

## **ASD and Inclusion: Teacher Training and the Use of Alternative and Extended Communication in Inclusive Educational Contexts**

**Robéria Vieira Barreto Gomes (Corresponding Author)**

UFC – Federal University of Ceará

Fortaleza, Ceará, Brazil

ORCID: <https://orcid.org/0000-0001-7783-7376>

E-mail: [roberia.vieira@ufc.br](mailto:roberia.vieira@ufc.br)

**Heloisa Fonseca Barbosa**

PUCRS – Pontifical Catholic University of Rio Grande do Sul

Porto Alegre, Rio Grande do Sul, Brazil

ORCID: <https://orcid.org/0000-0003-2134-2790>

E-mail: [heloisa.fonseca@hotmail.com](mailto:heloisa.fonseca@hotmail.com)

**Ademárcia Lopes de Oliveira Costa**

UFAC – Federal University of Acre

Rio Branco, Acre, Brasil.

ORCID: <http://orcid.org/0000-0001-9570-6660>

E-mail: [ademarciaacosta@gmail.com](mailto:ademarciaacosta@gmail.com)

**Francisca Janaina Dantas Galvão Ozório**

IFCE – Federal Institute of Education, Science and Technology of Ceará

Maranguape, Ceará, Brazil

ORCID: <https://orcid.org/0000-0001-8826-8578>

E-mail: [jana.ozorio@hotmail.com](mailto:jana.ozorio@hotmail.com)

**Petrônio Cavalcante**

UNILAB – University for International Integration of the Afro-Brazilian Lusophony

Redenção, Ceará, Brazil

ORCID: <https://orcid.org/0000-0002-4732-7014>

E-mail: [petronioprofessor3@gmail.com](mailto:petronioprofessor3@gmail.com)

**João Carlos Braga Torres**

IFCE – Federal Institute of Education, Science and Technology of Ceará

Umirim, Ceará, Brazil

ORCID: <https://orcid.org/0000-0003-2528-3695>

E-mail: [joaocarlosbraga001@gmail.com](mailto:joaocarlosbraga001@gmail.com)

**Igor de Moraes Paim**

IFCE – Federal Institute of Education, Science and Technology of Ceará  
Maranguape, Ceará, Brazil

ORCID: <https://orcid.org/0000-0000-0001-9968-2213>

E-mail: [igormoraes@ifce.edu.br](mailto:igormoraes@ifce.edu.br)

**Sinara Mota Neves de Almeida**

UNILAB – University for International Integration of the Afro-Brazilian Lusophony  
Redenção, Ceará, Brazil

ORCID: <https://orcid.org/0000-0002-8183-1636>

E-mail: [sinaramota@unilab.edu.br](mailto:sinaramota@unilab.edu.br)

**Abstract**

*In recent decades, there has been a search for a model of education that allows the participation of all students in the same school space, that is, an inclusive school. Inclusion of students with autism spectrum disorder (ASD) has been a recurring topic and has posed challenges for teachers, families and school management aiming at the participation of these students in the school environment and its pedagogical practices. ASD is currently classified as a neurodevelopmental disorder marked, mainly, by the difficulty of interaction and social communication (APA, 2014). As a result, it is common for students with ASD to present verbal and/or nonverbal communicative deficits. Given the pivotal role communication has in ensuring the socialization and educational inclusion of students with autism, this research seeks to answer the following questions: How does teacher training prepare teachers to help students with ASD? What resources of alternative and/or extended communication (AEC) can enable students with ASD to better communicate with their teachers? In order to answer these questions, the present paper investigates the theoretical and political foundations that regulate the inclusion of students with ASD in regular school, and analyzes teacher training in its relation to promoting their inclusion. Thus, the present paper discusses teacher training for the use of AEC tools in the regular classroom. It is believed that the great challenge teachers face is continuing education of the pedagogical strategies and practices for assisting students with ASD in their learning processes in the regular classroom. This paper also addresses relevant public policies and the responsibility of the public power to effectively promote education for all, an education that respects the Other as a true Other.*

**Keywords:** ASD; inclusion; alternative and extended communication; teacher training.

**1. Introduction**

In the last few decades – especially after Brazil’s endorsement of the international and domestic treaties stating the importance of students sharing the same school environment, as well as the approval of the Brazilian National Policy for Special Education in the Perspective of Inclusive Education (PNEEPEI, 2008) –, the social inclusion of students with autism spectrum disorder (ASD) has been debated among

educators who seek to develop activities that will encourage the participation and learning of these students in the regular school system (NUNES; AZEVEDO; SCHMIDT, 2014, WALTER; NUNES, 2013).

ASD is currently classified as a neurodevelopmental disorder marked, mainly, by the difficulty of interaction and social communication (APA, 2014). As a result, it is common for students with ASD to present verbal and/or nonverbal communicative deficits. The scientific literature points that, approximately, 20% to 30% of people with ASD do not develop spoken language, and those who do may show lack of colloquial exchanges or speech that is contextually ill-adjusted, echolalic or repetitive (AVILA, 2011; KLIN, 2006).

