

**UNIVERSIDAD MAYOR DE SAN ANDRÉS
FACULTAD DE HUMANIDADES Y Cs. DE LA EDUCACIÓN
CARRERA DE LINGÜÍSTICA E IDIOMAS**



**“HYBRID SIGN LANGUAGE SYLLABUS AS AN
EDUCATIONAL MATERIAL SUPPORT FOR BILINGUAL
LEARNING THROUGH THE UNIVERSAL DESIGN
LEARNING THEORY FOR HEARING IMPAIRED CHILDREN
OF PRIMARY GRADES OF “HUÁSCAR CAJÍAS SCHOOL”**

Project submitted to obtain the Academic Degree in Linguistics and Languages

BY: VANIA ALEJANDRA BUTRON LUNA

KAREN SOFIA CANDIA RAMOS

TUTOR: MSc. OSCAR OSWALDO ALVAREZ CHAMBI

**LA PAZ- BOLIVIA
2022**

**UNIVERSIDAD MAYOR DE SAN ANDRÉS
FACULTAD DE HUMANIDADES Y CIENCIAS DE LA EDUCACIÓN
CARRERA DE LINGÜÍSTICA E IDIOMAS**

**PROYECTO DE GRADO: “HYBRID SIGN LANGUAGE SYLLABUS AS AN
EDUCATIONAL MATERIAL SUPPORT FOR BILINGUAL LEARNING
THROUGH THE UNIVERSAL DESIGN LEARNING THEORY FOR HEARING
IMPAIRED CHILDREN OF PRIMARY GRADES OF “HUÁSCAR CAJÍAS
SCHOOL”**

Presentado por:

Univ. VANIA ALEJANDRA BUTRON LUNA
KAREN SOFIA CANDIA RAMOS

Para optar el grado académico de **Licenciatura en Lingüística e Idiomas**

Nota numeral:

Nota literal:

Ha sido:

Directora de la Carrera

Dra. María Teresa Terán Zubieta

Tutor:

Mg.Sc. Oscar Oswaldo Álvarez Chambi

Tribunal:

Mg. Sc. Leidy Ibañez Rodriguez

Tribunal:

.....

Mg. Sc. Angela Romay Frías

La Paz, 28 de Noviembre de 2022

DEDICATORY

This project is dedicated to our parents whom still take care of us whether it be from earth or heaven.

ABSTRACT

The following Project was accomplished to suggest the use of a pedagogical mobile application called “LSB NIÑOS” as a technological material support for the benefit of hearing-impaired students of the first 3 grades of the “Huáscar Cajías” school (La Paz, Bolivia), to be useful as an educational material support for their Bilingual Learning LSB-L1/spanish-L2 (Lenguaje de Señas Boliviano- First language and written Spanish – Second Language).

Nowadays, and because of the pandemic, the institution uses some technological resources as Zoom, Meet, etc. as a tool for video communication but, regarding to ‘the way’ of teaching, they keep the traditional teaching as the core of it. Pedagogical mobile applications are one of the most widely used technological resources today and that is why this path was chosen. Therefore, this project was based on theories and approaches such as The Blended learning theory, Universal Design for Learning (UDL) and the Mobile Assisted Language Learning (MALL) to create a new syllabus called ‘Hybrid syllabus’ (which, also, takes some characteristics of the situational content based syllabus).

To delimit our student population, a qualitative research method was carried out conducting direct observation to find out the needs of the institution, also a SWOT analysis was built, an interview with the general director of the institution was collected and questionnaires made to the teachers to find out how their study plan is developed and how the parents and students are accepted.

RESUMEN

Se realizó el siguiente Proyecto para proponer el uso de una aplicación móvil pedagógica denominada “LSB NIÑOS” como apoyo material tecnológico en beneficio de los alumnos sordos de los 3 primeros grados del colegio “Huáscar Cajías” (La Paz, Bolivia) , para que les sea útil como material educativo de apoyo para su Aprendizaje Bilingüe LSB-L1/español-L2 (Lenguaje de Señas Boliviano-Primera lengua y Español escrito-Segunda Lengua).

