

Review Article

Educational inclusion for visually impaired persons in the higher education¹

Inclusão Educacional da Pessoa com Deficiência Visual no Ensino Superior

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Abstract

Introduction: The number of students with visual impairment that have enrolled in higher education has been significant in recent years thanks to positive political action and designated changes in basic education. For that reason, access to information and accessibility conditions must be a priority, to ensure the continuation of these students within the university. **Objective:** To analyze the scientific production on educational inclusion of the visually impaired, specifically concerning the continuation within higher education institutions. **Method:** Integrated literature review in publicly accessible virtual environments, such as Brazil's Coordination for the Improvement of Higher Education Personnel (CAPES) and Scientific Electronic Library Online (SciELO), by combining the following descriptors: baixa visão, ensino superior, cegueira, acessibilidade, tecnologia assistiva e deficiência visual. **Results:** 21 articles were identified, organized, and analyzed, enabling the identification of one category: access and continuation of visually impaired students within higher education; and two subcategories: teacher training aimed at working with visually impaired students and availability of material resources at higher education institutions. **Conclusion:** The analysis of the resources indicates that, although access to higher education for people with disabilities is legally protected, actual inclusion is necessary within institutions. Hence, providing access is not enough if there are no suitable physical and material infrastructures to guarantee the continuation of the visually impaired student within the university.

Keywords: Education of Visually Disabled; Visually Impaired Persons; Education, Higher; Mainstreaming, Education.

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Resumo

Introdução: O número de estudantes com deficiência visual que ingressam no ensino superior tem sido expressivo graças às políticas de ações afirmativas e às mudanças na educação básica destinadas a este grupo nos últimos anos. Em vista dessas mudanças, o acesso à informação e as condições de acessibilidade disponibilizadas nas Instituições de Ensino Superior devem ser prioridades para garantir a permanência desses estudantes na universidade. **Objetivo:** Analisar a produção científica sobre a inclusão educacional das pessoas com deficiência visual, especificamente no que diz respeito à permanência em instituições de ensino superior. **Método:** Revisão integrativa realizada nos ambientes virtuais de acesso público, como o Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) e a Scientific Electronic Library Online (SciELO), combinando os seguintes descritores: baixa visão, ensino superior, cegueira, acessibilidade, tecnologia assistiva e deficiência visual. **Resultados:** 21 artigos foram selecionados, organizados e submetidos à análise, possibilitando a identificação de uma categoria: acesso e permanência de estudantes com deficiência visual no ensino superior; e duas subcategorias: formação docente para atuação com estudantes com deficiência visual; disponibilidade de recursos materiais nas instituições de ensino superior. **Conclusão:** A análise do material indica que, embora o acesso ao ensino superior das pessoas com deficiência esteja legalmente amparado, é necessária uma efetiva inclusão desses estudantes nas instituições, evidenciando que não basta apenas possibilitar o ingresso, se não houver estruturas físicas adequadas e recursos materiais disponíveis e acessíveis que garantam a permanência do estudante com deficiência visual.

Palavras-chave: Educação de Pessoas com Deficiência Visual, Deficientes visual, Educação Superior, Inclusão Escolar.

Introduction

To ensure the school inclusion of students with disabilities, the National Policy for Special Education in the Inclusive Perspective was established in 2008, which guides the education systems to ensure access to regular education and the participation, learning, and continuity at the highest levels of education (Brasil, 2008). The Brazilian Law for the Inclusion of Persons with Disabilities, enacted in 2015, also emphasizes the right of access, and to this end, equal conditions must be promoted for people with disabilities to achieve social inclusion and full citizenship (Brasil, 2015). In 2016, reinforcing the right of people with disabilities to access and stay in higher education, Law 13,409 comes into force, which establishes quotas for this group in federal universities (Brasil, 2016).

Supported by a set of laws and policies aimed at these groups, the democratization of higher education, in recent years, has contributed to the inclusion of students who declare to be people with disabilities in higher education institutions. Data presented by the National Institute of Educational Studies and Research Anísio Teixeira (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, 2017) reveal an increase in enrollment of people with disabilities in higher education between 2012 and 2017.

In 2012, 7,037,688 students enrolled in higher education, in which 27,143 declared to be people with disabilities: 3,613 declared to be blind and 6,679 declared to have low vision². In 2017, about 8,286,663 students entered higher education and 38,272 of them declared to be with some kind of disability: 2,203 declared to be blind, and 10,619 with low vision. The data also show that, although the access of people with disabilities in higher education is legally supported by law, an effective inclusion in the scope of HEIs is necessary, as it is not enough just to enable admission if there are no adequate physical structures and material resources available and accessible to ensure students stay in the academic environment (Martins & Silva, 2016).

