

Introductory Visual Dictionary to Teach Written English to Deaf Learners

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Inscriptions

To my husband, Elkin Fabian Rueda Consuegra, and my children, Amy Samantha and Christopher Damian. This goal would not have been achieved without your everlasting love and patience in those moments that I was not there for you. To my best friends María Belén and Jesmin Adriana for those years of friendship and moral support, motivating me to continue. To my family, for always expecting my best and believing this day would ever arrive.

Rai Basetsane Claro Fernandez (2025)

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Abstract

Title: Introductory Visual Dictionary to Teach Written English to Deaf Learners¹

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Description: This research project aims to design an introductory visual dictionary adapted to teach elementary written English vocabulary to deaf learners. Three specific objectives are determined: to identify the content, to design the visual dictionary, and to pilot it. Researchers implemented Design-Based Research (DBR), where nineteen participants from the Deaf community at Escuela Normal Superior de Bucaramanga validated the prototype. The data collection instruments implemented were semi-structured interviews, observation formats, open-ended questionnaires, and thematic documentary analysis. The findings revealed that the design of an introductory written English visual dictionary for this community addresses two essential considerations: first, the characteristics of the content. Its selection requires meaningful categorization, preservation of the language format, inclusion of language equivalences, and inclusion of visual aids; and second, the characteristics of the design, where the hand configuration of the signs, the list of symbols, and the content and index lists are essential elements. These characteristics of content and design must be complemented with thoughtful design elements—such as colors, font, size (image and text), visual loading, and intelligibility—focused on preventing visual overloading but leveraging the deaf community’s learning strength. Eventually, effective material may become teaching-learning tools that enable full inclusion of this population in the near future. It was concluded that effective materials foster L3 learning (written English) with the use of L1 and L2 as previous knowledge mediators and the importance of pyramidal theory as a guide for presenting and distributing the target language. Therefore, researchers suggest further exploration to study regionalisms of LSC aligned with its impact on target language comprehension.

Key words: didactic material, foreign language, deaf learners, English teaching for Deaf people.

¹ Degree work

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Resumen

Título: Diccionario visual introductorio para enseñar inglés escrito a estudiantes sordos³

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Descripción: Este proyecto de investigación busca diseñar un diccionario visual introductorio para enseñar vocabulario básico de inglés escrito a estudiantes sordos. Se determinaron tres objetivos específicos: identificar el contenido, diseñar el diccionario visual y pilotarlo. Los investigadores implementaron Investigación Basada en Diseño (IBD) para responder a la pregunta: ¿Cuáles son las características que un diccionario visual debe tener para estar adaptado a la población sorda?, de acuerdo con la validación de diecinueve participantes de la comunidad sorda de la Escuela Normal Superior de Bucaramanga (ENSB). Los instrumentos de recolección de datos fueron: entrevistas semiestructuradas, observaciones, un cuestionario y análisis documental temático, los cuales concluyeron la necesidad de mediar el aprendizaje de L3 con L1 y L2 (LSC-español) y la implementación de la teoría piramidal como guía para presentar la lengua meta. El pilotaje confirmó la importancia de dos lineamientos: primero, el contenido requiere de una categorización significativa, mantener el formato de la escritura, incluir equivalencias entre las lenguas y la inclusión de ayudas visuales. Segundo, el diseño debe incluir elementos como la configuración manual de las señas, la lista de símbolos, la lista de contenido y el índice. Otros elementos como el color, la tipografía, tamaños de imágenes y textos, la carga visual y la comprensión del material deben enfocarse a optimizar sus habilidades viso perceptivas para el aprendizaje del inglés. Los resultados expuestos permitirán que el material didáctico a diseñar para la comunidad sorda mejore la enseñanza y el aprendizaje de lengua extranjera, con el fin de alcanzar la inclusión total de esta comunidad en un futuro cercano; por esta razón, los investigadores recomiendan profundizar el análisis de los regionalismos de LSC y su impacto en la comprensión de la lengua meta.

Palabras clave: Material didáctico, lengua extranjera, estudiantes sordos. Enseñanza del inglés para personas sordas.

³ Trabajo de Grado

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Introduction

Nowadays, learning a foreign language is somehow mandatory for hearing people to ‘succeed’, while it is not optional for the Deaf population *to survive*. After acknowledging that the Deaf community has endured a silent war throughout the history of Colombian deafness (Hurtado, 2003), foreign language teachers must raise awareness of the linguistic needs of this community and create effective didactic materials. By leveraging their teaching autonomy, teachers can decide what and how the target content is best taught and learned to pave the way for deaf learners to access a wide variety of resources and foster meaningful learning processes. Thus, professionals should understand that inclusion is not about ‘accepting’ students’ differences or disabilities but rather about *improving* the conditions under which these learners ‘live’ the 21st century from within the classrooms.

Across four chapters, this research work intends to provide significant empirical contributions. These contributions aim to guide a more precise design of materials by displaying the characteristics that a visual dictionary should have to improve the effective teaching of foreign languages (written English) to the Deaf community. In Chapter 1, Theoretical Framework, contains the contextualization of important historical events and findings on the foreign language learning process of Deaf learners is presented. In Chapter 2, Methodology, type of study, participants, data collection instruments and data analysis for designing and piloting the visual dictionary are explained. In Chapter 3, Results, this chapter examines the findings aligned to the specific objectives: to identify the contents and meet specific characteristics of an introductory visual dictionary for teaching written English to the deaf community. Lastly, Chapter 4, Conclusions, presents the restatement of the problem, the summary of the findings and the implications of the findings in the near future.

Problem Statement

In Colombia, deafness is a critical condition that has marginalized Deaf⁵ people from past to present, despite notable national progress in inclusion efforts. Therefore, it is important to acknowledge and understand the evolution of the Deaf population through Colombian history to realize that *their empowerment has been due to their own actions, rather than those of the hearing society*.

Exploring the past, Hurtado (2003) found that during the 16th and 17th centuries, being deaf⁶ was considered an ‘abnormal’ condition, and it was only in the 18th and 19th centuries that deafness was recognized on the same level as mental and physical disabilities. Hurtado affirms that most documents and records avoid showing how rudely and cruelly the Deaf community used to be treated, marginalized, and isolated as passive subjects of sorrow and dependents of charity work. Deaf individuals could not receive any educational instruction, since they were considered uncivilized.

After that, by the 20th century, the Deaf community was forced—by foreign specialists such as religious people—to acquire the spoken language through treatments and therapies such as lip reading and use of American Sign Language (ASL) (Hurtado, 2003). However, members of this community built a *sense of belonging to a group*⁷ and began to create their own secret sign system of communication, allowing themselves to be perceived as part of a community. This eventually led to the formation of associations between 1955 and 1984, which later united to form FENASCOL (*Federación Nacional de Sordos de Colombia*) (Hurtado, 2003).

⁵ Deaf: D in upper case refers to those who embrace deaf culture, sharing a common identity with the Deaf community alongside others with the same cultural identity (Kontra, 2017).

⁶ deaf: d in lower case refers to the deafness state; person with hearing disabilities (Kontra, 2017).

⁷ At seeing peers with similar conditions.

In recent years, the Colombian government has made significant advances in the inclusion process of the Deaf community, focusing on preserving and strengthening its identity, culture, and language as a minority group (Linares, 2023). Several disability-related policies have allowed this community to be included in society; guarantying them access to health services, education, and job opportunities, among others. Nonetheless, according to data from the *Departamento Administrativo Nacional de Estadísticas* (DANE), the Colombian population is estimated to be 52 million people (DANE, 2024), but deaf community does not even represent 1% of the Colombian population, users of national sign language (Linares, 2023); so, there is scarcity of societal demand to promote learning of *Lengua de Señas Colombiana* (now on LSC⁸) among Colombian hearing population.

The aforementioned situation has led the Deaf Community to be forced to learn Spanish, as a second language, to achieve communication and appertain with others in their own society by the official language, as stated in *Ley 982 de 2005*. Thus, learning Spanish becomes a limiting element to equal opportunities to access to English as a foreign language due to the lack of aspects related to English training in *Ley 1651 de 2013*. Accordingly, the deaf population is placed in a disadvantageous position in comparison with their hearing peers, where their access to a second language is not voluntary but necessary; moreover, their access to the lingua franca is almost impossible as a consequence of the scarcity of adapted material for English teaching and learning for deaf people has delayed their English learning process (Riddle & Caballero, 2022).

⁸ Authors maintain the Spanish acronym “LSC” to refer to Colombian sign language, as suggested by Deaf participants. They emphasized the importance of maintaining original acronyms to refer to sign languages as these represent both cultural capital and heritage inherent of native languages, an approached supported by ley 1831 de 2010 in Colombia.

Although significant contributions have been made in this matter attempting to enhance English training to this community, still not success has been accomplished. The literature indicates that several researchers, such as Caballero & Riddle (2022) and Castro et al. (2024) have already taken innovative actions to create didactic material such as an e-book (for deaf learners in 5th grade) and a flipped book (for high school deaf learners). Unfortunately, according to the participants interviewed in this project, not having access to elementary English vocabulary constrains deaf learners of the possibility of using the mentioned material. Then, it remains the fact that this community is not taught English at any level of education due to the lack of educational policies, teachers trained in sign language and English, and didactic material adapted to their needs (Cortés & Cardozo, 2014), which can make it possible for the deaf community to receive English training, as it is expected to happened in Colombia, where everyone has the right to ‘equal education’, as stated in Ley 115 de 1994 and Decreto 1421 de 2017. Laws expected to ensure inclusive education for all, regardless of disabilities and being aware that *being deaf does not limit language learning*—supported by the precedents—this should be possible for Colombian deaf groups too.

In summary, Colombian Deaf community remains not only marginalized, but also linguistically invisible due to the linguistic imperialism of major languages (Phillipson, 2018): Spanish (L1), and English (lingua franca). The first one is the official language of the country and the second one is mandatory for enhancing bilingualism in Colombia, since regular citizens are expected to be part of the globalized world. Nonetheless, LSC is almost useless for deaf people to communicate in hearing contexts because it is learnt only by deaf individuals, whose Spanish proficiency is low, and whose access to English training is not official, as the law evidences it.

Justification

Despite the legal framework and policies that promote equality and integration of the Deaf community, there remains a significant gap in addressing their linguistic needs, particularly their development of communicative skills. So, in the search of providing suitable material to the identified need. Firstly, this Visual dictionary is aimed at integrating deaf students into basic foreign language education and to provide them with innovative opportunities to learn languages—different from the official language and the second one— as it has been mattered of international interest; intending to dealing with the lack of access to English education for deaf individuals, hindering their possibilities to communicate effectively with English speakers and to participate actively in globalized environments.

Secondly, this visual dictionary aims to rehearse Spanish and LSC learning for Deaf learners, allowing bilateral societal inclusion between deaf and hearing individuals. Deaf learners will rehearse Spanish as it mediates written English comprehension. Moreover, this material will be a learning tool for all hearing people to introduce themselves into Deaf community's culture and language, as it provides comprehensible access to LSC.

Thirdly, from the educational perspective, educators will get support to know and understand, and measure previous knowledges for identifying deaf learners' needs and strengths. Teachers will get the opportunity to take advantage of their teaching autonomy, to create suitable teaching and learning resources, to approach accurately English training to deaf students. Likewise, from the societal perspective, not only deaf people will access written English in the future, but also relatives from the deaf community will rehearse sign language learning and will learn English as well.

Finally, this designed based research will address two immediate educational needs. To provide essential information regarding foreign language education to deaf students, which literature in the matter of designing didactic materials adapted to them is scant here in Colombia. To contribute to the long-term goals of Colombian social and educational inclusion, while fostering and strengthening cultural capital of Deaf community.

1 Objectives

1.1 General Objective

To design an introductory visual dictionary as didactic material for deaf learners to learn basic English vocabulary (A1).

1.2 Specific Objectives

To identify the linguistic content to create the visual dictionary.

To design the visual dictionary according to information gathered.

To pilot the visual dictionary to identify key elements that the visual dictionary must have to be adapted to the deaf community according to participants at Escuela Normal Superior de Bucaramanga.

2 Theoretical Framework

2.1 Precedents

As mentioned above, access of foreign language education is limited to Deaf students in Colombia; making it challenging to find background information on this topic. However, a thorough search revealed some useful studies related to the teaching of foreign languages and the design of tools for teaching (sign language or other subjects) which significantly guided the theoretical framework and shaped the development of this research project. Previous studies were divided into two sections: national studies and international studies, presented chronologically.

2.1.1 *Historical work in Colombia*

In the search of innovative teaching within the New Literacies Project, which allows learning process occur by using diverse disciplines, Cruz & Rosas (2014) applied a pedagogical artistic technique to teach English, as a third language, to a small group of deaf people in 30 sessions of artistic activities in Bogotá. The project aimed at improving their literacy skills by familiarizing Deaf learners with the new written language and its visual representation. Researchers found that using the sight sense was beneficial for both hearing and deaf people to improve their foreign language learning; stating out the importance of making meaning and use as clear as possible when explaining symbolic, abstract vocabulary or content not existent in Lengua de Señas Colombia (LSC) to achieve the main learning goal. Researchers recommend using simple structures and setting small goals.

In line with the use of the visual channel as deaf learners' strength, Arroyave et al. (2016) developed and validated an online instructional tool for Deaf learners to communicate in LSC more effectively regarding common topics such as the alphabet, numbers, food, and animals with the use of an avatar. However, the results revealed the need to improve avatar's clarity of elements

such as clothes and facial expression, among others. Eventually, researchers determined that having a real linguistic model instead of an avatar was more effective, which led them to conclude that the guidance of LSC experts is crucial to achieve clarity, enhancing the accuracy of the sign language representation.

Likewise, based on innovative trans-linguistic practices, Becerra & Rojas (2018) analyzed the linguistic and assimilation processes that facilitated Deaf learners' learning of basic structures of written English in a public institution in Armenia, Colombia. Researchers discovered that although participants were taught Spanish as L2 for more than 10 years, academic curriculum, their production in this language revealed a strong detachment from its structures and rules; meanwhile, their production in written English (A1 level) showed a more correct syntax and grammatical form. Researchers suggest that English is assimilated in a more assertive way when English teaching is facilitated by interactive pedagogical practices, different from the experience they already had with Spanish, and that the first grammatical reference (LSC) creates a strong connection with the production in other languages.

Another effective interactive research was carried out by Najjar & Fonseca (2018), who developed a digital-tool-based didactic strategy to foster deaf learners' English language learning process, in Bogotá. Findings revealed that deaf students successfully achieved learning and displayed willingness to explore new learning possibilities for expanding their previously limited access to English knowledge. Nonetheless, researchers stand out that deaf learners' proficiency in LSC and Spanish hinders their performance in other knowledge competences.

Implementing technology, Guzmán & Florez (2020) also created an educational project aiming to teach Deaf and hearing people how to use and learn LSC through an audiovisual didactic strategy adapted to deaf learners. The topics introduced were the Colombian alphabet, emotions,

and colors, aiming at providing quick access to audiovisual tools for learning LSC. The findings revealed that some of the aspects that must be taken into account when designing are illumination, audio quality, and font.

The aforementioned studies revealed different strategies regarding use of senses, interactive and technological based projects in which deaf learners have achieved English learning in different times. Accordingly, It is worth noting that Molina (2021) wrote a systematic review of research studies published between 2010 and 2020 to identify teaching-learning strategies that have been implemented when teaching English literacy to Deaf students. Her exploration revealed that, while Deaf community might be interested in learning English and can develop language skills through visual motivation along didactic activities and technology, the lack of trained teachers in both English and LSC has placed deaf learners at a disadvantage within the regular context of English classes. Since deaf students' literacy processes are constrained by language aspects such as syntax, semantics, and morphology which differ from sign language structure. This is reflected in their literacy deficiencies in written Spanish which lacks of items non-existent in LSC.

Molina (2021) displayed deaf community's interest on learning English during the last decade, and some of the common challenges they had faced on its goal, revealing that the lack of adapted materials affected their English learning process. In line with her work, recently Caballero & Riddle (2022) and Castro et al. (2024) carried out design-based research to identify what are the characteristics of suitable didactic materials for deaf learners, such as an e-book and a flipping book which were adapted based on validation by experts.

Caballero and Riddle (2021) suggested that didactic materials for deaf fifth-graders in the metropolitan area of Bucaramanga should contain specific features aligned with their cognitive

and linguistic characteristics, such as flexibility, technology-based tools, and concrete visual aids. Accordingly, Castro et al. (2024) found that didactic materials for deaf students should contain specific features such as varied presentation of input and output, simplicity and repetition in grammatical structures and accessibility through familiar vocabulary.

Additional important characteristics noted by Castro et al. (2024) include clarity and conciseness in language equivalence, effective content comprehension instruction, and engagement, which means: 1. illustrations and intelligibility (font and size), 2. attractiveness (use of colors), and 3. organization (distribution of content). Castro et al. (2024) determined these characteristics according to the final version of the digital flipping book developed to foster English vocabulary learning for Deaf high schoolers in Bucaramanga.

Up to this point, it can be said that Caballero & Riddle (2022) and Castro et al. (2024) have laid a foundation for research on the design of didactic materials for deaf learners' English language learning process. However, there is still lack of didactic material that enables the development of foundational English skills, taking into account that those existing materials cannot be implemented in the expected classroom those are designed for (5th grade and high schoolers) because English is not taught to deaf learners in public schools at any level, due to Colombian bilingual policies and curriculum.

For this reason, designing an introductory visual dictionary adapted to the learning needs of this community, adopting those characteristics previously mentioned and complementing them with information collected will provide the necessary elements to create appropriate didactic material for deaf learners to start their English language learning process; allowing them to become familiar with the target language with a more accurate and flexible resource.

2.1.2 Historical International Work

In contrast to the national precedents, it was found that there have been many investigations and studies on the teaching-learning process of foreign languages for Deaf people in different countries.

Muñoz (2015) described, in a systematic review, the situation of teaching English as a foreign language to Deaf and hard hearing children in regular schools in San Juan, Argentina. Results of the study revealed the possibility for Deaf and hard hearing students included in regular education to build an appropriate knowledge and level of competence in a foreign language, through the reinforcement of written constructions. Furthermore, the authors state that positive outcomes are more visible when students and teachers adapt the learning process to incorporate cognitive approach principles, affective and sociocultural interactive strategies, and management strategies.

Birinci & Sariçoban (2021) carried out mixed action, with 80 Turkish participants divided into two groups, to show the effectiveness of implementing visual materials for teaching vocabulary to Deaf students of English as a Foreign Language (EFL). One group received instruction only in sign language, while the other one implemented flashcards and real objects. The findings indicate that vocabulary teaching through only sign language was more effective for deaf for adults. Deaf adults apprehended language equivalences in the target language using synonyms, definitions, mnemonics, guessing, and opposites, among others; whereas, sign language instruction of the English language complemented with visual materials enriched Deaf students' English learning process by improving visual memory of the vocabulary to the long-term retention.

Similarly to Birinci & Sariçoban (2021), Gonzales et al. (2021) revealed that using both sign language and visual aids was paramount when teaching written English vocabulary to five Deaf fifth-graders in a public institution in Chile. Visual such as flash cards, memory games, worksheet drawings, and unscrambled worksheets are resources that keep deaf learners' interest and motivation towards continuing learning. After this, researchers affirm that despite participants did not have any previous English classes, they found it easier to overcome.

Yasin and Mohamad (2024) published a literature review that aims to provide a relevant and cohesive compilation of previous studies regarding the implementation of visual aids for improving the English vocabulary learning process of Deaf students. Findings revealed that visual aids for vocabulary teaching facilitate understanding of concepts and meanings, improve memory and cognitive abilities, and encourage interest and engagement. The effectiveness of visual aids becomes noticeable when context is provided, but only after being introduced to the language with both visual aids and sign language; thus, Deaf students' learning results are displayed with improved language proficiency and a larger selection of vocabulary. Nonetheless some of the challenges observed were related to EFL, in which the lack of exposure to English and the lack of mastery in sign language constrained the effectiveness of using visual aids.

Domagała-Zyśk & Kontra (2016) conducted action research exploring what vocabulary teaching strategies should be taken into account in EFL classes for 40 Deaf and hard-hearing students in Poland. The findings revealed that general teaching strategies for EFL are also effective for Deaf students when materials and methodologies are carefully adapted rather than overly restricted. So, effective teaching and learning English for Deaf learners should include four aspects: 1. vocabulary personalization, which means useful to them; 2. vocabulary emotionalization, related to the use of emotional components to enhance memorization; 3. word

semantic analysis, existence of variable meanings; and 4. morphological analysis, awareness about written forms of language. Researchers affirmed the mentioned strategical aspects can guide teachers to help Deaf learners in their effective foreign language learning process.

Nadal and Collet (2020) created a project called 'Sign' Math's' with the goal of giving Deaf students and teachers access to educational materials that include mathematical terminology in Sign Language (SL) in order to improve and standardize vocabulary used in the classroom in France. The findings demonstrate that users liked the significant use of SL on the interface; however, users with SL training found it easier when searching for concepts written in French or with corresponding illustrations. Furthermore, some participants expressed that written French is essential for simplifying the search in the interface and that it might be helpful for a word search tool. Researchers affirmed the incorporation of visual aids to support textual and spoken information generate deaf learners' positive attitude towards the designed material.

Cano et al. (2015) proposed an app for Android tablets that can be used as a teaching tool to help Deaf students learn how to read and write and for motivating them to accomplish pedagogical goals. The findings revealed that implementing Fitzgerald keys (color coded visual aid strategy) facilitates arrangements for both written and spoken language used to instruct, practice, and correct syntactic structures of written language.

Hassan & Neves (2019) explored the impact of using enriched subtitling (ES) in the language learning (Arabic) of deaf and hard-hearing students in Qatar. The findings revealed that ES can effectively increase vocabulary acquisition when a clear strategy and lessons are planned. Findings demonstrated that both traditional and adapted teaching with Bloom's taxonomy display learning levels. Nonetheless, the highest vocabulary acquisition rates were reached by the adapted

one, which shows the benefit of this teaching strategy while encouraging learners to build up language knowledge through scaffolding teaching.

Finally, international precedents display evidences of researches showing the importance of providing clear meanings of visual aids, written text and complementing them with sign language are essential tools to teach to English to the Deaf community in particular, elements that must be considered at developing the prototype of the visual dictionary in this project.

