Shared disability: a commitment to inclusive deaf-hearing communication from assistive technology

Discapacidad compartida: una apuesta de comunicación inclusiva sordo-oyente desde la tecnología asistiva

Deficiência compartilhada: um compromisso com a comunicação inclusiva audição de surdos da tecnologia de assistência

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Abstract

Introduction: The approach to disability has moved from an individualistic model to a social model whose understanding focuses on the subject-environment interaction; For this reason, the article presented gives an account of a research process that had as its. **Objective:** to describe the incidence of a translation application of signifiers into Colombian Sign Language in the deaf-hearing relationship as an inclusive communication strategy in Ibagué (Colombia). **Method and/or methodology:** it was approached from a mixed descriptive approach and had the participation of ten (10) subjects with hearing disabilities and ten (10) listeners: relatives, teachers and educational peers. **Results:** From the applied instruments that made reference to the structured interview and the survey, it was found in the latter (on which the results of this document deal), that the application in question has contributed to reducing the communication gaps and the existing social distancing due to the different linguistic codes that each population group uses, revealing a shared disability insofar as deaf and hearing are contextually excluded from the communicative plot due to their interactional differences. **Conclusions:** that the translator of signifiers contributes to the mitigation of traditional communication barriers that for years have marked the deaf and have relegated them to exclusion, where the limitation is not in the language as such but in the primacy of communicative forms. of some (hearing) over others (deaf).

Key words: Sign language; Assistive Technology; Significant; Disability; Deaf community

Resumen

Introducción: El abordaje de la discapacidad ha transitado de un modelo individualista a un modelo social cuya comprensión se centra en la interacción sujeto-entorno; por ello, el artículo presentado da cuenta de un proceso de investigación que tuvo como Objetivo: describir la incidencia de un aplicativo de traducción de significantes a Lengua de Señas Colombiana en la relación sordo-oyente como estrategia de comunicación inclusiva en Ibagué (Colombia). **Método y/o metodología:** se abordó desde un enfoque mixto de tipo descriptivo y contó con la participación de diez (10) sujetos en situación de discapacidad auditiva y diez (10) oyentes: familiares, docentes y pares educativos. **Resultados:** A partir de los instrumentos aplicados que hicieron referencia a la entrevista estructurada y la encuesta, se encontró en esta última (sobre la cual versan los resultados del presente documento), que el aplicativo en mención ha contribuido a disminuir las brechas comunicativas y el distanciamiento social existente por los diferentes códigos lingüísticos que cada grupo poblacional utiliza, dejando en evidencia una discapacidad compartida en tanto contextualmente sordo y oyente quedan mutuamente excluidos de la trama comunicativa por sus diferencias interaccionales. **Conclusiones:** que el traductor de significantes contribuye a la mitigación de las barreras comunicativas tradicionales que por años han signado al sordo y lo han relegado a la exclusión, en donde la limitación está no en la lengua como tal sino en la primacía de las formas comunicativas de unos (oyentes) sobre otros (sordos).

Palabras Clave: Lengua De Señas, Tecnología Asistiva, Significante, Discapacidad, Comunidad Sorda.

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Resumo

Introdução: A abordagem da deficiência mudou de um modelo individualista para um modelo social cujo entendimento se concentra na interação sujeito-ambiente; processo de pesquisa que tinha como objetivo: descrever o impacto de um pedido de tradução de significantes em o impacto de um aplicativo para a tradução de significantes para a Língua Colombiana de Sinais sobre a audição de surdos a relação como uma estratégia de comunicação inclusiva em Ibagué (Colômbia). **Método e/ou metodologia:** foi abordado a partir de uma abordagem descritiva mista e contou com a participação de dez (10) sujeitos com deficiência auditiva: membros da família, professores e pares educacionais. **Resultados:** Com base nos instrumentos aplicados, que fez referência à entrevista estruturada e à pesquisa, encontrou-se neste último (sobre o qual tratam os resultados deste documento), que o pedido em questão tenha contribuíram para reduzir as lacunas de comunicação e o distanciamento social existente devido os diferentes códigos linguísticos que cada grupo populacional utiliza, revelando uma deficiência compartilhada como contextualmente surdo e ouvinte são mutuamente excluídos da trama comunicativa devido às suas diferenças interacionais **Conclusões:** que o tradutor de significantes contribui para a mitigação das tradicionais barreiras comunicativas que durante anos marcaram os surdos e a audição os relegaram à exclusão, onde a limitação não está no idioma como tal, mas no linguagem, mas na primazia das formas comunicativas de uns (audição) sobre outros (surdos).

Palavras-chave: Linguagem gestual, Tecnologia Assistiva, Significativo, Deficiência, Comunidade Surda.

Introduction

If all that I possess were taken from me with the exception of one thing, I would choose to retain the power of communicating, through which I would soon recover the rest"
(Daniel Webster, 1820).

Throughout history, the notion of disability has been approached from different points of view, ranging from the deficit perspective to an anthropological conception of difference. Deafness, known as a type of sensory disability, has been particularly marked by an unfortunate conception of deafness, given that the impossibility of acquiring an oral language has destined it to social stigma and, in this sense, it is seen as "an evicting characteristic, quite lapidary, where the processes of recognition and inclusion have been marked by the dictatorship of the hearing world" (Claros, 2004, p. 66). Therefore, in terms of inclusion, it is worth questioning the coloniality of being, being and coexistence experienced by the deaf subject in his daily life, so it is imperative, as mentioned by Ocampo (2021), to think differently about the onto-political and power relations that govern the non-bonding of the subject with his context. An inclusion that responds to a framework of legitimization driven by modernity, as a part of the history that hides and represses what does not fit into the imaginary (Walsh and Mignolo 2018, p. 111) thus becoming a form of regulation of the world through a corpus of relationships, rules and dynamics that frame the prevailing social structure.