For Lopes (2009), the guarantee of admission does not guarantee inclusion, and the permanence of students with disabilities in the university has a strong influence on the process of educational inclusion. Reis & Tenório (2009), discussing the permanence of black students in higher education, claim that this is an affirmative action policy and should be understood from two perspectives: the conditions of the student's existence, material permanence; and the conditions of coexistence, the symbolic permanence. For them, permanence cannot be attributed only to the time related to the duration of the university course, but also to the concrete possibility of the student's existence and, particularly, to the recognition of those who share this space.

The idea of permanence defined here is necessary because a considerable part of the studies produced on people with disabilities in higher education, especially on people with visual impairments, refers to access and permanence. In these identified studies, however, we noticed a notion of permanence commonly linked only to access, which, in addition to entering an institution, must also contemplate the appropriate conditions for these students to succeed in their training process (Castro & Almeida, 2014).

Given this context and because of the scarcity of specific studies on visually impaired students in higher education, this article aims to analyze the scientific production on the educational inclusion of people with visual impairment, specifically concerning the permanence in educational higher education institutions.

Method

This is an integrative review that allows analyzing the knowledge produced and, consequently, carrying out a synthesis of the main studies to gather the results of research on a theme delimited in a systematic and orderly manner (Mendes et al., 2008; Souza et al., 2010). The question that guided this study was: what has been produced in the scientific literature on the accessibility of students with visual impairments in higher education institutions? To answer this question, the researchers analyzed the scientific production on the educational inclusion of people with visual disabilities in higher education, especially in the access to facilities and material and human resources that ensure their permanence in the university.

² Visual acuity equal to or less than 0.05 in the best eye, with the best optical correction, is considered blind. Low vision corresponds to a visual acuity between 0.3 and 0.05 in the best eye, with the best optical correction, or to the sum of the visual field measurement in both eyes equal to or less than 60°; or, yet, the simultaneous occurrence of any of the previous conditions (Decree n. 5.296, Brasil, 2004).

The research was carried out in the virtual environments of the public access databases of *Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES) and Scientific Electronic Library Online (SCIELO), seeking studies whose theme was the person with visual impairment in teaching higher education, published between 2012 and 2017. This period is because research on people with disabilities in higher education is recent, starting in 2005, according to Castro & Almeida (2014). Specifically, on the inclusion of visually impaired people the studies are even scarcer and based on experience reports from some institutions, such as the pioneering study by Raposo (2006), at the University of Brasília, as well as case studies. Despite the expressive number of visually impaired people who entered higher education, the scientific production, even growing, is still small, focusing on studies carried out in the postgraduate courses of federal institutions, as shown by the study by Brito & Zeppone (2013).

The databases chosen were because they provide complete articles. Also, *Periódicos Capes* gathers several international bibliographic databases. For the aforementioned search for articles, we applied the Boolean operator “AND” (insertion of two or more words), opting for terms in Portuguese and English, based on the consultation with Health Sciences Descriptors (DECS/BVS), with the combination of advanced search, containing in the field “subject”: *baixa visão AND ensino superior; cegueira AND ensino superior; acessibilidade AND ensino superior; tecnologia assistiva AND ensino superior; deficiência visual AND ensino superior; low vision AND higher education; blindness AND higher education; accessibility AND higher education; assistive technology AND higher education; visual impairment AND higher education.*

We found 47 publications in the Scielo electronic database and 55 in the *Periódicos Capes* database, totaling 102 publications. Initially, the material was organized in a data table with the Microsoft Word® 2010 program. Reading the titles allowed the identification of repeated, incomplete articles, as well as some without an abstract, and led to the exclusion of 20 articles. In a second step, the abstracts of the remaining 82 articles were submitted for reading, with the application of inclusion criteria, such as articles produced in all areas, between 2012 and 2017, which led to the exclusion of another 53 articles. The exclusion of these publications was due to some combinations, such as accessibility and higher education, and assistive technologies and higher education used to expand the possibility of identifying publications, resulting in articles that did not specifically deal with the visually impaired person. Consequently, two researchers read 29 articles in full. Of these, we excluded 8 that although they dealt with the visually impaired person, they approached teaching more generally. Of the initial total of articles, we selected 21, as they discussed according to the filters established by the descriptors, that is, with a focus on the inclusion of students with visual impairment in higher education.