2.2 Theoretical Basis

2.2.1 *Deafness: Level of Deafness*

As a starting point, it is claimed that deafness is conceived as the inability to perceive sounds (Ávila, 2010); however, Mercado (2021) from INSOR explains that someone's level of inability to hear has its own implications since two cases of deafness are not the same. Therefore, being Deaf means that having a hearing impairment that affects one's ability to receive sound waves regardless of its severity (Mercado, 2021). Additionally, the Colombian legal framework (LEY 324, 1996, Article 2) categorizes hearing disabilities as limited hearing, deaf, or hearing impaired. Respectively, limited hearing has to do with one's progressive hearing loss throughout time; deafness is defined as the loss of hearing perception (more than 90 dB) affecting oral language acquisition and usage, and hearing impairment occurs when little sound is still perceived or heard (LEY 324, 1996, Article 2).

2.2.2 *Deafness and Foreign Language Learning*

Foreign languages are attainable for the Deaf community, as for hearing individuals. According to INSOR (n.d.), Deaf communities have the same learning abilities as hearing people do; but due to the nature of their deafness, they must use a variety of communicative techniques to create social interactions. Indeed, Hasan & Neves (2019) affirmed that the mother language (L1)

and language acquisition (L2 and L3) enable the Deaf community to enjoy the privileges of full citizenship; the reason for which reading and writing become essential tools for Deaf learners to achieve full inclusion in society. Furthermore, when deaf learners are exposed to a foreign language using visual aids, they can comprehend language use and content effectively because, after having learned the grammatical form of sign language, they have a better understanding of foreign language grammatical structures (Domagała-Zyśk & Kontra, 2016; Najar & Fonseca, 2018).

From the previous idea and from exhaustive reviews of previous works, it is acknowledged that foreign language learning for deaf people requires sign language proficiency from both teachers and learners. Sign language is the communicative tool needed to bridge and facilitate foreign language learning, understanding that vocabulary comprehension is achieved when the target language is taught directly (Luckner & Cooke, 2010) as in regular teaching: written word and meaning, and complemented with visual aids as contexts references. Therefore, foreign language teaching practices with the deaf population should integrate both sign language and visual aids engaged with translanguaging methodological practices to stimulate and promote reading and writing in the target language (Becerra & Rojas, 2018; González-Reyes et al., 2021; Luckner & Cooke, 2010). Understanding in this paper Translanguaging as the flexible meaning maker in the hunt of comprehension between the familiar and new language.

The literature indicates Deaf people achieve effective foreign language learning encountering some challenges. Some of these are the lack of exposure to the language, the absence of lexical items in their mother tongue, and the lack of semantic significance (Gonzales et al., 2021). These factors bias the Deaf community towards learning or not the target language (Domagała-Zyśk & Kontra, 2016). For instance, deaf learners may find listening or hearing topics

as irrelevant learning content due to their deafness, since it will never allow them to have real and meaningful experiences at learning that specific vocabulary. However, some deaf people may also have pre-existing connections with these topics due to their own interests and purposes for learning the new language, regardless of the significance and use to themselves.

Facing the previous challenges, requires extra strengthening of pedagogical knowledge and competences with translanguaging and pedagogical visual adaptation to enable their learning process. Hassan and Neves (2019), affirm the lack of adequate educational strategies hinders the foreign language learning process of deaf individuals, as it occurs with their hearing peers. Therefore, educators' sign language mastery and creativity are essential to implement visual didactics (Guzman & Florez, 2020; M. C. Molina, 2021; Najar & Fonseca, 2018). Even more, implementing learning activities supported with visual references such as flashcards, videos, visual dictionaries, and technology-mediated aids foster comprehension because, the natural form of communication of the Deaf community is gestural and visual (Hassan and Neves, 2019). Consequently, developing reading and writing skills through their natural language will increase learning success, and national actions on inclusion will be evidenced through Deaf people's active citizenship.

To shorten, effective foreign language learning for the Deaf people is achieved when mediating teaching with sign language and complementing instruction with visual aids for literal meaning and contextual understanding. Besides, just as with hearing learners, this process main challenges can arise: (1) not having the need to use the language can delay their language learning process; (2) the lack of language equivalent items (either sign language or target language) to pair with; and (3) uninterest in learning about certain topics for some Deaf individuals. It is worth noting that the last-mentioned challenge is given by the use and the relationship that *the input* has

with learners' contexts and the purpose the language will be used for. For this reason, instead of limiting or constraining language resources, Deaf learners' foreign language instruction requires implementation of translanguaging practices, sign language mediation, visual aids, and technology along with all necessary modifications and adaptations to learning needs (Domagała-Zyśk & Kontra, 2016).

It is worth noting that 'Translanguaging practices' has to do with the flexibility given to teachers and learners to switch from one language to other language, while achieving and scaffolding learning; along with the implementation of diverse elements to achieve both comprehension and total communication in the target language. Those elements can be: finger spelling, visual aids, written language and sign language (Hamdy Hassan & Neves, 2019).

2.2.3 Deafness and Vocabulary Acquisition in Foreign Languages

Luckner and Cooke (2010) affirm that developing language skills requires a continuous vocabulary learning process that begins at birth and continues throughout life. Exposure to new vocabulary is a requirement for individuals' cognitive and language development, which leads to natural skills such as thinking, communicating, reading, and learning. Besides, understanding of vocabulary requires three phases. First, to be unknown, when the word is presented for the first time. Second, to be acquainted, word recognition process. Third, to be established, the use of the word in correct context and forms (Luckner and Cooke, 2010).

However, there is vocabulary that will never be reached by the Deaf population due to their lack of meaning and purpose to them or their lack of existence in sign language (Yasin & Mohamad, 2024). This means that deaf learners may be limited or conditioned to apprehend vocabulary related to listening activities (listening to music or listening to someone) and hearing perception in onomatopoeic forms (animal sounds or background noise). Because some elements

of the language can be achieved merely through practice (Hassan and Neves, 2019). For that reason, the use of context clues facilitates social language meaning negotiation (Birinci & Sariçoban, 2021; González-Reyes et al., 2021; Luckner & Cooke, 2010), and multimodal and multisensory instruction is essential for deaf learners' vocabulary learning associative conditions (Castillo and Floréz, 2019). Accordingly, Deaf learners require more exposition to the language in diverse formats to enhance total comprehension, by analyzing body language, gestural expressions, contexts and reactions to it. So, multimodality means implementing blended input simultaneously: text and image or visual aid and context, as they occur in natural bi-cultural contexts.

Afterwards, Castillo and Floréz (2020) suggested that societies would benefit from the skills, talents, and contributions of Deaf and hard-of-hearing ones, as long as barriers and misconceptions on disabilities are broken down. After that, teachers will be leading to fuller, more empathetic, solidary, and productive lives for all, understanding that a visual-and-written blended strategy should be integrated in a foreign language classroom for providing vocabulary instruction to the Deaf community.

2.2.4 Deafness and Cognitive Language Development

Here is explained how deafness is related to the process of vocabulary acquisition and cognitive language development of foreign languages to acknowledge how Deaf learners' learning process occurs in order to understand what considerations will be needed during the designing process.

First of all, deafness is a factor that constrains learners in their language cognitive developmental process. Despite of certain characteristics of learners that influence their own language learning process (Uztosun, 2015); language input should not be minimized or restricted

due to this condition, since deaf individuals' interest in developing different language competencies is part of their communicative nature, which is needed to achieve integral inclusion among any globalized society (Deaf Children Australia, 2012). By contrast, they need larger exposure to the target language than regular learners do because at providing deaf learners fully accessible input, support, and teaching of the language, they can keep up with their hearing peers' linguistic competence (Deaf Children Australia, 2012; Hamdy Hassan & Neves, 2019).

Nonetheless, linguistic elements in sign language structure may be some of the reasons for Deaf learners not to be at the same linguistic level of written languages as their peers (Deaf Children Australia, 2012). For example, limited vocabulary, grammar and syntax, tense and grammatical forms (suffixes: ed, ing, er), idioms or sayings. Thus, the more consistent the information, the greater opportunity the learner has to develop strong language skills because there are deaf learners who avoid admitting not to understand to provide them further explanation. (Deaf Children Australia, 2012).

Secondly, Krashen (1982) affirms that only through time and practice, well-formed structures can be achieved by language learners. According to Krashen's Natural Order Hypothesis, there are certain language structures that are learned easier and faster than others, which evolve to well-formed and more difficult linguistic structures consolidated with practice. However, bilingualism for the deaf learners does not have to do with producing texts as hearing monolinguals do; rather, it has to do with a process that aims for intelligibility and reduces ambiguity (Valencia, 2022). In this way, foreign languages become mediators between the deaf and hearing society. For this reason, Valencia (2022) also states that denoting errors from deaf individuals' written utterances may not always be accurate since those acquired initial utterances

are revealed as fluency, and according to Krashen (1982), self-corrections are guided by the monitor⁹ only after presenting them in oral or written output form.

Furthermore, Birchenall and Müller (2014) affirm that those written utterances are produced inside the language acquisition device. Deaf people's communication and expression of thoughts follow sign language's grammatical structure which allows them to achieve correct language use (Birchenall & Müller, 2014), demonstrating that they need to be exposed to complex input and meaningful complete clauses to seek better language acquisition; eventually, literacy will be consolidated (Deaf Children Australia, 2012; Scott & Dostal, 2019).

Next, it is worth recalling Krashen's ideas referring that cognitive language development is influenced by the way in which the target language is presented rather than due to cognitive abilities. It is essential to include varied forms for input presentation where the language acquisition process places importance on meaning rather than on grammatical forms (Krashen, 1982). As exemplified by Deaf Child Australia (2012), it may be the case that a child may not know many of the presented words, but the learner can make mental representations of the general idea of *what* that written language means, supported on the elements that are *complementing* the previously known items, such as visual representations, context, and background that surround new input.

Last but not least, Deaf learners have manifested their ability to learn other languages under certain teaching adaptations, as the implementation of translanguaging teaching from sign language to English, and visual representation aids (Castillo & Florez, 2020; Hamdy Hassan & Neves, 2019; M. C. Molina, 2021; Najjar & Fonseca, 2018). However, the input presented

⁹ The monitor can be the learner itself (self-corrections) or the teacher (rehearsal and feedback).

influences the Deaf individuals' perspective about the significance or importance to the learner and relevance to be a learning priority in language development. Therefore, language content presented to deaf learners needs to be aligned with their real contexts and uses in which the acquired language will be needed.

This cognitive language development perspective is built upon teachers' practical experiences and professional intuition validated by proven findings, insights, and observations taken from the precedents. Taking convenience into account (Hernández & Fernandez, 2014) those strengths to enable researchers to deal with their own lack of experience at designing the prototype, since deafness has been acknowledged as a unique condition that influences how the Deaf population develops languages.

2.2.5 Design

The Cambridge dictionary defines 'design' as make or draw plans for something before creating it. Easterday et al. (2014) affirm that design has already existed from human history. However, when doing research, Bakker & Van Eerde (2015) state that designing intends to bridge any existing gaps between theory and practice in the attempt to provide more suitable solutions to complex issues, mostly in educational practices.

Jayatileke et al. (2018), affirmed the design process requires: to identify and to understand the problem, to define the goals, to conceive the expected prototype solution from previous designing, and to test effectiveness. These steps can be shortened in three phases for ending up with the solution: identification of the problem phase, designing phase and the testing phase.

2.3 Legal References

In Colombia, there already exists a great amount of normativity regarding disabilities (*Oficina Asesora de Planeación y Sistemas del INSOR 2018, 2018*), where deafness is recognized as an important factor that influences the different ways in which some citizens learn. However, it may require some extra modifications to the existing regulations and policies established in *Constitución Política de Colombia* (Constitución Política de Colombia, 1991), as follows:

Firstly, Article 13, which states the right of equality for all people; secondly, Article 47 states the policy of welfare, rehabilitation, and social integration for people with disabilities; and thirdly, Article 54 states that the national government is responsible for providing vocational training, rehabilitation, and employment for deaf people.

Additionally, *Ley General de Educación* (Ley 115, 1994) and *Ley de Educación Inclusiva* (Decreto 1421, 2017) guarantee that all populations in Colombia receive equal educational instruction, regardless of having disabilities or not. Even more, regarding English teaching policies: Article 21 from Ley 115 de 1994 states that all students have to learn at least one foreign language, as it was stated in *Ley de Bilingüismo* (Ley 1651, 2013) for intending to promote bilingualism in Colombia. Because of this law, Colombian learners receive English classes.

The mentioned law, bilingual education, does not include any foreign language teaching for Deaf learners. According to *Norma de Equiparación de Oportunidades para-Personas con Discapacidad* (Ley 982, 2005), deaf learners require LSC and Spanish for enhancing communication. It does not mention any foreign language component. At this point, it is worth recalling Moeller and Catalano (2015) to emphasize the fact that foreign languages are the ones *not* spoken in a country, as English is in the case of Colombia. Which is not the case of LSC (native language for the Deaf community) and Spanish (official language).

Finally, this design-based research oriented toward the needs of The Deaf community was carried out in alignment and supported by Ley estatutaria 1618 de 2013, where the government promulgates rights of people with disabilities under the slogan ‘Nada de nosotros sin nosotros’, ensuring them participatory inclusion. It allows direct consultations and development of valid criteria from the Deaf community¹⁰ across the nation.

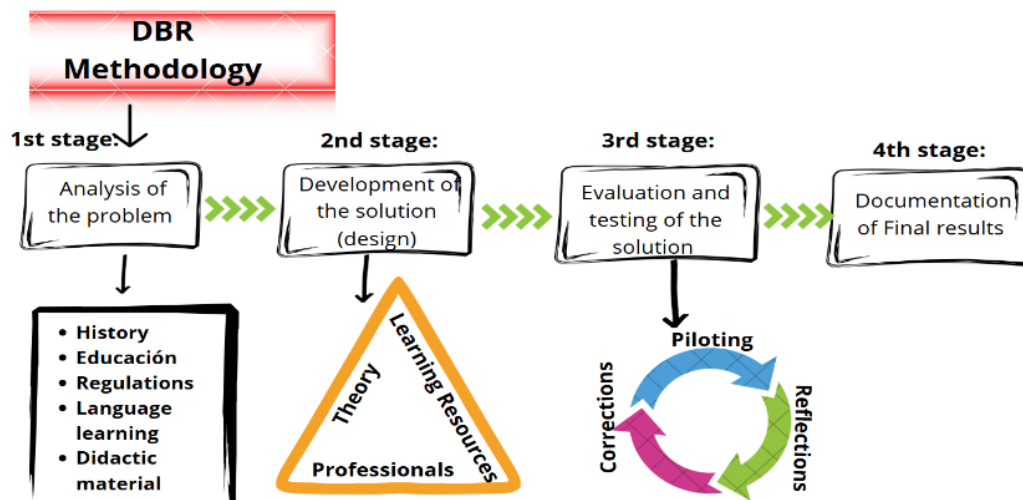
3 Methodology

3.1 Type of Study

This study adopts a design-based research (DBR) methodology. DBR is a relatively new qualitative research approach that aims at bridging gaps between teaching theories and practices (Bakker & Van Eerde, 2015) taking into consideration insights from teachers’ roles to lead learners to develop knowledge and skills with the help of learning materials (Bell et al., 2003). DBR focuses on providing innovative solutions that serve as a starting point to scaffold the creation of non-existing materials for complex pedagogical situations, rather than intending to provide universal principles or generalizations (De Benito Crosetti & Salinas Ibáñez, 2016).

This project is guided by the linear steps for conducting logical and systematic research (Jayatilleke et al., 2018) through 1. the analysis of the problem; 2. the development of the solution according to the precedents and theoretical framework (design); 3. the evaluation and testing of the ‘solution’ presented (piloting); and 4. a documented reflection on the characteristics that the design required to be considered as a solution (results from research carried out); see Figure 1.

¹⁰ Participants in this research affirm that the term Deaf community makes reference to both the people with any hearing disabilities and the people related to deaf contexts; such as family, friends, teachers, linguistic models, psychologists, linguistics and phono audiologists, among others.

Figure 1.*DBR Methodology*

Note: This Figure represents the stages of DBR Methodology, *taken* from own elaboration, designed in Canva

This methodological paradigm integrates elements from positivist, critical, design, transformative, and systematic methodology research, which makes DBR a flexible research design that results in innovative practices validated by experts and/or participants; to provide reflections on how the design is proven to *work* under determined pedagogical contexts (De Benito Crosetti & Salinas Ibáñez, 2016).

3.2 Stages of Methodology

3.2.1 First stage: Analysis of the problem.

3.2.1.1 Identifying a practical problem. It came to happened that a deaf friend, of one of the researchers in this project, expressed her desire to learn written English, and asked the researcher for strategies and didactic material for her to learn some vocabulary. Unfortunately, it was not possible for the researcher to find adapted material (videos, books, games) that could help her friend to understand written English in a dynamic and comprehensible way. Accordingly, that

researcher asked a colleague for the same question, where they reached to the conclusion that it was necessary to do research on the identified problem in order to provide an elementary learning resource.

Later, We found that some previous studies in the metropolitan area of Bucaramanga had already created learning resources directed to diverse academic levels. Then, we interviewed professionals from the deaf community who confirmed the following situations: they do not receive official English training, because it is the third language for the deaf community and the vast majority of deaf community, in Bucaramanga, does not even achieve proficiency in the first and/or second language. Even more, it was noted that there is not appropriated didactic material to the Deaf community; since the existing ones are oriented to high linguistic levels never achieved by deaf learners; so, they don't have the basis of vocabulary required to used them. Consequently, research conduct research on the history, education, and language learning of these individuals; acknowledging the significance and impact of carrying out research on this matter.

3.2.1.2 Significance of the problem. Regarding foreign language training, Ley 982 de 2005 guarantees bilingual education for deaf learners, emphasizing training in Colombian Sign Language and Spanish, but according to Moeller and Catalano (2015), a foreign language is one learned in the classroom, not one that is spoken in the society where it is taught. But in the case of LSC is deaf individuals' L1 and Spanish is deaf individuals' L2 (official language); neither of them is a foreign language.

Learning a foreign language helps students to understand different cultures and their own by connecting previous and new knowledge across socio-cultural and linguistic contexts (Moeller & Catalano, 2015). Therefore, the lack of foreign language training for deaf learners highlights not

only ongoing educational marginalization but also inhibition of access to learning opportunities and participation in English-speaking sociocultural groups.

This particular linguistic gap can be bridged by creating safe English learning environments for the deaf and implementing different second language theories and technological tools to facilitate their learning process. Afterwards, those actions can lead to the closure of the blaming cycle among deaf learners, stakeholders, and the lack of adapted teaching materials (Cortés & Cardozo, 2014); establishing the starting point to accept and work on the fact that foreign language teachers need to implement various strategies and methodologies to help the deaf community leverage their observational, reading, and visual analysis skills (Domagała-Zyśk & Kontra, 2016).

3.2.2 Second Stage: Development of the Solution (Design)

3.2.2.1 The process of content selection. Firstly, during this stage, we conducted an extensive review of the literature on deaf learners' language acquisition, recommendations for designing didactic materials for this population, designing theories for learners with special needs, the psychology of colors, and Colombian suggested curricula.

Secondly, teachers and professionals experienced in teaching to the deaf community were contacted by us. Through semi-structured interviews, we gathered information on essential resources, and we selected the linguistic content using clustering methods. Also, we considered using pictures and signs to meet the learning needs of deaf learners. Researchers acknowledged the relevance of using 'Lengua de Señas Colombiana-Tomo 1', as the first book designed for the deaf community to learn their native language (Mejía, 2009), and the videos from Formación Professorial by Universidad de Santander (UDES). The mentioned videos were resources suggested by LSC teachers (Hernández and Hernández personal communication, 2023-2024)

created to train hearing teachers in sign language at UDES. This resource was used as a guide for revealing the elementary vocabulary in LSC.

Eventually, we compared all content from resources to identify lexical items with equivalents in LSC, Spanish, and English, and the content selected was aligned with the Colombian suggested curriculum. After so, researchers specified at convenience (Hernández & Fernandez, 2014) the corresponding language level and verified what content was included or omitted to guarantee content comprehension and suitability at including it; aiming to maintain both comprehensible input and the specific repertoire settled for each level by the Common European Framework of Reference for Languages (CEFR).

Finally, the gathered information from the literature, didactic resources, questionnaires and interviews was triangulated in documentary analysis by themes to achieve accurate management and interpretation of the information at convenience (Hernández & Fernandez, 2014), ensuring the identification and clarification of essential aspects that guided both the content and design to be effectively adapted to deaf learners.

3.2.2.2 The Designing Phase. Due to the lack of literature to guide the design of the visual dictionary we began the process of empirical design. However, It is worth noting that the integration of the pyramidal theory (see section 5.2.2) served as guidance to present information to the Deaf community provided by MINTIC (Bedoya et al., 2023), and the application of some concepts from the graphic design field was essential information for developing the prototype in Canva (software). Additionally, researchers used artificial intelligence in Canva to generate pictures according to the vocabulary and the visual clarity required. Finally, researchers asked advisor teachers (Deaf and interpreters) to revise, suggest corrections and approve the piloted draft.

3.2.3 Third stage: Evaluation and Testing of the Solution (Piloting)

First of all, we requested administrative permission to pilot the prototype of the visual dictionary at Escuela Normal Superior de Bucaramanaga.; and printed the piloting version of the visual dictionary for deaf learners to be in contact with the suggested material, allowing Deaf participants to have physical prototypes.

Eventually, the prototype's content accuracy and adaptability were tested. To achieve this goal, the researchers designed a rubric integrating the prototype and the two criteria to be measured: content accuracy, and design adaptability with the help of the head teacher as interpreter, the Deaf participants were instructed and guided to tick unfamiliar or confusing elements about the content and the design.

This rubric was a visually adapted observation format aimed to enable the Deaf participants to evaluate the prototype by selecting a green thumb up ('yes') or a red thumb down ('no') to evaluate specific characteristics of the design. The characteristics were color, font (style and size), size of images, visual overloading and intelligibility. The mentioned rubric was designed for convenience following Hernández and Fernandez (2014) acknowledging that Deaf participants may encounter some challenges when responding to written questions. Annex H presents illustrative details on the elements needed to design the rubric for piloting the prototype of this visual Dictionary.

3.2.4 Fourth Stage: Documentation of Final Results

We were led to analyze all the aspects adopted for designing and creating the final version of the visual dictionary as well as the implications of the findings. Those were divided as *characteristics of the content* and *characteristics of the design*. Finally, researchers included the

limitations and recommendations about this study to complement the analysis carried out to answer the research question.

3.3 Participants

This research project involved a total of 19 participants. Three teachers (two bilingual-bicultural ¹¹teacher and a deaf teacher), a psychologist, four linguistic models, and 12 deaf learners. All the participants took place at different moments.

