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EDUCATIONAL EXPERIENCES AND ASSISTIVE TECHNOLOGY: CONTRIBUTIONS TO THE SCHOOLING OF THE BLIND

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ABSTRACT

Inclusive Education requires attention to learning and coexistence to provide spaces for everyone to play a leading role. We need to go beyond obstacles and look at the potential of people with disabilities. This article proposes a reflection on people with visual impairments, considering the processes that segregate and exclude them, as well as their potential and experiences of inclusion. To this end, narrative interviews were carried out to access the educational experiences of four adults with visual impairments. The interviews were analyzed using Bardin's Content Analysis (2011), with the support of the software Atlas TI, and were asked how the educational trajectories and experiences with Assistive Technology contributed to the interviewees' schooling process. The results show that the time the participants spent in educational institutions was segregating and excluding, but that there were also possibilities for developing potential and learning in inclusive and emancipatory contexts. Assistive Technology resources appeared throughout the participants' school lives in different ways and for different reasons, acting as mediators in the learning process.

Keywords: Visual Impairment. Cultural-historical Theory. Assistive Technology. Educational Trajectories. Compensation.

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INTRODUCTION

For many centuries, disability was seen with a negative connotation, as something incapacitating that should be hidden from society. Currently, there are still many ways of looking at disability that continue to spread prejudices and judgments that often end up resulting in acts of discrimination and rejection. These acts include words that attribute discriminatory meanings to disability, relating it to abnormality, retardation, weakness, incapacity, invalidity, etc. (Plaisance, 2010). Manifestations of prejudice and discrimination against people with disabilities have been called *ableism*, a characteristic ingrained in society and based on an individual's perceived abilities or limitations. Ableism is organized from the understanding that “normal” people are considered more “capable”. According to Marchesan and Carpenedo (2021, p. 6), “it refers to the power and theme of the body, based on the idea of a body standard, of the perfect body; in addition, it suggests a distancing from the capacity and aptitude that exists in human beings.”

However, even though ableism is an issue in society, we can see changes in how disability has been approached. These changes include legislation, the way disability is perceived, schools and society. In terms of legislation, for example, Brazil has made progress with the approval of laws, decrees and ordinances aimed at guaranteeing accessibility and inclusion for persons with disabilities. However, only recently has it had a law designed to ensure and promote, on equal terms, the exercise of fundamental rights and freedoms for these persons, with a view to social inclusion and citizenship: the Brazilian Law for the Inclusion of Persons with Disabilities (PwD), No. 13.146, of 2015 (Brazil, 2015).

In education, the change in view and practices towards students with disabilities has had an important contribution from the Special Education Policy from the Perspective of Inclusive Education (PNEEPEI), adopted in 2008. This policy aims to ensure the inclusion of students with disabilities, global developmental disorders and high abilities in schools, guiding education systems to guarantee access to regular education, with participation, learning and continuity at higher levels of education (Brazil, 2008, p. 14). The PNEEPEI points out that inclusive education adopts a paradigm based on the concept of human rights, combining equality and difference as inseparable values, overcoming the formal equity model and acting to abolish the historical scenarios of the production of exclusion inside and outside school. Although the publication of laws and decrees is an important step towards guaranteeing the rights of persons with disabilities, we understand that they do not take into account the specificities of disabilities, the potential of persons with

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disabilities, or inclusion in society and education. As far as education is concerned, it is also necessary to consider aspects linked to learning and development processes to provide inclusive spaces for everyone to play a leading role.

In order to enforce the rights and citizenship of persons with disabilities, we need to go beyond an understanding of the obstacles. We believe that it is necessary to shift the focus from defects or loss to ways of developing the potential of persons with disabilities, especially in the context of persons with visual impairments (PwDV), who are the focus of this study.

We therefore take Vygotsky (1997) as one of the bases for reflection on the potential and challenges that visual impairment brings to inclusion, learning and development throughout life. For the author, blindness is not just the lack of sight, but it is capable of giving rise to new possibilities, alternative paths for the development and manifestation of the abilities of PwDV. From this perspective, disability is constituted when compensatory stimuli are not recognized or presented, in other words, when we do not take the PwD as participants in our culture.

In the context of this research, we tried to look at PwDV, going beyond the concept of blindness in which the focus is on the loss of the sense of sight and the search for rehabilitation, as presented by the medical model of disability. We tried to conceive of PwDV from the social model, considering them from the perspective of someone who suffers from processes that segregate and exclude PwD (Shakespeare, 1996; Shakespeare & Watson, 2002).