Results

The following flowchart (Figure 1) presents the systematization of the material selected for this review, based on the procedures previously described:

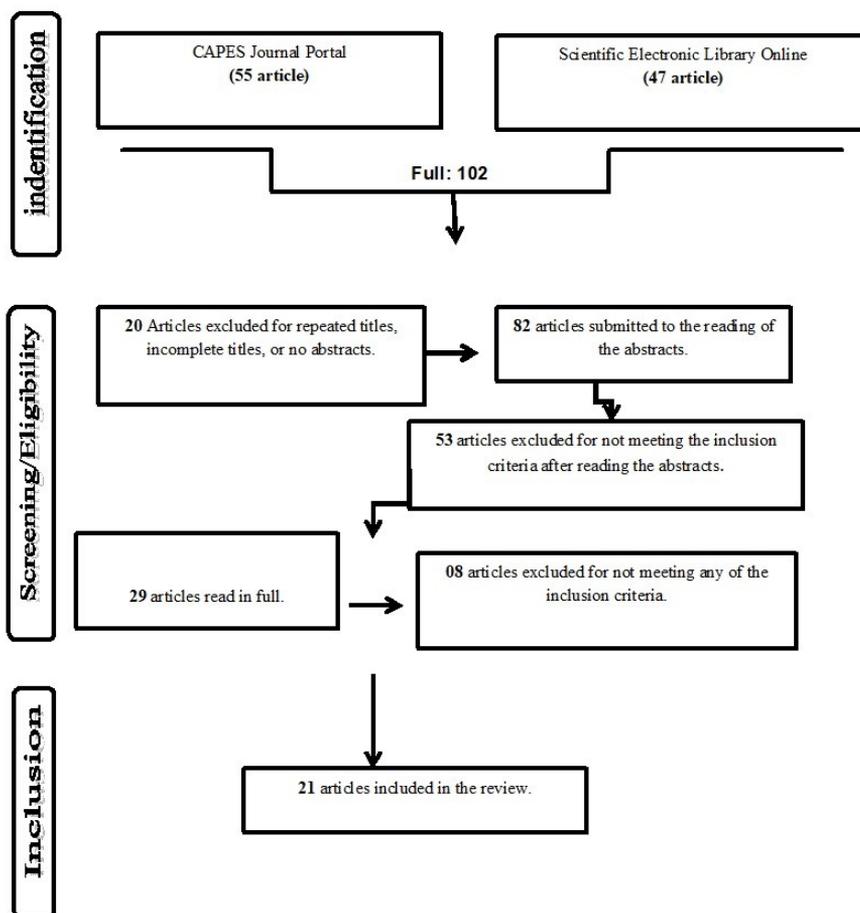


Figure 1. Flowchart of the schematic representation of the identification and screening methods.
Source: Elaboration of the authors.

The 21 selected articles were systematized in a table with the Microsoft Word® 2010 program, according to authorship, the purpose of the study, journal, and year of publication, shown in Table 1.

Table 1. Articles included in the review.

Nº	Authors	Objective	Jornal
1.	Alexandrino et al. (2017)	To investigate the difficulties that a higher education student with severe visual impairment experienced during graduation at a public higher education institution.	<i>Revista Cinergis</i>
2.	Branco & Leite (2016)	To depict the results of a survey that analyzed how students with disabilities enrolled in post-graduate courses identify accessibility conditions in the university context.	<i>Revista Psicologia da Educação</i>

Table 1. Continued...

Nº	Authors	Objective	Jornal
3.	Calheiros & Fumes (2016)	To understand the inclusion process of students with disability in Physical Education degree courses in the city of Maceio/AL.	<i>Avaliação: Revista da Avaliação da Educação Superior (Campinas)</i>
4.	Ciantelli & Leite (2016)	To present an overview of the actions carried out by accessibility centers to ensure the participation of disabled people at FIHE.	<i>Revista Brasileira de Educação Especial</i>
5.	Duarte et al. (2013)	To research the number of self-declared students with disabilities in the process of inclusion in public and private higher education institutions of Juiz de Fora	<i>Revista Brasileira de Educação Especial</i>
6.	Fernandes & Costa (2015)	To analyze and describe the perception of students with visual disabilities and without disabilities (tutors) regarding the activities carried out as mentoring pairs.	<i>Revista Brasileira de Educação Especial</i>
7.	Fialho & Silva (2012)	To show that the university libraries can be accessible to the visually impaired, without great costs for the sponsoring institution.	<i>Revista Perspectivas em Ciência da Informação</i>
8.	Guerreiro et al. (2014)	To build an instrument to measure the level of satisfaction of students with disabilities regarding their access and permanence in higher education.	<i>Avaliação: Revista da Avaliação da Educação Superior</i>
9.	Martins & Silva (2016)	To investigate and discuss the impressions of a student with visual impairments – low vision, on the first semester in an engineering course in UFRN.	<i>Revista Educação em Questão</i>
10.	Monteiro et al. (2013)	To verify if the Open University (UAB) portal is accessible to visually impaired users	<i>Revista Brasileira de Administração Científica</i>
11.	Nunes & Magalhães (2016)	To meet the strategic management actions developed by them to attend students with disabilities, comparing its internal actions regarding inclusive education policies practiced in the creation and consolidation of their accessibility centers.	<i>Revista Holos</i>
12.	Oliveira et al. (2016)	To analyze the scientific production of inclusive education in higher education.	<i>Revista Brasileira de Educação Especial</i>
13.	Pereira et al. (2016)	To analyze the scientific production on the inclusion of students with disabilities in higher education.	<i>Revista de Educação especial</i>