According to Passerino and Bez (2015), communication is pivotal to ensure socialization and school inclusion of students with ASD. They argue that, in order to enable students with ASD to access school knowledge and participate in the activities proposed in regular educational institutions, it is necessary for teachers to use complementary, supplementary or amplifying means of communication. In these cases, alternative and extended communication (AEC) may be seen as a promising resource to support the development of communication skills and social interaction in the regular classroom and, consequently, favor the inclusion of people with ASD who present communicative deficits (PASSERINO; BEZ, 2015).

Therefore, the present research seeks to answer the following questions: How does teacher training prepare teachers to help students with ASD? What AEC resources can enable students with ASD to better communicate with their teachers? It focuses on the theoretical and political foundations of the inclusion of students with ASD in regular schools, analyzes teacher training in its relation to the inclusion of these students, and identifies the AEC resources which facilitate their communication with teachers in the regular classroom.

We draw upon authors who show the relevance of AEC as a pedagogical resource to promote the communication skills of children with ASD (GONÇALVES, 2011; OLIVEIRA, 2015; MANZINI, 2015). Furthermore, reviews of literature were consulted that point towards the relevance of the use of the Picture Exchange Communication System (PECS) in the development of communicative skills of people with ASD, thus facilitating student-teacher communication, as well as the development of other interpersonal skills (OLIVEIRA *et al.*, 2015).

Thus the present paper presents a discussion of teacher training for the use of AEC in the regular classroom, and is organized as follows: section 2 details the Methodology; the research results – encompassing the concept and principles of ASD, teacher training in assisting students with ASD in the regular classroom, and the professionals and AEC resources that help teachers in this task – are presented in sections 3 to 5; our concluding remarks compose section 6.

## **2. Methodology**

Scientific research is continuous, complex and plural, and this is particularly true when its themes are multidimensional and their aspects, concepts, representations and knowledge, as is the case of inclusive education, with emphasis on teacher training and ASD. Ferrari (2015), and Bornmann and Mutz (2015) state there is a periodic need to synthesize the knowledge produced in a given field, as the volume and speed of output is very high in the technological society. In addition, revisional work allows for a panoramic view of divergences and consensus, the technical updates within a field, and even the gaps regarding themes and subjects of research (BOLDERSTON, 2008; MENDES-DA-SILVA, 2019).

The present research follows a qualitative approach, and belongs to the narrative review type – which, according to Rother (2007), is suitable to describe and discuss the “state of the art”, that is, the current level of theoretical or conceptual development of a field. The scientific community shows high interest in narrative reviews, as they not only allow to detail relevant aspects of the advances in a field, but also present research opportunities (MENDES-DA-SILVA, 2019).

Rother (2007) further suggests that the structure of a narrative review paper is fourfold, comprising an introduction, development (with sections that deal with the topics of the subject), comments and references. However, it is possible to add a fifth session, detailing the methodology adopted, and this is common practice in articles of this genre.

Narrative reviews are generally organized around broad central issues, not specific questions; they use unspecified sources and data selection; however, it uses scientific and reliable sources, and their selection is guided by the authors’ judgment – which has attracted criticism, as a source of bias (COOK *et al.*, 1997). The risk of bias in the selection of sources was eschewed by the high relevance of the works selected, their technical quality and concatenation within the theme in focus.

Narrative reviews are ideal to build general debates, resume previous discussions in current context, and highlight gaps in the knowledge construction of a field of research. The knowledge here summarized is predominantly qualitative, and its assessment is highly variable (ROTHER, 2007; FERRARI, 2015; COLLINS; FAUSER, 2005).

Narrative review was thus found to be most suitable to the features and research interests here pursued; it seemed the best way to approach them in a broad, consistent and up-to-date fashion.

## **3. ASD: Concept and foundations**

The history of autism, in Brazil and worldwide, is strongly marked by stigma, ignorance and intolerance. Although ASD is currently one of the most researched disorders in several fields, this was not always the case. Science had long neglected the condition of people with ASD; consequently, they were commonly

misdiagnosed with other disorders, and institutionalized in environments unsuitable to meet their real needs, and to help them develop their socio-educational potential.

The first studies on ASD were conducted only in the beginning of the twentieth century by health professionals, mostly psychiatrists. The term “autism” began to be used around 1910 by psychiatrist Eugen Bleuler (DONVAN; ZUCKER, 2017; BRAGA, 2018). Bleuler used it to refer to one of the symptoms shown by adolescent and adult patients with schizophrenia who tended to disconnect from social interactions, and focus on their own fantasies and thoughts.