Under this conception, historically the deaf community has experienced a rehabilitation process through the teaching of linguistic and speech codes that emphasizes orality to "normalize" the subject, seeking to act from the perspective of the listener. For Garcia (2020), the deaf subject was (and often still is) seen as someone who should be subject to all kinds of normalization processes, closer to the listening identity. However, this relentless pursuit of hearing the deaf person to conform to the so-called normality that society idealizes, is based on the classic concepts of the hegemonic biomedical paradigm, based on the fact that the absence of phonic sound, i.e., speech, implies lack of language and consequently a deficient cognitive development, which prevents the subject from full social integration (Rey, 2008).

Despite this conception, the deaf community has developed a culture and an identity that is based precisely on its form of communication, Sign Language, which is evidenced in the support for social interaction in a world marked by the hearing culture, being precisely here where technology has become a tool that manages to overcome the barriers that characterize the deaf-hearing relationship, establishing itself as an element that links the communication needs arising from such interaction (Castellanos and Montes, 2021).

In this sense, the article presented here seeks to socialize the findings of a research process that aimed in its qualitative phase, to describe the impact of an application as a strategy for inclusive deaf-hearing communication in Ibagué (Colombia), which allows through the use of mobile devices to identify signifiers in Spanish and translate them into Colombian Sign Language (CSL), which are found in the physical environment in a static way (advertisements, signs, names of places of interest, parts of a room, etc.) or in a dynamic way; in a dynamic way; in a way that allows for the translation of signifiers into Colombian Sign Language (CSL), which are found in the physical environment in a static way (advertisements, signs, names of places of interest, parts of a room, etc.).) or, dynamically; in other words, to be written by hearing people who wish to communicate with deaf subjects in terms of interaction. The above, with a view to fulfilling the premise of bringing cultures closer together and giving the deaf person the possibility of accessing a first level of independence in terms of communication. Likewise, to allow the hearing person to identify the signs corresponding to written signifiers, facilitating the acquisition of a semantic baggage in sign language.

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Thus, its purpose was focused on mitigating the communication barriers between the two population groups described above, promoting the access of deaf people to written Spanish and encouraging the learning of sign language by hearing people, as a way of contributing to the processes of social transformation to reduce the classic interaction gaps between hearing and non-hearing subjects due to the social stigma generated by a reductionist vision of the subject, in search of the generation of inclusive spaces in which diversity is respected, understood and protected (González and Espada, 2020), an inclusion understood as an action that transcends differences and suppresses discrimination scenarios within the framework of human rights (Ochoa et al., 2020).

A LOOK AT INCLUSIVE COMMUNICATION

Victor Hugo, French writer and scholar of deaf culture, wrote the book entitled "What matters the deafness of the ear when the mind hears, the true deafness, the incurable deafness is that of the mind", and in its content, incorporates reflections of the deaf otherness, threatened by the pressure of the hearing to achieve their orality, as a pretext to incorporate it into society, responding to the requirements of a context with predominance of the spoken word in culture. Communication has been and will continue to be decisive in the processes of human interaction, showing exclusion of those who use other forms that do not correspond to those of the majority, as is the case of the deaf community, which for many years has been stigmatized because of the founding arguments of the orthodox pathological look.

In this regard, Druetta et al. (2003) point out that:

Deafness implies considering the subject not as an individual carrier of a pathology that must be re-enabled to become a listener or at least a speaker so that his difference is noticed as little as possible, but as a member of a different culture with its own language, which in this case is not spoken but signed (p. 30).

Now, it has become evident that sonority is not the only form of communication, a fortiori, when new models and forms of communication have emerged. In fact, the exchange of meanings that is at the basis of communication is only possible in a social environment where there is a subject, an other who shares the codes that are exchanged, so communication is a sociocultural process in which are constru- yen, meanings and symbolisms (Cordero, 2018). Thus, communication through sign language for the deaf community becomes an alternative and emancipatory source that validates its existence, facilitating all forms of expression of ideas, feelings and experiences.

As stated by Albuerne and Pino (2013):

The term alternative communication refers to all those resources that we use to replace speech when it is absent or not understandable. For a person who lacks the ability to communicate through speech, writing, hand signs or graphic signs are alternative systems of communication. (p. 17)

In other words, communication exists in itself, as long as there is an interlocutor and someone (another) who pays attention to its understanding, as mentioned above, it will be through this view and its recognition that the subject can be considered as a signifier that communicates, that transmits and gives meaning to the symbolic world. Therefore, having a look at disability from an approach that is

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socio-anthropological, allows an approach from an inclusive perspective, breaking paradigms that limit, annul and exclude the deaf person, dignifying their integrity.

In fact, the INSOR (2006), regarding the deaf person, states that:

They are considered as people with full capacities to develop integrally; 2. It is recognized and respected that they acquire and use sign language as their first language; 3. They form a minority linguistic community; and 4. This community is called the deaf community. (p. 11).

In this sense, it is evident that the LSC becomes a vehicle for communicating both concrete and abstract information, acting as a "buffer for speech".

Sign language is the natural language of deaf people. It is based on movements and expressions through the hands, eyes, face, mouth and body. Many deaf people communicate with this language and require an interpreter or a person who speaks it to interact with hearing people who do not know it. In Colombia it is called Colombian Sign Language (INSOR, 2019).