Table 1. Continued...

Nº	Authors	Objective	Jornal
14.	Pivetta et al. (2016)	To understand what an institution of higher education has done for students with disabilities to continue their studies, reaching higher and postgraduate degrees.	<i>Revista Educação</i>
15.	Pletsch & Melo (2017)	This article presents results of a research on the structure and functioning of the Accessibility Centers (NA) of 19 Federal Universities of the Southeast Region.	<i>Revista Ibero-Americana de Estudos em Educação</i>
16.	Regiani & Mól (2013)	To understand the point of view of the professors of Chemistry courses on the process of inclusion of people with visual impairments.	<i>Revista Ciência & Educação</i>
17.	Salih & Kakizawa (2016)	To know the support provided by the university to students with visual impairments for the development of their studies during training based on the students' identification of the problems and their expectations before entering the institution.	<i>Journal of Special Education Research</i>
18.	Santos & Mendonça (2015)	This research aimed to examine how students with visual impairments enrolled in the Pedagogy Course at a university in the Paraíba Valley, São Paulo State, perceive the organization of the school and the teaching conditions offered by the university and analyze the actions and expectations of the teachers towards students with disabilities.	<i>Revista e-Curriculum</i>
19.	Selau & Damiani (2016)	To analyze the point of view of blind students about the difficulties found in higher education.	<i>Acta Scientiarum. Education</i>
20.	Selau et al. (2017)	To analyze the obstacles or difficulties faced by blind people in higher education, proposing some strategies that can be undertaken by managers and teachers to overcome such obstacles to their inclusion.	<i>Revista PERSPECTIVA</i>
21.	Vilaronga & Caiado (2013)	To describe and analyze the trajectories and expectations of school experience for students with visual impairment, who attended a community course to prepare for university level exams, because they aspired to admission to higher education.	<i>Revista Brasileira de Educação Especial</i>

Source: Elaboration of the authors.

The 21 selected publications were systematized through the application of the semantic categorization criterion, with thematic categories according to the content analysis of Bardin (2016). In this way, we could establish a large thematic category: access and permanence of students with visual impairment in higher education. The concept of permanence, especially of students in higher education, has been recurrent in the literature inherent to studies aimed at groups of students benefiting from affirmative action policies, such as indigenous, Afro-descendants, and students with disabilities, especially in the 2000s. The category access and permanence was evidenced at the beginning of the research, in the first readings and approaches to the object of study in question, and it was reaffirmed with the analysis of the material as a whole. From this category, two complementary subcategories were identified: ³teacher training to work with visually impaired students; and material resources for the visually impaired student. The set of raw data from the constituent elements of the selected articles created organized and systematized data, as shown in Figure 2.

