

## ARTICLE

## POSSIBLE RELATIONSHIPS BETWEEN TEACHING CONCEPTIONS AND PRACTICES WITH AUTISTIC STUDENTS IN MATHEMATICS CLASSES

**DAYANE BORGES DE ARAUJO WALKER<sup>1</sup>**

ORCID: <https://orcid.org/0000-0002-4757-1906>  
<dayane.araujo1@hotmail.com>

**FÁBIO ALEXANDRE BORGES<sup>2</sup>**

ORCID: <https://orcid.org/0000-0003-0337-6807>  
<fabioborges.mga@hotmail.com>

<sup>1</sup> Secretaria Municipal de Educação (SECEL). Peabirú, PR, Brasil.

<sup>2</sup> Universidade Estadual do Paraná (Unespar). Campo Mourão, PR, Brasil.

**ABSTRACT:** Considering the specificities of the autistic student and the perception of a significant increase in the number of enrolled in Basic Education, the present study was permeated around the following general objective: to investigate teachers' conceptions about the autistic student and practices in Mathematics Teaching possibly directed by these conceptions. The research approach, of the qualitative type, used as a procedure for data production semi-structured interviews, applied to eight teachers who teach Mathematics in classes where, among the students, there are autistics. For data analysis, some elements of Content Analysis were considered. From the defined categories, it was possible to conclude that: a) the practices with autistic students are different from the practices developed with the other students; b) in the conception of the research subjects, the inclusion of the autistic student proves to be a challenge for those involved in this journey; c) the lack of initial and continuous training and the inexperience with autistic people inside and outside the school context makes knowledge about autism even more precarious and, because of that, the teacher's role as a mediator in the inclusion process becomes limited; d) there is a need for structural support so that the teaching practice with autistic students happens in a more appropriate way; e) Mathematics is a discipline that favors the teaching and learning of the autistic, when approached from practical methodologies, with themes focused on the daily lives of these students; and f) there are valuations about the use of digital technologies in practices with autistic students.

**Keywords:** autism, teaching conceptions, inclusive mathematics education.

### RELAÇÕES POSSÍVEIS ENTRE CONCEPÇÕES E PRÁTICAS DOCENTES COM ESTUDANTES AUTISTAS NAS AULAS DE MATEMÁTICA

**RESUMO:** Considerando as especificidades do estudante autista e a percepção de um significativo aumento no número de matriculados na Educação Básica, o presente estudo foi permeado em torno do seguinte objetivo geral: investigar concepções docentes acerca do estudante autista e práticas no Ensino de Matemática possivelmente direcionadas por essas concepções. A abordagem da pesquisa, do tipo qualitativa, utilizou como procedimento para produção de dados entrevistas semiestruturadas, aplicadas a oito professoras que ensinam Matemática em turmas em que, dentre os estudantes, há autistas. Para a análise dos dados, foram considerados alguns elementos da Análise de Conteúdo. A partir das categorias definidas, foi possível concluir que: a) as práticas com estudantes autistas são diferenciadas das práticas

desenvolvidas com os demais estudantes; b) na concepção dos sujeitos da pesquisa, a inclusão do estudante autista se mostra desafiadora aos envolvidos neste percurso; c) a falta de formação inicial e continuada e a inexperiência com autistas dentro e fora do contexto escolar torna o conhecimento acerca do autismo ainda mais precário e, por conta disso, a atuação do professor enquanto mediador no processo de inclusão torna-se limitada; d) há necessidade de apoio estrutural para que a prática docente com estudantes autistas aconteça de modo mais adequado; e) a Matemática é uma disciplina que favorece o ensino e a aprendizagem do autista, quando abordada a partir de metodologias práticas, com temáticas voltadas ao cotidiano desses estudantes; e f) há valorações acerca do uso de tecnologias digitais em práticas com estudantes autistas.

**Palavras-chave:** autismo, concepções docentes, educação matemática inclusiva.

## **RELACIONES POSIBLES ENTRE CONCEPCIONES Y PRÁCTICAS DOCENTES CON ESTUDIANTES AUTISTAS EN LAS CLASES DE MATEMÁTICAS**

**RESUMEN:** Considerando las especificidades del alumno autista y la percepción de un aumento significativo en el número de matriculados en la Educación Básica, el presente estudio se permeó alrededor del siguiente objetivo general: investigar las concepciones de los docentes sobre el alumno autista y las prácticas en la Enseñanza de las Matemáticas posiblemente dirigidas por estas concepciones. El enfoque de investigación, de tipo cualitativo, utilizó como procedimiento de producción de datos entrevistas semiestructuradas, aplicadas a ocho docentes que enseñan Matemáticas en clases donde, entre los alumnos, hay autistas. Para el análisis de los datos, se consideraron algunos elementos del Análisis de Contenido. A partir de las categorías definidas, fue posible concluir que: a) las prácticas con alumnos autistas son diferentes de las prácticas desarrolladas con los demás alumnos; b) en la concepción de los sujetos de investigación, la inclusión del estudiante autista se revela como un desafío para los involucrados en este camino; c) la falta de formación inicial y continua y la inexperiencia con personas autistas dentro y fuera del contexto escolar hace aún más precario el conocimiento sobre el autismo y, por ello, se limita el papel del docente como mediador en el proceso de inclusión; d) existe la necesidad de apoyo estructural para que la práctica docente con alumnos autistas ocurra de manera más adecuada; e) La matemática es una disciplina que favorece la enseñanza y el aprendizaje de los autistas, cuando es abordada desde metodologías prácticas, con temáticas enfocadas al cotidiano de estos alumnos; y f) existen valoraciones sobre el uso de tecnologías digitales en prácticas con estudiantes autistas.

**Palabras clave:** autismo, concepciones docentes, educación matemática inclusiva.

## **INTRODUCTION**

Inclusive Education, in accordance with the National Policy of Special Education in the Perspective of inclusive Education (Brasil, 2008), is understood as a movement that defends the “[...] right of all students to be together, learning and participating, without any kind of discrimination” (Brasil, 2008, p. 01). Moreover, such a policy establishes inclusion as transversal to all modes and levels of education, becoming part of the school collective, and not just as a commitment of some sectors and people of the institutions. However, even though the educational inclusion of students supported by Special Education is a right, inclusion continues to be seen as a challenge, causing anxieties and expectations for much of the education professionals. In view of this, we find it appropriate to give voice to teachers who act directly (in the case of this research) with autistic students. We chose as a general objective to investigate teaching conceptions about the autistic student and possible relationships between these conceptions and the practices in the teaching of Mathematics. We start from the assumption that we teachers are influenced by our conceptions in all pedagogical movements: the choice

of a task to be taken to the room, the evaluation, the organization of methodologies, the planning, etc. But, after all, what are these relationships?