During the first and second stage, two teachers at Universidad Industrial de Santander provided essential information that guided our insights about the identified needs and how to approach the design of the proposed solution. Luisa Fernanda Hernandez Valdivieso, a psychologist, interpreter, and bilingual teacher, who has twenty-four years of experience in LSC teaching); and Claudia Hernandez, a pioneer of sign language teaching in Bucaramanga, who has thirty years of experience as a deaf professor of LSC. Teacher Luisa clarified confusing information and provided us feedback on the signs made for making corrections. Finally, teacher Claudia revised and approved the first draft of the material before piloting it with the participants.

During the third stage, the deaf individuals participating were: twelve students, four linguistic models, a teacher, a psychologist, and a father.

- The students: 11 girls and a boy aged 5 to 11 years old, belonged to '*Aula Paralela Multigrado*' covering courses from *Transición* (0) to 5th grade at ENSB. These deaf students belonged to diverse deaf and hearing families, and all of them had diverse linguistic proficiency in LSC.

¹¹ Bilingual- Bicultural refers to proficiency in LSC and another language (Hamdy Hassan & Neves, 2019)

- The linguistic models: Deaf participants whose working experience on deaf contexts varied from 6 to 29 years. Their educational backgrounds included high school, technical, and technological (*Normalista Superior y LSC, and Red Social Comunidad Sorda*).
- Teacher: the school's leader of inclusion, Katherine Ramirez, is a ten-year-experienced bilingual-bicultural teacher in charge of *Aula Paralela Multigrado*, where deaf primary graders take classes. She did the arrangement of dates (Annex A) and mediated interpretation between researchers and participants during the piloting stage.
- The psychologist and one father: These two people are deaf learners' academic support staff. They have belonged to the deaf community for 9 months and two years, correspondingly. The psychologist is the behavioral therapist of a deaf girl with special needs (autism); and the father -retired from the army-supports his son with hearing and physical disabilities every day during class time. Both are frequent users of LSC.

3.4 Data Collection Instruments

To design and pilot the didactic material, three instruments of data collection were used throughout this project.

Primarily, the use of semi-structured interviews helped researchers to understand (in the first stage) the most effective way to identify the content included in the material (second stage). Mashuri et al. (2022) state that semi-structured interviews are exploratory conversations between two agents (researcher and interviewee) who interact to interchange views about a certain topic. According to this author, the researcher has pre-established questions in order to guide the conversation and get the needed information, but at the same time, the interviewee is allowed to express ideas, make comments, and make suggestions that may not be demanded by the researcher,

which probably will be useful to the research since it allows the researcher to uncover the lived experiences of the participants.

Also, Kakilla (2021) affirms that semi-structured interviews are indispensable tools in qualitative research since they permit negotiation on interpretation immediately to expand knowledge or information gathered. The purpose of this instrument was to acknowledge how to identify the content selection process and how to design the first draft of the prototype. It is worth noting that, in response to the raising of questions, the advisor teacher also provided researchers a lot of valuable information through informal interviews.

Secondly, a documentary analysis was carried out in order to make an appropriate selection of content and to decide what the visual dictionary should have for the deaf participants of the study. Martinez-Corona et al. (2023) confirm that in order to produce the new information that results from reading what other authors have published, a methodical, objective, analytical, and synthesis task is also necessary in the search for knowledge. According to Tancara (1993), referenced by Martinez-Corona et al. (2023), documentary analysis is therefore understood to be a collection of methods and strategies that seek to find, process, and preserve information from documents in order to later present it in a new document in a methodical, cohesive, and argumentative manner.

This documentary analysis guarantee that the content is both pertinent and understandable to the intended audience, this preparatory stage was crucial. key topics, vocabulary, and communicative functions that are significant in educational and real-life contexts for deaf students were identified by the researchers through the documentary analysis. The documents that were taken into account were Vocabulary taken from videos '*Formación Professorial*' UDES (Annex

B), *Lengua de Señas - Tomo 1* (Mejía, 2009), and the modules selected from Colombian suggested curriculum, *Malla de Aprendizaje de Inglés (Transición a 5° Grado)* (Annex C).

Thirdly, During the pilot stage, seven adult participants responded to a questionnaire (See Annex D) intended to gather support from professionals' perspectives on the prototype presented as well as professionals' sociodemographic information. According to Young (2015), questionnaires are instruments presented in paper or digital form. Participants in research are given a number of questions or statements to indicate one or more answers by marking, checking, or selecting one from the options given. Taherdoost (2022) emphasizes that questionnaires are essential instruments for researchers to collect relevant data about specific topics. Additionally, the same author notes that questionnaires can be structured (close-ended questions), unstructured (open-ended questions), or quasi-typed (closed and open-ended questions), depending on the purpose of the information aimed at being collected. The questionnaire implemented in this study was a quasi-type questionnaire addressed to professionals in the field of deaf education, aiming to determine necessary modifications to the prototype. For that reason, the questionnaire ask essential aspects to modify the prototype of the visual dictionary presented, such as the size of pictures, paper size, font (style and size), the topics, the amount of content, and the language format (words, sentences, etc.).

Lastly but nor least important, an observation format was essential for registering the feedback on the content and design related to the prototype. According to Satapathy (2019), observation is a method implemented by researchers to collect information for enriching the research project, since through observation researchers intend to seek detailed information by looking in-depth at what occurs in natural environments. Additionally, the same author states that when researchers observe, it is necessary for them to make use of their senses and abilities to look,

judge, and interpret. Accordingly, the purpose of the observation format was to collect information from the feedback supplied by the participants of the piloting stage in written form.

Researchers adapted the prototype of the visual dictionary as a rubric of observation, enabling participants to evaluate both the content and the design. The content was evaluated by ticking unfamiliar or confusing elements (Annex E). The prototype design was tested by choosing thumbs up (green) or down (red) according to their perception of adaptability (Annex F). Furthermore, researchers included two observation formats. One for professionals from the Deaf community to take notes related to Deaf learners' attitude towards the material (see Annex G). The other one for researchers to write their own notes from comments and suggestions aligned with notes on research's development (Annex H). Researchers also observed participants' attitude towards the material to register not expressed thoughts, such as frowning or head and eyebrow movements showing approval, disapproval, or skepticism towards the material, among others.

Data Collection instruments are simplified in the following Table 1.

Table 1:

Data Collection Instruments

Stage	Data collection instruments	Purpose
Frist Stage	Semi structured interviews	-To gather data from LSC teachers. -To identify the target content.
Second Stage	Semi structured interviews	-To ask advices about accuracy and adaptability of the design.
	Documentary analysis	-Thematic classification of information.

Third Stage	Observation Format	To measure accuracy, intelligibility and participants' familiarity with the content. -To measure adaptability of the design.
		-to measure reactions towards the material.
Fourth Stage	Observation Format	-Built up reflections based on feedback supplied by the participants, and the observed events during the piloting.

Note. Table 1 describes the data collection instruments implemented in each stage of the research process.

3.5 Data Analysis

Qualitative and quantitative data analysis was used in this research project; however, to ensure accuracy in the application of the findings, convenience (Hernández & Fernandez, 2014) was essential in applying relevant concluded information to the construction of project's didactic design, following researchers' and teachers' intuition. Moreover, Hernández and Fernández (2014) affirm that relevance given to the interpretation of data at convenience depends on one's perception, but it also allows flexibility to the search without diminishing its impact in social relevance, practical implications and theory value.

3.5.1 *Qualitative Analysis*

Researchers carried out qualitative data analysis of the information gathered from the documentary analysis, the semi-structured interviews, and the informal interviews (Annex I). This data was analyzed based on the thematic analysis method (Ngulube (2015). The thematic criterial for classifying the data collected were:

- How deaf learners learn
- Limitations for learning

- How to design according to the teachers
- How to design according to the theory
- Adaptations according to the theory
- Adaptations according to the teachers
- Suggestions from the pilotage.

3.5.2 *Quantitative analysis*

As for the quantitative data, the researchers used inferential statistics to analyze the data from the questionnaires (see Annex J). Following Marshall & Jonker (2011), inferential statistics allowed us to make generalizations from the information gathered to create the prototype of the visual dictionary, as there is not existence of previous experimental studies; but the sample of deaf participants, as a minority group, allowed making valuable statements and considerations that can guide further exploration in this matter.

4 Findings and Results

This project aims to design a written English-LSC visual dictionary to introduce basic vocabulary to a group of deaf learners from a public school in Bucaramanga. To achieve this general goal, three specific objectives were established: first, to identify the content of the visual dictionary. Second, to design the prototype. Third, to pilot the prototype. This chapter is divided into three parts, each addressing a specific objective.

4.1 To identify the content of the visual dictionary

The data resulting from the documentary analysis, the semi-structured interviews, and the questionnaire revealed that the linguistic content from the target language needs to fulfill four

requirements: meaningful categories, language format, vocabulary equivalence (L1-L2-L3), and suitability.

4.1.1 Meaningful categories

It was concluded from the documentary analysis that one of the main requirements at the moment of defining the content of this visual dictionary is its logical and meaningful categorization by clustering languages (see Annex K). Lengua de Señas Colombiana, Spanish, and English are correspondingly L1, L2 and L3 to the Deaf community; then, these three languages were classified to find out any pattern to follow. The categories selected and included in this visual dictionary are family, colors, numbers, months of the year, days of the week, food, animals, personal pronouns, and possessive pronouns. These categories were identified based on the participants' expected previous knowledge, life experiences, and proficiency in both LSC and Spanish to align them with the target language level (CEFR-A1). The linguistic content of each category was determined as a result of the documentary analysis of three resources: Vocabulary from *Videos 'Formación Professorial' UDES*, *Lengua de Señas-Tomo 1* (Mejía, 2009), and Colombian suggested curriculum *Malla de Aprendizaje de Inglés (Transición a 5° Primaria)*, as a guide for this purpose.

4.1.2 Language format

Another important characteristic of the content of this visual dictionary is its language format. The written form of the target language is used to present concrete concepts of the target language that must belong to the learners' previous knowledge repertoire to facilitate the connection between their first, second, and third languages (Becerra-Calero & Rojas-Isaza, 2018b; Luckner & Cooke, 2010). The inclusion of simple structures (isolated words) facilitates deaf

learners' willingness to learn English by recognizing that the world¹² they know is connected to the new language, just differing in its written form. Therefore, language format is required when presenting the target vocabulary in the written language form. For further information about the content included in this visual dictionary, see Annex K. This requirement leads to the next aspect of language format: content universality of written lexemes.

Content universality is an important concept that supports the language format adopted by this visual dictionary. Due to the lack of grammatical conjugations in LSC (L1), the introduction of a new language demands time for deaf learners to discern grammatical structures (Luisa, personal communication, 2023-2024; Mendes, 2023). Correspondingly, the visual dictionary did not include variable-written lexemes of the target language. English lexicons must have the same written form and meaning in all possible contexts where that linguistic item occurs to avoid or reduce Deaf learners' frustration and misconceptions (Luisa, personal communication, 2024 and 2023; Domagała-Zyśk & Kontra, 2016). So, this means verbs are not included to avoid prefixes or suffixes, grammatical forms of tenses, third-person rules, and plurals, among other grammatical aspects of oral languages.

4.1.3 Vocabulary Equivalence

The next characteristic of the content is its vocabulary equivalence. After triangulating the content selected (high-frequency words) of the three languages, it was revealed that there are certain 'items' that do not exist in one language or the other due to the characteristics of the language itself (LSC (L1), Spanish (L2), and English (L3) (see Annex J). In fact, the researchers confirmed that, in agreement with Domagała-Zyśk & Kontra (2016), the lexeme 'it' from the

¹² World refers to familiar language vocabulary in LSC and Spanish.

category ‘personal pronouns’ does not have any equivalent (sign or lexeme) in either in LSC or in Spanish. Even more, it was found that the English lexemes ‘his’ and ‘her’ from the category ‘*possessive pronouns*’ have equivalents in LSC and Spanish, but it is necessary to omit its inclusion (Hernández & Fernandez, 2014) because there exists only one corresponding sign, lexeme and meaning for these English possessive pronouns, which is ‘su’. In both languages, LSC and Spanish, ‘Su’ is a LSC-and-Spanish polysemic lexeme (words with uses in different contexts). Linguistic polysemy can make these items confusing for Deaf learners (Medes, 2023): so, suitability was considered the most important aspect for several English lexicons not being included in the visual dictionary (Hernández & Fernandez, 2014) (see Annex J).

4.1.4 Suitability

As concluded in the characteristic ‘Vocabulary equivalence’, the last and most important characteristic of the content presented in the visual dictionary is suitability. *Suitability* is a term coined by the researchers as a result of the documentary analysis at convenience (Hernández & Fernandez, 2014). These characteristics enabled the recognition of ‘what’ and ‘when’ lexemes are ‘*facilitators or restrictors*’ of the Deaf students’ language learning process. Suitability is guided by four aspects: visual aids misinterpretation, false synonyms, linguistic polysemy, and target language level preservation

First, visual aid misinterpretation. The English word ‘they’ has its corresponding linguistic equivalents in LSC and Spanish, but its corresponding visual aids can be misinterpreted. The Colombian sign for the lexeme ‘they’ (one person points to different people—each time referring to someone different) can be confused with the Colombian sign for the lexeme ‘he’ (one person points to a man) because the illustrations and the Colombian signs may be perceived as ‘*the same*

item’ by the deaf reader. This subtle distinction in the hand configuration (number of times pointing to) can lead the learner to feel confused, so it is unsuitable for the visual dictionary.

Second, false synonyms. It was found that some pairs of lexemes can be confusing if they are presented at the same time. Lexemes such as ‘Our= *Nuestro*’ (possessive pronoun) and ‘We=*nosotros*’ (personal pronoun); ‘theirs= *su/de ellos*’ (possessive pronoun) and ‘They= *ellos*’ (personal pronoun) have similarities in their linguistic function in LSC and Spanish; for that reason, the lexemes ‘our, we, their, and they’ can be misunderstood as ‘false synonyms.’ These linguistic elements need to be introduced at different times to allow deaf learners to consolidate one at a time. In line with this, only ‘we= *nosotros*’ was included, making it unsuitable to include the others (‘theirs’, ‘they’, and ‘our’) in this visual dictionary.

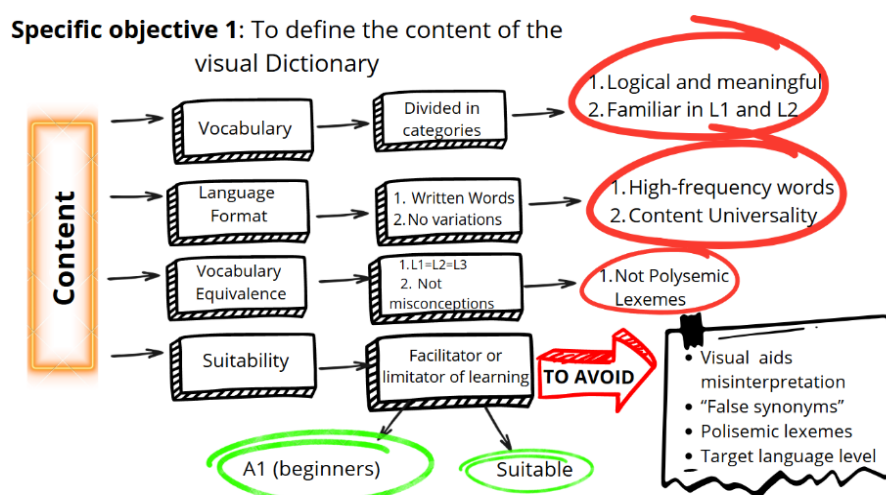
Third, linguistic polysemy. In the same line of ‘false synonyms,’ it was observed that the existence of polysemous English lexemes like ‘You’ can be confusing for deaf learners. The lexeme ‘You’ has three different equivalents in LSC and Spanish: ‘*Tú, Usted, Ustedes*’, which may confuse the deaf learners due to the absence of not clear linguistic differentiators. So, it is unsuitable to include the lexeme ‘you’ with its two uses (singular and plural) in this visual dictionary; for that reason, only the singular form is presented.

Fourth, the target language preservation. This visual dictionary comprises A1 level (CEFR). Researchers found that the English lexeme ‘theirs’ (possessive pronoun) is unsuitable for its inclusion in the visual dictionary (Annex J), although its equivalents correspond to introductory or elementary vocabulary in LSC and Spanish lexemes (‘*sus=de ellos*’, possessive pronoun). The word ‘their’ does not preserve the target language level as defined by the modules outlined in Annex B; so, it is not included in this visual dictionary.

Consequently, the content of the visual dictionary omits the inclusion of the following linguistic elements: ‘His= *su/de él*’, ‘Her= *su/de ella*’, ‘Our= *nuestro*’, ‘They= *ellos*’, ‘Theirs= *su/de ellos*’, and the plural ‘You’. Omitting carried out taking into account the four characteristics Logical and meaningful categories, language format, vocabulary equivalence, and suitability. Criteria to define the content of this visual dictionary is illustrated in Figure 2.

Figure 2:

To identify the content of the Visual Dictionary



Note: Figure 2 represents the criteria for the identification of the content included in the visual dictionary, Own elaboration in Canva (09/2024)

It is concluded that that these four characteristics of the content enable the vocabulary learning process of deaf learners when presented in appropriate didactic material adapted to their learning needs, and to avoid possible misconceptions produced by visual aid misinterpretation, false synonyms, linguistic polysemes, and preserving target language level, following consideration at convenience (Hernández & Fernandez, 2014) of teaching that including these lexicon is not suitable at introductory levels. According to Mendes (2023), it requires time for the

learner to categorize (internal language device of the brain) those lexemes used in different contexts from the original prototype (central meaning).

After determining the four characteristics of the content, researchers started the designing process, as will be explained in the next section.

4.2 To design a visual dictionary adapted for deaf learners:

To design this visual dictionary, several elements are taken into account: the software, the adaptations of the design for the deaf learners, and the layout.

4.2.1 Software

The designing tool used for this project is Canva. It is an online design and visual communication platform, launched in 2013, that aims at empowering people around the world to design and publish diverse content from anywhere (*Canva*, 2013). According to Canva users from different institutions or companies, such as Brandon Realmonte (*Zoom*), Jessie Mawson (*Amnesty International Australia*), George Lee (*Cast Academy Coordinator*), and Megan Lekkey (*Upworthy Writer*) (*Canva*, 2013) Canva is the most suitable software, for this research project, because Canva provides diverse elements that allow designers to develop their creativity while creating mesmerizing projects, without any expertise or specialized knowledge, in a short time. Canva (2013) affirms that this characteristic follows Canva's values, which is aimed to make simple the complex things and pursuing excellence by allowing regular people to set and reach crazy designing goals.

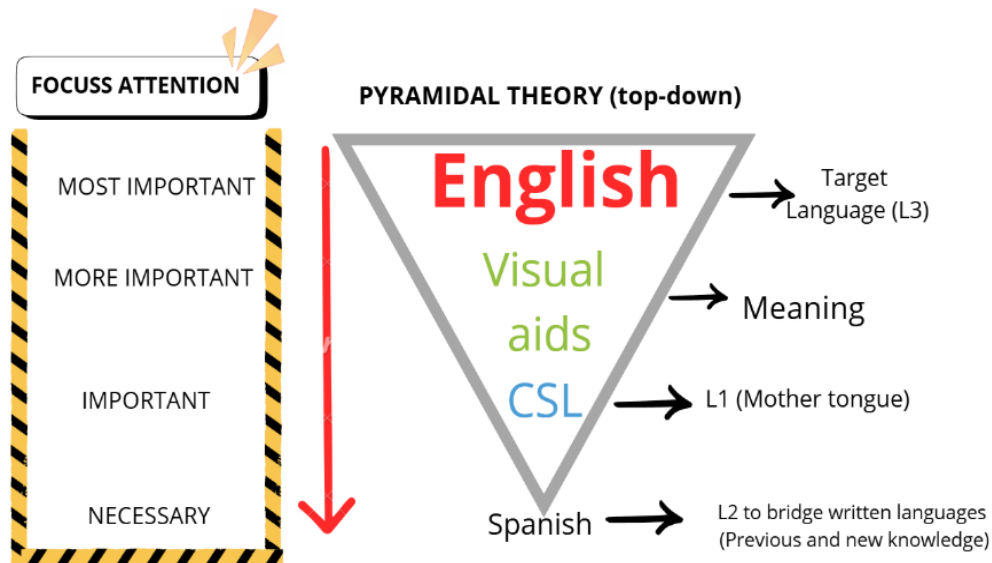
Moreover, Canva is a free software that enables the visualization of the designs in different formats, such as flipped books online, allowing researchers to visualize in a more realistic view what the prototype of the visual dictionary is expected to look like. Characteristic that, according

to researchers' experience, makes it the most suitable software to develop this design-based project without having any experience to design with more specialized software.

After choosing the software, researchers started the designing process according to these two main considerations: the adaptations of the design for deaf learners and the layout.

4.2.2 Adaptations of the Design for Deaf Learners

4.2.2.1 Organization and Distribution. Deafness is recognized as a unique restricting condition for the deaf population; however, there exist a pyramidal theory which served as the foundation to present the content of this visual dictionary to the deaf participants (Bedoya et al., 2023). According to the guide provided by MINTIC (Bedoya et al., 2023), the pyramidal organization of information allows deaf learners to understand and classify the information presented in written form, enabling reading and focusing readers' attention on important parts of the text, either from the general to the specific information (top-down pyramid) or from the specific to the general information (bottom-up pyramid), based on the informant's intention. For this reason, this visual dictionary adopts the top-down pyramidal design, emphasizing the target language as the central element.

Figure 3.*Pyramidal Theory (top-down)*

Note: Figure 3 represents the top-down pyramidal theory adopted to present the content in hierarchical or importance order, stating the target language as the central element.