In the 1940s, psychiatrists Leo Kanner (1943) and Hans Asperger (1944) published parallel studies in which they described cases of children whom they assisted, and who presented significant difficulties and impairments in communication and social interaction (DONVAN; ZUCKER, 2017). These studies, especially that of Kanner (1943), resulted in the recognition of a new diagnostic condition, currently called ASD.

After the medical community acknowledged ASD as a new diagnostic condition, studies on autism focused on identifying the genesis of this disorder; as it was considered too rare, scientists sought to understand why some people “present” autism while others do not.

Given the uncertainties regarding the etiology of ASD, one of most historically acknowledged theories among specialists was popularized by psychoanalyst Bruno Bettelheim, who defended the theory of maternal accountability and the term “refrigerator moms”. In 1967, Bettelheim published *Empty Fortress: Infantile Autism and the Birth of the Self*, in which he argued that autism would be a disorder of emotional and relational origins in which the child, not feeling welcomed in the family environment, would choose to inhabit an “empty fortress”, and surrender to a state of complete loneliness (LOPES, 2017).

The understanding that family rejection, especially maternal rejection, encouraged children to enter an “empty fortress” led Bettelheim to counsel the medical community to remove children diagnosed with ASD from family life (LOPES, 2017). Bettelheim’s theory on the etiology of autism enjoyed international acceptance for more than two decades and, as a result, many children, upon being diagnosed with ASD, were referred to institutions that isolated them from social life, and often remained institutionalized for the rest of their lives.

Currently, contrary to the theory that autism is a disorder of relational origin acquired through family upbringing, the neurodiversity<sup>1</sup> paradigm argues that the genesis of ASD is neurobiological and that, therefore, it is impossible to develop ASD in life, nor should a cure be sought (FADDA; CURY, 2016). Souza defines neurodiversity as the notion that “non-standard” neurological conditions are natural

---

<sup>1</sup> Australian sociologist Judy Singer is considered the creator of the term “neurodiversity” due to her pioneering thesis on the subject, later transformed into the book *Neurodiversity: the Birth of an Idea*.

variations, that is, they are part of human diversity. Souza states they are not due to a tragedy, “brain imbalance” or a “limitation”; they are simply different neural connections (2018, p. 1).

According to this understanding, from the perspective of neurodiversity, ASD is, above all, a different human condition that must be respected and valued like any other. It should be noted that neurodiversity does not deny the occasional need of health interventions for ASD patients; however, it posits that these actions should not be aimed at “curing” individuals or trying to make them “indistinguishable from their peers”.

Interventions should be planned and conducted as to stimulate the autonomy, independence and communication of ASD patients, inserting them progressively and comfortably into their community, without the need to eliminate their autistic identity or suppress their autistic behaviors (SOUZA, 2018, p. 1).

The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5<sup>2</sup>)*, consistent with the understanding of neurodiversity that it is not possible to “develop” autism throughout life, classifies ASD as a neurodevelopmental disorder present since birth (even though it is usually noticeable only in the early years of child development), and distinguishes three support levels: I (mild, requiring support), II (moderate, requiring substantial support), and III (severe, requiring very substantial support) (APA, 2014).

It is the exclusive task of doctors, usually pediatricians, child psychiatrists or neurologists to diagnose ASD, through observation and interviews with family members, caregivers and with the patients themselves, depending on their age.

#### **4. Teacher training in helping students with ASD in the regular classroom: collaborative work among Specialized Educational Service teacher, main teacher and “specialized caregiver”**

Thinking teacher training related to assisting students with ASD to learn requires reflection on how teacher training is established in the current Brazilian legislation.

In the Brazilian legal system, Law No. 12,764/2012 establishes the National Policy for the Protection of the Rights of People with Autism Spectrum Disorder, which has as its guideline encouraging the training of professionals specialized in the care of people with ASD (BRAZIL, 2012). One of the services regulated for teacher training in working with students with autism is Specialized Educational Service (SES). The provider of this service should be articulated with the teacher of the regular classroom, in order to promote

---

<sup>2</sup> Diagnostic and Statistical Manual developed by the American Psychiatric Association (APA) to define the criteria for the diagnosis of mental disorders.

the teaching-learning process, that is, school inclusion. The above-mentioned law also establishes that, in cases of proven necessity, the person with ASD included in the regular classroom, in accordance with Paragraph IV, art. 2 of the above-mentioned law, will be entitled to a specialized caregiver (BRAZIL, 2012).

According to current legislation, teacher training to work with autistic students involves a collaborative work of three types of professionals: the SES teacher, the specialized caregiver and the teacher of the regular classroom. Public authorities must provide initial and continuing training for these types of professional so that this service may be provided in regular schools.

It is noteworthy that the process of ASD student inclusion in the regular classroom will depend significantly on the level of understanding shown by the professionals assisting these students, that is, the fuller the understanding educators show, the more effective their intervention directed to students with ASD will be (BARBOSA & FREDERICO, 2016, p. 6394).