To better know the inclusive school environment, the specifics of the autistic students who participate there and the meanings that teachers are building in the face of inclusive education and the teaching of Mathematics, we consider as one of the possibilities to listen to what they have to say, trying to trace their conceptions. Among the studies on the conceptions of teachers in the field of Mathematical Education, we refer to Thompson (1984). For the author, the concepts about Mathematics and its teaching play an important and significant role in the training and teaching performance. The way teachers present the content suggests their views, beliefs and preferences about Mathematics, thus influencing their teaching practices. Moreover, attitudes towards students that differ from the majority also carry such conceptions.

This being said, we will present this research outlining a short historical path on understanding autism and then what brings the Brazilian research on teaching mathematics to autistic students. Next, we will bring the methodological outline, listing the emerging categories and the analyses. Finally, the final considerations of the whole development of this study.

## **A BRIEF HISTORICAL COURSE ON AUTISM**

The word autism originated from the Greek word *Autos*, “in itself”, and *ismos*, which means “turned to” (Lira, 2004). Etymologically, autism would be “turned back to itself”. According to Dias (2017), the term was first used in 1906 by Plouller and disseminated by Bleuler in 1911, in the description of a symptom of schizophrenia, evidenced by the loss of contact with reality, resulting, as a consequence, in impossibilities or a great difficulty to communicate with others.

According to Orrú (2016), in 1943, with the psychiatrist Leo Kanner, the first studies related specifically to autism were developed. From his studies, Kanner published in 1943 an article in which he described the case of 11 children who presented characteristics similar to what he was investigating, called by him “Autistic Affective Contact Disorders”, with the prevalence of stereotyped behaviour, obsession and ecology<sup>1</sup>, as well as the inability to establish relationships with other people.

In 1944, Hans Asperger also published detailed descriptions of children with unusual and similar behaviors to those that Kanner had mentioned, also making his presentation to the international scientific community through an article entitled ‘Die Autistischen psychopathen im kindesalter’<sup>2</sup>(Pereira, 1996).

According to Delabona (2016), in 1980, in the revision of the diagnostic criteria present in the Diagnostic and Statistical Manual of Mental Disorders (DSM III), written by the American Psychiatric Association (APA), autism was, for the first time, recognized and inserted into a new class of disorders: Invasive Developmental Disorder (TIDs). In 1987, in the revision of the above-mentioned document, DSM III defined and included autism in the framework of Global Developmental Disorders (GDD) and remained in DSM IV. In 2013, the APA (published in 2014) carried out its fifth revision of the document, which became known as DSM V. In this review, the TGDs were extinguished and a single category was

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<sup>1</sup> Echolalia is a persistent phenomenon that is characterized as a language disorder, defined as the repetition of the other's speech.

<sup>2</sup> Autistic psychopaths in childhood (our translation).

established, that of Autism Spectrum Disorder. According to Johnson and Myers (2007), spectrum terminology has been used in virtue of autism presenting different manifestations.

In the 1990s, an article was published that associated the triple vaccine, which protects against measles, rubella and rubella, with autism. According to Barboza and Martorano (2017), the article that 12 children treated at the Royal Free Hospital, located north of London, showed symptoms of a new syndrome. The main author of the paper, the British physician Andrew Wakefield (1957), used his data to advocate against the use of the triple vaccine and in favour of individual vaccinations and, although with great negative repercussions in society, the work also led to the emergence of the anti-vaccine movements. According to Barboza and Martorano (2017), after complaints and investigations, the work was portrayed 12 years later, showing that the data in the article were forged for the authors' personal interests. Even if the article was portrayed in 2010, it still causes great damage to public health.

According to Dias (2017), there are also psychoanalytic theories that seek to understand and explain autism, starting from the assumption that autistic children failed to have in their mother a figure guiding and steering signal of reality. However, this aspect has received much criticism, as it has negative effects on the families of autistic children, who are taken by feelings of guilt.

As for the diagnosis for ASD, Delabona (2016) stresses that this is essentially clinical, there is no laboratory examination or medical device that can diagnose it, being determined from the behavioral, social and cultural characteristics of the subject, that is, it is necessary to know the individual in its most varied ways of living in society and with his family. Neurologists also use some specific psychological tests, supported by the parameters of the International Classification of Diseases (ICD), as well as the DSM.

It is noteworthy that, over the years, Autism has been conceived, reclassified and inserted into different groups, such as TID's, TGDs, TEA, and that the changes have occurred by the studies and research about the causes and characteristics of autism. Such studies allow us to look at autism, or conceptualize it, through the medical, social and neurodiversity models.

In the context of Brazilian public policies specific to autism, it is worth noting the Berenice Piana Act No. 12.764/2012, sanctioned by the President of the Republic Dilma Rousseff, who instituted the National Policy on the Rights of People with Autism Spectrum Disorder. It was from this law that the person with autism spectrum disorder became considered a person with disabilities for all legal purposes, ensuring them all the constitutional rights guaranteed by specific laws. A clear example of guaranteed rights is in its Article 3 single paragraph, which ensures that, in cases of proven need, the person with autism spectrum disorder, included in the common teaching classes, will have the right to a specialised accompaniment, if proven need. Therefore, just as the deaf student is entitled to an interpreter in the classroom, in order to minimize the barriers of the educational environment and enable access to knowledge, the autistic student has guaranteed the right to a specialized accompanist so that difficulties in communication/language and social interaction do not emerge as barriers to teaching and learning.

We consider that the Berenice Piana Act is a achievement in guaranteeing the rights of autists, because if they were not legally recognized as people with disabilities, they would be deprived of a network of specialized services, becoming helpless in some types of assistance and social benefits, especially autists Level 3, since they require very substantial support, defined by the DSM-V because they present severe deficits in verbal and non-verbal social communication skills and great limitation in social interactions. In any case, we do not understand autism as a disability, and we support ourselves for this in the DSM-V, which classifies it within the disorders of neurodevelopment, and in the National Policy

of Special Education in the Perspective of Inclusive Education (PNEEPEI)/2008, which includes it in the group of the global development disorder, but we understand the reasons that legitimize this need for guarantees of rights. In any case, we understand that all these documents end up influencing conceptions about autism.

With a more recent approach to autism, the neurodiversity movement emerged in 1998, which, according to Armstrong (2011), originated as a movement between individuals labeled with autism spectrum disorder who wanted to be seen as different and not as disabled. The true meaning of the term 'neurodiversity' was attributed to sociologist Judy Singer, opposing the medical perspective of autism. According to Singer,

[...] 'neurodiversity' is just the right word at the right time to explain the recent evidence of brain science, evolutionary psychology and other fields that suggest that, amid the damage and dysfunctions that appear in the brains of people with mental health labels, there are bright and bright points of promise and possibility (Singer, s.d.; s.p. *apud* Armstrong, 2017, p. 10, grids in the original).