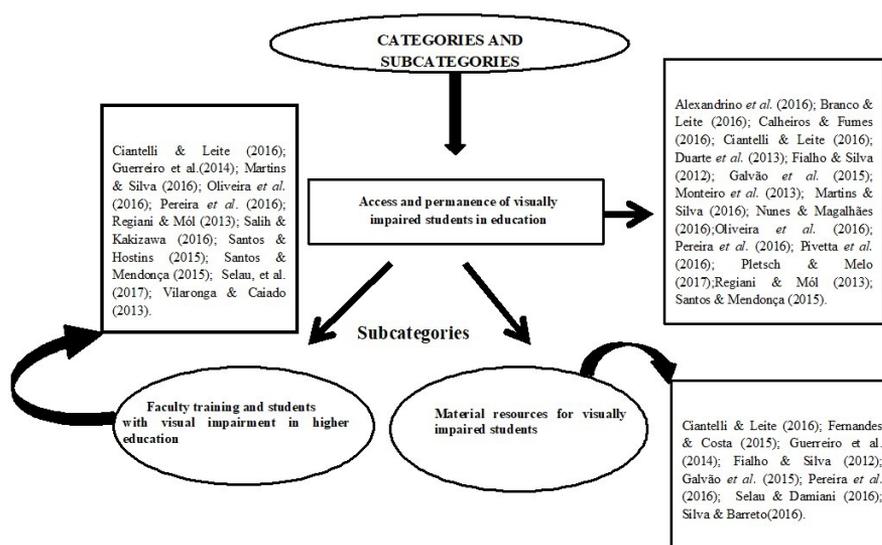


Figure 2. Flowchart with category and subcategories presented and the respective authors selected in the review. **Source:** Elaboration of the authors.

Discussion

Access and permanence of visually impaired students in higher education

Martins & Silva (2016) define the access category in two ways: in the first sense, the term is directly related to material resources that facilitate students' learning; in the second, it assumes the sense of entering the university system. The authors also clarify that the access of people with visual impairments comes from the elaboration of public policies that guarantee protective measures, supported by the legislation. Permanence,

³ Part of the material selected for this review dealt, in the same article, with different dimensions around the difficulties of visually impaired students in higher education. Because of this, some titles are present in both subcategories.

on the other hand, consists of the possibility of using spaces and technological and educational resources in an isonomic way that is offered to other students of the institution.

Alexandrino et al. (2017) highlight that there is a great gap between the legal guidelines and the effective access and permanence of students with disabilities in higher education. Calheiros & Fumes (2016) draw attention to the importance of implementing public policies based on the equity in material and architectural infrastructure, especially to meet the needs of students with disabilities. Branco & Leite (2016) also highlight that public policies that guarantee rights for people with disabilities should be intensified. The study carried out by them identified actions that aimed to guarantee the participation of students, from the point of view of admission. However, there was a limited number of those aimed at expanding communicational, informational, instrumental accessibility, among others that favor the student's permanence at the university. Access is seen as the gateway to the university, but such an action, although supported by laws, is not enough. On the contrary, it only makes sense when it finds, on its basis, a direct relationship with the permanence process.

In this sense, Santos & Mendonça (2015) stress the importance of the public authorities improving educational systems, as a way of ensuring permanence, in addition to access, in conditions necessary for the person with disabilities to be included fully and with quality, offering services, and accessibility resources.

As for accessibility, especially in the architectural infrastructure, Pereira et al. (2016) affirm that HEIs must guarantee students with disabilities access to the different spaces of the university, which must take place freely at the various facilities of the institution, making equipment and facilities available that can help student's academic and social performance. Consequently, permanence is linked to the creation of measures that alleviate the inherent obstacles to access to structural and didactic resources.

According to Monteiro et al. (2013), the adversities related to the permanence of students are also associated with access to printed materials such as publications in virtual media. The difficulty of permanence, associated with the lack of textual information, is also pointed out by Fialho & Silva (2012), who underlines that most people with disabilities are dissatisfied with the lack of accessibility to information resources in university libraries. Considering that libraries are or work as information managers and should make their collection available to all students entering the HEI, the authors cited propose two types of libraries that can facilitate access to information: adapted and accessible. The adapted library is the one that follows the norm of accessible design: with ramps, adapted restrooms, signs in Braille⁴, among other architectural adaptations. The accessible library is the one that has a technological means capable of transmitting information on any medium. The authors point out that one type does not exclude the other. On the contrary, the dissociation of these characteristics can contribute to making students with visual impairment feel discriminated against and not inserted in this informational environment. Effectively, the fact that space does not have mechanisms that guarantee accessibility or does not make teaching materials available compromises isonomy in the access to information between these students and

⁴ The Braille System is a universal code for tactile reading and writing, used by blind people, invented by Louis Braille, in France, in 1825 (Fundação Dorina Nowill para Cegos, 2016).

those considered to be without disabilities. It is important to note that blind students need resources such as screen reader programs, braille systems, and audio descriptions⁵, while students with low vision need enlarged letters, optical resources, contrast, and visual audio description. Therefore, the terms access and permanence, despite assuming different definitions, are interconnected in the process of educational inclusion of people with visual impairments.