For the deaf person, this will be his first language, with which he will be able to relate and communicate; however, it is worth considering what Alisedo (2018) calls, linguistic incompatibility, arguing that such incompatibility is present when the first language of parents and children is not compatible, which will require from both parties a greater effort to eliminate the barriers that exist in the communicative act.

Thus, by not responding to the same communicative logic of the majority, the deaf are discriminated against and as referred to by Arenas et al. (2018):

He is excluded and disappears in the communicative fabric as a relevant subject, thus ceasing to be considered a 'person' because he is unable to bring together a set of necessary social expectations - loaded with structural and cultural assumptions - that would allow him to be installed within the fabric of the 'normal' world on the basis of a factual inequality that marginalizes him from real opportunities for inclusion from the prejudices and deprivations produced and reproduced by the social order (p.7).

However, it is important to recognize that, for the deaf person, sign language has an identity character from their culture:

Let us now turn to the recognition of a wider and less alien world. To speak of the deaf as a linguistic and cultural minority is, first of all, to accept a difference. Deafness, beyond a physical handicap, is a life experience, a way of being and being in the world different from that of hearing people. But, as a relationship, Bernard Mottez points out that deafness is a shared disability that appears only in the encounter of a deaf person with a hearing person. In such an encounter, the problem belongs to the interlocutors, which is why we speak of a communication disability. Between deaf people, the disability disappears.... (Benvenuto, 2004, p. 95)

From this perspective, then, it is evident that the limitation in the communicative process is not only present in the hearing impaired person, but also in the hearing person, since the barrier is present in both directions; however, since oral communication is eminently hegemonic, this status predominates only in the deaf person. Therefore, it is essential to deconstruct the somewhat ambiguous discourse of the deaf.

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the deaf person as a communicating subject, and as Mascareño (2015) indicates, "both inclusion and exclusion of people are never an absolute phenomenon: no one is fully included or fully excluded" (p. 6). In this regard, Casado and Lezcano (2012), describe that the starting point of inclusion is to contribute to the equality of all people, and hence the correspondence of human rights that gives rise to the entire development of the inclusive movement, consistent with what was raised by Santiago Val (2021), who reflects on directing efforts to the understanding of the deaf subject from the interaction with him, as the bearer of his own culture.

Translation of signifiers: a contribution of technology to inclusive communication

Technology as a differential factor in inclusion processes, shows its potential in complex contexts where its action results in the welfare of a community, establishing itself as a means to model consistent solutions to social problems and aligning itself to its particular characteristics, acting as a catalyst between the needs of a group and its integration to life in society, where its importance goes beyond solving a physical or sensory impairment, addressing the relationship between technology and disability as a means of personal development, leaving aside the need to "normalize" the disabled individual and focusing its actions on their integration in all areas of life in society (Revuelta and Hernandez, 2021).

Precisely, the correspondence between the needs of the disabled community and the development of engineering solutions gives rise to the concept of Assistive Technology (AT), understood as an interdisciplinary area of knowledge that encompasses any type of electronic or mechanical device that can support independence and improve quality of life by assisting in activities of daily living, reducing harmful risks and improving communication (Howard et al., 2021). Thus, the field of action of AT is delimited by all those Technological elements developed through evaluation, testing and adaptation processes (de Wiite, 2018) that facilitate functional capabilities and meet the needs of this population group, addressing the sensory, cognitive or motor "difficulties" produced by the label of disability.

As described, Assistive Technology is conceived as "any product (including devices, equipment, instruments and software), specially produced or generally available, used by or for people with disabilities for participation, to protect, support, train, measure or replace bodily functions, structures and activities, or to prevent impairments, activity limitations or participation restrictions" (ISO, 2016 cited in Smythe et al., 2019, p.941).

Now, the heyday of mobile technology and the increasing processing power available in cloud services have provided new opportunities in the AT domain, where "mainstream technologies such as smartphones offer features that allow them to function as assistive products. This has opened up a whole new market of apps and other digital elements developed for specific populations with disabilities" (de Witte et al., 2018, p.469), allowing to ex- trap features of technologies developed for other purposes, thus leveraging their scalability and reliability for AT tasks.

Therefore, the use of the application for the translation of signifiers to LSC as a strategy for inclusive deaf-hearing communication in the country, becomes a support resource for deaf people as an Assistive Technology tool, whose purpose is to facilitate a process of meaningful communication.

The aim is to raise awareness among the population (in general) of the urgent need to recognize the usual forms of communication with minority groups characterized by their differential abilities.

METHODOLOGY

The research process covered in this document was developed from a mixed approach, which is a combination of qualitative and quantitative approaches, from which observation, collection and analysis of phenomena and data are carried out for subsequent triangulation. Hernández et al. (2003) point out that mixed designs represent the highest degree of integration or combination between qualitative and quantitative approaches. Both are intermingled or combined throughout the research process or, at least, in most of its stages, adding complexity to the study design... but contemplating all the advantages of each approach.

Population

The population participating in the research process consisted of:

a.   Deaf community composed of ten (10) subjects with hearing disabilities registered in the database of the Tolima Association of the Deaf (ASORTOL) and who use the services of the Tolima Association of Sign Language Interpreters (ATILS).

b.   Hearing community composed of ten (10) family members, teachers and educational peers belonging to the social circle of primary interaction of the deaf people linked to the project.

Participants were recruited on a voluntary basis, so a non-probabilistic convenience sample was used, whose fundamental characteristic is compliance with aspects such as homogeneity and temporality.

