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Weaving Knowledge about Assistive Technologies for the Deaf in Higher Education

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ABSTRACT

Reflecting on the education of deaf subjects in Higher Education, leads to finding possibilities with the use of assistive technologies. This bibliographic research seeks to analyze how the accessibility of the deaf subject has been regulated through assistive technology in Higher Education and which of these regulations can decrease the communication barriers between listeners and deaf people. It brings the main considerations in a reflection on the deaf community, seeking theoretical support to characterize it. Also, we approach the evolution of technologies, conducting a reflection on their insertion in daily life, as well as the main regulations that support the care for the deaf. Still, we researched how the inclusion of deaf subjects in Higher Education has been discussed in the theoretical field and how HEIs (Higher Education Institutions) can reduce the communication barriers between hearing individuals and deaf individuals. We conclude that assistive technologies are instruments capable of facilitating communication between the subjects and that, in order to include the deaf subjects, we need to break the physical, methodological and attitudinal barriers, aiming at ensuring HEIs build a universal design in which all feels as citizens with the same rights to express themselves and have access to the construction of professional and personal knowledge.

KEYWORDS

Higher education. Assistive technology. Deaf persons. Regulation.

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Weaving Knowledge about Assistive Technologies for the Deaf Subject in Higher Education

RESUMO

Refletir sobre a educação dos sujeitos surdos no Ensino Superior, reporta-nos a encontrar possibilidades junto ao uso das tecnologias assistivas. Esta pesquisa, de cunho bibliográfico, busca analisar como vem sendo regulamentada a acessibilidade do sujeito surdo através de tecnologia assistiva no Ensino Superior e quais dessas regulamentações podem diminuir as barreiras comunicacionais entre ouvintes e surdos. Traz as principais considerações em uma reflexão sobre a comunidade surda, buscando amparos teóricos para caracterizá-la. Também, abordamos a evolução das tecnologias, realizando uma reflexão sobre a inserção das mesmas no cotidiano, bem como, as principais regulamentações que amparam o cuidado com o sujeito surdo. Ainda, pesquisamos sobre como no campo teórico vem sendo discutida a inclusão dos sujeitos surdos no Ensino Superior e como as IES podem diminuir as barreiras comunicacionais entre os sujeitos ouvintes e os sujeitos surdos. Concluímos que as tecnologias assistivas são instrumentos capazes de facilitar a comunicação entre os sujeitos e que, para haver a inclusão dos sujeitos surdos, precisamos romper as barreiras físicas, metodológicas e atitudinais, visando uma constituir que as IES construam um desenho universal na qual todos se sintam cidadãos com os mesmos direitos para expressarem-se e terem acesso à construção do conhecimento profissional e pessoal

PALAVRAS-CHAVE

Ensino superior. Tecnologia assistiva. Sujeito surdo. Regulação.

Tejiendo Conocimiento sobre Tecnologías de Asistencia Para Sordos en la Educación Superior

RESUMEN

Reflexionando sobre la educación de las personas sordas en la Educación Superior, nos dice que encontremos posibilidades con el uso de tecnologías de asistencia. Esta investigación bibliográfica busca analizar cómo se ha regulado la accesibilidad del sujeto sordo a través de la tecnología de asistencia en la educación superior y cuáles de estos pueden reducir las barreras de comunicación entre sordos y oyentes. Trae las principales consideraciones en una reflexión sobre la comunidad sorda, buscando apoyos teóricos para caracterizarla. Además, nos acercamos a la evolución de las tecnologías, reflexionando sobre su inserción en la vida cotidiana, así como las principales regulaciones que apoyan el cuidado de las personas sordas y la investigación sobre cómo se ha discutido la inclusión de las personas sordas en la enseñanza. Educación superior y cómo las IES pueden reducir las barreras de comunicación entre los sujetos con audición y los sordos. Concluimos que las tecnologías de asistencia son instrumentos capaces de facilitar la comunicación entre los sujetos y que, para incluir a los sordos, necesitamos romper las barreras físicas, metodológicas y de actitud, con el objetivo de constituir que las IES construyan un diseño universal en el que todos sentir ciudadanos con los mismos derechos para expresarse y tener acceso a la construcción de conocimiento profesional y personal.