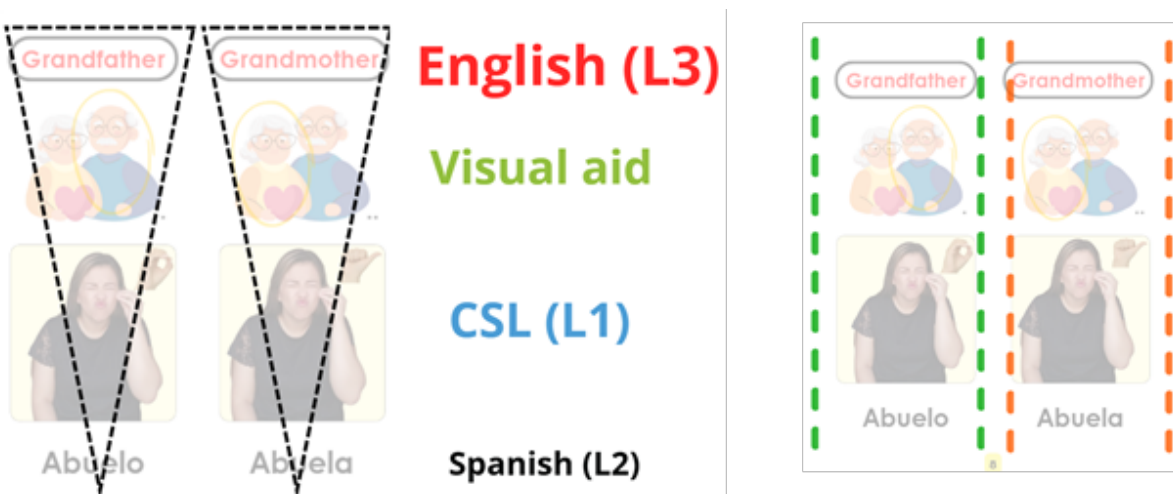
In Figure 3 is illustrated the application of the top-down pyramid and the hierarchical order as follows: first, written English word (as the most important information in red and larger-sized text). Second, visual illustration (to provide meaning in context). Third, LSC (as a mother tongue-L1), and fourth, written Spanish (as a familiar bridging tool between LSC and written languages).

Regarding the size of the material, the researchers decided to use half-letter paper since the literature fails to discuss criteria to design this kind of material. However, researchers adopted two guidelines from the graphic design field (Alberich et al., 2013), to determine the distribution of the content. First, the design contemplates two-column pages since the number of columns of the text depends on the size of the material to be presented. One column would lead to a waste of space, and more than two columns would cause an excessive visual overloading. Second, the layout

system of ‘book-like’ designs require a plain layout system that not only enables changes and adjustments of the elements of the design (quickly and efficiently) but also enables reading comprehension (Alberich et al., 2013). For example, for designing magazines and newspapers, images and texts are complemented or changed according to the needed suitability to catch readers’ attention. Therefore, researchers opted for the top-down pyramid distribution with the adoption of the two-column organization to present the content of this visual dictionary, as can be seen in Figure 4.

Figure 4:

Organization and Distribution



Note: Figure 4 shows how pyramidal theory (top-down) and two-column distributions were applied to present the content of the visual dictionary, Own creation in Canva (08/2024).

It is worth highlighting that the organization and distribution of the content of the prototype are intended to guide deaf readers’ attention to enable their understanding of the visual dictionary; nonetheless, previous knowledge is paramount to achieve reading comprehension. In other words, for learning a different language, the learner must be proficient in their mother tongue, which

provides the basis for understanding a different linguistic system (Bobillo, 2003; Domagała-Zyśk & Kontra, 2016; M. C. Molina, 2021). In the case of Colombian Deaf, they need to consolidate their L1 (LSC) for learning their L3 (written English).

Unfortunately, researchers found that deaf learners do not start their educational process as regularly as hearing learners do (between 3 and 6 years old, whether for preschools or primary schools). Bodilla (2003) indicates that this happens due to external and internal factors that are the root of most LSC deficiencies of deaf learners. Consequently, to deal with this linguistic gap, this visual dictionary also includes the hand configuration of LSC (L1 for deaf Colombians), aiming to provide tools to enable all learners' understanding of the target language, despite the *evident* existence of linguistic differences in LSC proficiency levels within deaf classrooms.

4.2.2.2 Hand Configuration of LSC. This visual dictionary includes the hand configuration of LSC. The inclusion of the diverse visual elements like arrows and gestural movements representing LSC hand configuration seeks to guide the corresponding movements of the signs to offer support to those teachers and learners who may not be proficient enough in LSC, since it is not an area of expertise for English teachers and the varying level of competence in LSC among deaf learners. Consequently, addressing those two teaching-learning gaps, the hand configuration of LSC provides learning benefits for both teachers, getting to know learners' L1, and deaf learners, reinforcing L1.

The inclusion of hand configuration is intended to facilitate the English learning-teaching process by complementing it with other elements of the design; structure, colors, font (size and style), and visual aids; which are explained in the layout section.

4.2.3.2 Introduction. It includes a brief explanation of the purpose and design of this visual dictionary as an introductory teaching-learning tool of written English (A1) for the deaf community, to serve as a trilingual mediator between the oral-written linguistic system of English (L3) and Spanish (L2) with the visuo-gestural and visuo-spatial system of LSC (L1).

4.2.3.3 Content List. The linguistic content included in the visual dictionary is introduced in a section titled ‘Content’. The Content list page provides a guide for the deaf reader to know where to find a specific category more easily and quickly. It displays the title ‘Content’ (red), its Spanish translation (black), and the categories’ names (in English and Spanish) with the corresponding page within the visual dictionary. The content page is in page number 1, but it includes a dark blue framework that differentiates it from the pages of content presentation as can be seen in Figure 6.

Figure 6:

Content

Content		Contenido	
• Family	5	Familia	
• Colors	9	Colores	
• Numbers	13	Números	
• Months of the year	19	Meses del año	
• Days of the week	26	Días de la semana	
• Food	31	Comida	
• Animals	40	Animales	
• Possessive pronouns	49	Pronombres posesivos	
• Personal pronouns	51	Pronombres personales	

Note. Figure 6 displays the layout of the “Content” page of the visual dictionary

See Table 2 and Annex J for further information about the vocabulary included in each category.

Table 2:

Content

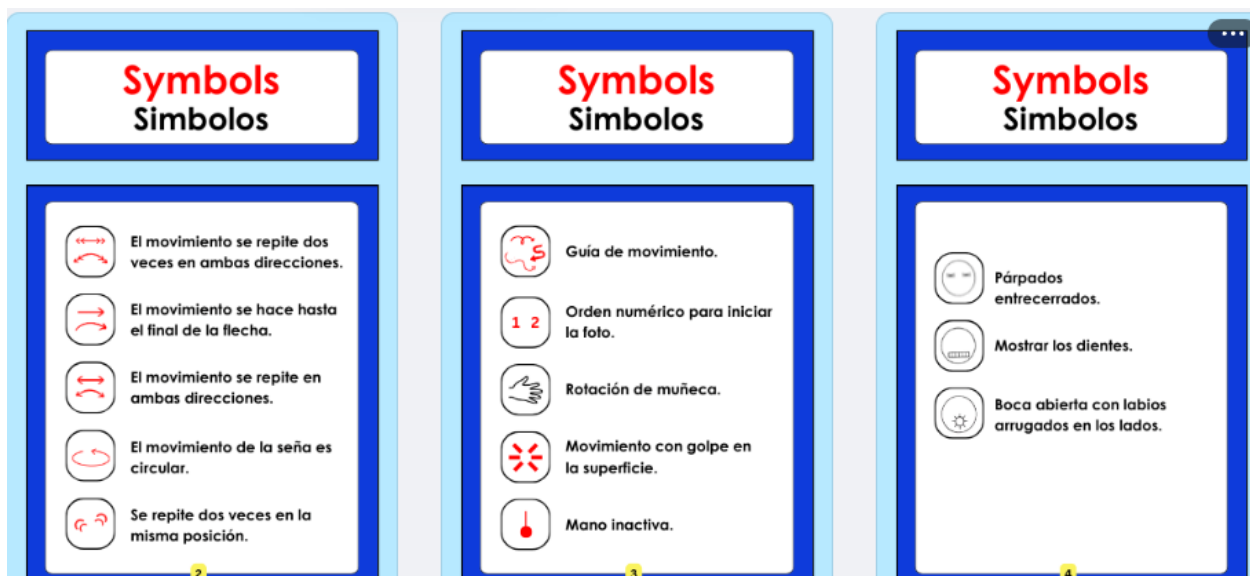
Category	Linguistic Content
Family	Mother, father, brother, sister, grandmother, grandfather.
Colors	Yellow, blue, red, green, orange, black.
Numbers	0,1,2,3,4,5,6,7,8,9.
Months of the year	January, February, March, April, May, June, July, August, September, October, November, December.
Days of the week	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday.
Comida- Food	Banana, Orange, meat, chicken, egg, salad, carrot, onion, spaghetti, hamburger, ice-cream, juice, cookie, cake, hotdog, pizza.
Animals	Spider, horse, pig, rabbit, snake, elephant, cat, giraffe, lion, monkey, bird, dog, fish, chicken, mouse, cow.
Possesive pronouns	Mi, suyo.
Personal pronouns	I, you, he, she, we.

4.2.3.4 List of Symbols. Aiming at dealing with the lack of English-LSC trained teachers and learners' LSC proficiency, researchers included the section 'Symbol' of the graphic elements related to the hand configuration of the signs to support the consolidation of learners' L1 while the learning process of English (L3); since contrary to expectations, deaf learners still present varying linguistic competence of LSC because of different factors, such as limited access to the language, lack of rehearsal at home, and access to education, among others (Bodillo, 2003). In the same line,

this list of symbols is also instrumental in providing support for English teachers to understand learners' L1 in the case of non-proficiency (L. F Hernández V, personal communication, 2024 and 2023; Domagała-Zyśk & Kontra, 2016). Figure 7 illustrates the layout of the section 'Symbols'. Those graphic illustrations of the hand configuration of LSC were based on the list of symbols provided by FENASCOL in 'Lengua de Señas Colombiana—Tomo 1. in Mejia (2009). In the visual dictionary, this list of 'Symbols' is presented on pages 2 to 4.

Figure 7:

Symbols



Note: Figure 7 illustrates the section Symbols included in the visual dictionary to support the hand configuration of LSC. Screenshot taken from own creation in Canva (08/2024).

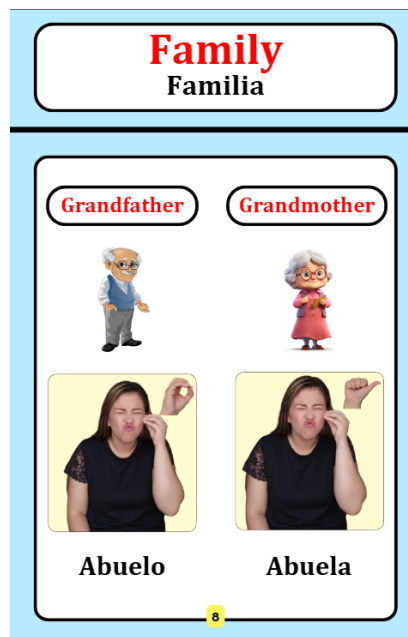
4.2.3.5 Presentation of the content. The content of this visual dictionary is organized and distributed according to the pyramidal theory (Organizations and distributions) as well as grouped into nine categories. The categories follow a determined order: Family, Colors, Numbers, Months of the Year, Days of the week, Food, Animals, Possessive Pronoun and Personal Pronoun (as

previously illustrated in Figure 6 Content). Each of the categories have a ‘Cover’ page that introduces the target topic. The Cover contains a large English title of the topic (red), its representative illustration, its corresponding sign of LSC and its Spanish translation (black). Figure 8 illustrates a sample of the layout designed for the ‘Cover’ of the categories.

Additionally, the target vocabulary is presented displaying the title of the topic or category (at smaller font size with its corresponding Spanish translation) and the specific vocabulary of the topic (red) accompanied with an illustration, the LSC sign and the written word in Spanish (black). The description of presentation of the content is better represented in Figure 8 and Figure 9.

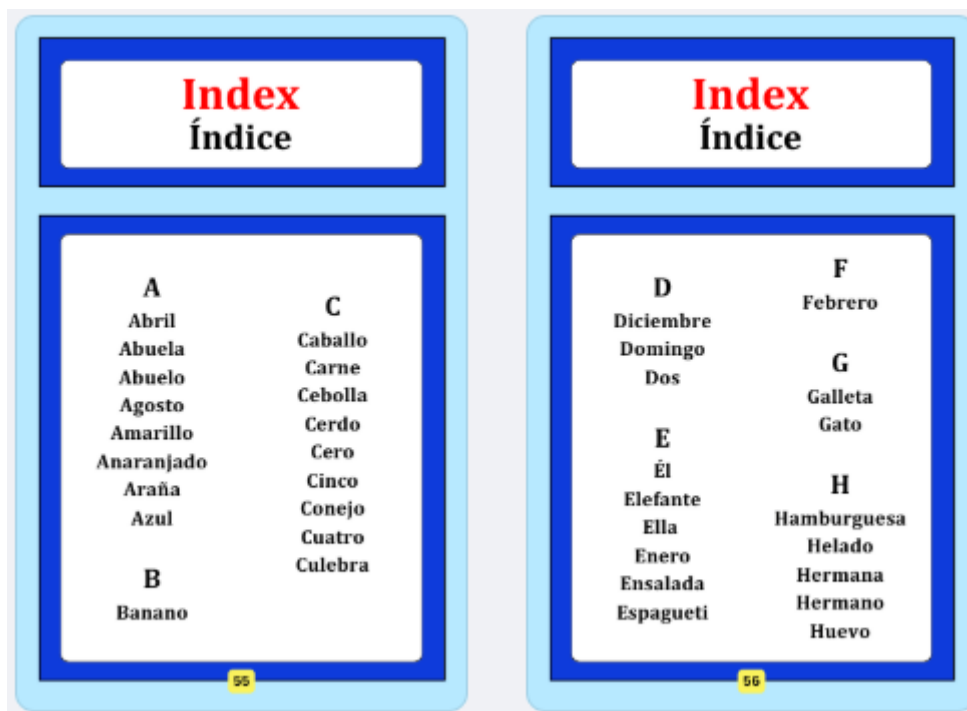
Figure 8:*Sample of "Cover" of the Categories*

Note. Figure 8 illustrates the sample of the Covers' layout displaying the category 'Family'. Own elaboration in Canva (09/2024).

Figure 9:*Sample of "Presentation of Content"*

Note. Figure 9 illustrates the sample of the layout for content presentation, displaying a content page from the category 'Family'. Own elaboration in Canva (09/2024).

4.2.3.6 Index. The 'Index' contains the list of words (target vocabulary) included within the categories but alphabetically ordered. It is located on pages 55 to 60 of the visual dictionary, indicating the page where the word is located within the visual dictionary. The inclusion of the index list was considered based on its presence in Mejia (2009), *Lengua de Señas Colombiana—Tomo 1*, and its use in class, when learners need to search for a specific word (L.F. Hernandez Valdivieso, personal communication, 2024 and 2023). Figure 10 presents two sample of index pages of the visual dictionary.

Figure 10:*Sample of "Index" pages*

Note. Figure 10 illustrates a sample of two index pages of the visual dictionary. Own elaboration in Canva (09/2024)

4.2.3.7 Credits. In gratitude to the collaborators, the researchers include the ‘Credits’ section at the end of the visual dictionary to highlight and recognize the collaboration of different people throughout the development of this project.

Up to this point, the structural elements that make up the layout of this visual dictionary (front page, prologue, content list, cover pages, presentation of the content, index, and credits) have been explained. Nonetheless, this layout not only addresses the pyramidal theory and the aforementioned structure but also design elements such as font (style and size), colors, and visual aids, as explained here below.

4.2.4 *Font: Style and Size*

It was found that using intelligible font styles enables the reading process for the deaf population (Castro et al., 2024; Riddle & Caballero, 2022). According to the analysis of the data collected, an ‘intelligible’ font style is understood as a lettering style with non-use of italics and a font size that enables reading for everyone. Moreover, the use of text inside this design is considered an image to be read by the deaf community, which must be complemented with other graphic design elements to be *intelligible* at combining meaning and style (Alberich et al., 2013). Consequently, this visual dictionary was designed using only the font ‘*Century Gothic*’ (see Figure 11) following the suggestions given by the deaf participants during the pilotage.

Figure 11:

Font of the Visual Dictionary "Century Gothic"

Century Gothic

Upper case:

ABCDEFGHIJKLMNÑOPQRSTUVWXYZ

Lower case:

abcdefghijklmnopqrstvwxyz

Note: Figure 11 illustrates the graphemes style of “Century gothic” determined the intelligible font style, by deaf participants, during the pilotage of the visual dictionary. Own creation in Canva (24/10/2024).

Respondingly, this visual dictionary includes the use of diverse font sizes and colors, guided by the pyramidal theory to reach two specific purposes. The first purpose is to introduce the target vocabulary (English L3), which also requires the largest size, as it is the most important visual element (in red). The second use is to provide familiarity and equivalency in Spanish L2, which requires the smallest size, as the L2 is a complementary written element (in black); and it is essential to preserve the importance given to written English. These purposes, defined by colors (*red or black*), follow the pyramidal theory in a new perspective allowing deaf individuals to read, classify, recognize and unconsciously differentiate the target language more easily. Font size and colors are presented in, Table 3 for further explanation about the use of colors.

Table 3:

Font Size and Colors

Font sizes	English (Red text)	Spanish (Black text)
Title of the Dictionary (Only in Black)	31,7	34,7
Title of Category's cover	39,9	26,5
Subtitles	39,9	26,5
Content	26.5	24,8

Note: Table 3 illustrates the font size and color of the texts integrates in the visual dictionary, Own creation (08/2024).

It is worth noting that researchers developed the aforementioned explanation based on the documentary analysis carried out and the conclusions drawn, which led to the recognition of the role that the pyramidal theory plays in guiding not only presentation of content but also its usage

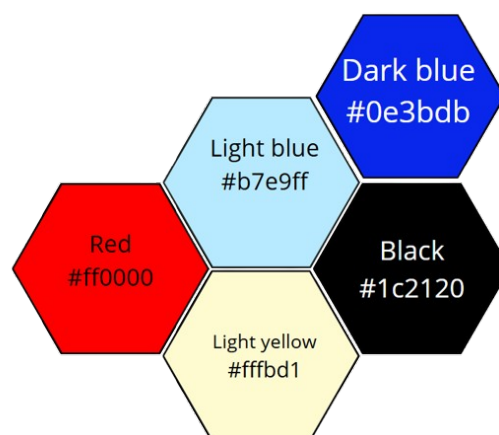
to integrate written language in the design of this visual dictionary. This contribution supported on methodological utility, social relevance, convenience, and practical implications (Hernández & Fernandez, 2014). Consequently, the acknowledgment of intertwined graphemes highlights an additional challenge that accompanies Deaf community's deficiencies in reading comprehension, beyond the linguistic lacks which they already have to deal with. Since revealing the specific font style that should guide the design of didactic materials for the Deaf community will enhance clarity and appropriateness in future design-based research.

4.2.5 Colors

Researchers explored the psychology of color to broaden acknowledgment about color theories and discovered that although warm colors catch learners' attention (Castro et al., 2024), exceeding the use of warm colors is counterproductive when learners are exposed to them for long periods of time (Mariel, 2007). Consequently, this visual dictionary includes warm and cold colors such as blue, light yellow, red, and black (Figure 12); each one with a different purpose.

Figure 12:

Color Palette of the Visual Dictionary



Note. Figure 12 displays the color palette used to design the visual dictionary.

4.2.5.1 Blue. This cold color catches learners' attention due to physical, biological, and psychological factors that not only activate the visual channel but also connect the neurological functions, helping the observer concentrate in the calming atmosphere of cold colors (Cuvelier García, 2022; Mariel, 2007; A. Molina, 2014).

In Canva, 'light blue' color is identified as #B7E9FF, while 'dark blue' is identified as #0E3BDB. The main color for the visual dictionary is light blue, but also it is complemented with dark blue in the sections: 'Prologue', 'Content', 'Symbols', 'Index', and 'Credits' to make particular distinction among the content presented. Finally, light blue is also contrasted with light yellow for balance.

4.2.5.2 Light yellow. This color was selected to follow not only the rule of the chromatic circle but also to take advantage of the natural color filters (Red, Green, and Blue -now on RGB filters) of the human's sight system. RGB filters modify observer's perception of colors, either the background enhances or limits the distinction of the observed object (Alberich et al., n.d.; Mariel, 2007; A. Molina, 2014). For that reason, the background of the Colombian signs was edited using 'removebg' (an online editor) to contrast with the main color of the visual dictionary (light blue), while directing deaf reader's attention on the hand configuration of LSC, as illustrated in Figure 13.

Figure 13:

Edited Background of Signs

Note. Figure 13 illustrates how the light-yellow background enhances the perception of the hand configuration of the Colombian sign for number “6” Own elaboration in Canva (09/2024).

In Canva, this color is identified as #FFFBD1. Alberich et al. (2013) state that the red filter human vision influences the perception of yellow color, a warm color, helping deaf learners clearly distinguish the image from the white paper color background, especially as it is complemented with a subtle framework and black clothes.

4.2.5.3 Black. According to Molina (2014) ‘black’ color tends to be invisible to the human sight filters due to the absence of light. In CANVA, black is identified as #1C2120. Researchers photographed the Colombian signs with individuals wearing black blouses to complement the edited light-yellow background, intending to avoid unnecessary elements that may cause distractions. Moreover, these color contrasts between black and yellow enable the lecture of signs, focusing the deaf reader’s attention on the hand configuration (see Red) and the gestural expressions of LSC. This color contrast is illustrated in Figure 14.

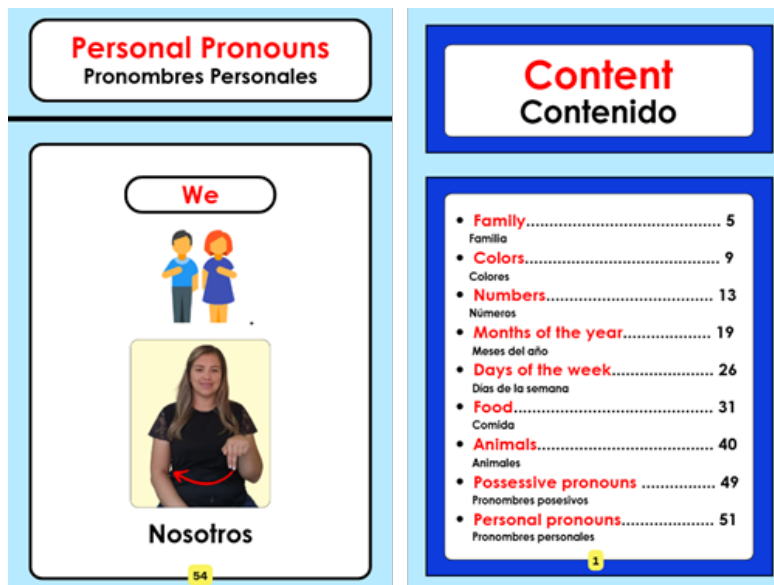
Figure 14.*Color Contrast with Black*

Note: Figure 14 illustrates how black and yellow contrast each other to maintain attention on the hand configuration of the signs. Own creation (09/2024).