Regarding the education of PwDV, according to Bianchetti et al. (2000, p. 44) the school “should be the vehicle where difference is taken into account, but in the education of blind children, biological facts should not be given greater attribution than the social consequences and conflicts that blindness brings them.” In this sense, inclusive schools have proved to be an opportune space for joint learning. It is worth highlighting the expansion of the use of Assistive Technology (AT) resources which, according to the Brazilian Inclusion Law (LBI), are products, equipment, devices, resources, methodologies, strategies, practices and services that aim to promote functionality, related to the activity and participation of the PwD or with reduced mobility, aiming at their autonomy, independence, quality of life and social inclusion (Brasil, 2015).

Combining aspects related to visual impairment, learning, AT and schooling, this paper aims to analyze how educational trajectories and experiences with AT throughout life

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contribute to the schooling process of people with Visual Impairment (VI). To this end, we conducted narrative interviews with a view to accessing the educational experiences of four people with VI. The interviews were analyzed using Content Analysis, by Bardin (2011), with the support of the software Altas TI. Below we present the methodology, the results and their analysis.

METHODOLOGY

This study was conducted using the assumptions of Qualitative Research, which aims to study the meaning of the life of a social group, representing the opinions and perspectives of that group (Rey, 2005). The participants in the research were four adult blind people. For data collection, narrative interviews were conducted to access the educational experiences of the participants and their experiences with AT. We seek an approximation with Moraes and Kastrup (2010), who approach the research from the perspective of research with, focusing on VI and considering the research subjects as experts of their realities.

Researching with implies carrying out interventions that make people with VI active in the research process, in the sense of having them as partners in the construction of knowledge. It is an affirmation of research as a “performative practice that is done with the other and not about the other” (Moraes & Kastrup, 2010, p. 7), in which the other is active in the process, since it is with them that the questions to be investigated are answered. In this way, Moraes (2010, p. 25) proposes that “in order to know what it is like to be blind; we need to follow this process in action, in the daily practice of the people who experience it. Researching with others implies a conception of research that is engaged, situated.” Thus, the relationship with the research subject with VI must be additive, produced from the intersection, taking into account the reference of the other, that is, “an intervention that could be done in the space between the blind and the seeing, and not from the seeing to the blind” (Moraes, 2010, p. 16).

PARTICIPANTS

The research involved four blind adults who use screen readers to navigate online on a daily basis. For the selection of participants, we followed the definition of blindness given by the Ministry of Education and the Secretariat of Special Education, which defines it as “a serious or total alteration of one or more of the elementary functions of vision, irremediably

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affecting the ability to perceive color, size, distance, shape, position or movement in a more or less comprehensive field" (Sá et al., 2007, p. 15).

Of the four participants, two are congenitally blind and two have acquired blindness, one in his teens and the other, who has lived with low vision since birth, became blind in 2019. In the research, the participants, considered partners in the construction of the data, were given the following fictitious names: Antônia, 33 years old, Armando 30 years old, Bernardo, 32 years old, and Carlos, 43 years old.

THE INTERVIEWS

As a way of listening to the participants, in the search for an understanding of their educational trajectories and the possible relationships with learning and with their constitutions as subjects who have experienced DV throughout their school lives, we chose the narrative interview. According to Flick (2009), this type of interview allows participants to tell a story related to the research area of interest. The researcher encourages the participant to speak based on a generative question, while remaining an active listener, signaling their interest with interjections, for example. Any questions that arise during the interview should be written down by the researcher. The proposal made by the researcher to the participants was as follows:

> I'd like you to talk about where you went to school during your life, your relationships with teachers, what it was like to be a visually impaired person at school, when technology came into your life. How has it all been up to the present day, your school career. You can take as long as you think you need and anything that's important to you interests me, it's important to me too. [Researcher]

Due to restrictions caused by the Covid-19 pandemic, the narrative interviews were conducted online via Google Meet, recorded with the participants' permission and later transcribed in full. The research followed the ethical principles for research with human beings, submitted to the Brazil platform and approved by report number 2.282.755.

The data was analyzed using Qualitative Content Analysis (Bardin, 2011). Once the interviews had been transcribed, we uploaded the files to ATLAS.ti, a software program suitable for analyzing research data using different and complementary instruments. Our decision to use this software was due to the possibility of analyzing and cross-referencing the data using different visual resources, which we saw as a differential that helped to enrich and deepen the analysis.