PALABRAS CLAVE

Enseñanza superior. Tecnología de asistencia. Sujeto sordo. Regulación.

Initial Reflections

The research, which we now present, is a bibliographic study, which explains the state of the art in relation to the scope that seeks to answer questions inherent to the accessibility of the deaf persons and Assistive Technologies (ATs) in Higher Education, constituting scientific concepts, observations and reflections present in the literature.

In the search for answers to a problem faced by a more specific social group and, therefore, by society as a whole, there is a need to carry out studies, whose object is "to discover answers to problems through the use of scientific procedures". (GIL, 2008, p. 26). Thus, the research makes it possible to find answers and understand the emerging paradigms, also promoting changes based on their results. When conducting a research it is necessary to start from a problem, search for existing data, theories and understandings that already exist, referring to it. It is with this in mind that the Research Group on Education and Technologies (GPET, in the Brazilian portuguese acronym), in the line of research that studies teacher training and digital technologies.

In this study, we seek to analyze how the accessibility of the deaf subject has been regulated through assistive technology in Higher Education and which of these can reduce the communication barriers between listeners and the deaf. Associated with this objective, the reflections are based on the main guidelines that Higher Education Institutions can give to assure the teacher a set of knowledge focusing on the main documents that report to it and assist in the pedagogical action when the teacher is in the presence of a deaf student.

Still, we need to reflect on the theoretical field that has been discussed regarding the inclusion of deaf subjects in Higher Education and how Higher Education Institutions (HEIs) can reduce the communication barriers between hearing subjects and deaf subjects.

When thinking about education in today's society, the student is not expected to be a reproducer of the information he has obtained, but rather to develop skills to research, seek information, becoming a critical subject who can give his opinion and intervene in his environment. It is also opportune to reflect that educating in contemporary times involves the use of different resources that facilitate learning, including technological ones. In this context, it is recognized that the use of technologies has become an important means of inclusion and interaction in the world, being something increasingly present in culture.

Deepening Knowledge about Assistive Technologies

When addressing the issue of education for the deaf, a set of formal and informal ideas and concepts emerges in relation to it. Education is not limited to a science with scientifically proven concepts. It also encompasses common sense, valuing the experiences of the subjects present in society.

When education aims to educate subjects, it is not restricted to the transmission of scientifically proven content, theories or information. The concept of education being addressed is one that helps subjects to transform their lives in a constant learning process. What is so desired is that education contributes to a better personal and professional formation of the subjects, helping them in the formation of their identities. In this perspective, education contributes to the formation of the subject, so that he can improve his skills of communicating, understanding his emotions and becoming a subject.

Moran (2012) makes us think that educating is to contribute so that teachers and students are able to transform their lives into a constant learning process in organizations. When assisting students in this learning process, it is also important to contribute to the construction of their identity, being necessary to develop communication, understanding and emotion skills, which allow them to have their personal, social and professional space in society.

> In the society of the 21st Century, due to the technological and epistemological revolution that occurred over the last three decades, there have been dramatic changes in scientific knowledge and in the products of thought, culture and art. So intense is the production of knowledge and its dissemination, that teaching to produce no longer meets the demands placed by the informational and global society in which we operate, which prioritizes the mastery of certain knowledge, skills and competences that we as educators need to be aware of and convinced of their need. (NOGARO; CERUTTI, 2016, p. 40).

The term technology, originating in Ancient Greece, means scientific knowledge (theory), transformed into technique (skill). To put it more explicitly, “technology involves an organized and systematized set of different knowledge, empirical and even intuitive scientific, aimed at a process of application in the production and commercialization of goods and services.” (GRINSPUN, 1999, p. 49). Technology is a support for human beings, helping them to perform their tasks with greater ease.

Technologies are present in our daily lives in several spaces, whether in the work, schools, commercial or home environments and their use has become increasingly natural, which often ends up being an involuntary attitude. This is because technologies have been incorporated into life, and it is no longer possible to dissociate them.