The implementation of public policies that favor and guarantee the educational inclusion of people with disabilities is essential for social rights to be guaranteed within institutions. Thus, the creation of support centers in Federal Higher Education Institutions (FHEI) emerges as an inclusive measure of public policy in this segment (Nogueira & Oliver, 2018). Ciantelli & Leite (2016) highlight the importance of two major programs that aim to strengthen actions that enable accessibility within the university environment: “*Programa Incluir*” and “*Programa Viver sem Limites*”. The first aims to foster the creation, expansion, and strengthening of accessibility centers in the FHEI and has been subsidizing the participation of people with disabilities, although it is not very significant in the country's university reality. The second, created in 2011 by Decree 7,612, aims to develop new initiatives and stimulate actions already underway, promoted by the Federal Government for the benefit of this group (Ciantelli & Leite, 2016). Both programs were created to subsidize and strengthen the accessibility centers to help students who declare to be disabled and contributed to alleviate the difficulties encountered in the academic environment. In 2020, the aforementioned programs were practically closed by the current federal government such as the *Viver Sem Limites* Program (Platini, 2020).

Inclusive policies need to be consolidated to enable the inclusion of people with disabilities in all areas, from training to the labor market. In this sense, Martins & Silva (2016) reinforce the importance of the HEI's Accessibility Centers, referring to the Accessibility Center of the Federal University of Rio Grande do Norte, a body whose main objective is to propose actions that eliminate architectural, attitudinal, pedagogical and communication barriers, aiming to guarantee access and permanence so that students can conclude the courses with full success.

A study by Pletsch & Melo (2017), in 19 federal universities in southwest Brazil, found that the accessibility centers also lack services to assist students with disabilities. For Regiani & Mól (2013) and Silva & Barreto (2016), the university cannot be understood only as a physical installation or an architectural ensemble, it must be a social organization, responsible for quality education. It must carry out actions that involve the planning and organization of resources, enabled in the selection processes and the development of all activities that involve teaching, research, and extension.

In a study at the Pedagogical Office of the University of Aveiro (Portugal), Pivetta et al. (2016) also emphasize that it is important that the whole society participates in the process of educational inclusion of people with disabilities and that this social commitment goes beyond public policies, funds for the necessary structural interventions in the institutions. According to the authors, little is achieved without the elimination of attitudinal barriers. Nunes & Magalhães (2016) affirm that, for effective

⁵ Audio description is a resource that translates images into words, allowing people who are blind or have low vision to understand audiovisual content or static images, such as films, photographs, plays (Freitas, 2015).

participation actions, the institutions should implement plans, projects, and partnerships that promote inclusive education.

An evaluation of this process carried out by Martins & Silva (2016) shows that the inclusion of students with visual impairments is under construction, because, until the moment of the study, carried out at the Federal University of Rio Grande do Norte (UFRN), the Institution had not met the requirements established by the Accessibility Law (Brasil, 2015), mainly for the human and material resources needed to guarantee the process of educational inclusion. Despite the efforts already made by educational systems to allocate resources to implement these policies, the scenario of educational inclusion in Brazil lacks more concrete actions, as established by the inclusion laws and guidelines, so that these inclusive resources are available in HEIs. In this sense, the need for more directive policies and greater funding from HEIs aimed at educational inclusion is highlighted, something that has been significantly impaired in recent years.

Duarte et al. (2013) highlight the importance of institutions reporting to governmental bodies the difficulties faced by students related to both access and permanence in universities. Based on this understanding, Regiani & Mól (2013) found that inclusive education at a higher level requires the reconstruction of the education system. The authors reinforce the need to overcome, in the academic universe, barriers that are not only physical, but also pedagogical and, consequently, methodological.

Among the studies aimed at understanding the access and permanence of students with disabilities in higher education, there is a close relationship between the guarantee of access and permanence. This is associated only with a material condition, inherent to resources, that is, physical accessibility to the equipment and materials that should be offered and available to students. According to Lopes & Fabris (2017, p. 107), “inclusion does not mean occupying the same physical space”, because what we often call inclusion is exclusionary inclusion. In addition to entering higher education, we need to reflect on the ways and conditions that students are existing in these spaces. Oliveira et al. (2016) also consider that inclusion in higher education necessarily depends on the conditions created by universities to adequately receive their students who self-declare with some type of disability, so that they are included in the educational process.

In this sense, two central aspects stood out in the material analyzed in the access and permanence of people with visual impairments in higher education: professor training to work with visually impaired students and material resources as indispensable for the permanence of these students in the teaching units.