Techniques and instruments

For the collection of information and based on the stated objectives, the techniques and instruments used were the structured interview and the survey, being pertinent to mention that the results of which are reported in this document, refer to the survey whose purpose was to describe the impact of the application of translation of signifiers as a strategy for inclusive deaf-hearing communication, which arose after the design, implementation and use of the application referred to.

RESULTS AND DISCUSSION

> *"Their eyes are their ears, their hands are their voices, with your hands and mine*
> *we can break communication barriers through Sign Language."*
> *World Federation of theDeaf (2000)*

Deaf-hearing communication has been the subject of reflection of many researchers and disciplines, due to the existing linguistic differences, obstacles in social interaction that not only exist from the perspective of the deaf but also of the hearing person, who emerges as an emerging category due to its inclusive character and its
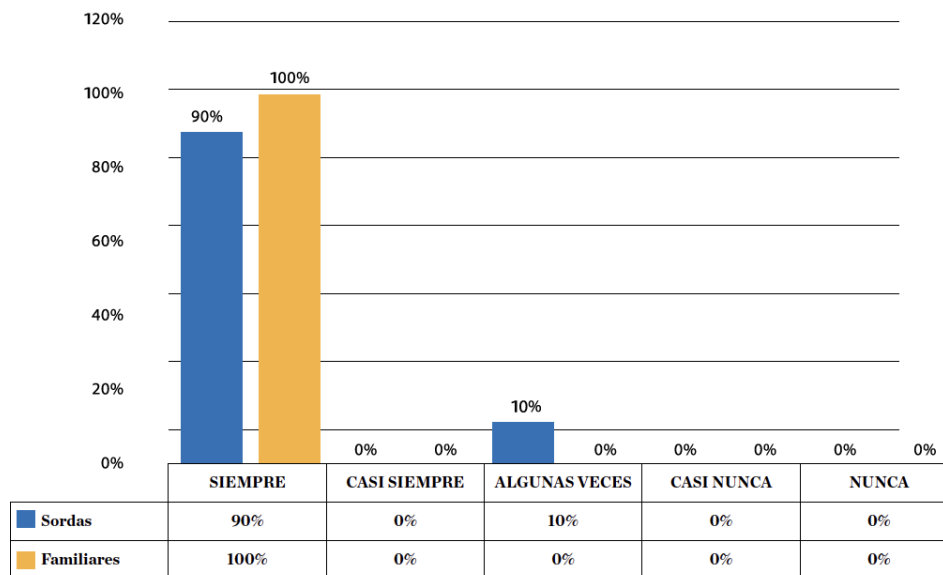
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direct relationship with the disability. The Ministry of National Education - MEN (2006), describes the deaf person as:

> a subject that has the potential to develop socially, culturally, cognitively and affectively; its particularity is located on the linguistic level and it is through sign language that the deaf make evident that singularity that identifies them as beings in permanent evolution and change. (p. 5-6).

Thus, it is evident from the above, that it is feasible to know the world through the signing voice of the deaf, reading their different behaviors and their communicative spectra, where this act is established as long as there is a motivation of both the speaker (listener) and "signing deaf", where each image of otherness becomes a space for interpretation and interaction that breaks the barriers of difference, recognized not from the stigma and discrimination, but from the acceptance and closure of any social distancing.

The following is a description of some of the elements identified with the instruments applied to the deaf and hearing community, in coherence with the approach chosen for the progress of the research.
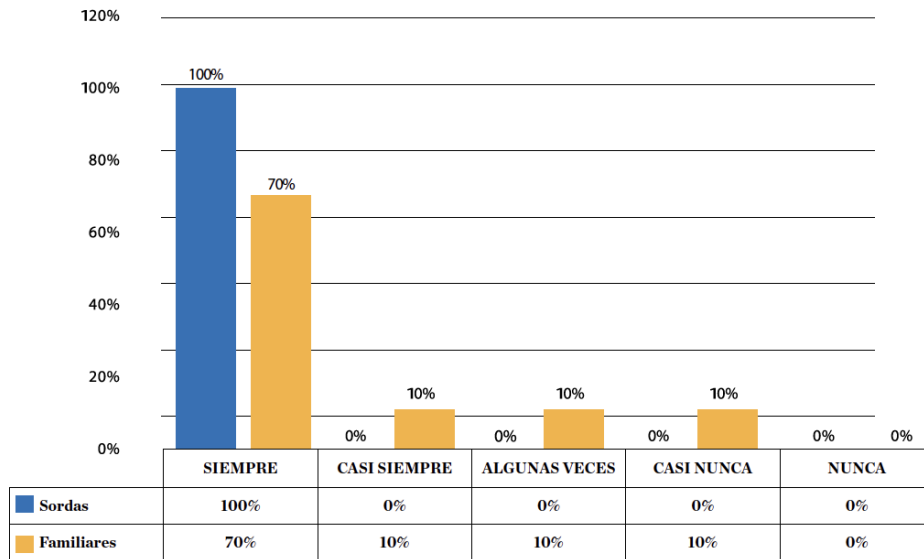
Figura 1.
Percepción de los procesos comunicativos

	SIEMPRE	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA	NUNCA
Sordas	90%	0%	10%	0%	0%
Familiares	100%	0%	0%	0%	0%

Nota: Elaboración de los autores.