En la actualidad, y debido a la pandemia, la institución utiliza algunos recursos tecnológicos como Zoom, Meet, etc. como herramienta para la comunicación pero, en cuanto a 'la forma' de enseñar, mantienen la enseñanza tradicional como eje de la misma. Las aplicaciones móviles pedagógicas son uno de los recursos tecnológicos más utilizados en la actualidad y es por ello que se eligió este camino. Por lo tanto, este proyecto se basó en teorías y enfoques como la teoría del aprendizaje combinado, el diseño universal para el aprendizaje (UDL) y el aprendizaje de idiomas asistido por dispositivos móviles (MALL) para crear un nuevo plan de estudios llamado “Hybrid syllabus” (que, además, toma algunas características del programa de estudios basado en contenido situacional).

Para delimitar nuestra población estudiantil se realizó un método de investigación cualitativa, realizando observación directa para conocer las necesidades de la institución, también se construyó un análisis FODA, se recopiló una entrevista a la directora general de la institución y se realizaron cuestionarios a los docentes para averiguar cómo se desarrolla el plan de estudios y cómo los padres y los estudiantes se desenvuelven con esto.

INTRODUCTION

Inclusion and innovation are keywords in the current era, which is why technology has become a fundamental piece for teaching. This project focuses on the development of a new syllabus coupled to the current needs of hearing-impaired children through the creation of a mobile application.

People with hearing impairment are 13% of the population in Bolivia INE (Instituto Nacional de Estadística). The institutions that specialize in teaching LSB (Bolivian Sign Language) are few and lack some resources. A school conducting the research was found, making possible the SWOT analysis in the process to be able to collaborate with the institution.

Hearing impaired children also suffer a type of cognitive delay, which hinders their learning, for this reason is that the problems and doubts they have with bilingual learning must be supported with educational extra material for the first levels. The populations are hearing- impaired children for and they need ways for learning in a more dynamic way. Smartphones are considered as the best tools for this aspect and project

For the creation of this pedagogical mobile application, a key aspect was taken into account such as developing multimedia materials (visual and kinesthetic) which can contribute to the bilingual learning of students. Bilingual learning is considered in this project since people with hearing impairment learn LSB (Bolivian Sign Language) and written Spanish language, both at the same time and they need to communicate in both languages in the Bolivian social context.

This project aims to create a totally new syllabus using theories that mix teaching with technology to improve the learning of our target population and thus be able to be a driving force for a better future.

TABLE OF CONTENTS

DEDICATORY	4
ABSTRACT	5
INTRODUCTION	7
CHAPTER I SITUATIONAL SECTION.....	9
1. DESCRIPTION OF THE INSTITUTION.....	9
1.1 A brief history of “Huascar Cajías” School	9
2. PROBLEM DESCRIPTION	10
2.1 Background of the Hearing impairment in Bolivia	10
2.1 Delimitation of the research place	11
2.3 Main Problem.....	12
3. NEEDS ANALYSIS	13
3.1 Interview with the school’s principal	13
3.2 SWOT analysis	14
3.2.1 Strengths	14
3.2.2 Weaknesses.....	14
3.2.3 Opportunities	15
Ley 070 “Avelino Siñani”	15
Ley 223/2012- Ley General Para Personas con Discapacidad ☐Artículo 5 (Definiciones)....	16
3.2.4 Threats	17
4. DESCRIPTION OF THE PROPOSAL	17
5. JUSTIFICATION	19
5.1 Convenience.....	19
5.2 Theoretical Value.....	20
5.3 Social Value	21
5.4 Methodological Value.....	22
5.5 Practical Value.....	22
6. OBJECTIVE.....	23
6.1 General Objective.....	23
6.2 Specific Objectives.....	23