In contrast to the use of black, the use of red is essential for an active purpose, as it is perceived from Figure 14.

4.2.5.4 Red. The use of this color in this visual dictionary is intended to focus attention mainly on the specific vocabulary of the target language and the hand configuration of LSC. In CANVA, red is identified as #ff0000. Red is used for the titles, the subtitles, the target vocabulary, and the hand configuration of LSC emphasizing the key elements expected to be learned or reinforced (English and LSC) depending on whether the reader is hearing or deaf (see hand configuration section, p.50). Figure 15 represents the application of red and the other colors (blue, yellow, and black) within the design of the visual dictionary.

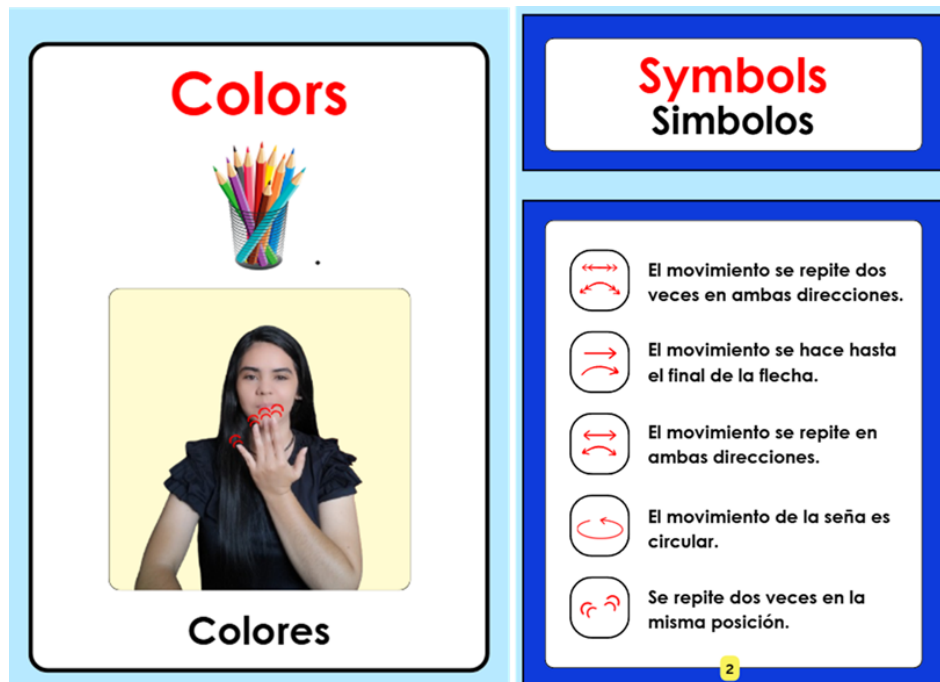
Besides, Figure 15 illustrates how the hand configuration of the signs and the use of visual aids contributes clarity to the signs and meaning in context to the written language, as mentioned earlier in the layout section.

Figure 15:*Use of Red Color in the Visual Dictionary*

Note: Figure 15 illustrates the use of red color aligned with blue, yellow and black to complement the layout designed for the visual dictionary. Own creation in Canva (09/2024).

4.2.6 Visual Aids

The nature of this dictionary is to be a visual material. Therefore, the accurate complementation of written languages (English and Spanish) with visual aids (illustrations) and signs (L1) mediates and enables the understanding of the target language to deaf learners (González-Reyes et al., 2021; Yasin & Mohamad, 2024) because the use of the familiar L2 (written Spanish) bridges equivalences between the L1 (LSC) and the L3 (English), but presented in a new form (written English). By doing so, the learner will feel safe and confident within the relearning process of already familiar linguistic items. Visual aids (illustrations and LSC) aligned with the hand configurations (LSC) are represented in Figure 16.

Figure 16:*Use of Red Color in the Visual Dictionary*

Note: Figure 16 illustrates the use of red color aligned with blue, yellow and black to complement the layout designed for the visual dictionary. Own creation in Canva (09/2024).

After designing the visual dictionary with all the necessary elements for the adaptations required (organization and distribution aligned with the hand configuration), and the layout (structure, font, colors, and visual aids) ensuring the attention to the identified learning needs, researchers piloted the prototype with Deaf participants at Escuela Normal Superior de Bucaramanga (ENSB), as part of the third specific objective.

4.3 To pilot the Visual Dictionary

The third objective of this research study is to pilot the prototype of the visual dictionary with deaf learners. The results obtained are divided into two main sections: ‘Piloting of Content’ and ‘Piloting of Design’.

4.3.1 *Piloting of Content*

The participants who piloted the prototype were 12 deaf students, 4 linguistic models (deaf people), a teacher (trilingual in Spanish, LSC, and English), a psychologist (bilingual in Spanish and LSC), and a father (Spanish and LSC user). The data collected indicated that all the participants provided feedback targeted to revise the following characteristics of the dictionary:

- The relationship between hand configuration and meaning
- The recognition of LSC regionalisms
- The presentation of the content by categories

4.3.1.1 *Relationship Hand Configuration-Meaning.* The pilot study evidenced the importance of considering the relationship hand configuration- meaning. There are some subtle elements of the signs which lead Deaf individuals to misunderstand the interpretation of the signs; just as orthography affects meaning in oral communication. This misunderstanding is caused by the positions and movements required in each sign, which according to the hand configuration certain elements change meanings. As an example, Figure 17 and Figure 18 represent the Colombian sign of the English word ‘Cat’.

Figure 17:

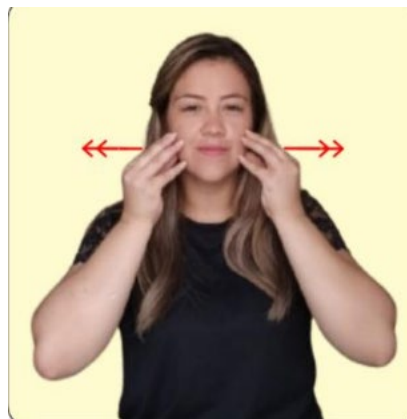
Colombian sign for 'Cat' according to the Teachers.



Note: Figure 17 Illustrates the sign for the 'Cat' expressing aggressiveness, Own creation in Canva (09/2024)

Figure 18:

Colombian sign for 'Cat' according to the Pilotage

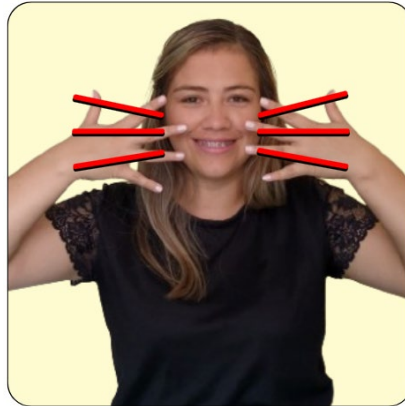


Note: Figure 18 Illustrates the sign suggested for the 'Cat' expressing meekness. Own creation in Canva (09/2024)

According to the Deaf participants, Figure 17 expresses aggressiveness because of the opened position of the fingers, whereas Figure 18 expresses the cat's meekness due to the closed fingers. However, advisor teachers affirmed that this is a misconception arising during their learning process of LSC. Therefore, it can be taken as 'a confusion' with other animal signs or even *the influence* of their linguistic models (Hernández, personal communication, 2023-2024). Besides, the same professionals suggested that Deaf participants' misconceptions will diminish as long as effective LSC training is provided. Nonetheless, this clarification led researchers to recognized that this sign required emphasis on the element where it originates from: 'Cats' whiskers' (Luisa, personal communication, 2023-2024); so, researchers modified the hand configuration of the sign in Figure 18 (even though it was correct) as represented in Figure 20 to clarify its intention.

Figure 19:

Sign for 'Cat' as Final Correction



Note: Figure 19 presents the final sign and hand configuration for “Cat” arose from reflections on the piloting of content. Own creation in Canva (10/2024)

In line with this, researchers found the case of the English word ‘Chicken’ which was misinterpreted as ‘small’. Participants expressed that the configuration of the sing in Figure 20 was not sufficiently clear, as it was confused with ‘Pequeño’ due to the missing ‘Chicken beak’. This suggestion and modification are best illustrated in Figure 20 and Figure 21.

Figure 20:

Sign for 'Chicken' before de Piloting



Note: Figure 20 presents the Colombian sign for ‘Chicken’ misinterpreted as ‘small’, due to the missing ‘chicken beak’. Own elaboration in Canva (09/2024).

Figure 21:

Sign for ‘Chicken’ after the Piloting



Note: Figure 21 illustrates the correction in the hand configuration of the Colombian sign for ‘Chicken’, according to the piloting. Own elaboration in Canva (09/2024).

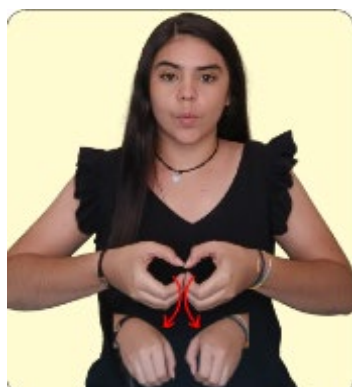
It is worth noting that some of those suggested changes are not always correct, which reinforces the importance of working together with LSC experts to maintain appropriateness. There may be cases in which due to the existence of regionalisms, the signs are modified and those modifications may interfere language learning; taking into account that languages are cultural products which particularly sing language evidences (Luisa and Claudia, personal communication, 2024 and 2023; Mišić Ilić, B, 2004). Regionalisms will be explained in the next section.

4.3.1.2 The Recognition of Regionalism in LSC. According to the Deaf community participants in this project, LSC is a cultural product. The findings display that there are variations in LSC related to the region where the language is created and used (dialects), as it occurs in oral languages (accents). The participants affirmed that there exist variations of the signs in LSC

because the Deaf community's identity is strongly related to the way in which the signs are connected to the action where the sign originates from. The deaf participants explained that they certainly recognized the existence and use of these two signs (Figure 22 and Figure 23) which correspond to the English word 'egg'.

Figure 22:

Sign for 'Egg' in Bogotá



Note: Figure 22 illustrates the Colombian sign 'Egg' used in Bogotá. Own elaboration in Canva (09/2024)

Figure 23:

Sign for 'Egg' in Bucaramanga



Note: Figure 23 illustrates the Colombian sign 'Egg' used in Bucaramanga. Own elaboration in Canva (09/2024)

These two Figures display two different situations. The first situation is that the word 'egg' has two different signs: one (Figure 22) used in Bogotá and the other one is specifically used in Bucaramanga (Figure 23). The second situation is that in Bucaramanga, Figure 23 refers to 'eggs' in general, but Figure 22 also represents an independent sign for 'Fried egg' in the same region.

Deaf participants emphasized on the fact that the lack of inclusion of regional signs has fueled their opposition to the standardization of LSC. According to the participants,

regionalisms in LSC are important, and the lack of recognition given to the existing regional signs have led several disagreements with FENASCOL. Moreover, the participants stated that, although the creation of the material ‘Lengua de Señas Colombiana’ is aimed to provide an elementary resource for learning LSC, it contributes to their own marginalization among the deaf community.

This data explains their rigorous attention in the recognition of regionalisms along the content of this visual dictionary, rather than aspects of the design, intending to avoid the repetitive linguistic marginalization that motivated language standardization resistance among the Deaf community.

4.3.1.3 Presentation of Content by Categories. Participants reacted positively to the presentation of content by categories in the visual dictionary, since it allowed them to filter their own knowledge by creating expectations of the content to be presented in each category according to the representative illustration in the covers. Furthermore, deaf and hearing participants affirmed that young learners revealed willingness to learn the target language, as evidenced by them at exploring the material at faster pace. In line with this, It was noted that the design of the prototype material aligned with the language level of content presented (A1) allowed some learners to feel excitement at recognizing L1 and L2 elements, vocabulary in LSC and written Spanish, which enabled them immediately access to L3, by finger spelling the English vocabulary presented (target language-L3). It is worth noting that, at slower paces, some other young learners showed interest on exploring the material by doing the signs with medium proficiency (sometimes faster than others), but they also ended up trying finger spelling of l2 and L3. Nonetheless, having focused their rigorous attention and interest on the material led participants to notice that some illustrations could be improved with more realistic cartoons preserving meaningfulness to this community. For example, Deaf participants explained that the illustration for ‘Pollo’ was not clear to differentiate

whether it was a female ‘Gallina’ or a male ‘Gallo’. Therefore, they suggested that integrating literal translation for ‘Chicken’ in Spanish ‘pollo’ is not considered appropriate, rather it was suggested to illustrate and translate it as ‘Pollito’ for preventing its visual misinterpretation with ‘Gallina=Hen’ or ‘Gallo= Rooster /Cook’. This modification is illustrated in Figure 24 and Figure 25. These suggestions maintain the general idea of the concept for these animal species.

Figure 24:

Chicken' during the Piloting

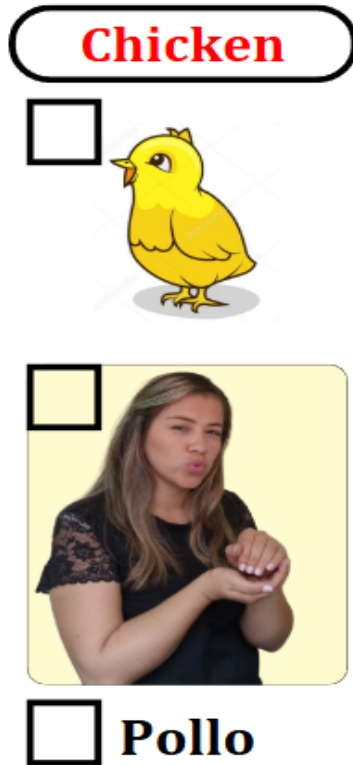
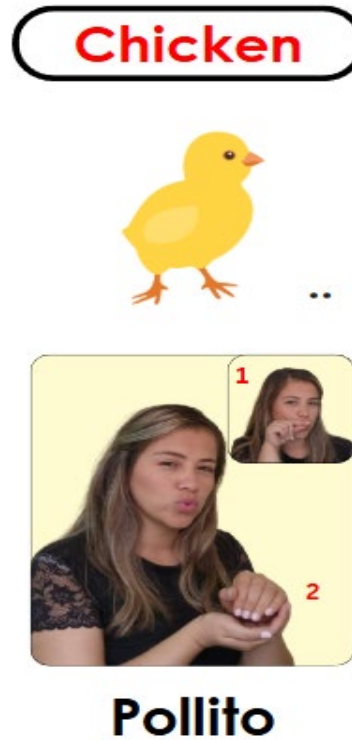


Figure 25:

Chicken' after the Piloting



Note: Figure 24 illustrates all the elements integrated to present the English word ‘Chicken’ in the piloted designed. Own creation in Canva (09/2024)

Note: Figure 25 illustrates all the elements integrated to present the English word in the final design of the visual dictionary’. Own creation in Canva (09/2024)

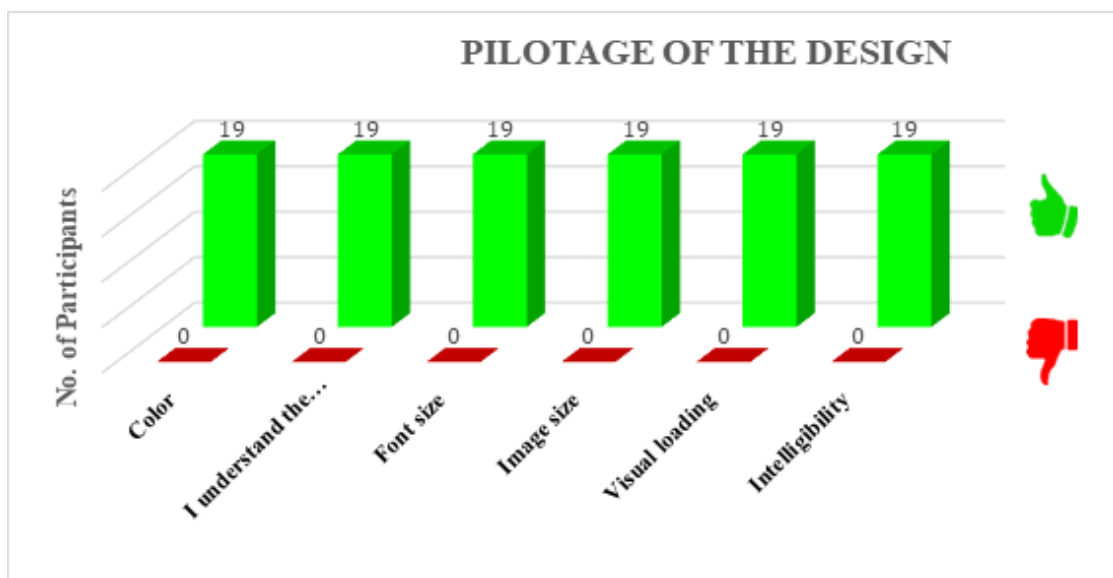
After evaluating the content, researchers guided the Deaf participants to pilot the design.

4.3.2 *Piloting of Design*

The piloting of the design was conducted under the guidance of the researchers with the use of a rubric as a visual observation format (see Annex H) where Deaf participants chose either thumbs up or down depending on their perception of accuracy of the design. The results revealed that all the participants agreed and affirmed it was well-adapted to their needs in the following aspects: Color, I understand the font (style), Font size, Image size, Visual loading, and intelligibility. Figure 26 presents the six aspects evaluated by the Deaf Participants in the visual dictionary as well as the results from the pilot of the design.

Figure 26:

Results from Piloting of the Design

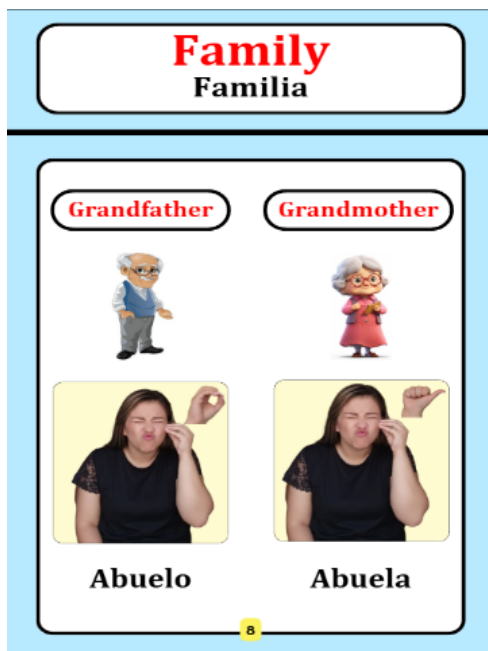


Note: Figure 26 presents the results of the piloting of the design. Own elaboration (10/2024).

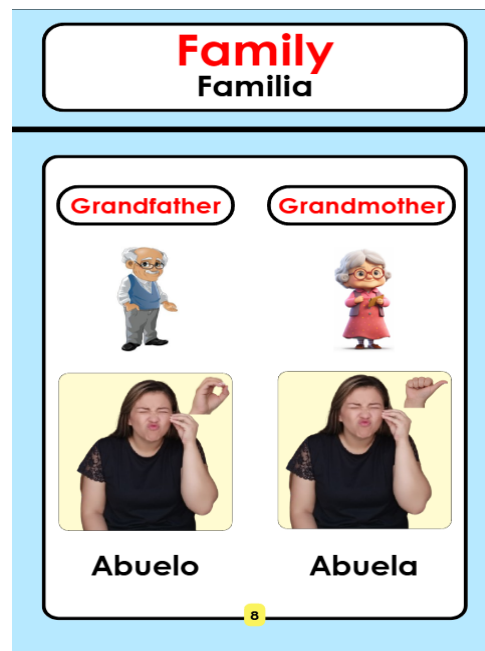
4.3.2.1 Visual Loading (Paper Size and Presentation of Content). After being in contact with the material, the half-letter paper size was confirmed appropriate. The Deaf participants affirmed that the amount of content presented on each page of the visual dictionary was appropriate in terms of visual loading, considering the paper size. Participants from the Deaf community reacted positively to the organization (top-down pyramid) and distribution (two columns of text) of this visual dictionary. This characteristic contributes to the lack of literature suggesting criteria to design this kind of didactic material because it revealed its intelligibility. Furthermore, the participants affirmed that the compilation of the aforementioned aspects makes the design of the visual dictionary suitable didactic material for deaf learners to learn written English vocabulary with the use of CSL (their L1) and Spanish (their L2) as it becomes a communicative foreign language learning mediator between the Deaf community and the hearing society.

Besides, some suggestions about the font size arose from the participants.

4.3.2.2 Suggestions: Font and Size. According to the linguistic models and the head teacher, the typography is intelligible, but the lettering of graphemes in certain font styles may be confusing to deaf learners. They affirmed that there are cases in which different graphemes, such as ‘a’ with the number ‘6’ are intertwined; so, it was suggested changing the font from ‘Cambria’ style to ‘Century Gothic,’ style. Differences among these font styles are illustrated in Figure 27 and Figure 28.

Figure 27:*Font 'Cambria'*

Note: Figure 27 presents the font 'Cambria' use by researchers in the prototype of the visual dictionary. Own elaboration in Canva (09/2024).

Figure 28:*Font 'Century Gothic'*

Note: Figure 28 presents the font 'Century Gothic' suggested by the Deaf participants during the piloting of the visual dictionary. Own elaboration in Canva (09/2024).

The aforementioned aspects confirm teachers' intuition was correct at recommending researchers the use of traditional font styles for presenting the target language in written forms to deaf learners. It is worth noting that a *traditional* font type is the one in which graphemes are made according to the line and the conventional geometrical lines, as a guides for its distribution (Alberich et al., 2013). Besides, Deaf participants agreed that the different font sizes integrated in the visual dictionary were perceived as appropriate.

5 Prototype

To visualize the prototype of this introductory visual dictionary (written English- LSC) [Click](#)

[Here.](#)

6 Conclusions

In Colombia, the Deaf community continues to face marginalization due to the linguistic gap that prevents Deaf individuals from taking active roles in a globalized world, particularly for the lack of access to English training, as evidenced in the legal framework. The Deaf community is not included in national policies aimed at enhancing English learning. It is worth noting that there have been research attempts to address this issue by designing specialized material. However, Deaf learners' L1 and L2 proficiency are not at the level required to effectively implement English teaching implementing those proposed materials.

Aimed at providing a suitable solution to the problem statement, researchers explored and considered the perspectives of the Deaf community to design and test a prototype that answered the research question: what are the characteristics that a visual dictionary adapted for deaf learners should have?