Social networks or applications for mobile devices are examples of technologies that facilitate interaction and communication between people, regardless of whether they are close or distant. This statement is even more evident when referring to the use of Information and Communication Technologies (ICTs) by people with disabilities. Lévy (1999) highlights that the insertion of ICTs in the subjects' culture and daily life is identified by the term cyberculture, which is inserted in cyberspace, a concept presented by the following definition:

> I define cyberspace as the communication space opened up by the worldwide interconnection of computers and the memories of computers. This definition includes the set of electronic communication systems (included there the sets of classic telephone and radio networks), as they transmit information from digital sources or ones intended for digitization. I insist on digital coding, because it conditions the plastic, fluid, accurately calculable and treatable in real time, hypertextual, interactive and, in short, virtual information that is, it seems to me, the distinctive mark of cyberspace. (LÉVY, 1999, p. 93).

In this context, cyberculture expands communication, breaking communication barriers between subjects. In this way, it makes it possible to experience, collectively, different forms of communication, which go beyond those that the classical media propose.

When technologies are added to assist in communication, efforts are being made to improve the efficiency of human activity in all spheres, especially in the productive sphere. Technology, too, is characterized by the transformation in the technological field, therefore, consequently in the market for goods, services and consumption in the mode of production, education/qualification and social relations.

We live in the information age with the challenge that each subject interacts in their social spaces, relearning to integrate the human with the technological, thus seeking information and different ways of using them in their daily lives, whether for personal or professional use. .

In the conception of Pinto (2004), when thematic, audiovisual, oral, musical, textual, corporal and playful technologies are integrated in an innovative vision, it is possible to acquire positive results in terms of learning. It is not enough to just be aware of the existence of technology, it is necessary to look for ways to understand how it can help and what is its function.

In this sense, there are several renovations in the technological environment in different areas and, consequently, society is in constant transformations, demanding that the people inserted in it seek an improvement. Access to ICTs triggers social transformations and several changes in the way of building knowledge, therefore, society and locals cannot ignore such movements.

For Valente (2010), if the subject who is using certain technologies does not understand its function or characteristics, it will not be assimilable. Therefore, they are being improved to accommodate the knowledge and needs of its users, using sensory, sound and gestural interface languages in their development to facilitate this digital appropriation.

In view of the changes brought about by technological development, it is important to note that the uses of these resources need to add meaning to users, who must critically appropriate these technologies in order to discover the possibilities that they offer.

It is evident that the technologies should not be seen as something that substitutes the human being, but as devices that come to facilitate and complement the capacity of the person who uses them, improving, in this sense, human activity. Therefore, it is important that the subjects are aware that the technologies need a user to generate an action.

In addition to the technologies used as tools for human support in daily activities, there are also digital technologies, which can facilitate communication between subjects and be used to expand the intellectual knowledge of their users.

When understanding technology as a support for human beings, it is understood that when applied or set in motion, it can help and minimize the limitations of the subjects. The technologies, in this sense, represent possibilities of aid for people with hearing impairment or deaf people, especially for facilitating non-verbal communication with the listening subjects and with the world.

In this context, the inclusion of people with disabilities has taken on new dimensions with the advancement of physical and technological resources. In everyday life, various tools are used in order to facilitate and favor the tasks performed, such as pens, cell phones, cutlery, automobiles, among other resources that are present in daily routines and that facilitate the performance of activities.

> For a person with a disability, technology is presented not only to facilitate, but to make it possible to carry out a necessary or desired action. Through technology, a person with a disability has possibilities of mobility, environment control, access to the computer, communication, performing daily tasks, among other activities. (WAGNER; LAZZERI; RAMOS, 2014, p. 80).

Thinking about the inclusion of deaf people, it is essential to analyze the promotion of accessibility of these subjects to technologies, as they believe that there are technological and didactic resources that facilitate communication between deaf people and the world. In other words, technologies should be seen as part of a solution and not the other way around.

