA method can contribute to the effectiveness of treatment development. Zachor *et al.* (2007) showed that the ABA intervention had a significant improvement in reciprocal social interaction, considering a group of twenty-two children with severe autism, similar cognitive abilities and socioeconomic status. The study compared to an eclectic development method, combining both TEACCH strategies (TEACCH and *Treatment and Education of Autistic and Communication Handicapped Children*; ZENG *et al.*, 2021) and ABA, with only the application of the ABA method. Through the ADOS test before and after one year of intervention, the authors show that children and young people with ASD had a significant improvement only with the application of the ABA method.

Recently Markeygianni *et al.* (2018) conducted a study that evaluated the efficacy of the ABA intervention based on three domains related to the child: IQ scores performed by verbal and nonverbal standardized tests, receptive and expressive language, and adaptive behavior. The study compared situations before and after the intervention. The results indicate that ABA programs have moderate to high efficacy rates, bringing significant benefits to children with ASD in the aforementioned areas. Improvements in intellectual skills, communication and expressive and receptive language stand out.

3 INTERVENTION IN CHRISTIAN EDUCATIONAL INSTITUTIONS

The term inclusion can be understood as "the practice of educating students with disabilities in the general education classroom environment" (ZINKIL and GILBERT, 2000, p. 225). This premise is also valid for students with ASD, as they tend to be better developed when they have opportunities to interact with other typically developing students (STRAIN, SCHWARTZ and BARTON, 2011). What's more, social interaction should be considered a fundamental and ongoing element in the treatment plan for children diagnosed with ASD.



Through the analysis of the execution of combat tasks in ten stages, Stokes *et al.* (2010) used a behavioral intervention to teach skills to American football athletes in high school, in the United States, in physical education classes. The authors point out that behavioral interventions can improve the tackling skills of soccer athletes. Although this study does not focus directly on students with disabilities, it demonstrates the effectiveness and importance of behavioral interventions, such as the ABA method, which can contribute not only to students with ASD, but to the entire class, ensuring the process of educational inclusion.

For Science, Technology, Engineering and Mathematics (STEM) teaching (*Science, Technology, Engineering and Mathematics*), studies prove that students with ASD may have learning difficulties, but that with the right intervention it can greatly improve development in this area (EHSAN *et al.*, 2018; MORAIS, 2022). In general, the ABA method, including stimulation and modeling, is effective in teaching science and mathematics to individuals with ASD (HART and WHALON, 2008). The methodology is similar to the instructional procedures that teachers apply to improve adaptive and social skills (CAMARGO *et al.*, 2014; HONG *et al.*, 2016).

In general, Christian educators believe in the effectiveness of the ABA method and promote its practice (HENDRICKSON, 2009), and there are Christian colleges and universities with training programs to help educators understand and deal with behavioral problems (TRINITY CHRISTIAN COLLEGE, 2022). Sargeant e Berkner (2015) conducted a quantitative survey of the perception and challenges of Seventh-day Adventist school teachers in the process of inclusion in classrooms in the United States. The results of this research show that teachers revealed five important perceptuals. First, teachers have positive reactions to inclusion. Second, accommodations help students with mild disabilities succeed in the regular classroom. Third, inclusion classrooms can be based on Christianity. Fourth, support staff in the school need to develop policies to accept students with disabilities. Finally, Adventist teachers can identify children with special needs. In the end, two challenges to implementing inclusive classrooms were identified: first, to develop policies and resources for teachers to use, and – second – to provide the necessary training to help teachers succeed in an inclusive classroom.

The application of the ABA method in schools, colleges and universities is old, but little documented. Nevertheless, the studies found in the literature demonstrate the effectiveness of the application of the technique in several areas of knowledge. For example, in a study conducted in a small American school with students ages 3 to 21 with multiple disabilities, Selinske, Greer e Lodhi (1991) demonstrated that the correct training of educators in the application of the ABA method significantly improved the way of teaching and learning, both from the perspective of teachers and students. In this work, the method became known as CABAS (from English, *Comprehensive Application of Behavior Analysis to Schooling*). This training for the educational team can be carried out after regular school activities (REIN, 2013).