Neurodiversity is defined as an understanding that differences of neurological order must be respected like any other human variation, including diversity of race, ethnicity, gender identity, religion, sexual orientation and so on, Armstrong points out. (2011). Still according to Armstrong (2011), although many advocates of the concept of neurodiversity focus their efforts specifically on ASD, the concept is increasingly being applied to other categories of disability, including learning difficulties, intellectual disability and social and emotional disorders. According to Viana and Manrique (2020, p. 02), "[...] one of the aspects of neurodiversity is the appreciation of a look at differences in a way that goes beyond what is instituted by clinical and medical optics".

Having made this brief historical rescue about the understanding that has been built around autism, we continue to deal with another central aspect in our research, the teaching of Mathematics for autists, under the lens of Brazilian research.

## **THE TEACHING OF MATHEMATICS FOR AUTISTS**

The Teaching of Mathematics for Autistic Students is presented, in this subtitle, through some highlighted aspects in Brazilian research. Currently, all students are guaranteed the right to education, preferably in common spaces, shared with all, without distinction. In that sense, we already have research discussing aspects about this inclusion, specifically here of autists in math class.

Seeking to learning through interaction, the manipulation of materials, among other resources, the research highlights, in the teaching and learning of Mathematics for autistic students, the role of the use of technological resources and the diversification of methodological strategies, as we have in the following paragraphs.

Cordeiro, Resende and Thiengo (2017) highlight the learning of autists through interaction, the manipulation of materials, among other resources. In the vision of Frizzarini and Cargnin (2019), the use of manipulable materials is effective, making it possible for the student to better 'see' the intended relationships. Takinaga (2015) points out that, in order for there to be a contribution to the teaching and learning process of Mathematics for autistic students, it is necessary to consider the characteristics of this audience in the development of teaching activities and from these characteristics, observe the organization of the site, the choice of materials, the role of the teacher and the way the content should

be approached so that this process is effective. Already Souza (2019) stressed that the use of technologies, together with the development of pedagogical work and teaching mediation, can favouring the practice of inclusive actions, so that the singularities of the autistic student are not reasons for his exclusion in the school environment.

With regard to inclusive practices, the research we are now bringing to the dialogue shows positive progress. The study of Fleira and Fernandes (2019) revealed that the experience of the inclusion of the autistic student by them investigated in the school space enabled an enriching experience, not only for the student with TEA, who, according to the same, felt belong to that group, but for the other students in the room. The authors Custódio, Luvison and Freitas (2018) highlight that the learning possibilities of all students, with or without disabilities, are tied to the conditions offered by the environment in which they are inserted. We believe that the experience of the inclusion of an autistic student in the school space benefits not only autistic students, but also all other students. We understand that living with differences from an early age in a school environment brings benefits to the formation of the individual, making him a more receptive person to differences, with fewer prejudiced attitudes and knowing how to respect differences.

Another topic highlighted in the research is related to the use of didactic resources for all students, with or without disabilities, providing an important inter-relation between the real and the abstract and resigning the learning of Mathematics. Furthermore, we understand that such resources cannot be taken as elements unrelated to the objectives of teaching and learning, but must always be considered in coherence with what is expected to be taught and, consequently, that students learn. Specifically referring to Specialized Educational Care, Decree No. 7.611/2011 (Brasil, 2011), in its Article 3º, reveals that one of the objectives is to encourage the development of didactic-pedagogical resources that eliminate barriers in the teaching and learning processes.

In this context, the authors Blanco, López and Castañeda (2019) present an exploratory case study, which aimed to describe the characteristics of the strategies and difficulties that an 11-year-old student, autistic, showed in the solution of division problems. For this purpose, the strategies were observed and the errors associated with the difficulties of understanding the concept of division. The mathematical problems used in the study were presented to the student in two different formats: with and without support of manipulable material. The results pointed to a positive progression in resolutions in which the student used material support.

In the same sense, Delabona (2016) analyzed the meaning given to objects of study of geometry by a student with Asperger syndrome, from the application of a pedagogical proposal in the School Mathematics Laboratory. According to the researcher, this physical space constituted as an important ally for the learning process, favouring the interaction of relationships between the student, the teacher, the pedagogical resources and the mediating activity, thus triggering the development of new concepts. Delabona (2016) presented as a result of her research that the mediations and social interactions between students and the teacher were fundamental for the development and learning of geometric concepts with greater meaning by the autistic student. Chequetto and Gonçalves (2015) highlighted, through their observations, that the use of play, concrete materials and games is an important ally in the learning not only of autists but of all students.

Viana (2017) investigated the performance of a student with ASD in mathematics didactic situations. Research has revealed that if the task has no meaning to an autistic student, he probably does not consider the possibility of performing it. The meaning of the task can be denoted by the resource

that is used at the time of its execution, and these are essential factors that direct the execution or not of the job.

It should be noted that these researches address didactic/pedagogical resources with the use of manipulable materials, resources of the School Mathematics Laboratory (LME), digital technologies and games. It is understood that the use of such resources is necessary, as well as to be connected to the planning of the teaching actions, to the objectives of teaching, the specificities of each student and, in a broader way, the plans of the teacher and the school as a whole. It is necessary to pay attention to an adequate use of these didactic/pedagogical resources, not allowing a generalized methodology, making these activities as if they were recreational and disconnected from school and teaching planning.

Considering that one of the characteristics of TEA is the difficulty with social interaction (although such a characteristic cannot be standardized for everyone), the texts presented here also reveal the importance of promoting tasks and environments that provide interaction as a form of inclusion of these subjects in the common school spaces. The authors Cargnin, Frizzarini and Aguiar (2018) the experience of a mathematics teacher who was teaching in a technical course at a public university who, when she encountered a student diagnosed with ASD, was concerned about her pedagogical actions, in the sense of adapting to the needs of that student, who presented difficulties in social interaction. Despite his good performance in Mathematics, the student sought ways not to participate, a fact that bothered the teacher, making her feel powerless because she could not understand the reason for not participating and, consequently, could not help him. The teacher sought readings to know how to deal with the student and, due to the precariousness of materials, realized that, in addition to her own interest in teaching, collaborative action and greater involvement with parents, pedagogical staff, teachers, auxiliaries and other professionals are also needed to try to get an advance in the learning of this student.

We understand that social interactions in teaching environments with autistic students are the needs of all those who participate in the school environment, seeking an inclusive education that works with good quality, in accordance with the main objectives of schooling, that is, teaching and learning new concepts.

To conclude this subtitle, we emphasize the importance of understanding the autistic student present in the classroom, as well as all their specificities. We need to allow them learning possibilities, aiming for inclusive mathematical tasks, so that one task can be thought of for all, respecting the educational needs primarily of those who present greatest difficulties in learning, and not the other way around. By inclusive math tasks, we consider as those that are proposed and, from their choice and development, the discussions and the inclusion is favoured. Next, we will present the methodological procedures in which we describe the approach of the research

## **METHODOLOGICAL PROCEDURES**

For this research, we take a qualitative approach within the established objective. For Mazzotti (1991), the qualitative aspect works, preferably, in the context of discovery, seeking to fill gaps in knowledge.