Thus, it is necessary that social environments are adequate and able to serve people with any type of disability, increasing the chances that this profile of the population will have

satisfactory experiences from their experiences. It is possible to use digital resources or technologies that can assist in this inclusion process.

Federal Decree No. 3,298/99 (BRASIL, 1999) mentions technical aids (AT), which are defined in its Art. 19, as

> The elements that make it possible to compensate one or more motor, sensory or mental functional limitations of the person with a disability, with the aim of allowing him to overcome the barriers of communication and mobility and to enable his full social inclusion.

In the single paragraph of this article we find the list of technical aids, which are rights:

> I - hearing aids, visual and physical;
>
> II - orthoses that favor functional adequacy;
>
> III - equipment and elements necessary for the therapy and rehabilitation of the person with a disability;
>
> IV - equipment, machinery and work utensils specially designed or adapted for use by a person with a disability;
>
> V - elements of mobility, care and personal hygiene necessary to facilitate the autonomy and safety of the person with a disability;
>
> VI - special elements to facilitate communication, information and signaling for people with disabilities;
>
> VII - equipment and special educational material for education, training and recreation of the person with a disability;
>
> VIII - environmental and other adaptations that guarantee access, functional improvement and personal autonomy; and
>
> IX - collection bags for patients with ostomy. (BRASIL, 1999, s-p).

It is worth mentioning that the terminology "Technical Assistance", found in Brazilian legislation, currently refers to the name of Assistive Technology (AT), which should contribute to the social inclusion of people with disabilities, be they visual, hearing, physical and / or intellectual, thus reducing the limitations arising from them. The term Assistive Technology is “used to identify the entire arsenal of resources and services that contribute to providing or expanding the functional skills of people with disabilities, and consequently, promoting independent living and inclusion.” (WAGNER; LAZZERI; RAMOS, 2014, p. 80).

Among ATs, we find ICTs (Information and Communication Technologies), which can be used in different ways and classified in different ways, according to the researcher's objectives, each of which aims to satisfy or improve something. They serve mainly as support, for people with some limitation or disability, in different activities, from the simplest to the most complex.

For Santarosa (1997), ICTs can be classified in four areas: as auxiliary systems or prosthesis for communication; used to control the environment; as learning tools or environments and; as a means of insertion in the work force. In this study, we chose to describe ICTs as facilitators of communication and, consequently, of learning for the deaf subject, as explained by Santarosa,

> ICT as auxiliary systems or prosthesis for communication: perhaps this is the area where ICT has made the most significant advances possible. In many cases, the use of these technologies has been the only way in which different people can communicate with the outside world, being able to make their desires and thoughts explicit. These technologies have enabled the optimization in the use of Alternative and Augmentative Communication Systems (SAAC), with the computerization of traditional alternative communication methods, such as Bliss, PCS or PIC systems, among others. [...].
>
> ICT as tools or learning environments: the difficulties of many people with special educational needs in their development and learning process have found effective help in using ICT as a learning tool or environment (SANTAROSA, 1997, p. 115).

Using ICTs for the purpose of communication, it is possible to break some communication barriers. Regardless of whether or not they have limitations related to communication, they allow contact with other subjects, whether they are close or not. There can also be communication between subjects who use different ways to communicate.

Based on this idea, ICTs as learning environments, when used together, can assist in the learning of the deaf subject, helping the subject who can establish communication with other subjects and also facilitating their learning through digital resources.

Expanding ICTs, there are Digital Information and Communication Technologies (TDICs), which, from different technological bases and equipment, allow the association of different individuals and environments in a network, in which communication between them is possible, expanding the technological resources that are already used. In addition to technological tools, TDICs can be seen as cognitive tools, making it possible to expand the intellectual knowledge of users. For that, it is enough that they know how to use them, improving digital technologies, enabling the creation of new forms of communication and expression, among them, creation of images, sounds, animations and combinations of these modalities, supported by the reflections of Valente (2007).