According to Figure 1, it can be seen that 90% of the Deaf people perceive that the application contributes to the communicative processes. Similarly, 100% of the hearing people who are part of the close family perceive that the application contributes satisfactorily to these processes, contributing significantly to closing the gap created between the world of the Deaf and the hearing, which will contribute to true spaces of inclusion, where the protagonist is not only the Deaf person who has his own language, but also the hearing person who, in the process of acquiring these notions and knowledge of this second language - LSC, will reduce the barrier of exclusion, denial and stigma and will open spaces to understand and understand each other in the difference.
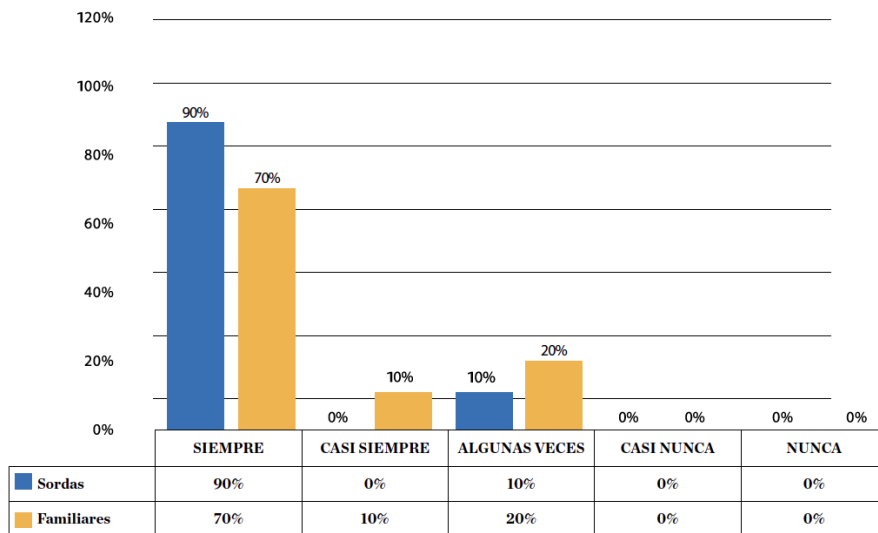
Figura 2.

Resignificando el lenguaje

	SIEMPRE	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA	NUNCA
Sordas	100%	0%	0%	0%	0%
Familiares	70%	10%	10%	10%	0%

Nota: Elaboración de los autores.

In Figure 2, it can be seen that 100% of the Deaf people perceive that the application resig- nifies the language by the possibility of learning new meanings, enriched by their interaction with the hearing person who, through inclusion, validate linguistic diversity, as Sacks (1989) expresses again when he says that "being deaf, being born deaf, places an individual in an extraordinary situation; It exposes him or her to a range of linguistic, and consequently intellectual and cultural, possibilities that most people, as natural speakers in a world of speech, can scarcely even imagine" (p.175). (p.175). At

Figura 3.

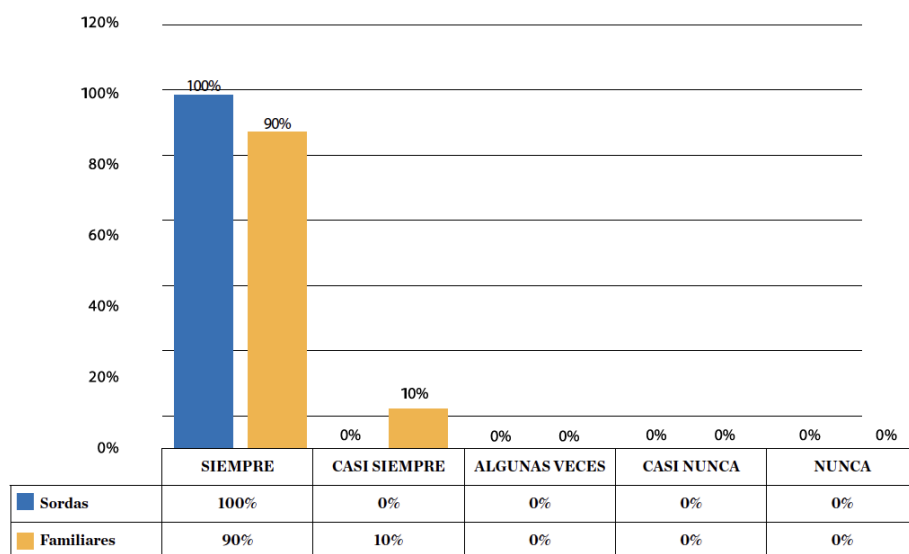*Aporte del aplicativo al proceso comunicativo*

	SIEMPRE	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA	NUNCA
Sordas	90%	0%	10%	0%	0%
Familiares	70%	10%	20%	0%	0%

Nota: Elaboración de los autores.

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As for the hearing population, 70% of family members and people close to them perceive that the application gives new meaning to the language, through the acquisition and learning of new signifiers that contribute to the communicative act of the deaf with the hearing, however, they consider that it should be strengthened much more to achieve a meaningful, continuous and permanent learning to favor the deaf-hearing relationship, understanding that it is through the acquisition of signifiers in Spanish that the coherent organization of thought is possible to represent their reality.

In Figure 3, 90% of deaf people perceive that the application contributes to the communicative process, since it has achieved a significant recognition of SL as an articulating vehicle for social interaction, and that it legitimizes their ways of being and acting in a world with a predominantly oralized world, but that each time, it contributes to social inclusion as a way to achieve social equity and as a space for mutual enrichment in the deaf-hearing relationship, overcoming all diversity. Now, 70% of the hearing relatives say that the application contributes to the communicative processes, perhaps because of the benefits acquired through the application to improve their interaction, however, it is not achieved in its totality because there are still symbolic differences that may affect the acceptance and understanding by the listener of SL, as Skliar (2007) refers "disability calls into question the existence of a unique and normal body, of a unique and normal language, of a unique and normal learning, of a unique and normal behavior" (p. 5). (p. 5).