For the production of the data, semi-structured interviews were conducted, which, according to Manzini (2012), has as characteristic a script capable of allowing greater interaction between the researcher and the interviewed, being indicated to study a phenomenon with a specific population, in the

case of this research, a group of teachers who teach Mathematics in Basic Education and that, among their students, there are also autists. From the screenplay of the interview, the teachers were invited to talk about teaching training, understanding about what it is to be autistic, the role of Mathematics in the development of autistic students, teaching practices in the classroom, infrastructure and materials needs, etc.

When approved by the Ethics Committee<sup>3</sup>, the research project was outlined with teachers who taught in the cities of Campo Mourão, Engenheiro Beltrão and Peabiru, both in the Central-West Region Paraná's state. The Regional Education Centre of Campo Mourão and the Education Secretariat of the municipalities listed in the survey were officially communicated through the Responsible Studied Field of Science Term, as the teachers would be contacted directly, without the intermediation of the schools in which they operate, since the interviews could take place where the respondents deemed most appropriate, including outside of the school. The invitation was made to teachers of Basic Education, who taught in public and private schools, acting in the Basic education, Phase I and II. As a condition to participate in the research, it was necessary to be active in Teaching Mathematics, regardless of their professional formation, and that, at that time, had or already had some classroom experience with autistic student.

Assuming fictitious names, 8 (eight) teachers were interviewed: Olívia, Milena, Sílvia, Rosa, Vilma, Luana, Tatiana and Dulce. The interviews were recorded in audio, giving the interviewer the possibility of speaking on the proposed topic, in a context similar to that of an informal conversation. In the possession of the audio, they were transcribed in their entirety and, as Manzini (2003) pointed out in the semi-structured type interviews, it is convenient that the transcription activity be carried out by the researcher himself, since this process already brings the researcher closer to the data, in a kind of pre-analysis.

In possession of the transcripts of the interviews, we started to analyze the data, guided in the Content Analysis (AC) of Roque Moraes. For Moraes (1999), AC is a research methodology to describe and interpret the content of any class of documents and texts, a neutral reading is not possible, because, according to the author, every reading constitutes an interpretation. The processes used for Content Analysis characterize the methodology in question and, according to Moraes (1999, p. 12), there are five possible steps to be accomplished: "Preparation of Information, Unitarization or transformation of content into units, Categorization or Classification of units into categories, Description and Interpretation".

The first stage of Preparation of Information, in our case, envisaged the transcription of the interviews, being necessary to listen again to the audio of the interview, perform several times the reading of all the recorded interviews as well as the textualization from them, aiming to identify the information and analyze those that were more directly related to the purpose of the research. The second stage, of Unitarization, in our case, happened through the transcripts of the interviews, from which extracts were extracted, called units of meaning. The units of meaning "[...] are cuts deemed significant by the researcher, among the various points to which the description can lead him. In order for the significant units to be cut, the researcher reads the testimony in the light of his interrogation" (Garnica, 1997, p. 116). In this research, in the separation of the units, we look for elements that contribute to the

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<sup>3</sup> Evaluation approved under process number 29424419.0.0000.9247 – CEP/ Unespar



constitution of what we call conceptions about autism and the autistic. To organize our writing and locate the reader, we use codes for each meaning unit. For illustration, the U1PO code refers to the Meaning Unit (U) 1 by teacher Olívia (PO). Already U8PD, refers to the eighth Meaning Unit of the interviewed teacher Dulce, and so on.

The next step was to categorize the units. Moraes (1999) understands categorization as “[...] an operation of classifying the elements of a message following certain criteria. It facilitates the analysis of information, but must be based on a precise definition of the problem, the objectives and the elements used in the content analysis” (p. 07). In the survey, the categorization was carried out from the convergence of the same topic or aspect by two or more surveyed respondents. In other words, and briefly, we group units of meaning from different interviewees around common topics. For each of these topics, our category, we gave a name according to what would be discussed, and then the following categories were defined: Teaching concepts about autistic students; Teaching ideas about the inclusion of autistic pupils in common schools; Teacher conceptions about the structural school support needed for the inclusion of the autistic student; Contributes of School Mathematics in the development of the Autistic pupil; teaching approaches in the teaching of mathematics for autistic students. We then promote data analysis from these categories.

## **ANALYSIS OF CONVERGENCE CATEGORIES**

### **Teaching concepts about autistic students**

In this category are gathered the teaching conceptions about autistic students revealed in the interviews of the eight (8) teachers, seeking to understand what the same concepts about being an autistic student, its teaching and its learning. For this first category, fifty units of meaning emerged, listed by all the respondents

Five (5) of the eight (8) professors interviewed reveal that they understand the autistic as a student who has very pronounced learning difficulties, with disinterest in the recording of content and specific disciplines, such as Mathematics. On the other hand, two other (2) teachers conceive such a student as a subject possessing outstanding intelligence and high skills in specified areas of their own interest.

U11PD: [...] he has a lot of difficulty in relationship [...] in learning also [...].

U23PT: The first thing that comes to mind is that the student is superdotated in some area [...].

We understand that all autists are different from each other, although some features bring them closer to each other to a greater or lesser degree. The conceptions of the interviewees, presented here, carry experiences that they had specifically with their autistic students and, considering that some of them only had this experience with one or two students, their conceptions about what they think is the autistic are based on them.

Listing one of the idiosyncrasies of the autistic, the disability in communication and language, relating it to learning difficulties, we see, in the studies of Williams and Wright (2008), mentioned in the

research of Lamb, Resende and Thiengo (2017), that autistic children, usually, have difficulty in assimilating language. Therefore, they need more time to understand what others are saying and, consequently, to appropriate the learning.

With regard to the high performance of some autistic students, mentioned by two interviewees, we have in Silva, Gaiato and Reveles (2012) the understanding that “Certain characteristics typical of autism, such as the obsession for specific subjects, attention to detail, the hyperfocus and the ability to research a subject thoroughly, make some people of the autistic spectrum magnificent in certain issues” (Silva; Gaiato; Reveles, 2012, p. 100).

According to four (4) respondents, autistic students need treatments that differ from the others and establishing differentiated educational practices is necessary for learning to happen. For them, enabling a welcoming environment and showing greater affection to these students makes them feel safe in their relationship with the teacher. The respondents understand that affectivity, combined with a structured and systematic school routine, will make it possible for the autistic student to be better positioned in space and time, which would directly reflect on the behavior and development of that student.

U4PV: It all depends. [...] depends much on the environment [...] whether it is welcoming or not [...].

U22PS: [...] when you gain their trust changes [...].

On Cunha’s opinion (2011), thinking about an inclusive school environment requires not only pedagogical resources, but also human quality involved. We communicated with the author about the important role of the teacher as a mediator in the development of affective relationships, promoting a receptive relationship to all students. In the opinion of Marinho and Merkle (2009), “[...] the fact is that there is no way to separate cognitive development from affective and its biological essence, and thus, regardless of the etiological and diagnostic view that one has about autism, it is of fundamental importance that the form of educational approach to these children is clear” (Marinho; Merkle, 2009, p. 06).