Currently, contact with different technologies is possible, which, in most cases, are easily accessible to the population. However, for technologies to assist in the inclusion process, it is necessary for people to be interested in seeking improvement in order to learn how to handle them correctly. Users need to have self-discipline, creativity, the ability to work in groups, be adaptable and flexible, in addition to constantly seeking new information to improve knowledge, know how to make decisions, be critical and not allow themselves to be accommodated, as Betts points out:

> In addition to becoming a lifelong apprentice and being responsible for his own career, the worker, to succeed in the age of knowledge, will have to develop other skills. To name just three, the first is learning to learn, enjoying learning, being curious, being able to collect, organize, structure, analyze and qualify information and build knowledge - to be self-taught. The second is a certain non-conformity with the present state, a disposition for the new, to constantly change, in short, highly adaptable. The third is self-discipline, that is, clarity of objectives, time management, without which there will be an informational 'indigestion' given the volume of information spread and accessible worldwide (BETTS, 2005, p. 28-29).

When thinking about easy access to digital media and technological advances, it is essential to include them in environments where knowledge diffusion occurs or where there is a need to satisfy something even though, in some places, the use of these tools is in phase evaluation or seen as controversial. (PERNISA JUNIOR; VIANA, 2010).

The technologies generally benefit a mass audience, however, it is notable that they play a fundamental role with disabled people, since they allow the development of activities that were previously inaccessible due to their limitations. There are many technologies that are designed and created to supply specific limitations of each disability, considering that, with the deepening of knowledge, many questions will arise and, thus, they will be able to show new options of technologies.

When thinking about technologies aimed at the independence of human beings, it is possible to mention Assistive Technology (AT), used for the purpose of mediation, a tool and instrument that facilitates activities that involve autonomy, especially for people with disabilities (GALVÃO FILHO, 2009).

It is possible to understand ATs as resources that allow the expansion of skills or, as a support for the limitations of each subject with disabilities, which can be adapted to different areas and with different objectives. In a world with fast and constant changes, TA occupies an area of knowledge and research of great relevance for the real social inclusion of people with disabilities.

A little more than a quarter of a century after the creation of the URI (its Recognition Ordinance dates from May 19, 1992), this scenario takes on new perspectives and, today, internationalization is a reality that is imposing itself, consolidating and bringing new challenges and needs. It is worth noting that the intense debates on the theme have caused the process to mature, allowing the understanding of what internationalization is to pass from a view, initially, more restricted to the idea of exchanging academics and professors, to add to it the construction of covenants, events, agreements and terms have their birthrates from the wishes and needs of professors or academics, endorsed by the Rectors, to become effective actions that are born in the midst of research groups, professional and personal relationships between colleagues, who share research themes and common study interests.

Assistive Technologies in Higher Education

When thinking about assistive technologies in Higher Education, it is necessary to find strategies that break the communication barriers between deaf persons and listeners. For this, assistive technologies are alternatives to minimize such distances. Nogaro and Cerutti (2016), emphasize that the current communication devices provide opportunities for interactions between people, and the available techniques have revolutionized the way of interaction and communication between academics present at universities. The authors also emphasize:

> New technologies are increasingly present, opening ample opportunities for individual and collective production, generating the construction of knowledge from interactions with the environment, as learning is built through interactions, cooperation, access and information exchange that they have always done part of society's experiences, but which were not always shared by the lack of adequate tools. (NOGARO; CERUTTI, 2016, p. 94).

Assistive technology is inserted and used by users, whether for carrying out the simplest and most common activities to the most complex, such as getting around, establishing communication with other subjects, improving vision, among others. When there is a relationship with collective productions, the subjects establish bonds and interactions, facilitating communication between deaf and hearing subjects not only in HEIs, but also in other environments and situations.

Article 43, of the National Education Guidelines and Bases Law - LDB, nº 9.394/96, provides that the HEIs are intended to "stimulate cultural creation and the scientific spirit and reflective thinking; [...] encourage the work of scientific research and investigation, [...], and in this way, develop understanding about mankind and the environment in which they live; [...]." (MOROSINI, 2006, p. 59). Thus, Higher Education is the locus to trigger, in academics, the desire for professional and cultural improvement and, through this, stimulate reflection on everyday situations, mainly of a regional and national nature, providing answers and specialized services to the community, in order to establish a reciprocal relationship. (MOROSINI, 2006).