CHAPTER II THEORETICAL FRAMEWORK.....	25
1. SIGN LANGUAGE BACKGROUND	25
1.1 Sign Language.....	25
1.2 Linguistic Conception about Sign Language.....	26
1.3 Bolivian Sign Language (LSB) – Dactylogy or Fingerspelling.....	26
1.3.1 Dactylogy as a Method.....	27
1.3.2 Uses of the Dactylogy/Fingerspelling.....	27
1.4 Sign Language and Linguistics	28
1.5 Sign Language acquisition.....	30
1.6 The hearing impairment community in Bolivia.....	31
1.6.1 Socio-anthropological conception	31
1.6.2 Clinical conception.....	31
1.7 The hearing impairment education in Bolivia	32
1.8 Bilingual Bicultural Learning.....	33
2. EDUCATION AND TECHNOLOGY	34
2.1 Blended Learning definition.....	35
2.1.1 Blended Learning Characteristics	35
2.1.2 Technology and Blended Learning.....	37
2.1.3 Models of Blended Learning	38
2.1.4 Benefits of Blended Learning	39
2.1.5 Advantages of Blended Learning for Students	40
2.2 MOBILE ASSISTED LANGUAGE LEARNING (MALL).....	41
2.2.1 Definition of MALL	41
2.2.2 MALL characteristics	42
2.2.3 Classification of Mobile Learning apps	43
3. THE SELECTION OF A SYLLABUS FRAMEWORK.....	45
3.1 Definition of syllabus	45
3.2 Types of Syllabuses.....	46
3.2.1 Product-oriented and Process-oriented syllabuses.....	46
3.2.2 Synthetic syllabuses Vs. Analytic	47
3.3 Content Based Syllabus.....	48

3.3.1 Benefits of Content-Based syllabus	49
3.4 Situational Syllabus.....	49
3.4.1 Types of Situational Syllabus	50
3.4.2 Benefits of Situational Syllabus	51
4. UNIVERSAL DESIGN FOR LEARNING (UDL)	51
4.1 Definition	51
4.2 Main principles of UDL.....	52
4.3 Learning and thinking differences and UDL.....	52
4.4 UDL Guidelines	53
4.4.1 UDL Guidelines organization	53
5. HYBRID SIGN LANGUAGE SYLLABUS.....	55
5.1 Aims and Learning Outcomes	55
5.2 Characteristics	56
5.3 Methodological strategies	56
5.4 Didactic resources	57
5.5 Learning assessment.....	57
5.6 Visual/Kinesthetic Communication	57
6. LEGAL FRAMEWORK.....	58
CHAPTER III: METHODOLOGY	60
1. TYPE OF APPROACH	60
2. TYPE OF DESIGN.....	61
3. POPULATION	61
4. INSTRUMENT.....	62
4.1 Open-ended questionnaire.....	62
4.2 Structured Interview	63
CHAPTER IV PROPOSAL	64
1. DESCRIPTION	64
2. HYBRID SIGN LANGUAGE SYLLABUS.....	65
3. HYBRID SYLLABUS SUBJECTS CONTENT.....	66
3.1 Initial (Kindergarten).....	67

3.2 First Grade (Elementary).....	79
3.3 Lesson Plan for Second Grade (Elementary).....	92
4. Evaluation and conclusions	104
CHAPTER V CONCLUSIONS AND RECOMMENDATIONS.....	104
5.1 CONCLUSIONS.....	104
5.2 RECOMMENDATIONS	107
BIBLIOGRAPHY.....	108
DIGITALBIBLIOGRAPHY	109
APPENDIXES.....	111

APPENDIXES INDEX

APPENDIX A

Figure 1: Product oriented- Process oriented	46
Figure 2: Product oriented- Process oriented	47
Figure 3: Principles of UDL.....	53
Figure 4: Access	54
Figure 5: Build	54
Figure 6: Internalize	54
Figure 7: Goal	55
Figure 8: Open Ended questionnaire model	63
Figure 9: Structured Interview.....	64

APPENDIX B

AppendixB1.Questionnaire	111
Appendix B2. Interview-Qualitative Method.....	113
AppendixB3. User Manual	128
Appendix B4. Stages of the Project	138
Appendix B5. Photos “LSB Niños” mobile application final submission	140

Appendix B6. Schedule of Activities..... 141

CHAPTER I SITUATIONAL SECTION

1. DESCRIPTION OF THE INSTITUTION

1.1 A brief history of “Huascar Cajías” School

The "Centro de Educación Especial Huáscar Cajías” works and cares for students with hearing disabilities. Apart from this, they also work for students with multiple disabilities but who have an addition to deafness. The “Huáscar Cajías” school, in the early days, was formerly operating with the CEA- “Erick Boulter” (another school but for people with diverse disabilities). But, with the parents' concern to seek a more specialized training for their children, they decided to leave that establishment and found their own special education center with the lead of the principal Elsa Mostacedo. With whom they founded the "Huáscar Cajías" school.