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RESULTS AND DISCUSSION

The narrative interview acted as a tool for us to access the experiences of the participants with VI in the educational and care institutions they went through, as well as when AT became part of their lives. Below, we present for discussion what emerged about the educational experiences in relation to the attention given to the participants and the experiences with AT throughout their school life, as a component of the schooling process for students with VI.

EDUCATIONAL EXPERIENCES AND CARE FOR PEOPLE WITH VISUAL IMPAIRMENTS

School experiences throughout life mark the individual's development and have the power to determine professional choices and attitudes in the way each individual relates to others. School can be an emancipatory space, but it can also be segregating and excluding. For Antônia, Armando, Carlos and Bernardo, the time they spent in educational institutions was segregating and excluding, but it was also a space for developing their potential and learning, and it was also inclusive and emancipating.

Armando joined the school in the 1980s, a period when special schools or special classes in regular schools still prevailed in the country, with a segregating character, which gave the right to education, but considered the PwD only fit to live and be educated among other people with the same characteristics (Mainardi, 2017b).

Armando's exclusion took place in a school that catered for students in special classes. However, reports of exclusion were also made about experiences in educational institutions that received students in mainstream classes. Antônia reported having experienced a situation in which she felt excluded at the beginning of her school life, but by her classmates: "*At first I went to kindergarten. The children weren't receptive to me. It was like I was an ET, you know. It was a difficult time for me. I have things that I block out, that I don't remember.*"

For Carlos, the memories of exclusion come from physical education classes, which also took place during high school: *So, my classmates went there to play, to play ball, to do other activities. And I stayed there playing Pop Up Pirate, playing with toys, with games*. These narratives reflect the processes that are linked to the difficulty of living together and accepting differences, as well as the lack of knowledge of the benefits that living together can have for all children, whether they have disabilities or not. These statements reveal

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what Kassar (2016, p. 1234) defines as a “restricted view of human development” in which students are discriminated against or left aside at different times in school activities.

For Vigotski (1998), learning drives development, so situations such as those experienced by Antônia, Armando and Carlos point to a context that restricts the possibilities for development, since “the restriction occurs not only in the provision of an education that is poor in possibilities (or by not providing it), but also in the human relationships that construct/inform/reinforce, at all times, the students' incapacity” (Kassar, 2016, p. 1235).

Similarly, the speeches present a notion linked to exclusion due to the characteristics of the disability itself, when they consider that Carlos' VI is an obstacle to his participation in a class that requires movement, spatial location and physical contact. On the issue of not being able to take part in activities due to disability and exclusion, Garland-Thompson (2014) uses the term misfit, which occurs when the environment in which a person finds themselves fails to offer the possibilities for them to actively participate in life in society, such as what happened in Carlos' Physical Education classes, for example, where the teacher did not seem to look for solutions so that he could take part in activities with his classmates.

Mainardi (2013) takes a similar view to Garland-Thompson when he brings the definition of disability by situation or context into the field of pedagogy. For him, when a PwD encounters barriers that prevent or hinder their participation, a condition of disadvantage is created, which is a secondary effect of the presence of a disability, i.e. if the conditions for participation are given, through communication devices, tools and instruments, etc., the possibility of the PwD being included will be much greater.

However, the participants' accounts also confirmed that maladjustment or deficiency due to the situation or context is not constant, and there are situations in which pedagogical action has provided possibilities for inclusion. For Antônia, for example, the feeling of being different and not fitting in accompanied her in the early years of elementary school. A change came about as a result of the work carried out by the school psychologist who, according to her account, carried out activities to bring Antônia and her classmates closer together:

> But when I arrived at school, I was welcomed there. But I was a very suspicious child and so I didn't open up to people and they didn't understand why. [...] Then I went to a psychologist at school. She helped me to make friends, to open up, and it was important that she went with me, because she made me feel secure, you

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> know. She helped me through this process, right? [...] by doing therapies and everything, and after that, it was quiet. [Antônia]

In Carlos' case, the feeling that he was taking part and being welcomed came about through a move on the part of a history teacher who, through a sensitive eye and connections with an institution that worked on inclusion through sport, managed to acquire a ball with a handle that helped Carlos to practice activities with his classmates, as we can see in his words: *So we played, practiced penalty kicks, goal kicks, dribbling. I did all those things. Then I felt good, I liked it, I was included with my classmates. Awesome!*

We understand that in these situations there was what Garland-Thompson (2014, p. 10) defines as fit, which occurs when “there is a harmonious interaction between a body that has a certain form and function and the environment that sustains that body.” It is important to note that the environment includes not only physical aspects, but also communication and interaction between subjects.