Combined with the inclusion of the deaf subject in this teaching segment, there is a need for HEIs to develop and research alternatives that can facilitate and assist them so that they do not feel harmed in the scope of intellectual knowledge and personal-professional growth. This concern is justified by taking into account that in the context of HEIs, the characteristics of the listening community prevail, and the Portuguese language is the official language, with the remaining 180 languages being recognized in Brazil. In the use of oral/auditory Portuguese, the deaf subject becomes a minority before the hearing subjects, as Valetini explains:

> People who belong to minorities often face daily challenges in interacting with others. One of the most difficult barriers to break is that of prejudice. The 'pre' 'concept' that the deaf also has cognitive difficulties is common. A deaf person may or may not have cognitive difficulties, but this should be assessed properly so as not to confuse what may be a difficulty in understanding due to language, or a difficulty in understanding at a cognitive level. (VALENTINI, 2012, p. 24).

Due to hearing limitations, deaf individuals often end up depriving themselves of information and contacts in their daily lives, in the same way that a public with no knowledge of Sign Language ends up generating deprivation for deaf subjects regarding their needs, which makes essential the presence of a translator and interpreter.

Law nº 12.319/10 (BRASIL, 2010), regulates the profession of Translator and Sign Language Interpreter (TILS), this professional is qualified to carry out translations between LIBRAS-Portuguese (Brazilian Portuguese sign language) or vice versa, and his presence at HEIs is essential so that the deaf subject is not deprived of information or excluded from his academic group.

We emphasize that only the presence of the interpreter in the environment where the deaf person is inserted is not a guarantee of full inclusion. To Stumpf (2008, p. 27):

> [...] inclusion happens from two movements: the social construction of the whole society that understands and welcomes, and the deaf, who will participate because they feel welcomed [...]. This movement of society implies social responsibility as a constant practice in the action of people and institutions from an ethical position, a position in which individual freedom is put in the background so that justice assumes primacy in inter-subjective relationships.

We perceive that the inclusion of the deaf subject becomes more viable when there is planning, when the subjects are thought considering the preservation of the deaf identity and, starting from its own characteristics, in order to elaborate alternatives that aim at the inclusion of these subjects.

LIBRAS is the foundation for the understanding and communication of deaf people, therefore, when environments and professionals are qualified about it, they contribute to a quality inclusion of these subjects. However, when thinking about the inclusion of the deaf subject in Higher Education, it is important to consider that the presence of the interpreter is not enough, making it necessary for the team of specialized care professionals to collectively search for appropriate alternatives and methodologies, also, for the deaf students. A set of actions is essential for this student to feel integrated in the educational space, creating affective, professional and personal bonds with the rest of the school community.

It is necessary to reflect on the inclusion of deaf subjects in Higher Education and what are the Assistive Technologies (AT) present in contemporary times that can reduce communication barriers. We also note the definition of the Technical Assistance Committee (TAC), issued by the Special Secretariat for Human Rights (SSHR) of the Presidency of the

Republic, which is defined (AT) as being:

> [...] an interdisciplinary area of knowledge, which includes products, resources, methodologies, strategies, practices and services that aim to promote the functionality, related to activity and participation, of people with disabilities or reduced mobility, aiming at their autonomy, independence, quality of life and social inclusion. (BRASIL, 2009, p. 9).

It is possible to notice that the subject in question is still in the initial stage of discussion in the academic scenario in Brazil. In a survey conducted at the Brazilian Digital Library of Theses and Dissertations (BDLTD) of the Brazilian Institute of Information in Science and Technology (IBICT, 2017), between the years 2006 to 2016, we searched for eight descriptors, for the scope of the study:

- technologies,
- assistive technology,
- disabled,
- deaf,
- Higher education institutions,
- inclusion of deaf people in Higher Education,
- accessibility for the deaf in Higher Education Institutions and,
- assistive technology and accessibility for the deaf in higher education institutions.