In this sense, it is essential to invest on initial teacher training, so it may contemplate theoretical and practical knowledge of the teaching-learning process of students with autism. Such knowledge may be acquired by participation in projects, pedagogical workshops, congresses, seminars, meetings, study groups, among other actions that provide opportunities to think, reflect and practice inclusive pedagogical actions in the regular classroom with autistic students. This set of actions may open for teachers in training the possibility of learning to rethink, create and recreate their practice, based on the reflection on the new knowledge acquired (BARROS, 2010, p. 40).

Such pedagogical actions for initial training should be the responsibility of Higher Education Institutions in articulation with the education systems, under the competence of the Ministry of Education. As Saviani states, the training institution must ensure, deliberately and systematically, by curricular organization, the pedagogical-didactic preparation; this is what Saviani calls the “pedagogical-didactic model of teacher training” (2011, p. 09). It is essential that initial teacher training provide experience of the functioning of basic education that may relate to the theories studied, especially regarding students with autism; such experience should allow for reflection on their own practice. Teacher-training institutions and education secretariats must, therefore, establish partnerships.

As Barbosa and Frederico state, massive investment is needed in initial teacher training, so continuing training need not be retroactive and compensatory. They believe it is essential to articulate initial and continued training, so the latter may elaborate on the former, and update teachers regarding changes in education, among other goals (2016, p. 6401).

With an initial training contemplating both theory and practice, and the continuing training of professionals working with autistic students (SES teacher, regular teacher and “specialized caregiver”), it should be possible to promote the educational inclusion of these students.

It is in continuing education that professionals have the opportunity to obtain knowledge related to educational changes, and thus be made aware of current discussions (BARBOSA; FIGUEREDO, 2016, p. 6.400). Such a training should respond to the anxieties that exist in your classroom to promote the teaching-learning process, answer questions and modify teaching practice through action-reflection-action. When acting with autistic students, the teacher must assume the role of essential mediator, seeking to build a teaching focused on students' potentials, in order to overcome their limitations, promoting, as Nascimento states, an educational intervention by means of age-appropriate techniques, bearing in mind students' potential and shortcomings (2018, p. 145).

Competent, properly trained professionals, who master challenging pedagogical strategies that favor the learning of students with ASD are pivotal for these students' educational progress. It also requires collaborative work with school management, as well as resources, family engagement, sound educational policies and a special education staff on school systems, offering regular classroom teachers support. This pedagogical support is legally provided for as SES teachers.

Students with ASD are part of special education's target audience, and, consequently, are entitled to SES. Camargo, Gomes and Silveira state that this special education service is currently a reference in meeting students' specific needs, in addition to establishing itself as support framework for students, teachers and families, being integrated to the other individuals and spaces within the school (2016, p. 21).

SES teachers assume an important role in their pedagogical relationship with regular classroom teachers – providing support for teachers and the students' families, developing intervention strategies that grant these students access to school social practices. According to Basic Education Chamber Resolution No. 4, one of the functions of SES teachers is to ascertain, in connection with regular classroom teachers, the availability of services, pedagogical and accessibility resources, and the development of pedagogical strategies that promote student participation (BRAZIL, 2009). This articulation becomes essential for regular classroom teachers to develop their teaching strategies targeting students with ASD, as talk with their peers – especially those more experienced – helps them model their pedagogical practice so it may favorably impact students.

However, without public authorities' commitment to provide continuing education for SES and regular teachers – by providing pedagogical and financial resources, and elaborating and implementing public policies –, policies are very unlikely to become a reality.

The third professional involved in this collaborative work and introduced by means of legislation is the “specialized caregiver” – a support professional that accompanies autistic students, when necessary, in the regular classroom.

Technical Note 24/2013, which guides school systems for the implementation of Law No. 12,764/2012, explains this professional must be available whenever the individual need of a given student is identified,



and must assist this student in communicating, as well as tending to their personal needs of food, hygiene and locomotion (BRAZIL, 2013, p. 4).

The above-mentioned Technical Note states that this service is directed to students who are not capable of eating, communicating, moving or cleaning themselves; it is also justified when the student's specific needs are not contemplated by the regular classroom; this service is not a substitute for those provided by the regular teacher, the SES teacher or any other school activity; furthermore, it must be evaluated jointly and continuously by family and school, in order to assess its efficiency and the need for its continuity.

This type of legally prescribed assistance to ASD students is not different from that which must be offered to any student, that is, it must aim at students' personal and social development, allowing for their participation in various different environments, without restraining their potential to their shortcomings. If this subject is still being discussed today, and if regulation was needed, it is because schools have not as yet succeeded in becoming fully inclusive.