In the same way, we noticed that, in the actions of the psychologist and the history teacher, there was an understanding of the context in which Antônia and Carlos found themselves, which, according to Mainardi (2013), led to an individualized and singular intervention in relation to the two and the context that surrounded them. This understanding of the context was also reflected in other moments, including their career choices.

Bernardo, who became blind in the last year of elementary school, reported that interaction and mutual respect prevailed in his school experience, in a space that was easy to live in, where he felt included, and which was a determining factor in him continuing to study:

> It was very smooth, very smooth indeed. It's like every interaction with the class, every interaction with the teachers. And then I didn't have any trouble, like having to get up there and say “Stop!” or “No, you don't!” “You didn't respect me!”, “We're going to fight!” No! No! None, none, none, and it was very, very peaceful. And then I had it in my mind: “I'm going, since it worked out, I'm going to carry on, I'm going to college. [Bernardo]

In Bernardo's account, we can see a latent feeling of belonging to the group and of being respected. This positive perception of the school experience refers to Vigotski's (1997) view of the social and the collective as a driver of learning and development. According to Kassar (2016), cultural-historical theory understands the development of individuals as a complex process of appropriation by each one of the cultural goods socially produced by humanity at each historical moment. We understand that, at school, this

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appropriation goes beyond learning concepts, with coexistence, affection and the feeling of belonging to the group being important for the student to progress, learn and develop.

In the examples of Bernardo and Carlos, we see the presence of compensation, because there was “quality of communication with adults and the social relationship with the ‘collective’, in an organized group of peers”, which is fundamental for compensation to happen (Gindis, 1995, p. 79). If, according to Vigotski (1997), blind people only feel their disability in an indirect way, reflecting on the social consequences, then, by breaking away from exclusion, by being included in the group and the community, Bernardo and Carlos were able to have their VI compensated, with experiences with their classmates and teachers being the alternative path to this compensation.

Another aspect that emerged from the interviews concerns the difficulties encountered in continuing studies at university level. Armando's view of Brazilian education may indicate a tendency to overprotect students with disabilities, an idea that they can only achieve something with the help of teachers, support and the resource room. If, on the one hand, all the assistance that students have access to today can help them learn, on the other, it can lead to a dependency that doesn't drive development. We understand that this is the perspective of integration, based on conceptions of the medical model, Shakespeare (1996) and Mainardi (2017a), which offers students the technical conditions to participate in classes, but without promoting changes in the social sphere so that these students can be heard in their needs and can show their potential to learn and develop.

We also understand that overprotection translates into a vision of assistance rather than emancipation, in the sense that “we have to help because the disability doesn't allow them to learn”, which in the future could be reflected in them dropping out of school and becoming underemployed. In this regard, Vigotski (1997) says that the education of blind children should be organized to develop their potential, giving them the right to social work “not in its humiliating, philanthropic, invalid forms, but in the forms that respond to the true essence of work, which is solely capable of creating the necessary social position for the personality” (p. 87).

The issue of students dropping out of school is not the prerogative of students with disabilities. In Brazil, the number of out-of-school children and adolescents has been high. According to data from the National Household Sample Survey (PNAD), in 2019 they reached almost 1.1 million. However, we understand that, for students with disabilities, the challenges to continuing their studies are even greater, since social barriers are

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compounded by attitudinal, communication and urban planning barriers (Brasil, 2015). These barriers are evident in the following excerpt:

> So, it's all a bit more difficult, isn't it? Then, when you go to study, people say “Oh, we want to include you, we intend to include you. But we're just signing you up. I don't know how I'm going to provide material for you.” But that's not a problem for the institution. It's a problem for the student. [Armando]

Armando found it difficult to access an institution, because the institution receives the student's application, but lacks the conditions for the full development of his potential as a student. Caiado (2003), in a study of the school experiences of blind people, also observed a lack of adapted resources, and dependence on the teacher's voice was one of the reasons found for the possible withdrawal from studies of the PwD. For Carlos, the communication barrier was what determined the course he chose:

> Now, at university, I was a bit sad... Sad, in the sense that the courses I took, that I chose, Huh? IT, it's not a course like, say, social work (where) everyone talks to each other, everyone gets along, everyone does things together. In IT, I've noticed, I've noticed, that it's every man for himself, you know? [Carlos]

We understand that Carlos, because of his previous experiences at school, where he felt he belonged to the group, was able to translate what studies such as Barbosa and Guedes (2020) and Guedes (2014) have said about the higher education of PwDV. These studies identified that the participation of students with VI in higher education can be revealed in the daily life of the classroom as a result of the recurring visual aspect in academic activities and in socializing with others. In higher education, in general, there is an orientation towards integrating students, but there is a lack of experience, dialog and recognition of differences by the group, in order to build an inclusive space. In educational contexts, inclusion can be more effective when the teacher is willing to get to know the student, to listen to their needs regarding the resources they use, to consider the relevance of these resources for the student's learning and development.

We also believe it is possible to think of the teacher as a mediator of interaction between students, in order to improve interpersonal exchanges. For Barbosa and Guedes (2020, p. 15), this means “working with the class to develop habits and attitudes of cooperation and respect for differences”, which can occur through group activities, in which students are encouraged to describe the images, to observe the direction of speech towards their colleague with VI and to use an appropriate tone of voice, without elevations.

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Also evident in the interviews were the paths taken at the school with regard to Specialized Educational Assistance (AEE) and the resource room, as well as the role of institutions in assisting PwDV, especially with regard to AT resources.

ASSISTIVE TECHNOLOGY RESOURCES IN EDUCATIONAL AND CARE INSTITUTIONS

Assistive Technology (AT) resources, such as Braille and screen reader software, magnification, tactile models, among others, appear throughout the school trajectories of Antônia, Armando, Bernardo and Carlos in different ways and for different reasons, acting as mediators in the learning of the four.

For Vigotski (1997), the concept of compensation can be understood from a social perspective, since it is in interaction with others that individuals learn and develop. “Blind children can achieve development in the same way as children without disabilities, but those with disabilities do so in a different way, by a different path, with other means” (Vigotski, 1997, p. 17). By “other means” we mean alternative paths or special resources that can be translated into the use of Braille, magnification, screen reader software and even the voice of the teacher acting as a text reader, for example.

According to Passerino, Roselló and Bladassari (2018), social compensation at school involves implementing strategies and resources to improve the teaching process in order to guarantee the learning and development of students with disabilities. These issues can be seen in the case of Armando, who used resources such as magnification and relief during elementary school. The materials were made by the school and the care institution. However, the materials usually arrived late, which affected his ability to follow the activities and the progress of the class. In this situation, there was an attempt to provide the necessary support, but the delay in delivering the materials ended up putting him at a disadvantage compared to the rest of the class.

Bentes (2010) provides an interesting reflection on this issue of delays, pointing out that, in mainstream schools, the task of creating alternative pathways and special resources is generally delegated to multifunctional resource rooms and does not reach the mainstream classroom, where the teacher could trigger the inclusive process through pedagogical mediation. We think that joint action between the teacher, resource room, institution and students engaged in a process of listening and seeking solutions could minimize the damage that the delay in materials causes to learning and development.

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On the other hand, for Carlos and Antônia, the fact that they had used Braille from the beginning of their school lives, combined with the help of the professionals in the resource room and the educational institution, proved to be an ally in compensating for their disability, through the alternative path of using the Braille system. Carlos reported that he used Braille from pre-school through to elementary school:

> The pre-school, pre-braille, all that stuff, I did at the (institution) itself. Then, at school, I went straight into the first grade [...]. I used it for a long time. Then, in 2002, I started having my own machine at school. [Carlos]

We think it's interesting to highlight the preparation prior to the first year of school, with Pre-Braille, as a strategy for monitoring literacy with the sighted. According to Garcia, Moraes and Mota (2001), blind children only incorporate reading and writing habits in general when they enter mainstream school, when they are introduced to the world of reading and writing. So, with compensation in mind, the institution, by working on introducing Carlos to the Braille system before he entered mainstream school, anticipated some issues that gave him the possibility of meeting the challenges of literacy.