From these, we collected 36,644 papers, 27,347 of which were dissertations and 9,297 theses. The analysis showed that most of the works found (75%) in relation to the theme are dissertations, with a big difference in the percentage in relation to the theses, which represent 25% of the total. For the topic to be filtered, we searched the descriptors separately, between dissertations and theses. It should be noted that future research will be important, using a text inclusion and exclusion protocol, as well as the redefinition of research arguments.

Regarding the descriptor “technologies”, we found a total of 31,023, 75% of which correspond to dissertations and 25% to theses on the theme. As it is a broad theme, there was a delimitation, considering the work carried out with the descriptor “Assistive Technology”. We found, then, 246 papers, in which 189 (77%) correspond to dissertations and 57 (23%) correspond to theses.

Due to the interest in researching technologies related to the inclusion of deaf people and being aware that different levels of low hearing are within the hearing impairment category, we also researched works with the descriptor “disabled”. In this, 2,224 works, of which 1557 (70%) are classified as dissertations and 667 (30%) as theses.

Based on the descriptor “deaf”, we found 779 papers, of which 608 (78%) correspond to dissertations and 171 (22%) to theses.

In view of the inclusion of students with different disabilities in regular schools in Brazil, legislation that supports not only to insert these students, but also to guide how this inclusion should be made, is intensified and regulated. Knowing that deaf subjects then entering Higher Education Institutions (IES), the descriptor “Higher Education Institutions”, 2,341 works, of which 1662 (71%) correspond to dissertations and 679 (29%) to theses.

Based on these data, through the descriptor “Inclusion of deaf people in Higher Education”, a total of 29 papers were found, 24 (83%) are classified as dissertations and five (17%) as theses. It is worth mentioning that one of the works found, is also included in the next descriptor, “Accessibility for the deaf in Higher Education institutions.”

Regarding the deaf community, there are specific resolutions, laws and documents for inclusion, always demonstrating the communicational need for the Brazilian Sign Language (LIBRAS). Thus, the research continued to observe the way in which accessibility is being worked on for deaf individuals, which was researched through the descriptor "Accessibility for the deaf in institutions of Higher Education." We found only two papers, with a percentage of 50% for dissertations and 50% for theses. Still, incipient, the study points out the need for advances for other deaf individuals to find this possibility. There is also the preparation of the HEIs in designing policies for welcoming and developing actions with this social group.

Aiming at assistive technologies as facilitators in accessibility for the deaf in Higher Education institutions, the search was made through the descriptor “Assistive Technology and accessibility for the deaf in Higher Education institutions”, however, no work was found on the subject.

Because no work was found with the descriptor “Assistive technology” and “Accessibility for the deaf in Higher Education institutions” and due to the descriptor “Inclusion of the deaf in Higher Education” and the descriptor “Accessibility for the deaf in institutions of Higher Education” being closer to the theme, we analyzed them by geographic regions. The search resulted in 31 scientific papers, the same paper being found in two descriptors.

Starting from the descriptor “Inclusion of the deaf in Higher Education”, it is explicit that 38% of the works were developed in universities in the South of Brazil, followed by 27% in the Southeast, 14% in the Midwest and 21% in the Northeast, and the North Region does not present any work.

With regard to the descriptor "Accessibility for the deaf in Higher Education institutions", 33% of the works were developed at universities in the Northeast of Brazil, followed by 33% in the Southeast, 33% in the South and none in the North.

As already mentioned, when the theme is linked to the deaf subject in Higher Education, with a focus on accessibility, the study points out that there is a vast path to be taken, especially in some regions of our country. The fact that we do not have a universe of researched works distances us from a horizon of institutionalized operations in HEIs.

Conclusion

Reflecting on the inclusion of deaf subjects, historically there are records of communication barriers due to the predominance of oral language in society. With the advent of technologies, deaf subjects started to have new opportunities for communication with other hearing subjects. Based on this assumption, it is possible to verify that through technologies it is possible to make activities more accessible and to break part of the barriers in the communication of deaf subjects with listeners.