Designing this visual English dictionary for the Deaf community is a time-consuming task that requires attention to two key elements: characteristics of the content and characteristics of the design.

On the one hand, the characteristics for the content require presentation in meaningful categories, preservation of language form, inclusion of language equivalences, and suitability. This means that the content presentation must begin with simple and familiar structures and meanings (isolated words in a specific topic), followed by the introduction of abstract and complex repertoire, like polysemic lexemes (Mendes, 2023), but the order for introducing it depends on the Deaf learner's learning pace. By doing this, it is enhanced the achievement of vocabulary identification and consolidation in varying grammatical forms (aspects of oral languages) (Domagała-Zyśk & Kontra, 2016; M. C. Molina, 2021), preventing, at all possible ways, Deaf

learners' frustration. For this reason, the inclusion of language equivalences (Birinci & Sariçoban, 2021)(L1=L2=L3) permits Deaf learners to make connections between linguistic systems to re-learn L1 and L2 in a new written form (L3).

It is worth noting that the difficulty that Deaf learners may face in learning the content is connected to prior linguistic knowledge, either L1 or L2, which is the same factor that affects and benefits the language learning process of hearing individuals. Then, teacher's discernment among suitability of content presentation is essential to determine at convenience what, when and how the target content must be presented to the Deaf learners. But this suitability is measured by L1 proficiency, seeking content comprehension and its meaningfulness to the Deaf readers.

In addition to the characteristics of the content, the characteristics of the design should meet five requirements. The first requirement is the pyramidal theory (Bedoya et al., 2023). This theory guides how to design, present, organize, and distribute the information, leading deaf learners to focus attention on the important content (target language). The second requirement is visual aids (Birinci & Sariçoban, 2021). The inclusion of illustrative elements is indispensable to provide clear meaning and context of the written target language.

The third element required is the hand configuration. Despite the failure of the literature to document the importance of complementing the photos of the LSC, the researchers found that photos of the signs also represent the inclusion of its corresponding hand configuration. The hand configuration of LSC plays a crucial role in addressing both: the linguistic deficiencies in deaf learners' L1, and the lack of language teachers trained in LSC (Domagała-Zyśk & Kontra, 2016). Then, by providing the graphic representations of the sign's 'movements' (symbols), social goals of inclusion in the short and long term will be achieved. In the short term, deaf learners reinforce and consolidate their L1, while teachers gain familiarity with Deaf learners' L1 in the long-term.

The inclusion of the hand configuration naturally fosters teaching and learning, with translanguaging practices integrated unconsciously.

Fourth, the inclusion of the list of symbols. This requirement is aligned with the hand configuration, and intends to facilitate effective LSC comprehension. The symbols complement the understanding of the hand configuration of the signs for hearing and Deaf readers. And the fifth requirement is the inclusion of two complementary elements: the content and the index lists. These two lists enable deaf learners to search any content by category or topic along the dictionary (the content list) as well as the search of specific words within alphabetical order (index) allowing the use of the material either with guidance or autonomously.

Researchers conclude that the characteristics of content and the characteristics of the design lead to the creation of didactic materials that preserve the intelligibility required for the target population. However, the aforementioned specifications must go along with the perspective of the Deaf community, as they will be the beneficiaries of the proposed didactic material. Since the Deaf people's learning strength is their visual channel (Domagała-Zyśk & Kontra, 2016; Najar & Fonseca, 2018), it is expected to leverage it with materials that present enough visual elements to enable foreign language teaching for the Deaf community in the near future. Finally, to prevent the mentioned isolation and marginalization of this community, it is expected through this research, that the process of educational inclusion will address foreign language teaching, equalizing opportunities for them to become citizens of the globalized world where they belong.

7 Limitations and Recommendations

7.1 Limitations

One of the major limitations for carrying out this project was the researchers' lack of mastery of LSC; therefore, we relied on the assistance of the head teacher for the piloting phase. Due to this limitation, our work was focused merely on the design of the visual dictionary and its validation by the focus participants.

One more limitation lied on the number of expected participants that initially were between 30 and 40. However, deaf learners from secondary courses did not participate due to academic events, reducing the sample to only 19 Deaf participants: 12 Deaf primary graders along with the four linguistic models and supportive staff.

A third limitation, following approval and guidance of the pioneer teacher in LSC training in Bucaramanga, researchers took into account the suggestions from *the piloting process*. According to the deaf advisor teachers, some suggestions in certain signs stemmed from mislearning and the need for effective learning support during their LSC learning process. Therefore; only the correct suggestions were included to ensure, as much as possible, the use of the standard signs of LSC system.

7.2 Recommendations

Due to the limitations and results, researchers suggest taking into account the following facts when doing research with deaf groups:

First, the pilotage demonstrates that although LSC is expected to be the first language of the mentioned community, the deaf population does not have equal access to education. Then, deaf learners in a specific course include children with different sociodemographic characteristics and language proficiency due to their background (deaf/hearing parents) and their access to education (early or late). For that reason, it is recommended—for future didactic material to be designed—

that researchers include the list of hand configuration of the signs, which can contribute to the rehearsal of their L1, when there is not proficiency enough of the mother tongue, before being introduced to other languages.

Second, in further explorations, researchers need to take into account that although there are variations of LSC (regionalisms); indeed, the signs may not always be correct in the way the participants may assert. For this reason, researchers need to work together with experienced teachers in the deaf context to maintain standardized signs. Because the discussion about the aforementioned situation (with the pioneer teacher of sign languages and the interpreter teacher) revealed that some of those 'variations' revealed during the pilotage are modifications or adaptations that LSC users make to the signs unconsciously, due to the lack of experienced users of LSC who guide them (deaf learners-beginners) through their learning process. Therefore, it is strongly recommended for future research work to continue exploring regionalism of LSC to acknowledge to what extent it influences the design and creation of linguistic didactic material for the deaf community, since those variations of signs and meanings may constrain the learning of the target language.

8 Primary Sources

Videos Formacion profesoral UDES- See **Annex B**

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Annexes

Annex A. Piloting Permission Letter

Bucaramanga, octubre 16 de 2024



Estimado director
Elías Vergel
Escuela Normal Superior de Bucaramanga
ENSB

Asunto:

Solicitud de autorización para Pilotaje de Material Didáctico.

Nos dirigimos a ustedes, Rai Basetsane Claro y Elizabeth Tatiana Silva, estudiantes de la Universidad Industrial de Santander, en Bucaramanga. Actualmente, cursamos el noveno semestre del programa de Licenciatura en Lenguas Extranjeras con Énfasis en inglés.

En el marco de este programa, estamos desarrollando una investigación que busca diseñar un Diccionario Visual Introductorio al idioma inglés, adaptado a las necesidades de los estudiantes sordos, con el fin de facilitar la enseñanza y el aprendizaje de esta lengua a la población sorda.

Cabe resaltar que este trabajo de investigación se realiza, con el fin de obtener el título profesional como profesores de lengua extranjera. Por lo tanto, es de nuestro interés contar con su autorización única y exclusivamente con fines académicos e investigativos para llevar a cabo el pilotaje con los estudiantes sordos de su institución con el apoyo de los profesores encargados.

Este permiso marcaría el inicio de la creación de soluciones viables no solo para la falta de material didáctico adaptado a las necesidades de esta comunidad; sino también de los docentes que lo puedan requerir.

Agradecemos de antemano su atención y colaboración.

Rai Basetsane Claro Cod. Estudiante: 2122000
Elizabeth Tatiana Silva Cod. Estudiante: 2152504
Estudiantes de Licenciatura en Lenguas Extranjeras con Énfasis en inglés
Universidad Industrial de Santander

Annex B. Vocabulary – Videos ‘Formacion Profesorial’.**VOCABULARIO DE VIDEOS FORMACIÓN PROFESSORIAL UDES**

Normas generales: Enseñar, Saber, No sé, Gustar, Querer, Profesor, Estudiante, Contacto, Sordo, Oyente, Hipoacúsico, Necesitar, Importante, Otra vez, No puedo, Si puede, Tranquilo, Cansado, También, Descansar, Siempre, Recordar, Grosería, Obedecer, Desobediente, Pereza, Molestar, Confuso, No importa, Tener, Clase, Curso, Palabra, Frase, Letra, Sí, No

Pronombres posesivos: Mi, Mío, Suyo, Tuyo

Pronombres personales: Yo, Tu, Él, Ella, Ud., Uds., Ellos, Ellas, Nosotros, Todos

Interrogativos: quien que, cuando, donde, por donde, para que, porque, donde vive, cuanto, como. Cual (x3), que le pasa, que paso, que es eso, cuál de los dos.

Vocabulario de tiempo 1: Los días de la semana, lunes, martes, miércoles, jueves, viernes sábado, domingo,

Vocabulario de tiempo 2: Día, Semana, Mes, Año, fecha, Fin de semana, Fin de mes, Festivo, Ayer, Hoy, Mañana, Pasado mañana, Anteayer, Todo el día, Todos los días, Todos los ..., Semana santa, Vacaciones Pronto, De pronto, En la mañana, En la tarde, En la noche, Próximo, Temprano, Urgente, Ocupado, Ya, Tarde, Más tarde, Tal vez, Pasado, Terminar

Vocabulario de tiempo 3: Hace poco, Hace poquito, Hace tiempo, Seguir, Hasta, De día, De noche, Medio día, Ahora, Algunos, Antes, Después, Atrasada, Esperar, Demora, Casi, Madrugada, Amanecer, Fiesta, Cumpleaños, Hora, Minuto, Sueño, Por eso, Primero, Último, Viejo (persona), Viejo (cosas), Nuevo (persona), Nuevo (cosas)

Meses del año; enero, febrero, marzo, abril, mayo, junio, julio, agosto, septiembre, octubre, noviembre, diciembre)


Miembros de la familia: papá, mamá, hijo, hija, hermano, abuelo, tío, sobrino, primo, nieto. Suegro, yerno, nuera, padrino, madrina, esposo, novio, amigo, bebé, Niño, hombre, mujer, enamorar, casado, soltero, joven, viejo, amante, unión libre, luna de miel, embarazada, nacer, bautizar, matrimonio, católico, civil, cristiano, judío, hacer el amor, terminar relación, separación, divorcio, viudo, muerte, vivo, mayor, menor

Verbos: comer, jugar, caminar, correr, llorar, leer, pensar, bañar, explicar, reír, saltar, dialogar, pelear, invitar, estudiar, dormir, felicitar, mostrar, cantar, acompañar, buscar, regañar, escuchar, deber, dejar, hacer, decir, encontrar, escribir, esperar, contar, soñar, cambiar, sentir, vivir, conocer, dibujar, bailar, viajar, visitar, pintar, recortar, traer, tomar, mirar, terminar, perder.

Annex C. Modules – Maya Curricular A1.**Level A1: (Beginners)**

Grado/Module	Module 1	Module 2	Module 3	Module 4
Transición (0)	<ul style="list-style-type: none"> • Numbers (1 to 3) • Colors (blue, yellow, red) 	<ul style="list-style-type: none"> • Numbers (4 and 5) • Colors (green, orange, purple) 	<ul style="list-style-type: none"> • Numbers (6 to 8) • Animals 	<ul style="list-style-type: none"> • Numbers (9 and 10) • Family • Months • Days of the week
Primero (1st)	<ul style="list-style-type: none"> • Personal Pronouns (I, you, he, she, it, they) • Possessive Pronouns (my and your) 	<ul style="list-style-type: none"> • Possessive Pronouns (his and her) 		
Segundo (2nd)	<ul style="list-style-type: none"> • Healthy food (Fruits and Vegetables) 	<ul style="list-style-type: none"> • Animals 		

Annex D. Questionnaire for Professionals.

	<p><i>Cuestionario para la Creación de un Diccionario Visual para la Enseñanza del Inglés a Población Sorda</i></p>	<p>ELABORADO POR: RAI BASETSANE CLARO F. ELIZABETH TATIANA SILVA</p>
	<p>CUESTIONARIO PARA LOS PROFESIONALES</p>	<p>Fecha: 01-10-2024</p>
		<p>Revisión: 2</p>
		<p>Página: 1 de 1</p>

Introducción.

Este cuestionario forma parte de la investigación orientada a la creación y diseño de un diccionario visual como material didáctico para la enseñanza del inglés escrito a la población sorda de Colombia. Su motivo es recolectar información por parte de los profesionales en el área sobre el contenido y diseño del material de acuerdo a los siguientes temas:

- Contenido lingüístico: temas por categorías
- Cantidad de contenido: cantidad de palabras.
- Forma del lenguaje: por oraciones o palabras sueltas.
- Diseño del material: uso de imágenes, fuentes, tamaño del material, entre otras.

Tenga en cuenta las siguientes características de la población para responder este cuestionario:

Institución educativa: Escuela Normal Superior de Bucaramanga.

Cantidad de mujeres: _____

Cantidad de hombres: _____

Rango de edad de los estudiantes: de 4 a 19 años

Grados académicos: transición a undécimo (0-11)

I. DATOS DEL ENCUESTADO

1. **Nombre:** _____.

2. **Título profesional:** _____.

	Interprete
	Profesor de: _____
	Otra: _____

3. **Funciones que desempeña en o con la comunidad sorda:** _____
 _____.

4. **Años de experiencia laborando con población sorda:** _____
 _____.

5. **Rol:** _____.

II. CONTENIDO:

1. Según las características de los participantes, organice los temas sugeridos en orden de prioridad de 1 a 12, siendo 1 el más relevante, y 12 el menos relevante:

	Meses del año (enero - diciembre)
	Miembros de la familia (papá, mamá, hijo, hija, abuelo, abuela)
	Días de la semana (lunes, martes, miércoles, jueves, viernes, sábado, domingo)
	Colores (amarillo, azul, rojo, verde, naranja, rosado)
	Pronombres personales (yo, tu, el, ella, ellos, ellas, nosotros)
	Pronombres posesivos (mío, suyo, tuyo)
	Números (1-10)
	Animales (perro, gato, conejo, pájaro, león, elefante, ratón, delfín, pez, hormiga)
	Comida: (hamburguesa, perro, pizza, banano, naranja, carne, pollo, huevo, ensalada, zanahoria, cebolla, espagueti, helado, jugo, galleta, ponqué)
	Otra: _____

III. DISEÑO DEL MATERIAL:

Basado en su experiencia escoja de las siguientes opciones la que considere más adecuada para cada aspecto relacionado con el *diseño* del Diccionario Visual seleccionándolo con una X.

1. Tamaño de la Hoja

<input type="checkbox"/>	Media carta
<input type="checkbox"/>	Carta
<input type="checkbox"/>	Oficio

2. Estilo y tamaño de letra para el título

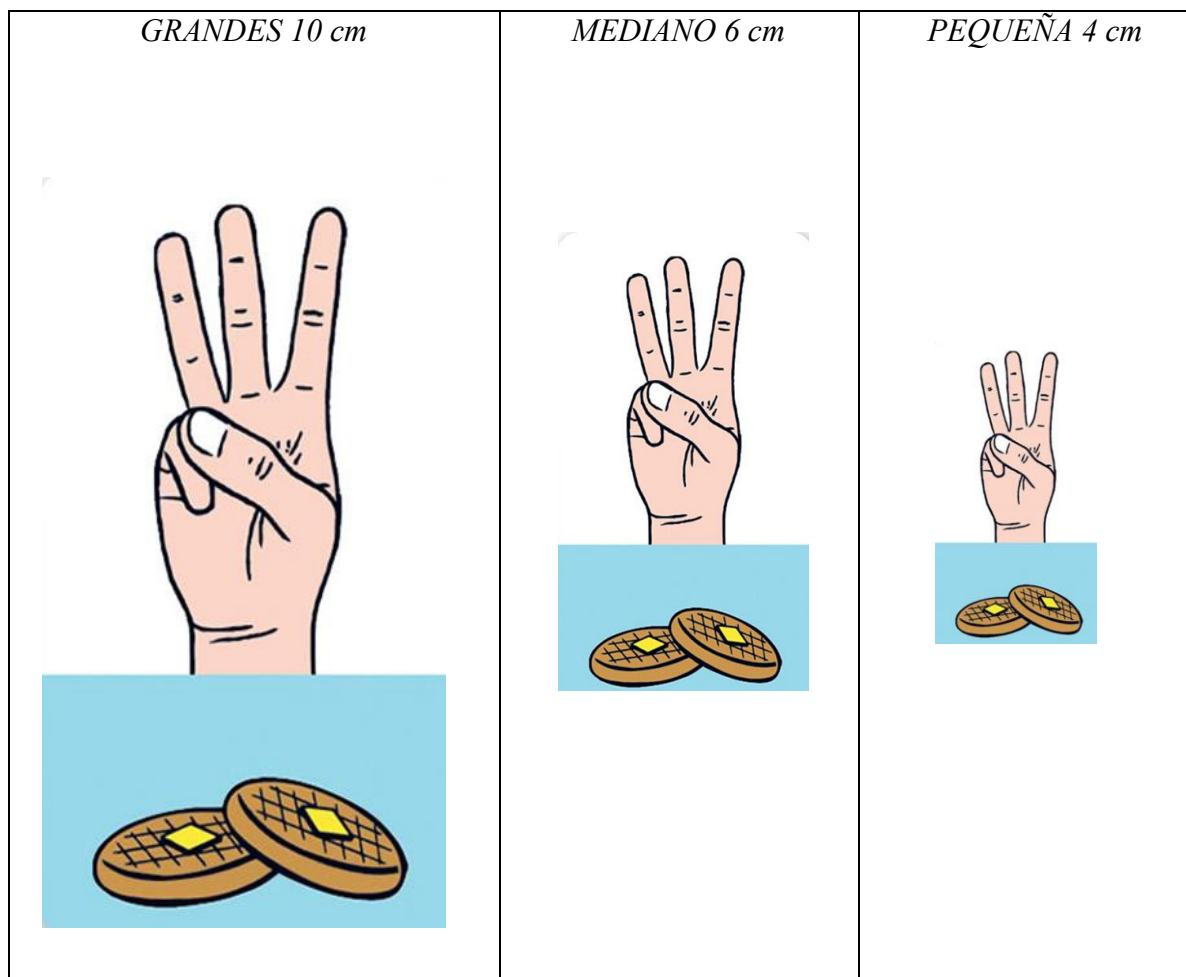
Tamaño \ Tipo	24	26	36
ARIAL	Título	Título	Título
CAMBRIA	Título	Título	Título
COMICS SANS	Título	Título	Título

3. Estilo y tamaño del contenido general

Tamaño \ Tipo	16	18	20
ARIAL	Título	Título	Título
CAMBRIA	Título	Título	Título
COMICS SANS	Título	Título	Título


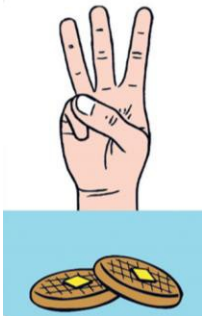

INTRODUCTORY VISUAL DICTIONARY WRITTEN ENGLISH-LSC

4. Uso de imágenes



INTRODUCTORY VISUAL DICTIONARY WRITTEN ENGLISH-LSC

5. Localización de texto

 <p>Texto en español Texto en inglés</p>	 <p>Texto en español Texto en inglés</p>	<p>Texto en español/inglés</p>  <p>Texto en español/inglés</p>
---	---	---

IV. PRESENTACIÓN DEL CONTENIDO

1. ¿En total, cuantas palabras considera que debe incluir el Diccionario Visual como material introductorio al aprendizaje de lengua inglesa?

<input type="checkbox"/>	1-10
<input type="checkbox"/>	11-20
<input type="checkbox"/>	21-30
<input type="checkbox"/>	31-40

2. Cree usted que el Vocabulario debe presentarse:

<input type="checkbox"/>	Palabra Sola: Palabras individuales con dibujo, seña y escritura correspondiente.
<input type="checkbox"/>	Palabra en contexto: Palabras en una oración acompañada de la seña y traducción en español - inglés.

3. ¿Cuál considera que es el mejor orden para presentar el contenido del diccionario visual?

<input type="checkbox"/>	Palabra en inglés, imagen, seña, y palabra en español
<input type="checkbox"/>	Palabra en español, seña, imagen y palabra en inglés.
<input type="checkbox"/>	Imagen, seña, Palabra en español y palabra en inglés.
<input type="checkbox"/>	Imagen, seña, Palabra en Ingles y palabra en español


V. SUGERENCIAS

Si tiene alguna sugerencia sobre el contenido en inglés que las personas sordas deban conocer (diferente al listado mencionado) o sobre algún otro asunto relacionada con el aprendizaje de lenguas extranjeras para la comunidad sorda, coméntenlo aquí.

¡Muchas Gracias por su participación!

Annex E. Sample of Rubric for Piloting of Content.



Colors
Colores



9



Colors
Colores

Yellow



Amarillo




Blue



Azul

10



Personal Pronouns
Pronombres Personales



11



Possessive Pronouns
Pronombres Posesivos

My



Mi



Your




Suyo


12

Annex F. Rubric for the Pilotage of the Design.





**“Diseño de un Diccionario Visual de Ingles
Escrito y Lengua de Señas Colombiana para
estudiantes sordos”**






Edad: _____

Padres : Sordos ____ Oyentes ____

 		
Color		
Entiendo la letra		
El tamaño de la letra		
El tamaño de las imagenes		
Carga visual		
Facilidad de entender		

60

Annex G. Observation Format for Professionals from Deaf Community.

	<i>Formato de Observación para Pilotaje de Diseño un Diccionario Visual para la Enseñanza del Inglés a Población Sorda.</i>	ELABORADO POR: RAI BASETSANE CLARO F. ELIZABETH TATIANA SILVA
	FORMATO PARA LOS PROFESIONALES	Fecha: 01-10-2024
		Revisión: 2
		Página: 1 de 1

Agradecemos su participación en el pilotaje del prototipo del Diccionario Visual y solicitamos diligenciar la siguiente tabla con las observaciones percibidas en los estudiantes, teniendo en cuenta los criterios de la siguiente tabla:

Criterios de Observación	Notas de observación
Actitud frente al material	
Actitud frente al pilotaje	
Interacción con el material	
Dificultades para realizar el pilotaje	

Notas Adicionales: _____

Annex H. Observation Format for Researchers.