Cunha (2011, p. 53) points out that “the affective relationship of the autistic student with the teacher is the beginning of the process of building their autonomy in school. Although the autist usually encounters difficulties to understand people’s feelings and subjectivity, he is not without emotions.” It is noted that there is a concern of the teachers interviewed in getting to establish a link with the autistic student to better know their specifics, aiming their teaching and their learning in a more appropriate way. Thus, we understand that the affectivity, mentioned by them, provides a less informal connection with all students and, in the case of autists, this personal connection between student and teacher can both lead to overcoming barriers and barriers that may prevent learning from developing.

With regard to the characteristics of the autistic student, difficulty in relationship, isolation and lack of socialization are autistic specificities highlighted by six respondents. According to them, autists live in a different world than other students, and, for this reason, they maintain behavioral attitudes so singular. The respondents have the autist as a ‘different’ student, an unknown being, who lives and thinks differently from others. Still, according to them, because their characteristics do not resemble the others, the autist becomes an unknown to them.

U17PV: [...] an unknown, because it needs to be unraveled [...].

U15PD: He has his own world, which is different from ours.

Corroborating Falcão (2011), we believe that, in order for inclusion to be beneficial for all, it is necessary to understand the differences as something positive, given that each has singularities that are manifested through attitudes, simple situations, like dressing, or even more pronounced differences, as is the case of disabilities.

Regarding the difficulties of relationships, even if they are not considered as rules, due to the diversity of behaviors presented by autists, we see that “not to relate with visual contact, facial expressions, relationship with peers, primarily by the routine, being that the autistic child can both isolate itself and also interact in a way strange to the usual patterns” (Marinho; Merkle, 2009, p. 06-07) is a common characteristic in much of autists.

Given the existence of a heterogeneity of people within a classroom, with different feelings, characteristics and personalities, we do not always pay attention to this diversity. In dealing with the world of peculiarities of the autists mentioned by the respondents, Silva, Gaiato and Reveles (2012) point out that

When you hear the word "autism", you immediately come to mind the image of a child isolated in his own world, contained in an impenetrable bubble, who plays strangely, swings his body over and over, alien to everything and everyone. It is usually associated with someone "different" from us, who lives on the margins of society and has an extremely limited life, in which nothing makes sense. But it's not exactly that way. This look seems too narrow to us: when we talk about autism, we are referring to people with absolutely revealing abilities, who shut down deep in our soul, and make us reflect on who actually lives alienated (Silva; Gaiato; Reveles, 2012, p. 03, authors' emphasis).

For Silva, Gaiato e Reveles (2012), a person with autism feels, looks and perceives the world in a very different way from the common behaviors expected of other people (although even among non-autistic people there is no rule) and it is the role of parents, teachers, professionals and society as a whole to seek to enter this particular universe and try to understand and respect the world from the point of view of autists. Furthermore, according to the authors, “[...] to understand and master the unique world of individuals with autism is to have the opportunity to participate in a daily miracle: the rediscovery of what is most human in us and in them” (Silva; Gaiato; Reveles, 2012, p. 04).

According to Marinho and Merkle (2009, p. 02), “we live in a society with pre-established standards, where anyone who is outside them is in the first instance excluded”. When it comes to the inclusion of autists in common school classes, it is considered important to approach the theme of autism, to know its specifics and to bring students and the entire school group a better understanding in this regard. According to Marinho and Merkle (2009), promoting strategies capable of decreasing the delay in the social development of the autist is one of the biggest problems faced by educators in the school environment, which, consequently, entails losses in the relationship with other people and communication skills.

In a perspective opposite to the one highlighted by the respondents, the studies of Marques, Barbosa and Gomes (2018) report that there is a peaceful acceptance on the part of students in relation to fellow students with disabilities. According to the authors, students not only welcome autistic people,

but also care to help them at all times. From these discussions, looking at our data, we are led to reflect that possibly what teachers think about the interaction between autistic and non-autistic students is more related to the very way these teachers conceive of students than to the way different students actually understand each other.

In general, it can be noted that the teachers interviewed characterize the autistic student as a subject that presents many difficulties. Such difficulties are listed by the lack of socialization and interaction, accentuated learning difficulty and non-acceptance of other students, becoming a challenge for teaching and learning. It draws our attention to the fact that there is no direct mention of the part that belongs to teachers to deal with these aspects, that is, they are exempt, in their conceptions listed here, from the difficulties of interaction, of learning of their students.

### **Teaching concepts about the inclusion of autistic students in common schools**

In this category, the views of the teachers interviewed about the movement of inclusion of autistic students in common schools will be discussed. The interview questionnaire did not give prior and more explicit direction for the interviewees to talk about this topic. Meanwhile, she appeared in five units of meaning, revealed by two interviewees.

The two-teacher concept of including autists in common schools is a major challenge. In the view of the respondents, the education of autists in an inclusive perspective is challenging by the fact that the student himself notes that there are differences in involvement with school tasks.

U40PS: [...] a child with autism suffers [...] when she sees that she cannot accompany the class [...].

Again, as in the previous category, one of the teachers interviewed is excluded as a participant in the schooling process of their student, that is, if the autist suffers, it would be due to problems that do not compete with the teacher, nor the other students. He wants to know about his autistic status. Such a conception approaches the characteristics of the concept of school integration, in which the role of adapting to the environment was the sole competence of the student.

Another teacher interviewed believes that, in order for inclusion to happen, it is necessary to get the autistic student to perform the same tasks as the others, however, according to her, by knowing the specificities of the student, considers this a difficult task. This feeling of difficulty on the part of autistic students in the conception of teachers must be highlighted, as this can disadvantage a learning-seeking movement: it has difficulties, there is not much to do, "it is difficult". According to her,

U18PT: [...] to me, to include is to make that student do the same thing that everyone is doing [...].

This idea is closer to the concept of inclusion that we are advocating, that is, participating in the same space, with the same tasks, although some of them need some support. It is noted that teachers reveal different conceptions about inclusion, which consequently results in different concerns about having an autistic student in the classroom.

According to Kupfer and Petri (2000), inclusion became a concern for Brazilian educators especially after a whole series of federal and state laws came into force. However, they are laws that have not been accompanied by measures to enable their proper implementation, as well as measures facilitating their implementation. We need to discuss, in the training sessions, the subject of the legislation, the concepts behind these documents, as well as having a continuous reflection on how we, as teachers, conceive inclusion in our role. More than that, we need to reflect on what is exposed in inclusive education policies in relation to our school contexts.