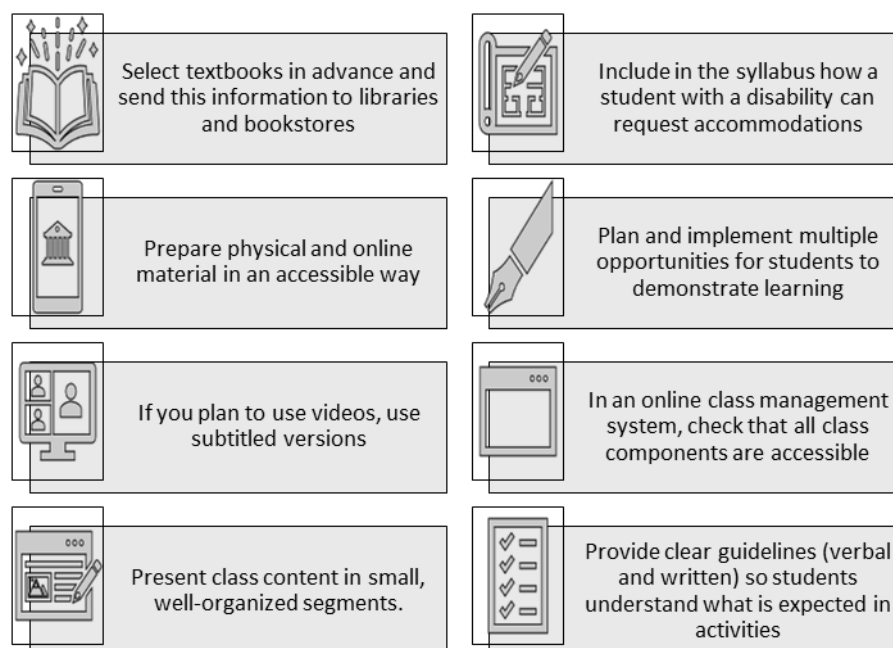


In addition to the educational benefits, the implementation of ABA intervention in public and private educational institutions can also bring economic improvements. In a two-year study conducted in Pennsylvania, in the United States, it indicates that with early and intensive intervention based on the principles of ABA, children with autism can achieve intellectual, academic, communication, social and daily living skills within the normal range (JACOBSON, MULICK GREEN, 1998). At different efficacy rates and in constant dollars, the authors estimated through cost-benefit models that the cost savings for regular educational institutions for a child or young person with ASD who have periodic ABA intervention ranges from \$187,000 to \$203,000 when compared to people in the same condition but without any therapeutic support.

4 IMPLEMENTATION PROPOSAL IN EDUCATIONAL INSTITUTIONS

Considering the behavioral intervention applied to educational institutions described in the previous section, the importance of implementing these techniques in schools and colleges is noted. Witzel *et al.* (2015) They made some suggestions to educators to help in the process of including students with disabilities in Seventh-day Adventist colleges and universities. Figure 1 presents these suggestions, supported by both face-to-face and distance learning, as well as in the hybrid modality. The guidelines suggested by Witzel *et al.* (2015) deals with the inclusion process for students with disabilities in general. It can also be applied at any level of academia.

Figure 1. Suggestions for assisting students with disabilities in educational institutions.



Source: The author, based on Witzel *et al.* (2015).