Figura 4.
Aporte del aplicativo al proceso comunicativo

	SIEMPRE	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA	NUNCA
Sordas	100%	0%	0%	0%	0%
Familiares	90%	10%	0%	0%	0%

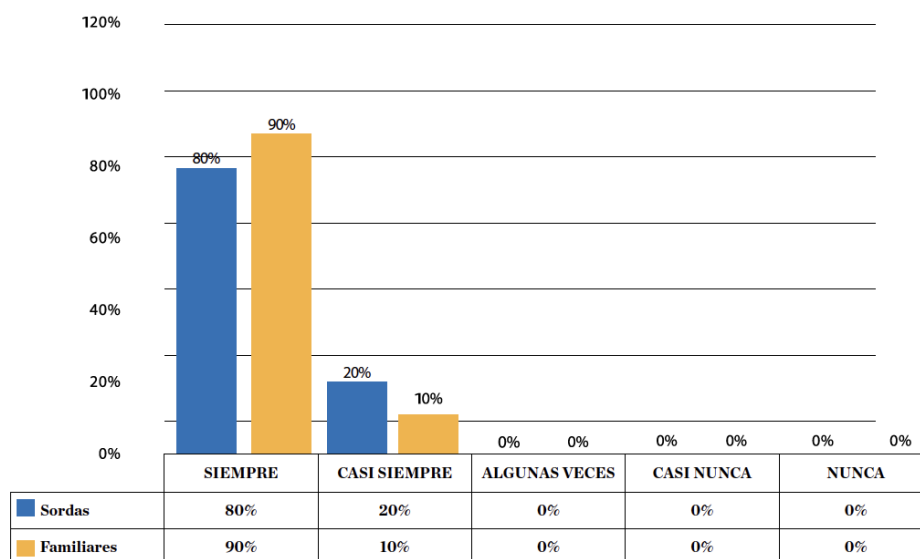*Nota:* Elaboración de los autores.

According to Figure 4, 100% of deaf people mention that disability is shared, i.e., it is experienced in two ways, both the hearing and the deaf people face it. Likewise, 90% of the hearing people also agree with this statement. It is evident that the hearing person, when facing the world of the deaf, shows incapacities in such interaction, since the language of the latter corresponds (only) to the language spoken by 5% of the world population (WHO, 2021), and this limitation is only present when establishing a communicative process with a deaf person. Similarly, this communication gap occurs when the deaf person has to face a world of hearing people who are totally unfamiliar with SL, and there is no

recognition of any symbolic code, there is a glimpse of the disability on the part of the Deaf who increases the abyss and his agony in the relationship with others. Therefore, there is no limitation of speech of a hearing person with another hearing person, as there is no limitation of speech of a deaf person with another deaf person, this disability disappears, however, it is through the LSC that it is sought to develop skills to facilitate asymmetrical relationships with people who do not share the same language.

{...) questioned the phonological character of language in its oral modality and the phonocentrism inherent to it ...) If language constitutes the only existing index of a latent thought in the body and if, on the other hand, it is found only in the human being, it will be by granting a language status to the signs that the deaf create to communicate, that the latter can be placed among human beings. (Benvenuto, 2004, p. 92).

In relation to Figure 5, 80% of deaf people state that the application contributes to the satisfaction of their daily communication needs and 20% state that it is almost always used. This is a significant percentage, based on the premise that language is the result of social interaction, which is established in the daily life of this group that, although it is a silent community, has a voice, a voice that is not audible, but that can be seen in action through its Sign Language. Therefore, the application is presented as a tool that favors the richness in the deaf-hearing interaction and in an opening to their worldview through their language and with new meanings for the enjoyment of different social contexts. For the hearing family, 90% affirms that the application contributes to the satisfaction of the communicative needs in the daily life and 10% affirms that almost always. These percentages are representative, since they make evident the contribution of this tool to achieve an ontological understanding of the deaf, from their own history, from their complexity, in the understanding that the LSC is a symbolic medium that allows and guarantees cultural reproduction and an identity fabric that circumvents exclusion.

Figura 5.

Necesidades Comunicativas en la cotidianidad

	SIEMPRE	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA	NUNCA
Sordas	80%	20%	0%	0%	0%
Familiares	90%	10%	0%	0%	0%

Nota: Elaboración de los autores.

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Therefore, according to the results presented, it is possible to show that the hearing impaired subject faces limiting situations as a result of the difference in the communicative processes that are established in the deaf-hearing community, where these two experience the limitation due to the lack of knowledge of the LSC or non-orality, generating a shared disability that transcends the exclusively physical standards and is inserted in the context of interactions, for which the responsibility to overcome the classic deaf-hearing communicative obstacles is incumbent on both population groups through their transformational power in terms of acceptance of the difference in conditions of equality, because as established by Skliar et al. (1995):

Belonging to the deaf community is defined by the use of sign language, feelings of group iden- tity, self-recognition and identification as deaf, recognition as different, endogamous marriages, factors that lead to redefine deafness as a difference and not as an impairment (p. 10).