## **5. SES resources instrumental in assisting students with ASD**

As autistic people present communication and language impairments, they can use resources to aid in the communicative process, the so-called "assistive technologies" (AT), which can be understood as any artifact that allows better accessibility to the individual who has some specific need. According to Manzini, "we can call assistive technology a cane, used by our grandparents to provide comfort and safety when walking, as well as an amplification apparatus used by a person with moderate hearing loss" (2005, p. 82).

Thus, people with ASD can make use of AT tools to promote communication in an alternative and extended perspective. In education, AEC has been pointed as favoring the development of verbal and nonverbal communicative skills of students with ASD (PASSERINO; BEZ, 2015).

According to Santarosa et al. (2010), AEC is defined as a set of resources (boards, albums, software), strategies (storytelling, games, mimicking), techniques (pointing, tracking, holding) and symbols (gestures, signs, images) that aims to promote processes that facilitate communication and sociocognitive development.

Thus, the use of AEC tools in the teaching-learning process allows teachers to develop and implement pedagogical strategies that help in the exploration and development of numerous communicative functions of students with ASD, especially for those who have changes in verbal and/or non-verbal communication and interaction. The educator must plan his pedagogical strategies taking several aspects of qualitatively differentiated assistance into account, especially in the case of autistic children.

Educators must also observe and assess these children's particularities, interests and learning styles, as well as their specific communicative limitations. Taking the potential and limitations of an autistic child into

account, as well as using visual resources that meet their interests are points to be considered for interventions that will consequently promote the development of more effective communication (GAIATO, 2018).

In the search to improve the communicative process, as well as interpersonal interactions, autistic people can make use of AEC, as it has shown positive results, with a history of success in its use, to the extent that research has shown positive results with significant improvement in the development of communication and language (TOGASHI; WALTER, 2016, p. 356).

Thus, there are many AT tools incorporated into AEC for the public with ASD that may or may not have significant financial value. The Picture Exchange Communication System (PECS) is among the resources that enable the communication of people with deficits in communication skills; it uses low-tech resources such as pictures, images, posters, etc., which enable interaction and communication between student and teacher, positively impacting learning. PECS was developed by Andy Bondy and Lori Fost in the US in 1985; Togash and Walter define PECS as an AEC system that uses communication cards: in order to communicate, users trade a card they possess by an item they desire – an object, the performance of an action –, or even to express feelings and sensations (2016, p. 353).

Such a system can also be adapted, as Walter (2000) proposes, by dividing it into five application stages, and is indicated for autistic people or people who have other communication impairments (WALTER, 2017). Moreover, the adapted PECS generates the same positive results as the one developed by Bondy and Fost (MIZAEL; AIELLO, 2013).

Walters describes PECS as a system that requires neither complex materials nor specialized techniques for training; it does not use expensive equipment or comprehension tests, nor is it financially burdensome on family and technical staff (2000, p. 25). Oliveira et al. state that PECS enables the use of learning strategies through visual stimuli, with the exchange of a card for objects of interest of the child or the performance of a given action (2015).

PECS requires no previous skills of the child, although, as Gonçalves (2011) points out, they should be able to hand the cards to their instructor. Thus, Gonçalves views PECS as seeking to develop in the child the ability to initiate communication, and to be spontaneous in the communicative process (2011, p. 39), which is highly relevant for autistic children with various levels of language and communication impairment.

In addition to enabling AEC and the development of verbal repertoire, the use of PECS has other advantages. Among these, Jesus mentions its low cost, the fact that it is portable, which allows it to be used in different places, and the fact that it requires few complex movements of the child (2012, p. 25). Thus, PECS is easily available to families and schools, as it has low cost; the portability of the resource is also

relevant, mainly because it allows interventions to occur in different environments, which enables the skills developed to be more highly generalized.

When assessing the implementation of PECS, instructors must evaluate the level of understanding of the pictures, photos, words or other resources that may be part of the AEC. There are, therefore, different AEC systems, which, as Gonçalves states, must be used according to the specific potential and needs of their users, enhancing their communication capacity, so that they may be as effective and independent as possible in the communication process (2011 p. 35).

For adapted PECS, Walter (2017) suggests drawings, clip-arts, inserts, as well as pictures found on Internet pages. However, it will always be necessary to diagnose the potential and limitations of an autistic child for more effective interventions and communications.

Oliveira, et al. (2015), in a revisional bibliographic study on the considerations of the application of PECS with autistic people, systematized different contributions from different studies. They showed an increase in communicative intentions after the use of PECS, as well as the presence of vocalizations (FIDALGO, 2008; AZAROFF et. al., 2009). The studies reviewed also found an increase in the number of figure exchanges autonomously, which enabled the development of interpersonal interactions (BEZ, 2010; FIDALGO, 2008; ORRÚ, 2006; CHAABANE et. al., 2009).

In summary, all the artifacts used in PECS, as well as in all the systems that enable AEC, should be easily understood by autistic students, as well as meet their interests and preferences, so that the communicative process, especially between teacher and student, can occur effectively, thus facilitating the promotion of communication, both in an alternative and/or extended perspective.