All items presented can be directed to students with ASD. In addition, the authors suggest the creation of a department focused on educational management for people with disabilities (PWD). This department would have the following functions:

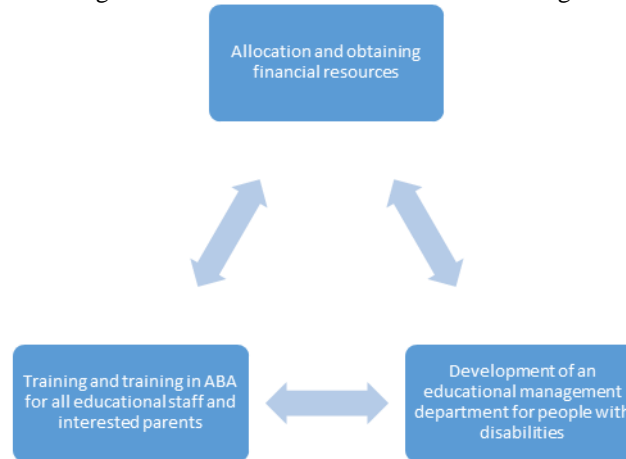
- Learn more about services and public policies for PWD.
- Form a network with others working in the field.
- Keep institution administrators and directors up to date
- Develop policies for PWDs within the institution itself.
- Apply procedures, such as interviews, collect data, and notify faculty.

Supported by these guidelines, it can be understood that the application of the ABA method has a significant improvement in all aspects for students with ASD, in several areas of knowledge. Thus, the proposal to develop after-school programs to train and qualify teachers and the entire educational team of the institution should also be taken into consideration (REIN, 2013). This training could be considered for family members and people close to the students, and should be the responsibility of the department focused on educational management for people with disabilities, from the hiring of specialized personnel or companies that work in the sector.

One of the greatest difficulties for the implementation of this proposal lies in the allocation of financial resources for the formalization of this department. In this sense, the first suggestion would be the presentation of projects in state and national scientific research funding agencies, with the support of research centers in the area of Psychology and Education, from private institutions. Another suggestion, more feasible for private education institutions, would be to consider charging a monthly fee for parents interested in training in the ABA method. Depending on the characteristics of the educational institution, one way to raise funds and develop high-level research would be to develop graduate programs in the area of behavioral intervention. Figure 2 presents a diagram that characterizes this cycle of the proposed formation of an educational management department for people with PWD. Thus, from the formation of the department, it would also have the function of guaranteeing financial resources for its maintenance.



Figure 2. Cycle of training and maintenance of the educational management sector for PWDs.



Source: The author.

5 CONCLUSION

In this work, an exploratory qualitative research was carried out in order to develop a proposal for the implementation of behavioral interventions in educational institutions. Given the different characteristics and academic models of teaching, it focused on Christian institutions.

In general, the ABA method demonstrates high efficacy in all aspects related to people with ASD, such as improvement in verbal and physical communication, and in social interaction. In this sense, a behavioral approach can improve academic performance for these students in several areas, from physical activity to knowledge in science and technology. Several educational institutions have used the technique. Christian colleges have even proposed *stricto-sensu* graduate programs in education from a behavioral perspective.

In the proposal suggested in this study, which follows the guidelines of Witzel *et al.* (2015), introduces a sector dedicated to people with disabilities. This department would be responsible for monitoring the entire school community, including the families of students with ASD. Within the scope of this department would be the search for and maintenance of resources, one of the main difficulties of policies for the inclusion of students with disabilities. Participation in research projects with financial resources, in addition to the training of parents – financed by them – and teachers, can be an alternative for organizing the institution and improving the process of inclusion of students with ASD and other disabilities.