Faced with what the interviewees explained regarding the inclusion of autistic students in common education, and falling into the first category, in relation to what they think about the autistic student, Camargo and Bosa (2009, p. 69) point out that, “[...] to the extent that the subject is seen only under the angle of its limitations, the belief in its educability and possibilities of development will be associated with the impossibility of the stay of this subject in spaces such as the common school”. Still according to the same authors, “[...] these conceptions seem to influence pedagogical practices and expectations about educability of these students. The difficulties of teachers, in a general way, presented themselves in the form of anxiety and conflict in dealing with the ‘different’” (Camargo; Bosa, 2009, p. 69, grids in the original).

In another unit of meaning that follows, an interviewer draws attention to the fact that we should pay attention to which room to include the student. This goes against the idea of an inclusive school, because if it were, any classroom would present conditions for inclusion. If we have problems, they're all over the school. If we have a solution in the same way, it must be discussed with everyone. With this, the idea that we should think in which room we will include our students, any of them, needs to be rethought, consistent with the conception that each has about inclusion.

U43PT: [...] when we are going to make an inclusion, the school needs to think a lot about the room where it will put that student [...].

The conception of the respondents about having an autistic student in secondary school turns out to be a challenging fact. For them, inclusion creates a personal discomfort for the autistic student, as well as for the others. Again, the discomfort of the teachers themselves was not explicitly highlighted, leaving them in the condition of analyzing the process without being included in it. In general, the discomfort is given, according to the interviewees, by the autistic student, for noticing that there are differences in the treatment with him and by the students, for not accepting and not respecting the idiosyncrasies of this subject.

### **The teacher's conceptions about the school's structural support needed for the inclusion of the autistic student**

In this topic, we discussed the conceptions of the teachers interviewed regarding the need for structural school support that favours the inclusion of the autistic student. 26 units of significance listed by the eight respondents were considered.

Having in the room an auxiliary teacher for the autistic student is considered by 5 interviewees an essential support that should be provided by the school in order to favouring learning,

interaction and collaboration with the work of the regent teacher. In the opinion of these respondents, having an autistic student in a common room without him having an auxiliary teacher to serve him individually becomes a much more difficult task for themselves.

U15PS: [...] until the time he had no attendant [auxiliary teacher], to teach was very difficult [...].

According to Souza (2019), the presence of supporting teachers in common education is essential for the care of children supported by Special Education, as well as being a fundamental element for inclusive education. Law No. 12.764, of 27 December 2012, in its Article 3, in its single paragraph, states that “in cases of proven need, the person with autism spectrum disorder included in the common classes of regular education, pursuant to paragraph IV of article 2, shall have the right to specialized accompaniment” (Brasil, 2012, p. 01). In this way, some autistic children have the right of an auxiliary teacher and, many teachers, when they encounter autistic students in the classroom, already expect from the school management this specialized support, because in the case of failure to meet, individually, the specificities of that student, will have the auxiliary teacher to assist him. It should be noted that, even if the law guarantees the right to a specialised accompaniment, the school and family interventions with the public educational sector are often required in order to enforce the legislation, and most of the time the professional provided is a trainee teacher, often without the specific training for Special Education.

As pointed out by Vigotski (2006, p. 113), “what a child can do today with the help of adults can do tomorrow by himself”. In this sense, it is understood that, with a good mediation, you can launch challenges and qualitative results in the development and learning of new skills of the autistic student, being the teacher of support of the utmost importance for the mediation of learning and support to the teacher in the process of Learning and inclusion.

On the other hand, the role of the relationship between the regent and the supportive teacher must be discussed and, given the importance shown between the two, we understand that the teaching and learning process must take place through collaborative work, so that it is possible to a training with good quality, equity and autonomy of the autistic student. These are different tasks and so they must be understood. Above all, the student cannot be assigned as responsibility only to a few, such as the supporting teachers, but to all school staff.

The importance of having a specialist to work with the school inclusion of the autistic student, as well as with his idiosyncrasies of the school daily life, was pointed out by three (3) interviewees as an important structural support that should be provided by the school. The interviewees cited a psychopedagogue or a psychologist as specialists suitable for the work in the care, not only to autistic students, but to all those who interact directly with these subjects, i.e. parents, teachers, classmates and teaching staff.

U30PV: [...] the school needs to have a psychologist, [...] not only for autistic students, in general [...] to assist both teachers [...] and students.

The psychologist with specific and well-defined training, inserted in a context of knowledge of human development, will be able to detect the phased and compromised areas of the autistic student and, being sensitive to the reports of teachers and family, can contribute to the inclusion and learning of this student in an indirect way, since we understand the commitments of the teacher and the psychologist as different,

and should be respected their guidelines of performance. Now, if there is a need for a multidisciplinary team to diagnose an autistic student, we also have to have this collective look after the diagnosis.

Healthcare or psychology professionals must not interfere with the individual commitment of other school employees, i.e. they must be a support in what they are adequately trained for. However, we cannot all give up our commitments and duties, which must be pedagogical when we are inside a school. Finally, if everyone focuses on their limits (teachers with the pedagogical issues and professionals with the issues that fit them) and together dialogue continuously and collaboratively, we can draw better paths, more inclusive. Even because, many of us do not have enough knowledge to deal with the schooling of autistic students in isolation.

The need for classrooms equipped with games, computers, multimedia projector, finally, physical and pedagogical structure that are favourable for the development, the reception and the inclusion of the autistic student in the common education is pointed out by four (4) interviewed as the necessary structure that the school should provide for the attention to inclusion of this subject.

U47PT: [...] a computer, a date-show in the classroom is the minimum that can offer [...] only the book does not provide more [...] that a student needs.

Challenges such as adequate physical infrastructure, accessibility, training of teachers, multidisciplinary staff, teacher support and didactic-pedagogical materials are necessary resources for enabling inclusive education. As an alternative to such challenges and in view of what was stated in the interviews, it is noted that the teachers claim these resources as a way to assist them in the development of learning, not only for students supported by Special Education, but for the entire school community.

In summary, the teachers conceive that, in order for there to be educational inclusion of autistic students in teaching, it is necessary structural school support in the form of specialized services with professionals such as psychologists, psychopedagogues, rooms equipped with manipulable materials, as well as the support of the auxiliary teacher. In this sense, the concept of these services and professionals assumes a fundamental character in an inclusive space for autistic students. However, we stress that, from our point of view, these spaces and professionals should participate in a dialogue involving the entire school community, avoiding the creation of demands that are delegated to each individual. In our understanding of inclusion, for teaching design to receive more meaningful influences, we need to promote the debate of the role of all of us around a common goal.

### **Contribution of School Mathematics to the development of the autistic student**

In this unit, teaching conceptions on the contributions of Mathematics in the development of the autistic student in common education are gathered. In other words, the interviewees seek to discuss what kind of contribution this can be, if there are differences between other students, etc. We highlight here 12 units of analysis by 5 five (5) of the eight (8) professors interviewed.

The teachers maintain that Mathematics brings positive contributions to the teaching, school development and personal of the autistic student in the common school. However, as well mentioned by Viana (2017, p. 16), “the teaching of mathematics in the perspective of inclusive education, brings a challenge to the teaching action at its core of pedagogical action: to address the differences” and, in the

case of autistic students, the challenge increases even more, by the fact that TEA manifests itself in a different way in each person, requiring the teacher to adopt methodological strategies appropriate to the specificities of each student.