Thus, the application translator of signifiers to LSC as an element that promotes interaction between the deaf and hearing community, empowers its potential in the communicative process that is generated in two ways, on the one hand, the translation of signifiers in Spanish to LSC in everyday scenarios that facilitates the integration of the deaf community as a participatory element within the social dynamics. On the other hand, the application allows the hearing community to become familiar with Colombian Sign Language, understanding that this communicative process must be produced from all the interlocutors present in the plot, where the reciprocal action between these communities becomes a means of inclusion that is gestated from a mainly hearing context. This allows the developed application to approach the problem from a different perspective, where the Colombian sign language translator applications developed so far focus on sign dactylology transcription, as is the case of the studies conducted by Bautista et al. (2021), in which, for the operation of the application it is necessary to spell each letter of a signifier, leaving aside fundamental elements such as hand movement, spleen and facial gestures that are essential for the correct interpretation of a signifier. Likewise, these applications act in only one direction, that is, communication is given exclusively from a deaf person to a hearing person, but this is not done in reverse, leaving out of the communicative plot the hearing person, who as an essential part of the inclusion process must act as both receiver and speaker.

CONCLUSIONS

The life experience of the deaf person seen by the social context from the defectology, as a different being due to the use of linguistic codes that do not correspond to those of the majority, hides a history that has marked his personal development, since he has been stigmatized and labeled from a pathological position since childhood, without recognizing that the only difference is in the way he interacts with the hearing person, because among deaf people, disability disappears. This reality has allowed demystifying the prevalence of the deficiency discourse, identifying the communicative richness of the sign language, which contributes to break the stigma and opens the way to inclusion.

Deafness is constituted more than a sensory disability, in a product of the interaction of the subject in and with the environment where oral language prevails, finding that the real limitation is not in the language as such, but in the primacy of the communicative forms of some (hearing) over others (deaf) that when interacting are on an equal footing in terms of communicative limitation.

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Therefore, the concept of the subaltern deaf, who is dominated by the hearing, is called into question, thus allowing for the recognition of the essence of each culture, and respect for deafness, as a fundamental element of the inclusion that is being gestated as a principle of citizenship.

As a space for reaffirmation, sign language is recognized for its symbolic value, which can sometimes generate confidence in their social interaction and sometimes mistrust, frustration and lack of communication when the interlocutor does not know it. However, it seeks to compensate the cultural value of the deaf community, which contains its own elements, being sign language its greatest strength.

The translator of signifiers to Colombian Sign Language was constituted in a bet of inclusive communication, from the perception of the interlocutors taking into account aspects focused on the contextual interaction deaf-hearing as a process located in a reciprocal action that gestate a scenario of social inclusion, where the "shared disability" that occurs in these populations because they have different linguistic codes can be reduced by the action of assistive technology, allowing to mitigate the traditional communication barriers that for years have marked the deaf and have relegated them to exclusion, placing them in a distant position from the prevailing social structure. Thus, the application has become, according to the perception of deaf and hearing people, a tool that reduces the distance in the interaction process of both communities, through the acquisition of communicative skills by learning new signifiers of the LSC as a semiotic mediator and why not, a transmitter of culture.

References

Albuerne, S y Pino, M. (2013). *Apoyo a la comunicación.* Mc Graw Hill Education.

Ocampo, A. (2021). Educación inclusiva: interpelaciones al paradigma occidental, nuevas configuraciones onto-epistémicas. *RUNAE, 6* (1), 115-130. https://www.aacademica.org/aldo.ocampo.gonzalez/83.pdf

Alisedo, G. (2018). Sordera infantil y educación. Factores de riesgo psicosociolingüístico. *Desvalimineto Psicosocial, 5*(1). http://dspace.uces.edu.ar:8180/jspui/handle/123456789/4510

Arenas, A., Castellanos, G. y Rojas, J. (2018). Voces del silencio: la inclusión social desde una ruptura en la homogenización comunicativa oyente-sordo. *Sciences PI Journal - by Psychology Investigation, II.* https://www.sciencespijournal.com/ediciones/2018-volumen-ii/art%C3%ADculo-3/

Bautista, J. E. B., Otavo, J. P., Alba, J. J. B., Páez, M. L. y Riveros, Ó. C. V. (2021). *DESARROLLO DE UN APLICATIVO TRADUCTOR PARA LA LENGUA DE SEÑAS COLOMBIANA*. Encuentro Internacional de Educación en Ingeniería. https://acofipapers.org/index.php/eiei/article/view/1659

Benvenuto, A. (2004) ¿Cómo hablar de diferencias en un mundo indiferente? La sordera de los oyentes cuando hablan de sordos. *Revista internacional de análisis educativo y social De Encuentros 4*(8). 84 - 97.

Casado, R. y Lezcano, F. (2012). *Educación en la escuela inclusiva. Formación del profesorado y perspectivas del futuro.* Grupo Editorial LUMEN.

Castellanos, G. y Montes, J (2021). Traductor de significantes a lengua de señas: La tecnología asistiva como mediadora de la interacción comunicativa sordo-oyente. En Serna, E. (Editor). *Ciencia transdisciplinar para el desarrollo y la supervivencia de la humanidad.* Editorial Instituto Antioqueño de Investigación. 362-375. https://zenodo.org/record/5139646#.YhZeeS-xCL8

Claros, R. (2004). *La Desmitificación de la educación de sordos. Hacia una pedagogía de éxito.* Editorial del norte. https://isbn.cloud/9789562919944/la-desmitificacion-de-la-educacion-de-sordos-hacia-una-pedagogia-de-exito/

De Witte, L., Steel, E., Gupta, S., Delgado, V. y Roentgen, U. (2018). Assistive technology provision: towards an international framework for assuring availability and accessibility of affordable high-quality assistive technology. *Disability and Rehabilitation: Assistive Technology, 13*(5), 467–472. https://doi.org/10.1080/17483107.2018.1470264

Cordero, L. (2018). La comunicación como proceso cultural. Pistas para el análisis. *Revista Estudios del Desarrollo Social: Cuba y América Latina, 6*(3), e13. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2308-01322018000300013&lng=es&tlng=pt.