REFERENCES

- ANDERSON, S. R.; ROMANCZYK, R. G. Early intervention for young children with autism: Continuum-based behavioral models. *Journal of the Association for Persons with Severe Handicaps*, v. 24, n. 3, p. 162–173, 1999.
- BAER, Donald M.; WOLF, Montrose M.; RISLEY, Todd R. Some current dimensions of applied behavior analysis. *Journal of applied behavior analysis*, v. 1, n. 1, p. 91, 1968.
- BRASIL. Lei No 13.146, de 6 de julho de 2015. Institui a Lei Brasileira de Inclusão da Pessoa com Deficiência (Estatuto da Pessoa com Deficiência). Brasília, DF, 2015. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2015/lei/l13146.htm. Acesso em: 10 out. 2021.
- BRASIL. Política Nacional de Educação Especial na Perspectiva da Educação Inclusiva. Brasília, DF, jan. 2008. [Documento elaborado pelo Grupo de Trabalho nomeado pela portaria n. 555/2007, prorrogada pela portaria n. 948/2007, entregue ao ministro da Educação em 7 de janeiro de 2008]. Disponível em: <http://portal.mec.gov.br/arquivos/pdf/politicaeducespecial.pdf>. Acesso em: 10 out. 2021.
- CAMARGO, Sígla Pimentel Höher et al. A review of the quality of behaviorally-based intervention research to improve social interaction skills of children with ASD in inclusive settings. *Journal of autism and developmental disorders*, v. 44, n. 9, p. 2096-2116, 2014.
- EHSAN, H. *et al.* A Systematic Review of STEM Instruction with Students with Autism Spectrum Disorders. *Review Journal of Autism and Developmental Disorders*, v. 5, n. 4, p. 327–348, 2018.
- GOLDSTEIN, H. Communication Intervention for Children with Autism: A Review of Treatment Efficacy. *Journal of Autism and Developmental Disorders*, v. 32, n. 5, p. 373–396, 2002.
- GRINDLE, C. F. *et al.* Parents' experiences of home-based applied behavior analysis programs for young children with autism. *Journal of Autism and Developmental Disorders*, v. 39, n. 1, p. 42–56, 2009.
- HALL, Gale Dionne. A transcendental phenomenological study on the experiences of Christian school teachers educating students with autism spectrum disorder. 2019. Disponível em: <https://digitalcommons.liberty.edu/doctoral/2036/>. Acesso em 07 de março de 2022.
- HART, Juliet E.; WHALON, Kelly J. Promote academic engagement and communication of students with autism spectrum disorder in inclusive settings. *Intervention in School and Clinic*, v. 44, n. 2, p. 116-120, 2008.
- HENDRICKSON, Laura. *Finding Your Child's Way on the Autism Spectrum: Discovering Unique Strengths, Mastering Behavior Challenges*. Moody Publishers, 2009.
- HONG, Ee Rea et al. The effects of video modeling in teaching functional living skills to persons with ASD: A meta-analysis of single-case studies. *Research in Developmental Disabilities*, v. 57, p. 158-169, 2016.
- JACOBSON, J. W.; MULICK, J. A.; GREEN, G. Cost-benefit estimates for early intensive behavioral intervention for young children with autism - General model and single state case. *Behavioral Interventions*, v. 13, n. 4, p. 201–226, 1998.
- JENSEN, V. K.; SINCLAIR, L. V. Treatment of autism in young children: Behavioral intervention and applied behavior analysis. *Infants and Young Children*, v. 14, n. 4, p. 42–52, 2002.