## **6. Final Remarks**

ASD is classified as a neurodevelopmental disorder marked, mainly, by the difficulty of interaction and interpersonal communication, and by various levels of repetitive, stereotypical behavior.

The use of AT tools intends to promote direct and intensive learning, prompting higher communicative autonomy, so individuals may manifest their personal and social needs and demands in an understandable way.

This paper investigated the theoretical and political foundations that regulate the inclusion of students with ASD in regular school, analyzed teacher training in its relation to promoting their inclusion of these students, and identified AEC resources used by regular classroom teachers and directed to ASD students.

The narrative research was chosen as methodological strategy, as it was understood as the best approach to treat the theme under discussion in a broad, updated and consistent way. In addition, revisional work

allowed for a panoramic view of divergences and consensus, the technical updates within a field, and even the gaps regarding themes and subjects of research (BOLDERSTON, 2008; MENDES-DA-SILVA, 2019).

The importance of SES as a fundamental part in the process of school inclusion is emphasized, assisting the student in the resource room and in the classroom. It is necessary for the SES teacher to work in parallel with the regular teacher, despite the difficulties and barriers encountered. In the case of students with no verbal communication, it is essential that resource room teacher guides the regular teacher in using AEC, as a means of promoting this student's inclusion and autonomy. Only from the moment students are able to express their desires, fears and anxieties, will they be able to organize their feelings and abate their challenging behaviors.

It is worth noting that there are many possibilities to work on the needs of students with ASD, in terms of communication and learning, improving their social interaction within the school environment. AT tools show themselves as an excellent option, taking into account the technological apparatus, technical conditions and improvement of methods.

From the theoretical framework presented, it is believed that the great challenge of the teacher is to understand the pedagogical strategies and practices that help in the teaching and learning process of students with ASD in the regular classroom, focusing on the elaboration of public policies and the responsibility of the public power to effectively offer an education for all – an education that respects the other as a true other.

## **7. Works Cited**

- A. Bolderston, Writing an effective literature review. *Journal of Medical Imaging and Radiation Sciences*, vol.39 issue 2, 2008, pp. 86-92. Available at <https://doi.org/10.1016/j.jmir.2008.04.009>; accessed March 12, 2021.
- A. Klin, "Autismo e síndrome de Asperger: uma visão geral", *Revista Brasileira de Psiquiatria*, vol. 28, n. 1, São Paulo, May 2006, 2006.
- A.M.F.D. Camargo, R.V.B. Gomes, and S.M.P. Silveira. "Dialogando sobre a política de educação especial na perspectiva inclusiva", in R.V.B. Gomes, R.V.D. Figueiredo, S.M.P. Silveira, and A.M.F.D. Camargo (eds), *Políticas de inclusão escolar e estratégias pedagógicas no atendimento educacional especializado*, UFC/MC&C, Fortaleza-Brasília: MC&C, 2016, pp. 17-29. Available at [http://www.repositorio.ufc.br/ri/bitstream/riufc/43200/1/2016\\_capliv\\_amfcamargo.pdf](http://www.repositorio.ufc.br/ri/bitstream/riufc/43200/1/2016_capliv_amfcamargo.pdf); accessed March 12, 2021.
- American Psychiatric Association (APA). *DSM-5: Manual diagnóstico e estatístico de transtornos mentais* (transl. Maria Inês Corrêa Nascimento et al.), Artmed, Porto Alegre, 2014. Available at <http://www.niip.com.br/wp-content/uploads/2018/06/Manual-Diagnostico-e-Estatistico-de-Transtornos-Mentais-DSM-5-1-pdf.pdf>; accessed March 12, 2021.