Professor training to work with visually impaired students

Regarding the training of professors, Vilaronga & Caiado (2013) and Regiani & Mól (2013) warn about their unpreparedness to receive students with disabilities in the classroom. The authors also highlight that the professors are unaware of the accessibility resources⁶ necessary for the student to follow the classes satisfactorily. For the authors,

⁶Resources that aim to help visually impaired people in their day-to-day tasks: screen reader software, such as JAWS VIRTUALVISION, ORCA (on Linux), Voiceover (Mac and IOS), Talkback (Android), NonVisual Desktop Access (NVDA); screen magnifiers and high-contrast resources such as tactile floors,

this lack of didactic materials is also a factor that hinders the professor to act, especially in the classroom environment (Regiani & Mól, 2013). Santos & Mendonça (2015) highlight that the professor is not always aware of the structures offered by the university in the training of personnel, as well as the availability of material resources and the organization of an accessible space.

Corroborating this idea, Martins & Silva (2016) stress the importance of professors adopting accessible resources for students who need adapted materials, not only printed and digital. They also emphasize that the professor's posture must be constantly changing in the face of diversity to include his students with disabilities, guaranteeing equity among the class participants. According to the authors, professors should be more attentive to compliance with laws that regulate national and institutional policies on the rights of students with disabilities, specifically the visually impaired.

In this perspective, Santos & Hostins (2015) consider professional qualification, physical adaptations, and pedagogical innovations indispensable factors to guarantee people access, permanence, and success in higher education. We emphasize that these adaptations and pedagogical innovations should not fall only on the competence of the professor since a directive policy of inclusion brings together other subjects involved, such as administrative technicians and students, as well as financial resources, logistics, HEI conditions, among other aspects. The authors also explain that the democratization of education is configured as a strong point for the formative process in graduation, mainly with the implementation of the quota system and the expansion of federal universities.

Estácio & Almeida (2016) affirm that it is vital to adopt a continuous proposal for the training of its teaching and technical-administrative staff in higher education institutions, to promote the integration of visually impaired students in the academic community and, thus, ensure their permanence. For Martins & Silva (2016), who also address continuing education, institutions must offer courses that deal with the topic of inclusion in higher education and carry out improvement programs related to university pedagogy for professors and technicians. The authors also underline the importance of discussing the renewal of methodologies in the classroom, as some professors still use teaching techniques that do not address the complexity and needs of blind or low-vision students, who need adapted resources.

According to Selau et al. (2017), when the professor has a visually impaired student in the classroom, he must adopt some pedagogical strategies that allow overcoming the obstacles that students may encounter when coming into contact with the contents and methods used in the classroom. Pereira et al. (2016) corroborate the need for greater investment in training to encourage the professor to participate in refresher courses aimed at inclusive teaching. For Oliveira et al. (2016), this training must be treated as a requirement for the challenges of inclusive education. Salih & Kakizawa (2016) emphasize the importance of professional qualification in the process of educational inclusion to meet the needs of students with visual impairment effectively and satisfactorily. As can be seen, different authors point to the need for professional qualification as a way to alleviate the difficulties faced by students or even as a solution,

audible traffic lights, high-contrast signals, which seek to make locomotion feasible; magnifying glass, walking stick, guiding dog, sunglasses, visor, etc.

calling attention to the need to make educational spaces related to the physical and pedagogical, and methodological interactions.

All authors highlight the difficulties of professors in aspects such as methodologies and pedagogical strategies, availability of material resources in the classroom, professional training, which are considered defining factors in the process of permanence of students with visual impairment in higher education.

Material resources for visually impaired students

According to Galvão et al. (2015), giving accessibility is synonymous with providing adapted materials and a set of other strategies necessary for the access and permanence of these students at the university. Silva & Barreto (2016) highlight that there is a limitation regarding the availability of educational support materials for people with visual impairments in educational institutions, especially in braille books, in different areas of knowledge, making the student's academic journey difficult. These authors also emphasize that some students do not like to use reading or writing in Braille because it requires more time, both for the adaptation of the printed material and for reading in this format. The study carried out by them reveals that the students' dissatisfaction is due to the time for preparing the material when delivered to the responsible sectors of the institutions and the non-commitment of professors to supply the didactic material already in adapted digital format. In reading, we understand that when a book is adapted to the Braille format, its pages multiply and the book can have more than one volume, making reading tiring for the student. Therefore, it becomes relevant to consider other assistive technologies, already demanded by students, familiar with other devices.