	<p><i>Formato de Observación para Pilotaje de Diseño un Diccionario Visual para la Enseñanza del Inglés a Población Sorda.</i></p>	<p>ELABORADO POR: RAI BASETSANE CLARO F. ELIZABETH TATIANA SILVA</p>
	<p>FORMATO PARA LOS INVESTIGADORES</p>	<p>Fecha: 01-10-2024</p>
		<p>Revisión: 2</p>
		<p>Página: 1 de 1</p>

Escriba los detalles observados en los participantes sordos durante el pilotaje del prototipo del Diccionario Visual, teniendo en cuenta los criterios de la siguiente tabla:

Criterios de Observación	Notas de observación
Actitud frente al material	
Actitud frente al pilotaje	
Interacción con el material	
Dificultades para realizar el pilotaje	

Notas Adicionales: _____

Annex I. Thematic Analysis of Data - at Convenience

Criteria/Themes	Literature	Semi-structure and informal interviews	Questionnaires
How deaf learners learn	<ul style="list-style-type: none"> -Visual learners -Learning strength is the sight -Visual aids support for meaning - Visual aids support for context - CSL (L1) mean of communication -Isolated words -lack of elements in the CSL linguistic system -No to overload the visual channel 	<ul style="list-style-type: none"> -Read the literature form ‘Cultura Sorda’ - Read Carlos Skliar -CSL is the native language -Access to communication is given by CSL and Spanish (L2) -Illustrations are indispensable learning tools - Clear meaning and context must be given in visual aids - Unnecessary elements need to be omitted to avoid misinterpretation. -visual aids need to be the more similar to realia. 	
Limitations for learning	<ul style="list-style-type: none"> - Foreign language teachers are not trained in learners’ L1 - CSL Teachers don’t know English - Lack of adapted lessons -lack of adapted material -Lack of 	<ul style="list-style-type: none"> - Not early access to education - Diverse classrooms (age, context, linguistic level proficiency) - CSL Teachers don’t know English 	

<p>How to design according to the teachers.</p>	<p>-In writing, some elements are omitted due to the lack of existence in CSL linguistic system.</p>	<ul style="list-style-type: none"> - Simple and direct - Attractive - Take care of - Material that catches attention - Use of Colors - Use of realia for the signs - Include the hand configuration - Hand configuration is crucial - Big lettering - Easy to read Avoid confusing similar graphemes. 	<p>All the vocabulary is accurate and necessary.</p> <p>Estas palabras (familia, colores, números, días de la semana, meses del año, pronombres personales, pronombres posesivos, animales y comida) y otras palabras son importantes.</p> <p>-4 – 6 cm</p>
<p>How to design according to the theory</p>	<ul style="list-style-type: none"> -Use of blue color influence and benefit the learning process -Blue color increases understanding -Blue. 	<ul style="list-style-type: none"> -Revise the suggestions form MINTIC - Revise psychology of colors - Be careful with the amount of content -Contrast the theory with the reality 	

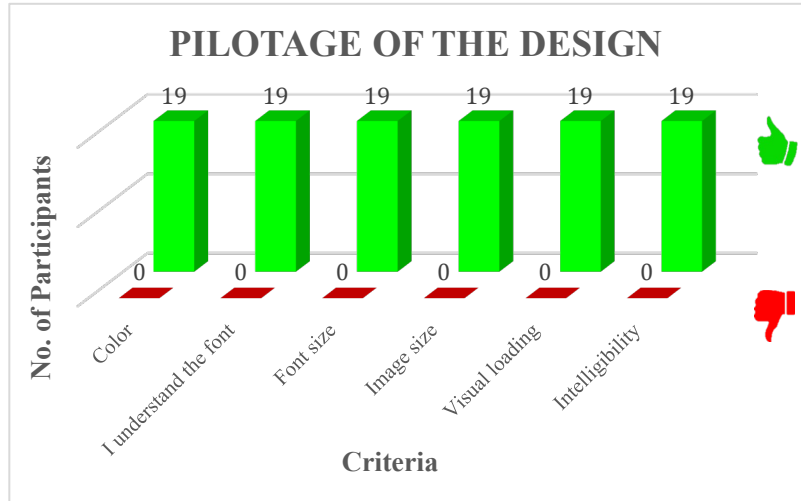
<p>Adaptations according to the theory</p>	<p>Pyramidal Theory Order of importance.</p>	<p>-Be careful not to frustrate deaf learners -English is the 3rd language for them -They need to consolidate L1 and L2 before starting to learn L3</p>	<p>English CSL</p>
<p>Adaptations according to the teachers</p>	<p>Use of L1 and L2 Use of visual aids Use of clear meaning Use of clear context</p>	<p>-You as English teachers know what is most important to teach. - You know what is more difficult -You know what is Basic - You know what is necessary - Deaf learners can learn anything when it is presented in accurate forms. -Include the CSL hand configuration -Include the list of symbols of the hand configuration</p>	<p>Big and medium Font size</p>
<p>Suggestions from the pilotage</p>	<p>Pilotaje del Contenido Las palabras están bien, se entienden, pero tengan en cuenta que los significados de las señas cambian de acuerdo con la posición de los dedos:</p> <ul style="list-style-type: none"> - ‘Meses’ se parece a ‘Positivo’ - voltear el dedo - ‘Pollito’ se parece a ‘Pequeño’ – le falta el pico - ‘Pájaro’ la imagen parece un ‘Colibri’ - cambiar la imagen - ‘Mono’ (dos manos en los lados) se parece a ‘pereza’ - mejor usen la seña de mono que tiene una mano en la cabeza y otra en la barriga. 		

	<ul style="list-style-type: none">- En todos los meses del año se mueve la mano en forma circular, si están bien las señas, pero falta ponerle el movimiento circular- Los dedos de los números 6,7,8,9 deberían ponerlos también doblados, porque solo con la flecha no se entiende bien como es que se hace.- Es mejor cambiar la seña de ‘perro caliente’ por qué esa seña (mano horizontal hacia arriba atrapando dedo índice de la otra mano) tiene un doble sentido. Mejor hacer esta seña (mano horizontal hacia arriba en posición de coger el perro y la otra mano echando salsa en zigzag). <p>Pilotaje del diseño</p> <ul style="list-style-type: none">- -El color es muy bonito- -Las imágenes están bien, se distinguen bien- - Las señas también se entienden- -la letra se entiende y se lee bien, pero es mejor usar ‘Century Gothic’ porque los estudiantes confunden la letra ‘a’ con el ‘6’, por eso con ellos en el colegio intentamos manejar la escritura en cursiva. En la letra Scribe de lo digital se parecen muchas letras y mejor ‘Century Gothic’.- -Estos proyectos deben seguir haciéndose, si trabajamos juntos sordos y oyentes podemos hacer más para poder crecer.- - ¿Cuándo podemos usar este libro para aprender?- - ¿Nos pueden dejar el libro para practicar?- - ¿Cuándo vienen otra vez?
--	--

Annex J. Data Collection - Inferential Analysis.

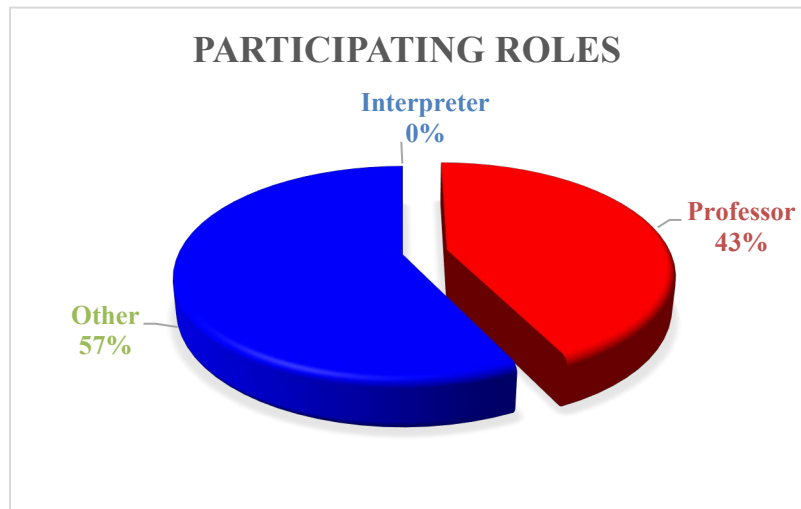
1. Pilotage of the design

Criteria	No. of Participants
Color	19
I understand the font	19
Font size	19
Image size	19
Visual loading	19
Intelligibility	19



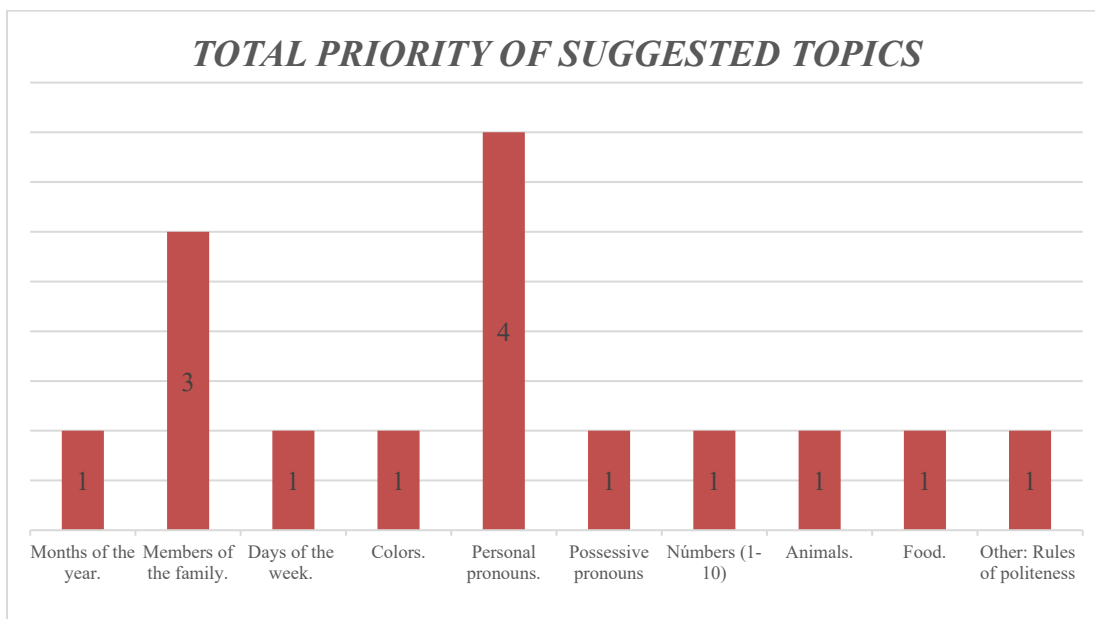
2. Participating roles.

ROL	TOTAL
Interpreter	0
Professor	3
Other	4



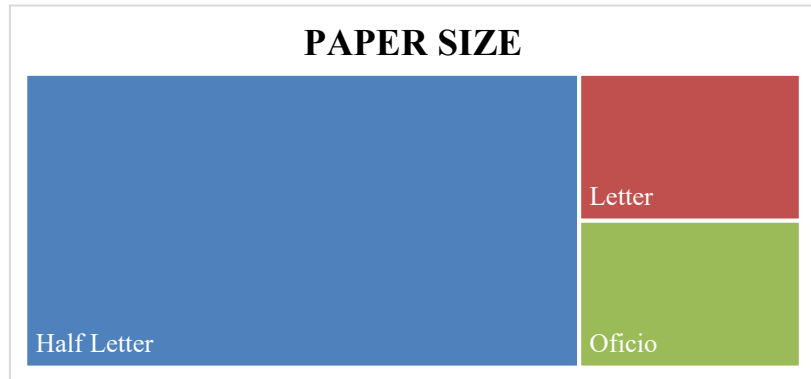
3. Priority of suggested topics

PRIORITY OF SUGGESTED TOPICS								
SUGGESTED TOPICS \ PRIORITY	PAR TICI PAN T 1	PAR TICI PAN T 2	PAR TICI PAN T 3	PAR TICI PAN T 4	PAR TICI PAN T 5	PAR TICI PAN T 6	PAR TICI PAN T 7	TOTAL
	Months of the year.	9	1	6	4	6	3	
Members of the family.	1	1	4	3	7	1	3	3
Days of the week.	8	1	5	6	5	2	6	1
Colors.	2	1	7	5	4	4	8	1
Personal pronouns.	7	1	2	1	1	9	1	4
Possessive pronouns	6	1	3	2	2	8	2	1
Numbers (1-10)	3	1	0	7	3	5	4	1
Animals.	4	1	9	8	8	6	7	1
Food.	5	1	8	9	9	7	9	1
Other: Rules of politeness	0	0	1	0	0	0	0	1



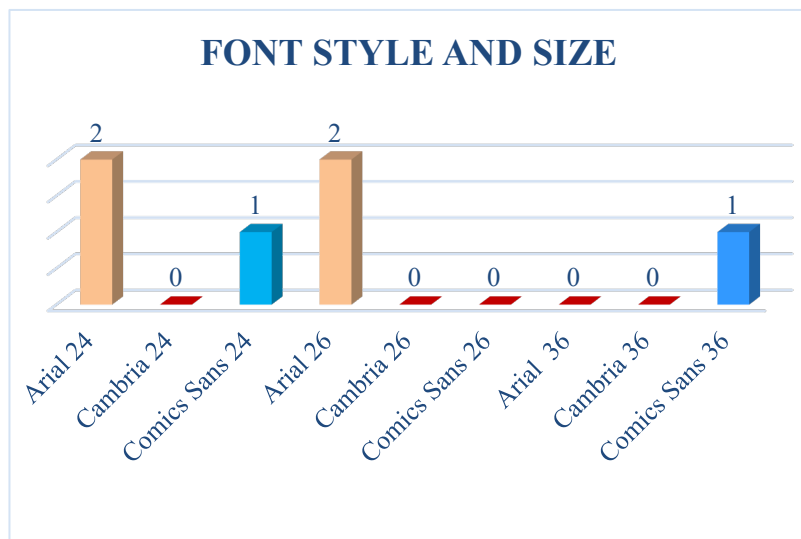
4. Paper size

SHEET SIZE	TOTAL
Half Letter	5
Letter	1
Oficio	1



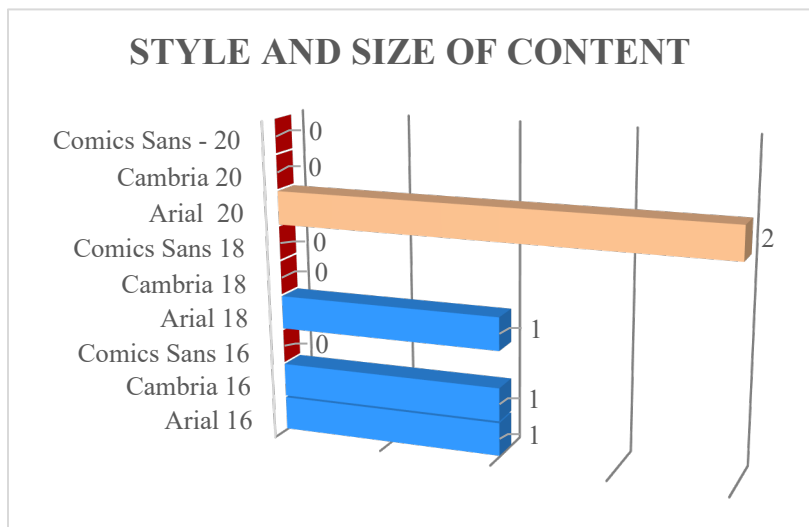
5. Font style and size.

STYLE AND SIZE.	TOTAL
Arial 24	2
Cambria 24	0
Comics Sans 24	1
Arial 26	2
Cambria 26	0
Comics Sans 26	0
Arial 36	0
Cambria 36	0
Comics Sans 36	1



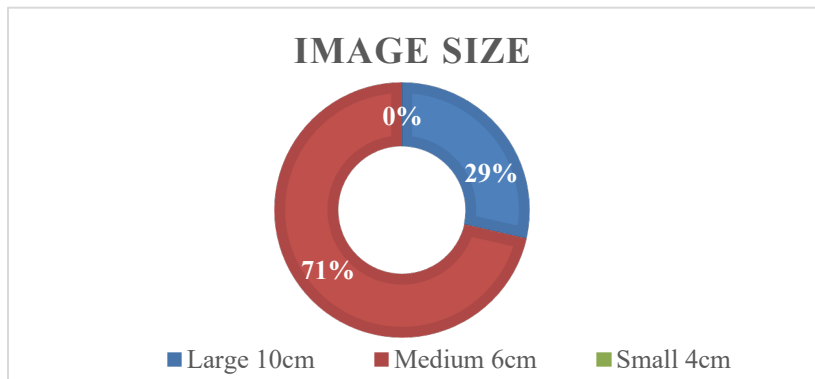
6. Style and size of content.

STYLE AND SIZE	TOTAL
Arial 16	1
Cambria 16	1
Comics Sans 16	0
Arial 18	1
Cambria 18	0
Comics Sans 18	0
Arial 20	2
Cambria 20	0
Comics Sans 20	0



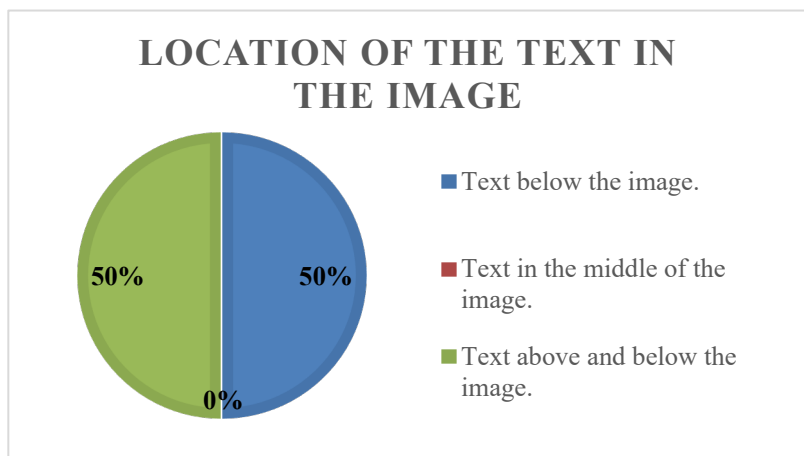
7. Image size

SIZE	TOTAL
Large 10 cm	2
Medium 6 cm	5
Small 4 cm	0



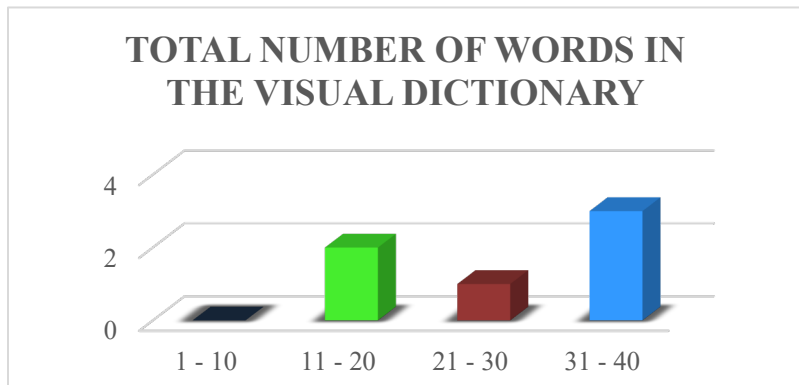
8. Location of the text in the image

POSITION	TOTAL
Text below the image.	3
Text in the middle of the image.	0
Text above and below the image.	3



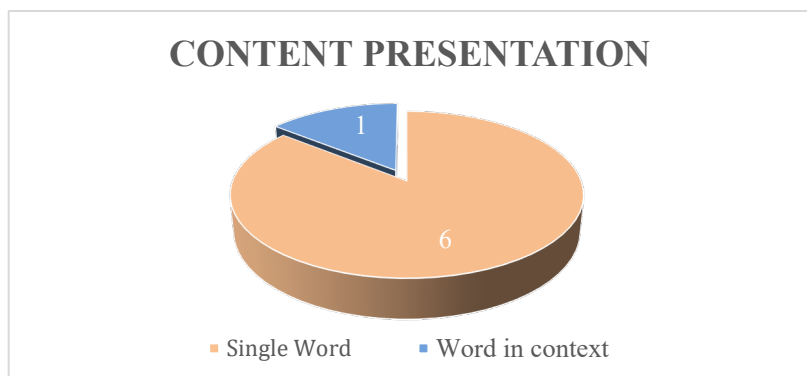
1. Total number of words in the visual dictionary.

NUMBER OF WORDS	TOTAL
1 - 10	0
11 - 20	2
21 - 30	1
31 - 40	3



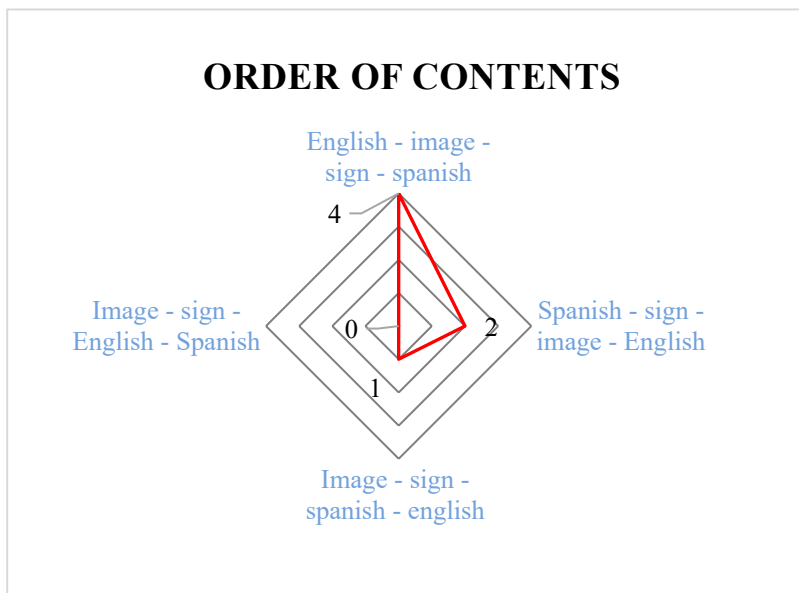
2. Content presentation

MEANING OF THE WORD	TOTAL
Single Word	6
Word in context	1



3. Order of contents

ORDER OF CONTENTS	TOTAL
English - image - sign - spanish	4
Spanish - sign - image - English	2
Image - sign - spanish - english	1
Image - sign - English - Spanish	0



Annex K. Content Selection Clustering.