For Antônia, the use of the Braille machine at school was a worrying factor at the beginning of her school life, because her classmates liked to touch the machine, which bothered her: *In the beginning there were some classmates who liked to touch my machine. I still couldn't bring myself to tell them not to touch it. I felt uncomfortable about it too, but life went on, huh?*

Although Antonia felt uncomfortable with her classmates' attitude, we can see that there was an excellent opportunity that could have been explored by the teacher, if she had carried out an activity that could have been a first step towards Antonia's inclusion in the class. A moment of experimentation with the machine by the sighted students could have been an icebreaker, a generator of connection, an alternative way for her to impose herself, and for her classmates to understand that this machine was a resource that helped her in class, just as a pencil and notebook also helped them to record the content. There was an unexploited opportunity to direct compensatory processes towards establishing relationships with the sighted, which Vigotski (1997) sees as one of the important points for the development of higher psychological processes in disabled individuals.

The use of computers and screen reader software took place in secondary school for all four research partners. Bernardo, who became blind in the last year of elementary

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school, began his rehabilitation work in an institution for PwDV and opted to use screen reader software, known as Assistive Technology (AT). To use the screen reader software, he relied on a desktop computer bought by his mother, as there was no access to AT at school. However, although he pointed out the absence of AT at school, there was a joint search for alternative ways to reconcile what he was studying in class with the use of AT at home, as we can see in Bernardo's words: *We were talking. "Wow, that's fine, that's not fine!" "Send it by e-mail", "Don't send it!", "Wow, you scanned it, it didn't work!" Then the [institution] helped me a lot, because there were a lot of books that weren't, weren't accessible.*

Bernardo's speech reveals an important aspect for the development of higher psychological functions, as mentioned by Passerino et al. (2018): mutual social action using cultural media, the search for and adjustment of media to the different needs of students with disabilities. For Bernardo, the openness to dialog and the search for accessibility solutions, together with the institution, were decisive for the possibility of AT acting in the social context when compensating for his VI.

Carlos told us about the use of computers only at school and not for all subjects. Until then, there had been a mixed use of the computer and Braille. For him, as for Bernardo, there was mutual action between the school and the student to find solutions that would help him learn. However, the use of Braille became secondary towards the end of secondary school: From then on, I'm not going to say that I abandoned Braille, right, because we can't abandon it, because, you know, when we need it, let's say, we use it when we need it.

This move by Carlos to prioritize screen readers over Braille reflects what research, such as that by Omena (2009) and Batista (2012), has found regarding the preferences of blind adults today. Although these people were literate in Braille and used it in childhood, they now prioritize the use of high-resolution screen readers because it broadens interaction and participation in social exchanges, expands the communicative potential of blind people and promotes social, cultural and intellectual development.

Carlos' move to prioritize screen readers over Braille reflects what research, such as Omena (2009) and Batista (2012), has found in relation to the preferences of blind adults today. Although these people were literate in Braille and used it in childhood, today they prioritize the use of high-resolution screen readers because it broadens interaction and

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participation in social exchanges, expands the communicative potential of blind people and promotes social, cultural and intellectual development.

For Armando, his first use of AT via screen reader software came at the institution for persons with disabilities, where he attended a computer course and was introduced to the Dosvox software. Armando considers this moment to be a milestone: “a new range, a new horizon”. He also says that another screen reader software played a decisive role in his studies:

> And then, at the end of 1998 or so, Virtual Vision appeared, and it was perfected. And since it was mainly visually appealing, I started using my voice to make it easier. And that gave me the courage to go to university. [Armando]

We can see, in what they say about their experiences with screen readers and computers, the power of these resources as alternative paths, as instruments of compensation between them and the social context in which they live. According to Vigotski (1997), one of the aspects of compensation is the possibility of PwD being able to act in an independent and participatory way, using symbolic tools. We understand that this independence, combined with consideration of the social aspects of disability involved in exchanges with others, was the path to compensating for VI.

The participants in the research had AT as an ally when they went on to higher education. Carlos used it intensively during his degree in Information Technology. Antônia, Bernardo and Armando used it during their undergraduate studies to access books, the activities provided by their teachers and, later on, also during their postgraduate studies, which were carried out in distance learning mode. Armando considers technology to be his great partner, which accompanied him and enabled him to progress to postgraduate studies, as he reports: I was able to achieve this because of technology. It was technology that got me a long way in undergraduate and postgraduate studies.