- LABRADOR, F. J. Skinner and the rise of behavior modification and behavior therapy. *The Spanish Journal of Psychology*, v. 7, p. 178–187, 2004.
- MAKRYGIANNI, M. K. *et al.* The effectiveness of applied behavior analytic interventions for children with Autism Spectrum Disorder: A meta-analytic study. *Research in Autism Spectrum Disorders*, v. 51, n. March, p. 18–31, 2018.
- MATSON, J. L. *Applied Behavior Analysis for Children with Autism Spectrum Disorders*. New York: Springer, 2009.
- MORAIS, M. V. B. DE. Comparação sobre ensino de matemática para pessoas com Transtorno Autista utilizando técnica de Mineração de texto. *REMAT: Revista Eletrônica de Matemática*, v. 8, n. 1, p. e2002, 2022.
- MORRIS, E. K.; SMITH, N. G.; ALTUS D. E. B. F. Skinner's contributions to applied behavior analysis. *The Behavior Analyst*, v. 28, p. 99-131, 2005.
- NUNES, D. R. de P.; AZEVEDO, M. Q. O.; SCHMIDT, C. Inclusão educacional de pessoas com Autismo no Brasil: uma revisão da literatura. *Revista Educação Especial, Santa Maria, RS*, v. 26, n. 47, p. 557-572, 6 nov. 2013. DOI: <https://doi.org/10.5902/1984686X10178>
- ONU – Organização das Nações Unidas. Strengthen inclusion, participation of people with autism to ‘achieve their full potential’ says UN chief. Disponível em: < <https://www.un.org/en/desa/strengthen-inclusion-participation-people-autism-%E2%80%98achieve-their-full-potential%E2%80%9999>>. Acesso em 28 de fevereiro de 2022.
- REIN, M. *Applied Behavior Analysis Training for after-school staff: A grant proposal*. [s.l.] California State University, 2013.
- SANTANNA, B. G.; GOMES, A. C. A revisão da Lei Brasileira de inclusão à pessoa com deficiência (Lei N.13146/15) e as falhas na sua aplicação. *Revista de Iniciação Científica e Extensão da Faculdade de Direito de Franca, Franca, SP*, v. 4, n. 1, p. 141-158, jun. 2019. DOI: <https://doi.org/10.21207/2675-0104.2019.917>.
- SARGEANT, M. A. A.; BERKNER, D. Seventh-Day Adventist Teachers’ Perceptions of Inclusion Classrooms and Identification of Challenges to Their Implementation. *Journal of Research on Christian Education*, v. 24, n. 3, p. 224–251, 2015.
- SELINSKE, J. E.; GREER, D.; LODHI, S. A Functional Analysis of the Comprehensive Application of Behavior Analysis to Schooling. *Journal of Applied Behavior Analysis*, v. 24, n. 1, p. 107–117, 1991.
- SKINNER, B. F. (1953). *Science and human behavior*. New York: Simon & Schuster.
- SMITH, T.; EIKESETH, S.; LEVSTRAND, M.; LOVAAS, O. I. Intensive behavioral treatment for preschoolers with severe mental retardation and pervasive developmental disorder. *American Journal on Mental Retardation*, v. 102, p. 238-249, 1997.
- STOKES, J. V.; LUISELLI, J. K.; REED, D. D. A Behavioral Intervention for Teaching Tackling Skills To High School Football Athletes. *Journal of Applied Behavior Analysis*, v. 43, n. 3, p. 509–512, 2010.
- STRAIN, P.S.; SCHWARTZ, I.S.; BARTON, E.E. Providing interventions for young children with Autism spectrum disorders: What we still need to accomplish. *Journal of Early Intervention*, v. 33, n. 4, p. 321-332, 2011.



TRINITY CHRISTIAN COLLEGE. M.A. Special Education: Behavior Intervention Specialist (+ABAI VCS & LBS II: BIS Endorsement Sequence). Disponível em: <<https://www.trnty.edu/academic-program/graduate-special-education-lbsi/major-minors/special-education-behavior-intervention-specialist-ma-bcba-certification-eligibility-and-lbs-ii-bis-endorsement/>> Acesso em: 06 de março de 2022.

WATSON, J. B. (1919). Psychology from the standpoint of a behaviorist. Philadelphia and London: J. B. Lippincott Co

WITZEL, C.; GREULICH, L.; JEFFERY, J. Accomodating Students with Disabilities in Higher Education. The Journal of Adventist Education, v. 49, p. 43–46, 2015.

ZACHOR, D. A. *et al.* Change in autism core symptoms with intervention. Research in Autism Spectrum Disorders, v. 1, n. 4, p. 304–317, 2007.

ZENG, Hongling et al. Effect of the TEACCH program on the rehabilitation of preschool children with autistic spectrum disorder: A randomized controlled trial. Journal of Psychiatric Research, v. 138, p. 420-427, 2021.

ZIKIL, S.S.; GILBERT, T.S: Parents' view: What to consider when contemplating inclusion. Intervention in School & Clinic, v. 35, n. 4, p. 224, 2000.