From that, their journey has been a bit long because they had to move from several neighborhoods in the city to keep the school alive. Until nowadays, they do not have their own establishment. Nevertheless, they are placed in Miraflores Neighborhood. The school celebrates 15 years of operation in 2021. The school was founded on April 15, 2006. Currently in 2021, this school works with 9 teachers and 69 students and it works in the morning and in the afternoon.

The school teaches under the “December 20th, 2010. Law N° 070 of Education- Avelino Siñani - Elizardo Pérez" and they teach under Bolivian sign language (LSB-L1) and written Spanish language (L2). The levels of education that this school works with are:

- Initial level (kindergarden)
- Primary level and
- Educational Programs.

Educational programs for students from 1 to 3 years old, like the “Comprehensive program” for hearing impaired students who does not belong to the school because probably they overpass the age range for it. Another program is “the productive workshop” for students who have multi-disabilities there is also the program “personal independence and social independence”.

Between the main goals or objectives of the school, they mention to coordinate effectively with teachers and parents. To carry out a planned work in what is the development of the curriculum itself. To make an educational inclusion of the students along the regular educational units. To coordinate and make agreements with institutions that can be government, the Mayor's Office, universities, etc. Finally, to try to spread the LSB by giving continuity to the sign language courses for the various families and the public who would like to learn.

2. PROBLEM DESCRIPTION

2.1 Background of the Hearing impairment in Bolivia

In Bolivia, special education began in the first half of the 19th century and regulations and laws on the subject were promulgated, but it was not until 2009 that the “Ministerio de Educación” promulgated supreme decree No. 0328, which officially recognizes the LSB (Bolivian Sign Language), which was updated in 2018, under the mandate of President Evo Morales Ayma, as the “Ley General Para Personas con Discapacidad N° 223”.¹

Talking about the community with different capacities in the country, according to the 2001 Census of the INE (National Institute of Statistics), hearing impairment or deafness ranked first in Bolivia in terms of impairments, and La Paz was the department with the largest number of people with these characteristics. Besides,

¹ “Ley General Para Personas con Discapacidad N° 223” refers to laws that protects people with hearing impairment.

according to the data of the Census-2012, there were 50562 people with hearing impairment in Bolivia.

2.1 Delimitation of the research place

According to the book “Curso de enseñanza de la lengua de señas boliviana” (2010: p.18) and Maria Angelica Ticona Varela “Huascar Cajías” School’s principal, La Paz has four institutions for deafness: three education centers specialized in bilingual school teaching (Sign Language - written Spanish language) for children, one of which is in El Alto city and the other two in La Paz and the fourth one are institutions (ASORPAZ- Asociación para Sordos La Paz). According to this data the chosen place for this investigation is the “Centro de Educación Especial Huáscar Cajías”, working for ten years now, dedicated to the education of children with hearing impairment. This elementary school is located next to Triangular Square in Miraflores neighborhood.

In the interviews and visits made in this educational center, the following internal aspects were perceived: The current infrastructure is in deterioration (only have 7 courses, one per level) and has small classrooms which are not designed to take classes, there is a difference in ages between the students of each level and in some cases it is because the parents did not insert their children on time in a specialized school, or that they did not see the seriousness of the case to insert them into a special education on time and others come from families with scarce economic resources. Besides, mentioning that the supporting material used in this institution is developed by teachers according to their creativity and their own resources such as: prints, photocopies, exhibition cards, children’s tales, etc. But one of the main problems is that they do not have more than just one book adapted to the LSB and L2 (Spanish), it is divided by subjects, but it is not specialized for each course first grade, second grade and so on. This book was developed by the teachers Mari Luz Gomez and Iván Andrade with the sponsorship of the government of the city.