García, C. A. (2020). Cultura sorda e inclusión. *Avances de investigación, 7*(1), 31-41. https://plataformas.ude.edu.uy/revistas/rifedu/index.php/Avanz-Inv/article/view/59/88

González-Montesino, R. H. y Espada, R. M. (2020). Espacios universitarios de aprendizaje inclusivos, bilingües y multimodales: el caso del alumnado sordo signante. *Revista De Estilos De Aprendizaje, 13*(25), 70–83. http://revistaestilosdeaprendizaje.com/article/view/1519

Hernández, R., Fernández, C. y Baptista, P. (2003). *Metodología de la investigación* (3ª ed.). Editorial Mc Graw-Hill.

Howard, R., Gathercole, R., Bradley, R., Harper, E., Davis, L., Pank, L., ... y Gray, R. (2021). The effectiveness and cost-effectiveness of assistive technology and telecare for independent living in dementia: a randomised controlled trial. *Age and ageing, 50*(3), 882-890.

INSOR. (2006). *Educación Bilingüe para sordos* - Etapa Escolar. Imprenta Nacional de Colombia. http://www.insor.gov.co/home/wpcontent/uploads/filebase/cartilla_etapa_escolar.pdf

INSOR. (2019). *Portal INSOR para niños.* http://www.insor. gov.co/portalninos/

Mascareño, A. y Carvajal, F. (2015). Los distintos rostros de la inclusión y la exclusión. *Revista Cepal. 116.* https://re-positorio.cepal.org/bitstream/handle/11362/38800/1/RVE116Mascareno_es.pdf

Druetta, J., Massone, M. y Simón, M. (2003). *Arquitectu-ra de la escuela de sordos.* Libros en red. https://isbn.cloud/9789875610415/arquitectura-de-la-escue-la-de-sordos/

Ministerio De Educación Nacional. (MEN). (2006). *Orien-taciones pedagógicas para la atención educativa de estudiantes sordos.* https://discapacidadcolombia.com/index.php/inclusion-educativa/196-orientacio-nes-generales-para-la-atencion-educativa-de-las-po-blaciones-con-discapacidad-en-el-marco-del-dere-cho-a-la-educacion

Ochoa, C. U., Corredor, M. Y. C. y Bueno, A. C. B. (2020). Salud y educación de niños, niñas y adolescentes con TEA o TDI: una relación simbiótica para su garantía o vulneración. Caso Bucaramanga. *Pensamiento Americano, 13*(26), 113-126. https://publicaciones.americana.edu.co/index.php/pensamientoamericano/article/view/424/524

Organización Mundial de la Salud (OMS). (2021). *Sordera y pérdida de la audición.* https://www.who.int/es/news-room/fact-sheets/detail/deafness-and-hearing-loss

Rey, M (2008). *El cuerpo en la construcción de la identidad de los sordos.* Universidad Nacional de la Plata. https://cultura-sorda.org/wp-content/uploads/2015/03/Rey_CUERPO_CONSTRUCCION_IDENTIDAD-SOR-DA-2008.pdf

Revuelta, B. y Hernández, R. (2021). Estudios críticos en dis-capacidad: aportes epistemológicos de un campo plural. *Cinta de moebio,* (70), 17-33. https://scielo.conicyt.cl/scielo.php?pid=S0717-554X2021000100017&script=s-ci_arttext

Sacks, O. (1989) *Veo una voz.* Viaje al mundo de los sordos. Edi-torial Anagrama.

Smythe, K. C., Adam, D. L., da Silva, C. T. y Okimoto, M. L. L. R. (2019, July). *Including Users in the Evaluation Process of Assistive Technology: Applied Methods and Techniques.* In International Conference on Applied Human Factors and Ergonomics (pp. 940-947). Springer, Cham. https://link.springer.com/chapter/10.1007/978-3-030-19135-1_92

Smythe K.C.A.S., Adam D.L., da Silva C.T. y Okimoto M.L.L.R. (2020). Including Users in the Evaluation Process of As-sistive Technology: Applied Methods and Techniques. In: Ahram T. y Falcão C. (eds) *Advances in Usability and User Experience.* AHFE 2019. Advances in Intelligent Systems and Computing, vol 972. https://doi.org/10.1007/978-3-030-19135-1_92

Skliar, C., Massone, M. y Veinberg, S. (1995). El acceso de los niños sordos al bilingüismo y al biculturalismo. *Cultura sorda.* http://escritorioeducacionespecial.educ.ar/da-tos/recursos/pdf/skliar-massone-veinberg- acceso-ni-nos-sordos-al-bilinguismo-1995.pdf

Skliar, C. (2007). *La pretensión de la diversidad o la diversidad pretenciosa.* Ponencia vertida en las 1ras Jornadas Nacio-nales de Investigación Educativa, Mendoza.

Val, S. (2021). Dejemos de hablar de los sordos. *Estudios sordos: activismos, lenguas, 31.* http://onteaiken.com.ar/wp-con-tent/uploads/2021/05/5.pdf

Walsh, K. y Mignolo, W. (2018). On decoloniality. Mignolo, D. W. y Walsh, E. C. On *Decoloniality Concepts, Analysis, Praxi.* http://www.dukeupress.edu/Assets/PubMate-rials/978-0-8223-7109-0_601.pdf

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