- B. Souza, "Autistas e a vida em comunidade" Available at: <https://abraca.net.br/autistas-e-a-vida-em-comunidade-opiniaio-beatriz-souza>; accessed March 16, 2021.
- B.A. Lopes, "Autismo e culpabilização das mães: uma leitura de Leo Kanner e Bruno Bettelheim", Seminário Internacional Fazendo Gênero 11& 13th Women's Worlds Congress (Electronic Proceedings), Florianópolis, 2017, pp. 1-10. Available at [http://www.en.wwc2017.eventos.dype.com.br/resources/anais/1503543977\\_ARQUIVO\\_AUTISMO-E-CULPABILIZACAO-DAS-MAES-UMA-LEITURA-DE-LEO-KANNER-E-BRUNO-BETTELHEIM.pdf](http://www.en.wwc2017.eventos.dype.com.br/resources/anais/1503543977_ARQUIVO_AUTISMO-E-CULPABILIZACAO-DAS-MAES-UMA-LEITURA-DE-LEO-KANNER-E-BRUNO-BETTELHEIM.pdf); accessed March 15, 2021.
- B.G. Avila, Comunicação Aumentativa e Alternativa para o Desenvolvimento da Oralidade de Pessoas com Autismo (Masters' Thesis in Education). Federal University of Rio Grande do Sul, Porto Alegre, 2011. Available at <https://www.lume.ufrgs.br/bitstream/handle/10183/32307/000785427.pdf>; accessed March 12, 2021.
- BRAZIL. Basic Education Chamber Resolution No. 4, October 2, 2009. Available at: [http://portal.mec.gov.br/dmdocuments/rceb004\\_09.pdf](http://portal.mec.gov.br/dmdocuments/rceb004_09.pdf); accessed March 19, 2021.
- BRAZIL. Law No. 12,764, Dec. 27, 2012. Available at: [http://www.planalto.gov.br/ccivil\\_03/\\_ato2011-2014/2012/lei/112764.htm](http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/112764.htm); accessed March 12, 2021.
- BRAZIL. Technical Note 024, March 21, 2013. Available at [http://portal.mec.gov.br/index.php?option=com\\_docman&view=download&alias=13287-nt24-sistem-lei12764-2012&category\\_slug=junho-2013-pdf&Itemid=30192](http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=13287-nt24-sistem-lei12764-2012&category_slug=junho-2013-pdf&Itemid=30192); accessed March 12, 2021.
- C.C.D.F. Walter, and L.R.D.D.P. Nunes, "Comunicação alternativa para alunos com Autismo no ensino regular", Revista Educação Especial, vol. 26, n. 47, Santa Maria, Sept.-Dec., 2013, pp. 587-601.
- C.C.D.F. Walter, Os efeitos da adaptação do PECS ao curriculum funcional natural em pessoas com autismo infantil (Masters' Thesis in Special Education). Federal University of São Carlos, São Carlos, 2000.
- C.C.D.F. Walter, PECS-Adaptado na sala de atendimento educacional especializado, in L.R.D.O.D.P. Nunes, and C.R.Schrimer (eds), Salas Abertas: formação de professores e práticas pedagógicas em comunicação alternativa nas salas de recursos multifuncionais, EDUERJ, Rio de Janeiro: , 2017. Available at <http://books.scielo.org/id/xns62>; accessed March 16, 2021, pp. 311-332.
- C.M. Togashi, and C.C.D.F. Walter, "As contribuições do uso da comunicação alternativa no processo de inclusão escolar de um aluno com transtorno do espectro do autismo", Revista brasileira de educação especial, vol. 22, n. 3, Marília, July-Sept., 2016, pp. 351-366. available at <https://www.scielo.br/pdf/rbee/v22n3/1413-6538-rbee-22-03-0351.pdf>; accessed March 16, 2021.
- D. Saviani, "Formação de professores no Brasil: dilemas e perspectivas", Poiesis Pedagógica, vol. 9, n. 1, Jan.-June, 2011, pp.07-19. Available at <https://doi.org/10.5216/rpp.v9i1.15667>; accessed March 16, 2021.
- D.J. Cook, C.D. Mulrow, and R.B. Haynes, "Systematic reviews: synthesis of best evidence for clinical decisions", Annals of Internal Medicine, 126, March 1st, 1997, pp. 376-380. Available at <https://doi.org/10.7326/0003-4819-126-5-199703010-00006>; accessed March 12, 2021.
- E.J. Manzini, "Tecnologia assistiva para educação: recursos pedagógicos adaptados", in: MEC/SEESP (ed), Ensaios pedagógicos: construindo escolas inclusivas. MEC/SEESP, Brasília, 2005. Available at <http://portal.mec.gov.br/seesp/arquivos/pdf/ensaiospedagogicos.pdf>; accessed March 15, 2021.