PáginaSiete (2017). Besides this, there are only books that are carried in traditional schools.

2.3 Main Problem

The communicative processes have a vital importance for the human development; these allow expressing ideas, feelings, and needs. Starting from the senses, which are defined at an early age and are in constant feedback, so the early stimulation of language learning in children with hearing impairment is of utmost importance. Brown, R. (1981)².

According to the book “Discapacidad Auditiva/Investigación Educativa” del Ministerio de Educación de Bolivia (2013: 29-30), hearing impairment is categorized in : Deaf , refers to a person with very little or no functional hearing and who often uses sign language to communicate and the other level is Hard of Hearing (hipoacusia), which refers to a person who has a mild-to-moderate hearing loss who may communicate through sign language, spoken language and these categories are taken into account in this project inside of the community of “CEE Huáscar Cajías” School.³

In this institution, all teachers dominate the Bolivian Sign Language (In fact, two of them belong to the community of people with hearing impairment). Besides, the learners that are involved in this project have not developed their linguistic competence properly, because its mother tongue (Bolivian Sign Language) is not yet fully acquired. Although according to The National Institute of Deafness and Other Communication Disorders (2010), a child should develop it from 2-5 years. Other important fact is that the book “Curso de Enseñanza de Lenguaje de Señas Boliviana LSB” (2010: p.33) says that a person with hearing impairment, in essence, is

²Brown, R. (1981). “Psicolingüística: algunos aspectos acerca de la adquisición del lenguaje”. México D.F: trillas.

³Ministerio de Educación (2013). “ Discapacidad auditiva-investigación educativa comprensión de la discapacidad iv”. Viceministerio de educación superior y formación profesional: dirección general de formación de maestros La paz- Bolivia.

bilingual because he/she shares two languages: LSB as his first language L1 and Spanish as a second language L2 and they must be learned in correlation from the initial process by stimulating the children's abilities, because in order to learn both languages children need more educational material support options.

Therefore, ignoring this would lead to problems at higher school course levels. Another fact is that the teaching-learning of the L2 (written Spanish) is mostly not learned by the students at an appropriate level according to the expectations of the school and if this is not reinforced at the right age, it would lead to future problems in the working life of the students. According to Biser, Rubel, & Toscano (2007), they indicate that 93% of the possibilities of job promotion for workers with hearing impairment was related to their performance in writing since in them it was emphasized that grammar, coherence, the organization of the message were not very understandable.⁴ For this reason, the acquisition of the LSB and the learning of the L2 must go in a synchronized form, beginning from primary grade. Nowadays, the technological advance developed up to now can be used as a support tool to reinforce these difficulties in Bilingual / Bicultural learning of children with hearing impairment.

3. NEEDS ANALYSIS

3.1 Interview with the school's principal

According to an interview we had with the Director María Angélica TiconaVarela-Huascar Cajias' school' principal on April 14th, 2021 ([watch:https://www.youtube.com/watch?v=vRJk9SoBWGs&t=2194s](https://www.youtube.com/watch?v=vRJk9SoBWGs&t=2194s)).

The main needs, mentioned by the principal of the school, are:

- To be able to own an infrastructure or building for the school.
- To have more support, mainly, from the government.
- To include technological features to the regular teaching that they offer.

⁴Biser, R. and Toscano, C. (2007). "Bending the rules: when deaf writers leave college. *american annals of the deaf*". EE. UU: University of Chicago.

- To have more specialized material or books that could be in L1 and L2.

3.2 SWOT analysis

3.2.1 Strengths

- “El Centro de Educación Especial Huáscar Cajías” is one of the few schools, in Bolivia, dedicated to teaching Bolivian Sign Language (LSB), but also, L2 (written Spanish) to children with hearing impairment.
- The “CEE Huáscar Cajías” has professionals who dominate Bolivian Sign Language and written Spanish.
- The school have a book designed for children “Aprender desde el Silencio”, which was made by teachers of the school in coordination and sponsored by the “Gobierno Autónomo de la Ciudad de La Paz”. This book teaches Bolivian Sign Language (LSB) and written Spanish (L2) but in a general way.
- This school has been held with the economic support of the “Gobierno Autónomo Municipal de la Ciudad de La Paz” and the “Estado Plurinacional de Bolivia”.