1. Content Selection Criteria

Category	Languages			Criteria				Conclusion
	English	Exists in L2 (Spanish)	Exists in L1 (LSC)	Equivalence	CEFR (A1) Malla Curricular	Confusing	Suitable	
Topic	Vocabulary L3	Yes	Yes	Yes	Yes	No	Yes	Yes
		Yes	Yes	Yes	Yes	Yes	No	No
		Yes	Yes	Yes	No	No	No	No
		Yes	Yes	Yes	Yes	Yes	No	No
		Yes	No	Yes	Yes	Yes	No	No

2. Family.

Category	Languages			Criteria				Conclusion
	English	Español	LSC	Equivalence	CEFR (A1) Malla Curricular	Confusing	Convenience	
Family	Mother	Mamá	Yes	Yes	Yes	No	Yes	Yes
	Father	Papá	Yes	Yes	Yes	No	Yes	Yes
	Grandfather	Abuelo	Yes	Yes	Yes	No	Yes	Yes
	Grandmother	Abuela	Yes	Yes	Yes	No	Yes	Yes
	Brother	Hermano	Yes	Yes	Yes	No	Yes	Yes
	Sister	Hermana	Yes	Yes	Yes	No	Yes	Yes

3. Colors

Category	Languages			Criteria				Conclusion
	English	Español	LSC	Equivalence	CEFR (A1) Malla Curricular	Confusing	Convenience	
Colors	Yellow	Amarillo	Yes	Yes	Yes	No	Yes	Yes
	Blue	Azul	Yes	Yes	Yes	No	Yes	Yes
	Red	Rojo	Yes	Yes	Yes	No	Yes	Yes
	Orange	Anaranjado	Yes	Yes	Yes	No	Yes	Yes
	Black	Negro	Yes	Yes	Yes	No	Yes	Yes
	Green	Verde	Yes	Yes	Yes	No	Yes	Yes

4. Numbers

Category	Languages			Criteria				Conclusion
	English	Español	LSC	Equivalence	CEFR (A1) Malla Curricular	Confusing	Convenience	
Numbers	One	Uno	Yes	Yes	Yes	No	Yes	Yes
	Two	Dos	Yes	Yes	Yes	No	Yes	Yes
	Three	Tres	Yes	Yes	Yes	No	Yes	Yes
	Four	Cuatro	Yes	Yes	Yes	No	Yes	Yes
	Five	Cinco	Yes	Yes	Yes	No	Yes	Yes
	Six	Seis	Yes	Yes	Yes	No	Yes	Yes
	Seven	Siete	Yes	Yes	Yes	No	Yes	Yes
	Eight	Ocho	Yes	Yes	Yes	No	Yes	Yes
	Nine	Nueve	Yes	Yes	Yes	No	Yes	Yes
	Zero	Cero	Yes	Yes	Yes	No	Yes	Yes

5. Months

Category	Languages			Criteria				Conclusion
	English	Español	LSC	Equivalence	CEFR (A1) Malla Curricular	Confusing	Convenience	
Months of the year	January	Enero	Yes	Yes	Yes	No	Yes	Yes
	February	Febrero	Yes	Yes	Yes	No	Yes	Yes
	March	Marzo	Yes	Yes	Yes	No	Yes	Yes
	April	Abril	Yes	Yes	Yes	No	Yes	Yes
	May	Mayo	Yes	Yes	Yes	No	Yes	Yes
	June	Junio	Yes	Yes	Yes	No	Yes	Yes
	July	Julio	Yes	Yes	Yes	No	Yes	Yes
	August	Agosto	Yes	Yes	Yes	No	Yes	Yes
	September	Septiembre	Yes	Yes	Yes	No	Yes	Yes
	October	Octubre	Yes	Yes	Yes	No	Yes	Yes
	November	Noviembre	Yes	Yes	Yes	No	Yes	Yes
	Dicember	Diciembre	Yes	Yes	Yes	No	Yes	Yes

6. Days.

Category	Languages			Criteria				Conclusion
	English	Español	LSC	Equivalence	CEFR (A1) Malla Curricular	Confusing	Convenience	
Days of the week	Monday	Lunes	Yes	Yes	Yes	No	Yes	Yes
	Tuesday	Martes	Yes	Yes	Yes	No	Yes	Yes
	Wednesday	Miércoles	Yes	Yes	Yes	No	Yes	Yes
	Thursday	Jueves	Yes	Yes	Yes	No	Yes	Yes
	Friday	Viernes	Yes	Yes	Yes	No	Yes	Yes
	Saturday	Sábado	Yes	Yes	Yes	No	Yes	Yes
	Sunday	Domingo	Yes	Yes	Yes	No	Yes	Yes

7. Food.

Category	Languages			Criteria				Conclusion
	English	Español	LS C	Equivalence	CEFR (A1) Malla Curricular	Confusing	Convenience	
Food	Banana	Banano	Yes	Yes	Yes	No	Yes	Yes
	Orange	Naranja	Yes	Yes	Yes	No	Yes	Yes
	Meat	Carne	Yes	Yes	Yes	No	Yes	Yes
	Chicken	Pollo	Yes	Yes	Yes	No	Yes	Yes
	Egg	Huevo	Yes	Yes	Yes	No	Yes	Yes
	Salad	Ensalada	Yes	Yes	Yes	No	Yes	Yes
	Carrot	Zanahoria	Yes	Yes	Yes	No	Yes	Yes
	Onion	Cebolla	Yes	Yes	Yes	No	Yes	Yes
	Spaghetti	Espagueti	Yes	Yes	Yes	No	Yes	Yes
	Hamburger	Hamburguesa	Yes	Yes	Yes	No	Yes	Yes
	Ice cream	Helado	Yes	Yes	Yes	No	Yes	Yes
	Juice	Jugo	Yes	Yes	Yes	No	Yes	Yes
	Cookie	Galleta	Yes	Yes	Yes	No	Yes	Yes
	Cake	Ponque	Yes	Yes	Yes	No	Yes	Yes
	Hot dog	Perro	Yes	Yes	Yes	No	Yes	Yes
Pizza	Pizza	Yes	Yes	Yes	No	Yes	Yes	

8. Animals.

Categor y	Languages			Criteria				Concl usion
	English	Español	LSC	Equival ence	CEFR (A1) Malla Curricular	Confusi ng	Convenie nce	
Animals	Spider	Araña	Yes	Yes	Yes	No	Yes	Yes
	Horse	Caballo	Yes	Yes	Yes	No	Yes	Yes
	Pig	Cerdo	Yes	Yes	Yes	No	Yes	Yes
	Rabbit	Conejo	Yes	Yes	Yes	No	Yes	Yes
	Snake	Culebra	Yes	Yes	Yes	No	Yes	Yes
	Elefant	Elefante	Yes	Yes	Yes	No	Yes	Yes
	Cat	Gato	Yes	Yes	Yes	No	Yes	Yes
	Giraffe	Jirafa	Yes	Yes	Yes	No	Yes	Yes
	Lion	León	Yes	Yes	Yes	No	Yes	Yes
	Monkey	Mico	Yes	Yes	Yes	No	Yes	Yes
	Bird	Pájaro	Yes	Yes	Yes	No	Yes	Yes
	Dog	Perro	Yes	Yes	Yes	No	Yes	Yes
	Fish	Pez	Yes	Yes	Yes	No	Yes	Yes
	Chicken	Pollo	Yes	Yes	Yes	No	Yes	Yes
	Mouse	Raton	Yes	Yes	Yes	No	Yes	Yes
Cow	Vaca	Yes	Yes	Yes	No	Yes	Yes	


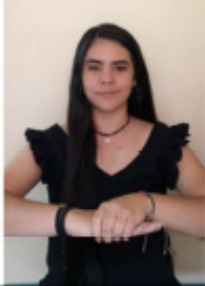



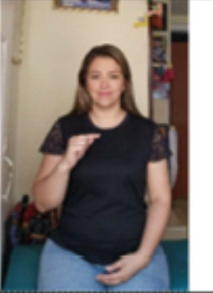

9. Possessive Pronouns.

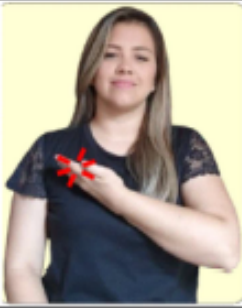
Category	Languages			Criteria				Conclusion
	English	Español	LSC	Equivalencia	CEFR (A1) Malla Curricular	Confusión	Conveniencia	
Possessive pronouns	My	Mi	Yes	Yes	Yes	No	Yes	Yes
	Your	Suyo	Yes	Yes	Yes	No	Yes	Yes
	His	De él	No	Yes	Yes	Yes	No	No
	Her	De ella	No	Yes	Yes	Yes	No	No
	Theirs (A2)	De ellos	No	Yes	Yes	Yes	No	No
	Ours (A2)	Nuestro	Yes	Yes	Yes	Yes	No	No

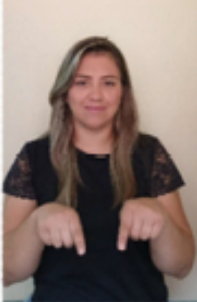

10. Personal Pronouns.


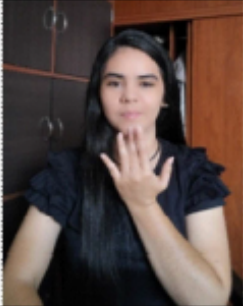




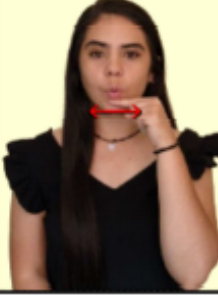
Category	Languages			Criteria				Conclusion
	English	Español	LSC	Equivalencia	CEFR (A1) Malla Curricular	Confusión	Conveniencia	
Personal pronouns	I	Yo	Yes	Yes	Yes	Yes	Yes	Yes
	You	Tú	Yes	Yes	Yes	No	Yes	Yes
	He	Él	Yes	Yes	Yes	No	Yes	Yes
	She	Ella	Yes	Yes	Yes	No	Yes	Yes
	They	Ellos	Yes	Yes	No	Yes	No	No
	You	Ustedes	Yes	Yes	Yes	Yes	No	No
	We	Nosotros	Yes	Yes	Yes	No	Yes	Yes
	It	Eso	No	No	Yes	Yes	No	No

Annex L. Photo.




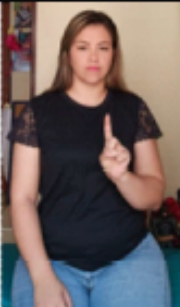

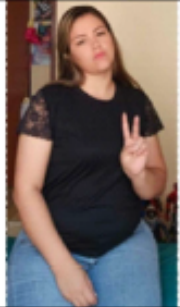

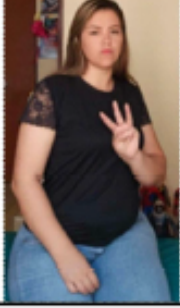

		<h1>PHOTOGRAPHIC RECORD</h1>	
Category: Front Page		Registry No 1	
			
<p>Figure 1: "English" sign in LCS. Left image original photo and right image final edited photo.</p>			
			
			
<p>Figura 2: Rótulo «LSC» en LSC. Left image original photo and right image final edited photo.</p>			
N.A		N.A	
N.A			
N.A		N.A	
N.A			


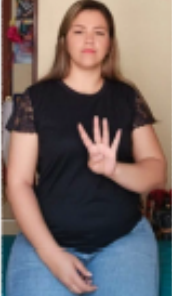







		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Family		Registry No 2	
			
<p style="text-align: center;">Figure 3: “Family” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 4: “Mom” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 5: “Father” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 6: “Brother” sign in LSC. Left image original photo and right image final edited photo.</p>			




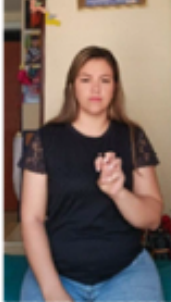

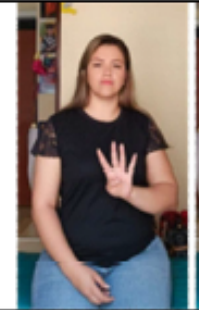
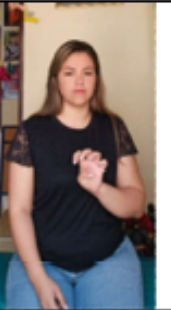

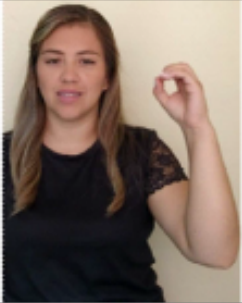

		PHOTOGRAPHIC RECORD	
Category: Photographic Attachment: Family			Registry No 3
			
<p>Figure 7: "Sister" sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p>Figure 8: "Grandfather" sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p>Figure 9: "Grandmother" sign in LSC. Left image original photo and right image final edited photo.</p>			
N.A		N.A	
N.A			

		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Colors			Registry No 4
			
<p style="text-align: center;">Figure 10: “Colors” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 11: “Yellow” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 12: “Blue” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 13: “Red” sign in LSC. Left image original photo and right image final edited photo.</p>			



 PHOTOGRAPHIC RECORD	
Category: Photographic Attachment: Colors	Registry No 5
	
<p>Figure 14: "Green" sign in LSC. Left image original photo and right image final edited photo.</p>	
	
<p>Figure 15: "Orange" sign in LSC. Left image original photo and right image final edited photo.</p>	
	
<p>Figure 16: "Black" sign in LSC. Left image original photo and right image final edited photo.</p>	
<p>N.A</p>	<p>N.A</p>
<p>N.A</p>	

		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Numbers			Registry No 6
			
<p style="text-align: center;">Figure 17: "Numbers" sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 18: Sign of "1" in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 19: Sign of "2" in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 20: Sign of "3" in LSC. Left image original photo and right image final edited photo.</p>			




		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Numbers			Registry No 7
			
<p style="text-align: center;">Figure 21: Sign of "4" in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 22: Sign of "5" in LSC. Left image original photo and right image final edited photo..</p>			
			
<p style="text-align: center;">Figure 23: Sign of "6" in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 24: Sign of "7" in LSC. Left image original photo and right image final edited photo.</p>			

 		PHOTOGRAPHIC RECORD	
Category: Photographic Attachment: Numbers			Registry No 8
 			
Figure 25: Sign of "8" in LSC. Left image original photo and right image final edited photo.			
 			
Figure 26: Sign of "9" in LSC. Left image original photo and right image final edited photo.			
			
Figure 27: "0" sign in LSC. Left image original photo and right image final edited photo.			
N.A		N.A	
N.A			

		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Months of the Year		Registry No 9	
			
<p style="text-align: center;">Figure 28: “Months” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 29: “Year” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 30: “January” sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 31: “February” sign in LSC. Left image original photo and right image final edited photo.</p>			




 		<h1>PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Months of the Year		Registry No 10	
			
Figure 32: "March" sign in LSC. Left image original photo and right image final edited photo.			
			
Figure 33: "April" sign in LSC. Left image original photo and right image final edited photo.			
			
Figure 34: "May" sign in LSC. Left image original photo and right image final edited photo.			
			
Figure 35: "June" sign in LSC. Left image original photo and right image final edited photo.			

		<h1>PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Months of the Year		Registry No 11	
			
Figure 36: "July" sign in LSC. Left image original photo and right image final edited photo.			
			
Figure 37: "August" sign in LSC. Left image original photo and right image final edited photo.			
			
Figure 38: "September" sign in LSC. Left image original photo and right image final edited photo.			
			
Figure 39: "October" sign in LSC. Left image original photo and right image final edited photo.			


		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachment: Months of the Year		Registry No 12	
			
<p style="text-align: center;">Figure 40: "November" sign in LSC. Left image original photo and right image final edited photo.</p>			
			
<p style="text-align: center;">Figure 41: "December" sign in LSC. Left image original photo and right image final edited photo.</p>			
N.A		N.A	
N.A			
N.A		N.A	
N.A			

 		<h1>PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachments: Days of the Week		Registry No 13	
			
Figure 42: "Days" sign in LSC. Left image initial version and right image final version			
			
Figure 43: "Week" sign in LSC. Left image initial version and right image final version.			
			
Figure 44: "Monday" sign in LSC. Left image initial version and right image final version			
			
Figure 45: "Tuesday" sign in LSC. Left image initial version and right image final version			

		PHOTOGRAPHIC RECORD	
Category: Photographic Attachments: Days of the Week		Registry No 14	
			
Figure 46: "Wednesday" sign in LSC. Left image initial version and right image final version			
			
Figure 47: "Thursday" sign in LSC. Left image initial version and right image final version			
			
Figure 47: "Friday" sign in LSC. Left image initial version and right image final version			
			
Figure 48: "Saturday" sign in LSC. Left image initial version and right image final version			

		PHOTOGRAPHIC RECORD	
Category: Photographic Attachments: Days of the Week			Registry No 15
			
Figure 49: "Sunday" sign in LSC. Left image initial version and right image final image			
N.A		N.A	
N.A			
N.A		N.A	
N.A			
N.A		N.A	
N.A			

 		<h1>PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachments: Food			Registry No 16
			
Figure 42: "Food" sign in LSC. Left image initial version and right image final version			
			
Figure 43: "Banana" sign in LSC. Left image initial version and right image final version			
			
Figure 44: "Orange" sign in LSC. Left image initial version and right image final version			
			
Figure 45: "Meat" sign in LSC. Left image initial version and right image final version			

 		<h1>PHOTOGRAPHIC RECORD</h1>	
<p>Category: Photographic Attachments: Food</p>			<p>Registry No 16</p>
			
<p>Figure 46: "Chicken" sign in LSC. Left image initial version and right image final version</p>			
			
<p>Figure 47: "Carrot" sign in LSC. Left image initial version and right image final version</p>			
			
<p>Figure 48: "Cebolla" sign in LSC. Left image initial version and right image final version</p>			
			
<p>Figure 49: "Spaghetti" sign in LSC. Left image initial version and right image final version</p>			

		<h1>PHOTOGRAPHIC RECORD</h1>	
<p>Category: Photographic Attachments: Food</p>		<p>Registry No 16</p>	
			
<p>Figure 50: "Hamburger" sign in LSC. Left image initial version and right image final version</p>			
			
<p>Figure 51: Sign "ice cream" in LSC. Left image initial version and right image final version</p>			
			
<p>Figure 52: Sign "juice" in LSC. Left image initial version and right image final version</p>			
			
<p>Figure 53: "Cookie" sign in LSC. Left image initial version and right image final version</p>			





		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachments: Food		Registry No 16	
			
<p>Figure 54: "Cake" sign in LSC. Left image initial version and right image final version</p>			
			
<p>Figure 55: Sign "hot dog" in LSC. Left image initial version and right image final image.</p>			
			
<p>Figure 56: "Pizza" sign in LSC. Left image initial version and right image final image.</p>			
<p>N.A</p>		<p>N.A</p>	
<p>N.A</p>			

	<h1>PHOTOGRAPHIC RECORD</h1>	
<p>Category: Photographic Attachments: Animals</p>		<p>Registry No 16</p>
		
<p>Figure 57: Sign "animals" in LSC. Left image initial version and right image final image.</p>		
		
<p>Figure 58: "Araña" sign in LSC. Left image initial version and right image final image.</p>		
		
<p>Figure 59: Sign "horse" in LSC. Left image initial version and right image final image</p>		
		
<p>Figure 60: Sign "pig" in LSC. Left image initial version and right image final image</p>		





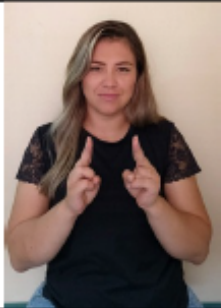

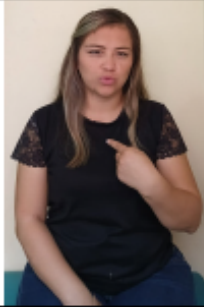
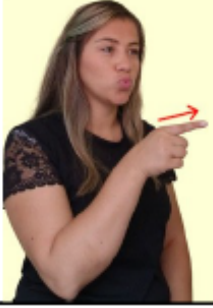
 		PHOTOGRAPHIC RECORD	
Category: Photographic Attachments: Animals			Registry No 16
			
Figure 61: Sign "rabbit" in LSC. Left image initial version and right image final version.			
			
Figure 62: Sign "snake" in LSC. Left image initial version and right image final version.			
			
Figure 63: Sign "elephant" in LSC. Left image initial version and right image final version.			
			
Figure 64: "Cat" sign in LSC. Left image initial version and right image final version.			









		<h1>PHOTOGRAPHIC RECORD</h1>	
<p>Category: Photographic Attachments: Animals</p>			<p>Registry No 16</p>
			
<p>Figure 65: Sign "giraffe" in LSC. Left image initial version and right image final version.</p>			
			
<p>Figure 66: Sign "lion" in LSC. Left image initial version and right image final version.</p>			
			
<p>Figure 67: "Monkey" sign in LSC. Left image initial version and right image final version.</p>			
			
<p>Figure 68: "Bird" sign in LSC. Left image initial version and right image final version.</p>			

 		<h1>PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachments: Animals			Registry No 16
			
Figure 69: Sign "dog" in LSC. Left image initial version and right image final version.			
			
Figure 70: Sign "fish" in LSC. Left image initial version and right image final version.			
			
Figure 71: Sign "chicken" in LSC. Left image initial version and right image final version.			
			
Figure 72: Sign "mouse" in LSC. Left image initial version and right image final version.			

 		PHOTOGRAPHIC RECORD	
Category: Photographic Attachments: Animals		Registry No 16	
			
Figure 73: Sign "cow" in LSC. Left image initial version and right image final version.			
NA			NA
NA			
NA			NA
NA			
NA			NA
NA			

		<h1 style="text-align: center;">PHOTOGRAPHIC RECORD</h1>	
Category: Photographic Attachments: Possessive Pronouns			Registry No 16
			
Figure 74: Sign "pronouns" in LSC. Left image initial version and right image final version.			
			
Figure 75: "Pronoun" sign in LSC. Left image initial version and right image final version.			
			
Figure 76: Sign "my" in LSC. Left image initial version and right image final version.			
			
Figure 77: Sign "yours" in LSC. Left image initial version and right image final version.			

 		PHOTOGRAPHIC RECORD	
Category: Photographic Attachments: Personal Pronouns			Registry No 16
			
Figure 78: Sign "yours" in LSC. Left image initial version and right image final version.			
			
Figure 79: "Personal" sign in LSC. Left image initial version and right image final version.			
			
Figure 80: 'T' sign in LSC. Left image initial version and right image final version.			
			
Figure 81: "Sign "tu" in LSC. Left image initial version and right image final version.			

 		PHOTOGRAPHIC RECORD	
Category: Photographic Attachments: Personal Pronouns			Registry No 16
			
Figure 82: "He" sign in LSC. Left image initial version and right image final version.			
			
Figure 83: Sign "she" in LSC. Left image initial version and right image final version.			
			
Figure 84: "We" sign in LSC. Left image initial version and right image final version.			
N.A		N.A	
N.A			