In the midst of the research, we concluded that there is a vast collection of works in relation to the descriptors "technologies" and "disabled", however, there are few results aimed at research in which there is a relationship between technologies and the deaf in Higher Education.

Based on the state of knowledge achieved, research was carried out on the descriptors "Technologies", "Assistive Technology", "Disabled People", "Deaf People", "Higher Education Institutions", "Inclusion of deaf people in Higher Education", "Accessibility for the deaf in Higher Education institutions" and "Assistive Technology and accessibility for the deaf in Higher Education institutions".

It was also possible to verify researches in which Assistive Technologies are facilitators for the accessibility of deaf people in Higher Education and, still, were not contemplated, which calls attention to the need for further studies on the theme for this teaching segment. .

Based on the assumption that there are no works related to the descriptor “Assistive Technology and Accessibility for the Deaf in Higher Education Institutions” and aiming at their right, combined with the importance of the whole society in recognizing them as subjects of subjectivity and their own culture, it is essential to carry out further studies in the area.

In view of the above, the relevance of the theme of the inclusion of deaf subjects is evident. In this way, discussions with theoretical clashes and legal protection intensify, which contributed to the respect and recognition of the deaf person. It is understandable, then, that the subjects involved also change the way they think about their daily attitudes. The HEIs, with its intellectual capital, has the challenge of interpreting legislation in depth and operating

it in such a way as to achieve inclusion and create mechanisms that enhance the access and permanence of the deaf person.

Considering that the advances are relevant to understand education and deaf culture, it is essential to discuss the identity of these subjects. Thus, it becomes opportune to reflect, also, on the historical context and the questions that involve the formation of their identity.

In this context, the inclusion of students with different disabilities in Higher Education Institutions (HEIs) in Brazil is intensified and regulated from and through public policies, which support not only those who enter, but also regulate how this inclusion must be made. With regard to the deaf community, there are specific Resolutions, Laws and Documents, always demonstrating the communicational need for the Brazilian Sign Language (LIBRAS).

We also note the advancement of ATs, which are increasingly being improved so that they facilitate and result in positive actions for its users. Knowing that it can reduce the limitations of people with disabilities, it is important to reflect on how much cyberculture has been a trigger for AT production for deaf students in HEIs.

It is essential that educational sites, especially in HEIs, are suitable for receiving people with a disability, whether they are professionals working in these institutions or students who will be undergoing their training for a certain period of their lives. We know that these people have the same rights and, also, often need adequate physical places or support to communicate. Policies in HEIs to meet such demands are becoming increasingly relevant.

Considering the urgency of inclusion of the deaf and technological advancement, it is opportune to research, through AT, what the regulatory documents address about the inclusion of deaf students in HEIs. Therefore, it is necessary to verify which are the supports in the theoretical and methodological materials that can facilitate and if it is possible to base the necessary accessibility, so that deaf students feel really included and not just integrated, representing only a quantitative data in the enrollment.

Nowadays, it is possible to perceive, in daily actions, that deaf individuals enjoy technologies on a daily basis, especially those that are characterized as communication technologies, in which they express their criticisms, ideas, suggestions, opinions on various subjects, report events, among others. Technologies have become a primary alternative for deaf individuals to establish communication with other subjects.

Assuming that through these technologies, deaf people express themselves most of the time, through the written Portuguese language, it is assumed that all people linked to these technologies have access to the ideas of the deaf, even those who are unaware of LIBRAS, recognized by Law 10.436/2002 (BRASIL, 2010).

Still, we conclude that studying the education of the deaf person reports not only to questions related to their limits and possibilities, but also to the prejudices existing in the attitudes of family, society and, also, in the HEI, since they face numerous obstacles to participate in Higher Education, resulting from hearing loss and the way educational proposals are structured. It is important to carry out new related studies, capable of analyzing how the accessibility of the deaf subject has been regulated through Assistive Technology in Higher Education and which of these can reduce the communication barriers between listeners and deaf people.

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