3.2.2 Weaknesses

- The CEE “Huascar Cajías” does not have its own infrastructure, they count only with the infrastructure that the Municipal authorities could get for them, for this reason, this institution lives moving every certain time, the current one is quite small and deteriorated.
- This educational center has few students per class the maximum number of students is 7 and the minimum is 4.
- The book that they normally use to teach “Aprender desde el Silencio” is not divided by levels like: kindergarten, 1st grade, etc.

- Shortage of school materials such as: books for each subject (mathematics, Natural Sciences, etc.) which could be in L1 and L2 based on each course.
- Shortage of desktop material: glue, pencils and others.
- The technological support material is nonexistent, for example: videos, computer's, data and others.
- There are no children stories or videos adapted to L1- Sign language or L2-written Spanish.
- Most of the students of the “CEE Huáscar Cajías” arrive at inappropriate ages for each course, for it, it is more difficult for teachers to teach them.
- People with hearing impairment have more learning difficulties because they do not handle their senses well, and in some cases, they suffer from cognitive delay. All these points were written based on the responses of the directors of “Centro de acogida Erick Boulter” and the “CEE Huáscar Cajías”.

3.2.3 Opportunities

Bolivia has laws that support people with hearing impairment such as:

Ley 070 “Avelino Siñani”

- **Artículo 5 (Objetivos de la Educación).** Garantizar el acceso a la educación y la permanencia de ciudadanos en condiciones de plena igualdad y equiparación de condiciones.
- **Artículo 7 (Uso de idiomas oficiales y lengua extranjera).** La enseñanza del lenguaje en señas es un derecho de las y los estudiantes que lo requieran en el sistema educativo. La enseñanza del lenguaje de señas es parte de la formación plurilingüe de los maestros.

Here is emphasized that the Bolivian State guarantees the civil right of any Bolivian citizen to access to an education according to the necessities that this person could

have. Besides, teachers must be prepared to teach, in this case, Bolivian sign language to students who use this type of communication.

Ley 223/2012- Ley General Para Personas con Discapacidad □Artículo 5 (Definiciones)

La educación debe dar respuesta a la diversidad mediante adaptaciones físicas, curriculares y personas de apoyo buscando mayor participación en el aprendizaje, las culturas y las comunidades para reducir la exclusión de la educación.

- **Artículo 7 (Material Educativo y Comunicacional).** El Ministerio de Educación promoverá y orientará la producción y aplicación de materiales educativos y comunicacionales en el Sistema Educativo Plurinacional con enfoque inclusivo, destinados a estudiantes con discapacidad.

Therefore, both laws support this project since it seeks to be adapted for the population with hearing impairment. It offers inclusive educational material, all with the intention that students have more options in educational resources.

In Bolivia we also find some educational material related to sign language:

- “Ministerio de Educación” released a book in 2010 called: “Curso de Enseñanza de la lengua de Señas Boliviana”-Module I, which was made for people who do not have hearing problems but are interested in learning LSB.
- “Ministerio de Educación” has released a physical and online book in 2013 called: “Discapacidad Auditiva/Investigación Educativa”, for teachers who are in their academic formative process in inclusive education.⁵

⁵Ministerio de Educación (2013). “Discapacidad auditiva-investigación educativa comprensión de la discapacidad iv”. Viceministerio de educación superior y formación profesional: dirección general de formación de maestros La paz- Bolivia.

- The technological resources are now more accessible both in their management and economically.
- There are 20 sessions of instructional videos on the Youtube platform called:

“Primer Curso Básico de Lengua de Señas Boliviana”, carried out by the Training Service in Radio and Television for the Development of the “Universidad Católica Boliviana San Pablo”.

- The education center offers dedicated to hearing impairment offer free classes for any person who wants to learn LSB (Bolivian Sign Language).