The authors emphasize the importance of these materials for the visually impaired student, especially the printed material received by the students, which must contain texts in braille or editable for reading by speech synthesizers⁷, such as cell phones, spoken books, and software, such as Dosvox and NVDA⁸, tools that can be used as teaching resources both for writing and reading academic materials on the computer for the blind student. Reprinting, in enlarged characters, is one of the tools that can be used for students with low vision.

Pereira et al. (2016) also emphasize the importance of this assistive technology as an indispensable tool for the student, to both entering and staying in institutions, as it allows access to study materials and information, reducing academic barriers. Fialho & Silva (2012), in turn, show the information professional duty is to adapt the information unit, for example, libraries and information centers, assisting all users, particularly students with visual disabilities, which must be guaranteed from admission to the end of the course. Reinforcing the comments of Silva & Barreto (2016) on the availability of didactic support materials for the student, Ciantelli & Leite (2016) declare that there is a limitation in access to these materials in higher education institutions, for example, the materials adapted for the visually impaired student.

Selau & Damiani (2016) pointed out the need and importance of consulting visually impaired students about the format in which they prefer to receive material for their

⁷ Speech Synthesizer is a device used to produce text characters in sounds close to human speech.

⁸ It is an open source screen reading platform for Windows operating system (Uliana, 2008).

studies, such as lesson plans, books, texts, scientific articles: in braille, audiobook, or digital format. According to the authors, measures could be adopted, such as the early delivery to the support center of didactic content for people with disabilities in the institutions that professors will use, entrusting this sector with adapting the material and delivering it to the student promptly, as some students report that the fact that they do not have real-time access to the materials needed for their studies impairs and delays the academic path.

In this scenario, students are deprived of many opportunities, because the way universities are structured, physically and pedagogically, interferes in the students' study dynamics, and can create obstacles capable of interrupting their academic trajectory. Access to didactic materials, therefore, is fundamental in the student's training process at the educational institution to guarantee the autonomy of this audience and their insertion in the different environments that provide learning (Fernandes & Costa, 2015). This aspect was also highlighted by Castro & Almeida (2014), in a study to learn about the actions taken by higher education institutions aimed at assisting students with disabilities. The study revealed that a considerable part of the researched institutions has material resources. However, it lacks a greater articulation between more individualized support services for students and greater involvement of teachers and technicians in academic life, an articulation that the authors appointed as *facilitators of permanence*.

The integration of the university community (professors, students, administrative technicians) is necessary as a way of improving access and ensuring the permanence of people with disabilities. According to Guerreiro et al. (2014), to understand the space, limitations, and context of the visually impaired student, it is necessary to promote discussions about visual impairment, about the material resources and professional training in assisting this student, that is, it is necessary to implement actions that promote the permanence of these students in higher education institutions.

Conclusion

This study allowed us to know the scientific production of students with visual impairment in higher education. There is a growing production due to experiences that have been occurring in Brazilian higher education institutions, as well as those identified in countries on other continents, highlighting the difficulties that students, professors, and managers encounter in the process of guaranteeing the right to inclusive education. The analysis of the studies showed that entry into higher education for people with visual impairments was regulated, and Brazilian legislation corroborates it, but that inclusion, however, will occur at the moment when the permanence of these students can be made effective: a permanence that takes advantage, insofar as the students can take advantage of the physical spaces, the available equipment, material, audiovisual and information resources, as well as a greater preparation of professionals to assist these students.

We consider it relevant to know the studies to understand the situations, experiences, and reflections presented in them to build research and intervention paths that are more transparent and useful. Although there has been a considerable increase in the enrollment of students with visual impairments in HEIs, we recognize that universities are not yet prepared to meet the demands of students with disabilities. Although the

access of these students is guaranteed, the HEIs face difficulties related to compliance with the legislation that supports and ensures equal service to people. As a result, there is a need for investments, mainly material, that promote the educational inclusion of the visually impaired person in these institutions, especially for the courses to update all professionals and the HEIs, aimed at the availability of material and human resources that offer adequate conditions to people with disabilities in the university environment. Despite the difficulties and obstacles identified, many of these students can complete their studies and it is because of this that significant transformations have occurred within educational institutions. Finally, we emphasize the importance of motivating the people involved in the teaching environment (professors, technicians, and students), so that they contribute and participate in the educational inclusion of this student in the academic environment, providing an egalitarian environment and alleviate the challenges faced in the academic trajectory.

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Author's Contributions

Jailma Cruz da Silva: She contributed to the entire process of drafting the article. Adriana Miranda Pimentel: Advisor, contributed to writing, reviewing, and discussing the article. All authors approved the final version of the text.

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