- E.T. Rother, "Editorial: Revisão sistemática X revisão narrativa", *Acta paulista de enfermagem*, vol. 20, n. 2, 2007, pp. v-vi. Available at <https://www.scielo.br/pdf/ape/v20n2/a01v20n2.pdf>; accessed March 16, 2021.
- G.C.D. Oliveira, V.D.S.V. Rosa, W. Carvalho, and E.F.D. Freitas, "Considerações da aplicação do método PECS em indivíduos com TEA", *Revista Estudos*, vol. 42, n. 3, Goiânia, May-June, 2015, pp. 303-314. Available at <http://seer.pucgoias.edu.br/index.php/estudos/article/view/4129/2359>; accessed March 16, 2021.
- G.M. Fadda, and V.E. Cury, "O enigma do autismo: contribuições sobre a etiologia do transtorno", *Psicologia em estudo*, vol. 21, no. 3, 2016, pp. 411-423. Available at <http://old.periodicos.uem.br/ojs/index.php/PsicolEstud/article/view/30709/pdf>; accessed March 12, 2021.
- J. Donovan, and. Zucker, C. Outra sintonia: a história do autismo (transl. Luiz A. de Araújo). Companhia das Letras, São Paulo, 2017.
- J.A. Collins, and B.C.J.M. Fauser, "Balancing the strengths of systematic and narrative reviews". *Human Reproduction Update*, vol.11, no. 2 pp.103-104, 2005. Available at <https://doi.org/10.1093/humupd/dmh058>; accessed March 12, 2021.
- J.C.D. Jesus, *Ensinando crianças autistas a requisitar: avaliação e generalização de comunicação mediada por figuras com uso do PECS*. 2013 (Masters' Thesis in Developmental Psychology). Federal University of Minas Gerais, Belo Horizonte, 2013.
- L. Bornmann, and R. Mutz, "Growth rates of modern science: a bibliometric analysis based on the number of publications and cited references", *Journal of the Association for Information Science and Technology*, vol. 66 issue 11, Nov. 2015, pp. 2215-2222. Available at <https://doi.org/10.1002/asi.23329>; accessed March 12, 2021.
- L.M. Passerino, and M.R. Bez (eds) *Comunicação Alternativa: mediação para uma inclusão social a partir do Scala*, Ed. UPF, Passo Fundo, 2015. Available at [http://editora.upf.br/images/ebook/Comunicacao\\_alternativa\\_SCALA\\_PDF.pdf](http://editora.upf.br/images/ebook/Comunicacao_alternativa_SCALA_PDF.pdf); accessed March 16, 2021.
- L.M.C. Santarosa et al., *Tecnologias Digitais Acessíveis*, JSM Comunicação, Porto Alegre, 2010.
- M. Gaiato, S.O.S. autismo: guia completo para entender o Transtorno do Espectro Autista, 2nd ed., nVersos, São Paulo, 2018.
- M.A. Flores, "Algumas reflexões em torno da formação inicial de professores", *Educação* n. 3, PUC-RS, Porto Alegre, Sept.-Dec., 2010, pp. 182-188. Available at [https://www.researchgate.net/publication/277219172\\_Algumas\\_Reflexoes\\_em\\_Torno\\_da\\_Formacao\\_Inicial\\_de\\_Professores](https://www.researchgate.net/publication/277219172_Algumas_Reflexoes_em_Torno_da_Formacao_Inicial_de_Professores); accessed March 12, 2021.
- M.A.F.T. Gonçalves, *Alunos com perturbação do espectro do autismo: utilização do sistema PECS para promover o desenvolvimento comunicativo*. 2011. (Masters' Thesis in Special Education) Polytechnical Institute of Lisbon, 2011. Available at <https://repositorio.ipl.pt/handle/10400.21/1208>; accessed March 12, 2021.
- M.O. Barbosa, and N.D.L.F. Fumes, "O transtorno do espectro autista e a formação docente em debate." III Congresso Nacional de Formação de Professores (CNFP) and XIII Congresso Estadual Paulista sobre Formação de Educadores (CEPFE) (Proceedings), vol. 03, issue 03, 2016. pp. 6393-6404 Available at

[http://200.145.6.217/proceedings\\_arquivos/ArtigosCongressoEducadores/5999.pdf](http://200.145.6.217/proceedings_arquivos/ArtigosCongressoEducadores/5999.pdf); accessed March 12, 2021.

R. Ferrari, “Writing narrative style literature reviews”, *Medical Writing*, vol. 24 no. 4, 2015, pp. 230-235. Available at <https://doi.org/10.1179/2047480615Z.000000000329>; accessed March 12, 2021.

S. Nascimento, “Formação de professores: Um desafio no processo de aprendizagem da criança com Transtorno do Espectro Autista”, *Colloquium Humanarum*, vol. 15, special issue n. 1, Jan.-March 2018, pp. 143-153. Available at <https://journal.unoeste.br/suplementos/humanarum/vol15nr1/>; accessed March 15, 2021.

T.M. Mizael, and A.L.R. Aiello, “Revisão de estudos sobre o Picture Exchange Communication System (PECS) para o ensino de linguagem a indivíduos com autismo e outras dificuldades de fala”, *Revista brasileira de educação especial*, vol. 19, n. 4, Marília, Oct.-Dec., 2013, pp. 623-636. Available at: [https://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S1413-65382013000400011](https://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-65382013000400011); accessed March 15, 2021.

W. Mendes-Da-Silva, “Contribuições e limitações de revisões narrativas e revisões sistemáticas na área de negócios”, *Revista de administração contemporânea*, vol. 23, n. 2, 2019. Available at <https://doi.org/10.1590/1982-7849rac2019190094>; accessed March 15, 2021.

W.C. Braga, *Autismo: azul e de todas as cores: guia básico para pais e profissionais*, Paulinas, São Paulo, 2018.

### **Copyright Disclaimer**

Copyright for this article is retained by the author(s), with first publication rights granted to the journal. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).