School Mathematics, in the development of the autistic student, is conceived by the respondents as a discipline that favours teaching and learning. However, it is necessary for the teacher to have knowledge of the specificities of the student in order to be able to serve him with better quality. The teachers understand that teaching and learning processes should include mathematics that involves everyday experiences with practical activities and logical reasoning, such as those related to Financial Mathematics, in order to make teaching more meaningful and less abstract. On this subject, Cunha (2011) reiterates that the child or adolescent with autism has great difficulties in carrying out daily activities and it is in this sense that the school, through curricular activities, will become a support to collaborate with their learning and, consequently, autonomy. It is also highlighted that the concern in some of the speeches is in the direction of a discipline that favours this autonomy, especially the topics related to the financial life of each.

U29PT: [...] it has to be applied mathematics, that makes sense in the lives of students.

U19PV: Towards independence [...]. I am very much in favour of financial mathematics [...] it can be essential for many things [...].

It is important to highlight the fundamental role of initial and continuous training to teachers who attend autistic students, because even mathematics can collaborate with the school performance of the apprentice, if the teacher does not have knowledge about their specificities, their behaviors, their learning time and the methodologies that may be adopted, in very little will be able to contribute to their learning.

The analyses of the interviews allowed us to understand that, for teaching mathematics to autists, the best are activities that aim to build meaning with functional and daily activities. In this sense, we note a certain limitation of the contribution of School Mathematics pointed out by the respondents in relation to the curriculum as a whole. It draws our attention to the fact that some aspects have not been mentioned, for example, the contribution on the use of games as a possibility of socialization, manipulable materials as in favor of cognitive development and/or use of the Computer Laboratory and its various possibilities for learning.

To counteract this result, we can quote studies that have been carried out, such as the research of Fleira and Fernandes (2019), which uses manipulable materials to insert the content of equations of the 2nd degree. According to the authors, the resource used not only collaborated with the autistic student in mathematical practices, but also to their effective inclusion in the classes. Chequetto and Gonçalves (2015), with the use of play materials and games, found a way to bring the student closer to the discipline of Mathematics, specifically the content of multiplication and division. The study by Amaral (2018) shows that the use of digital games, applied to an autistic student and also to other children who need Specialized Educational Care, has triggered a better understanding of concepts of the additive and multiplicative field.

The limitation of this power of scope of Mathematics, conceived by the respondents, makes us wonder whether it is related to what the autist can/will or not learn, or with the difficulties of the teachers themselves in the absence of discussions in teaching training. Such a conception does not share



what we understand by Inclusive Mathematical Education, in which all students, regardless of any characteristics they possess, can learn, depending on the resources and tasks that we propose, which may or may not broaden the barriers to their participation. However, we cannot limit their possibilities in advance.

In Souza and Silva's vision (2019), overcoming this limited vision of the school's capacity to contribute to these students requires a change in the paradigms of inclusion, enabling a differentiated look at the autistic student, realizing his potentialities and recognizing him as a subject capable of learning. According to the authors, from the moment that there is this recognition and appreciation, the school and teachers start to develop innovative and non-exclusive educational practices, enabling the student to participate actively in the process of building knowledge.

### **Educational Approaches to Teaching Mathematics for Autistic Students**

We present, in this category, what the conceptions of teachers about teaching approaches applied to autistic students as necessary in the teaching of Mathematics in common schools. 40 units of meaning were shown, presented by all the respondents. The use of technological resources, such as electronic games, computers, math software, educational websites and applications, was pointed out by three (3) respondents as resources associated with teaching and learning. For the respondents, the use of such resources gives students greater interest in the discipline of Mathematics and, consequently, in the process of schooling.

U29PV: [...] use the multimedia with the activities in books and PowerPoint, [...] Geogebra [...] website and games [...].

U40PT: [...] made him interested in my class.

Silva, Moura and Soares (2017) highlight, in their studies, that autistic children show interest in handling and using computer resources (mobile, tablet, electronic games etc.) and for this reason are being inserted more and more often in therapies and in the teaching and learning processes of these children. Although the educators interviewed showed interest in the use of such resources, what concerns us is the precarious training and information, as mentioned earlier, that most teachers have regarding autism and these students, specifically. The act of knowing the student and his specific needs contributes to achieving the goal of learning in the applied activity. It is not enough to know only the materials, but also the students. According to Orrú (2003, p. 04), "such an individual exposed to various visual stimuli without the proper intervention of the educator, becomes stressed because of the saturation of information that remains unfunctional to him".

The use of manipulable materials, such as games, was mentioned by four (4) respondents as a teaching methodology that provokes the interest of the autistic student in learning. According to the teachers, the use of these recreational resources as a teaching strategy motivates them to participate better in mathematics classes, improving the student's attention to activity.

U31PS: [...] I knock on that key that when you work with concrete material [...] attracts attention and is interesting.

With proper planning, in the sense of being articulated to the teaching objectives of the teacher, the use of manipulable materials is a suggestion of methodology that can resignify the pedagogical practices in teaching Mathematics for autists. However, before presenting activities with these materials, it is necessary to know the autistic student so as to establish what skills he possesses and what he needs to develop, given that, as the teacher is getting to know his student, he can establish new strategies.

According to Chequetto and Gonçalves (2015), the use of manipulable materials can be a way to bring students closer to the discipline of Mathematics, sometimes considered to be of greater difficulty for understanding. However, the authors emphasize the importance to be given to the planning of classes, combining such resources, mainly in the work with autistic students, thinking about their specifics and taking into account their behavioral nuances and their learning time.

Some alternatives that can be used in the classroom are pointed out by Brito and Sales (2017) and Gaiato (2019), to enable the learning of autistic students. They are: use of materials of interest to the student, clear and objective explanation of the work that will be carried out, involve the student in the organization of the activity, sit him/her in front of the room, adopt positive reinforcements (such as compliments), use visual resources, among others. We realize that the use of games can enable most of these alternatives approaching in a playful way the contents to be worked on.

Even considering the commitment of educators to work with methodological strategies that involve games and manipulable materials, we agree with Nacarato (2005), which points out that no manipulable material constitutes the guarantee for the improvement of mathematics teaching. Its effectiveness or not will depend on the way it is used. The strategy is not only in the material, but also in the teaching leadership.

Although not mentioned in the interviews, we know that there are difficulties that may arise with the use of manipulable materials. Some factors may interfere negatively in the application of these materials, for example overcrowded rooms, lack of aiding teacher, insufficient pedagogical resources that serve all students, etc. However, even with all these challenges, it is clear from the interviews that educators are looking for alternatives to the care of autistic students, so that they have the opportunity to learn in a playful way and aimed at interaction with the other students.