The autonomy developed with the support of AT and the understanding that society and resources need to be available for people with VI to be able to learn and develop emerged from the speeches, which reflects a connection with the social model of disability, in which the environment needs to provide the conditions for people with VI to be able to act independently in society.

Listening to the accounts of the school experiences of Antônia, Armando, Bernardo and Carlos, we realized that the potential to learn and develop was present in all of them

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and that, with the right resources, added to the exchanges with classmates, teachers and support institutions, they were able to advance in their studies and wish to be more, not in spite of their disability, but with their VI.

Thus, according to Vigotski (1997, p. 7), we understand that, faced with the uniqueness of their way of relating to the world, “the child is forced to follow an indirect path in search of overcoming the deficiency and in their interaction with the environment, [where], the situation is found that will make them move forward along the path of compensation.” It was this movement that we saw recurrently in the four research partners who experienced difficulties during their school career and overcame them in different ways in their quest for learning.

For Armando, learning took place in different ways and was mediated. At times, it was through adaptations of materials made by teachers, at others, through the use of AT. However, we identified that there was an understanding that he would need to find his own way to learn and develop. One of the examples that came up in his interview was when he entered higher education. There was an understanding that, in order to succeed, he had to learn and develop, and it had to be made clear to those involved in the process what needed to be done/acted upon:

> And then I started university, and there was another challenge, which was that I was going to go into secondary school, elementary school, and there's a lot of talk about inclusion, about having ways of including. But at university level, you go out into the world, and the world doesn't want to create possibilities for you. You have to look for possibilities. So, what did I do? I went to the coordination office and said: “Look, I need the professors to be notified”. But it's one thing for you to notify them, it's another thing for them to realize how they're going to help you, right? [Armando]

With the realization that just notifying wouldn't be enough for him to make progress in his studies, Armando went further and presented the strategies he himself adopted throughout higher education, as he says below:

> The attitude I adopted was: on the first day of class, inform him and say: “Look, I need it to be like this: you have the lessons, will you make a summary, some sketches of your lesson before you type it up or something?” Then he said: “Yes!” “Then send me this outline so that, through this outline, I can at least, um, keep up, have something written down.” [Armando]

Armando's movements throughout his school life reflect a proactive stance, seeking solutions for learning and personal development. According to Barbosa and Guedes (2020),

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many of the difficulties faced by PwDV in the university environment are related to communication issues, access to content, teaching materials, available resources and forms of assessment. Armando sought solutions to the problems of communication and access to content through the use of technological resources. The use of these resources and his autonomy in his studies were important factors in his success in higher education. According to Bataliotti (2017), we understand autonomy as an alternative way to solve problems and with independence. For Armando, autonomy was built on self-confidence, the result of a trajectory and exchanges that allowed him to build a subjective understanding of himself as being capable. This self-confidence allowed him to face up to ableism, which is present in many contexts and situations.

CONCLUSIONS

Based on the analysis of the narratives, we understand that Antônia, Armando, Bernardo and Carlos had experiences with Assistive Technology, computers and other technological resources that gave them the independence to explore their potential, learn and develop. In this sense, educational experiences and technology can reveal aspects that are relevant to understanding how blind persons experience and reorganize themselves in the face of challenges, which can indicate ways forward in the search for inclusion, coexistence and recognition of others as capable.

In the process of listening between the researchers and the research partners during the narrative interviews, we realized that the experiences lived in the educational and care institutions that the participants attended were important for their personal and professional development. These experiences were able to create the conditions for the four research partners to continue their studies insofar as, even in a context of mistakes and successes, they were spaces for dialog, learning and support at many points in their careers, which was reflected in learning.

The interviews made it possible to observe the autonomy developed with the support of Assistive Technology and the understanding that society and resources need to be available so that PwD can learn and develop. This issue reflects a connection with the social model of disability, whose environment needs to provide the conditions for the PwD to be able to act independently in society. By analyzing the statements made by Antônia, Armando, Bernardo and Carlos, we were able to see evidence of situations of inclusion,

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exclusion, segregation and integration in their school experiences, which marked their learning, development and way of being and acting in the world.

Furthermore, from a cultural-historical perspective, we think that the interpersonal exchanges could have contributed more to the autonomy of the partners if the interlocutors (teachers, managers and colleagues) had a less normalizing view of PwDs. An understanding and experience of the social role for equity could build very different interpersonal relationships, which would provide the opportunity to experience other possibilities in the future for society and for people with disabilities.

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