According to three (3) professors interviewed, by understanding that autists are students who present marked difficulties, who cannot accompany the class in the activities and need a more individualized follow-up, reveal the need for teaching strategies with activities that are differentiated from the others.

U24PR: [...] all activities [...] had to be different [...] did not copy, nor wrote [...] speech problem [...].

U33PD: [...] I have always sought to do in a differentiated way, the activities [...].

On the activities that autists carry out in the room, Azevedo (2014) mentions three classifications: the adapted activities in which they are part of the curricular adaptations that teachers must make when necessary with the aim of enabling the learning of all; the different activities where only autistic students carry it out; and the equal activities, that is, those that all carry out together. However, the same author stresses the importance of these activities not to be a reason for segregation, but rather to be carried out in accordance with what is being worked by the class or at times when everyone can

participate. From our point of view, rather than already defining in advance whether the activities will be the same or not, we need to maintain coherence with our individual conception of inclusion.

The autistic student, like all others, already arrives at school with a baggage of interests in some objects, subjects, themes, that is, he already comes with certain interests established before the school environment. Some teachers appropriate this interest and start from this principle to try to establish a relationship between teacher and student.

As mentioned earlier in the theoretical section, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (APA, 2013) is a document used by health professionals as a reference to diagnose mental and behavioral disorders, such as, for example, ASD, but that does not portray the pedagogical issues of the student. The document addresses the specific interest that autists demonstrate with great intensity for certain subjects, objects, themes. According to the document, we have: “[...] 2. Insistence on the same things, inflexible adherence to routines or ritualized patterns of verbal or non-verbal behavior [...] 3. Fixed and highly restricted interests that are abnormal in intensity or focus [...]” (APA, 2013. p. 50).

In general, teachers understand that the use of technological resources, manipulable materials, differentiated activities and knowledge about the specifics of their autistic student are teaching approaches that contribute to the teaching of mathematics for these subjects.

## CONCLUSION

From the interviews conducted with the teachers and once identified and encoded all the units of meaning in each transcribed interview, the categories were identified by means of the convergence on a same topic or aspect listed by two or more respondents. Thus, we resume here in a briefly way and try to answer our research problem.

The first category highlights that teachers conceive of autistic students as individuals with many learning, socialization and communication difficulties. In view of this and looking for possible answers to the question guiding the research, we conclude that the respondents understand that their practices with such an audience should be differentiated from the practices developed with the other students, seeking to contemplate the specifics of their difficulties. The establishment of an affective bond is one of the practical attempts adopted as a way to enable a better interaction between teacher and student so that the teacher can better know their specificities, providing them with a more appropriate teaching.

With regard on the second category, in which we sought conceptions from teachers about the inclusion of autistic students in common schools, we did not have a more explicit direction for teachers to talk about the topic in our script and, in this sense, only five units of meanings appeared, presented by two teachers. In general, the respondents perceive the inclusion of the autist as something challenging. According to them, it is challenging for the other students, because they will relate to these students, and challenging to the autists themselves, for recognizing that they are different and feeling excluded by it. However, what we note is that teachers are not included in this analysis as participants in the same context. Thus, we note that the look of the teachers focusing on their interactive limitations can influence their pedagogical practices, as well as the expectations about the learning of these pupils.

The conceptions emerged from the third category reveal the need for conditions of structural support so that the teaching practice of the interviewees takes place in a more appropriate way aimed at the inclusion of autistic students. According to the respondents, it is necessary to support professionals, such as psychologists and psychopedagogues, who can assist both the autistic student and the others involved in its inclusive process, including teachers. Another point highlighted by the teachers is about the need for resources, such as classrooms equipped with pedagogical games, computers, adequate physical infrastructure, accessibility, training for teachers, teacher support. Finally, materials and services favourable for the development, the reception and the inclusion of the autistic student in the common education. We believe that reclaiming such resources assumes what teachers perceive as fundamental to the development of their educational practice with respect to their autistic students.

It is present, in the fourth category, the question of the contributions of Mathematics in the development of the autistic student in common education. In the conception of the respondents, Mathematics is a discipline that favours the teaching and learning of the autistic student. Furthermore, the methodology of content approach should include practical activities, in order to lead the teaching of Mathematics to have greater meaning and less abstraction. What we perceive embedded in the lectures of the teachers is that, for teaching Mathematics to autistic students, what favours are activities aimed at the construction of meanings with functional and everyday activities, noting a certain limitation, enunciated by the conception of the interviewees, on the contribution of School mathematics in relation to the curriculum as a whole, compared to what is expected for the other students. The concern is with the autonomy of the student in everyday activities that involve mathematical knowledge. In view of the above, we understand that the limitations found may be related to the absence of initial and continuing training presented by the respondents, since, even mathematics can collaborate with the school performance of the autistic student, if the teacher does not know its idiosyncrasies and the most appropriate methodologies to be used, there may be no significant contributions.

The last category presents the conceptions of the teachers about the teaching approaches applied to autistic students in teaching Mathematics in common schools. The respondents mention the use of technological resources such as electronic games, computers, mathematical software, educational sites, applications and also manipulable materials, such as educational games. Such resources, according to them, arouse in the autistic student greater interest in the content and discipline of Mathematics. Although we recognize the interest in the use of such materials, we know of the difficulties existing on the part of teachers derived from the ignorance about autism, this ignorance resulting from the precarious initial and continuing training, already mentioned earlier in this research.

Through the interviews, we gave the teachers voices and we were able to hear their wishes and, from such conceptions, to reflect on what teachers aspire in the school environment. We hope that the school as a whole, and also the initial training courses, can also reflect on these conceptions, seeking to provide teachers with greater physical, structural, pedagogical training conditions for the development of the learning of the autistic student, but, first of all, of the teachers themselves.

In this research, it became clear how necessary is the knowledge of teachers in relation to the specificities of the autistic student, aiming for a good quality educational development for these people. However, we were also able to see that the reality does not correspond to what the teachers want, that is, the absence of initial and continuing training that discusses this issue sufficiently. In view of this, we hope that this study reaches educational leaders, such as education secretaries, directors, coordinators, finally, professionals who can bring to the teachers (and with them) training and information of good

quality about autism, mainly so that they feel more and more part of the process of inclusion. We understand that if we want to know their conception and the relationship with teaching practices, it is because they are fundamental to the classroom, being impossible to dissociate our conceptions from our practices.

This work's theme does not end here, on the contrary, it is the beginning for other reflections and future actions, especially with regard to the conception of teachers about their inclusive practices. If we want to change teaching practices, from our point of view, we must always start from our concepts. In view of this, we wish, with this research, to stimulate reflection on the topic and contribute to the achievement of a good quality inclusion for all.

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Author 1 - responsible for the production and analysis of the data, as well as for the initial writing of the text, considering that it originated from a Master's dissertation.

Author 2 - responsible for the final reading of the text and guidance of all the research that originated in it. In addition, he was responsible for the approval by the Research Ethics Committee of the university involved.

#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.