3.2.4 Threats

- People with hearing impairment have difficulties in being able to interact with the Spanish speaking social environment because the social context is not yet adapted for their inclusive needs.
- Some of the families of children with hearing disabilities don't take their children's education with the seriousness of the case, this provokes that children enter in traditional schools, which mostly do not have teachers who know and could teach in LSB.
- Not all children with hearing impairment have bilingual parents (LSB-Spanish), which make it difficult to get feedback at home, thus, they do not develop their senses or cognitive skills as it should be developed.

4. DESCRIPTION OF THE PROPOSAL

The use of didactic technological support material since primary grades in Elementary School, offers the students the possibility to observe, investigate, discover, and practice the rules of coexistence and values they need to learn in order to understand their social context. For it, we have created a technological

pedagogical resource that stimulates visual-kinesics features, which are the most important in children with hearing disabilities.

The tool was created under the following terms:

- Under the kids „characteristics of being "Bilingual Bicultural". Bilingual and since their necessities of learning their mother tongue (Bolivian Sign Language LSB) and a second language (written Spanish). For our hearing impairment learners, the listening skills are null, nevertheless, writing skills become the common vehicle to communicate with regular society.
- Under the need of pedagogical material support that the school´ students have. Perhaps due to lack of social or economic support, cannot take private classes; therefore, the present degree project has created a free tool which is not going to have an economical cost.
- A tool made for the school grades that need more support, which are: Initial (kindergarten), first and second course of primary grade.
- Also considering that, if there was a lack of knowledge of technology, the tool is very easy to use because it will only need certain amount of storage of any android cellphone or computer.

The tool also proposes a new syllabus, made specially for hearing impairment students. This syllabus is called “Hybrid Sign Language Syllabus” which, in few words, is a symbiosis of the characteristics of a situational and content-based syllabus, but the innovation of it is that it was designed for teaching in two languages, L1 (Bolivian Sign Language) and L2 (written Spanish), all the lesson contents that include this new type of syllabus will be taught in both languages.

- A tool created giving the Visual and Kinesics stimulation that the learners need. Which also is fully interactive and have special virtual characters that will be with and guide the learners throughout all the courses or lessons that this syllabus offers, like in a regular school class?

5. JUSTIFICATION

Hearing impairment in children need innovative language/pedagogic methods in order to overcome their L1 (Bolivian sign language) and L2 (written Spanish) difficulties. Therefore, the reasons of why this project tries to be useful and relevant are the following:

5.1 Convenience

- This project aims to focus on the teaching-learning of Bolivian sign language and Spanish as a second language L2, so we made a series of visits to the facilities of the Huascar Cajías School and noticed the following. The Huascar Cajías School, which works with children with hearing disabilities, is experiencing several problems related to infrastructure, social and economic aspects; however, the main problem is the lack of technological support materials and daily teaching instruments for both teachers and students. In the absence of these important tools teachers must use their creativity to reinforce students' learning by using photocopies and recycled material such as bottle caps, ice cream sticks, etc. For these reasons the project plans to develop a mobile application for the teaching of the Bolivian sign language and Spanish as a second language to be used as a technological support material by the teachers and children of “Huascar Cajías” School.
- This application could also facilitate the bicultural bilingual teaching process of teachers and feedback from students. Learning can be reinforced at home because students can use over there the application, in addition it is cheap and easy to use according to the technology era we live nowadays, and in the future, it can be used as a model to create new technological support materials that help to all hearing impairment community at “Huascar Cajías” School and in La Paz city.

5.2 Theoretical Value

- This project focuses on reinforcing, as a support material, the acquisition of both, mother tongue (Bolivian sign language) and second language (written Spanish).
- For it, it is being proposed a new educational proposal called “Hybrid sign language syllabus”, specifically, for sign language beginning learners, which includes characteristics of the approaches: Blended Learning, MALL and UDL. Besides, it is being proposed under the perspective of considering characteristics of a traditional class with a virtual class.
- This model will be reflected in the development of a syllabus for hearing impairment children, taking as a basis principles of the content-based and situational syllabus, with this, will be gathered pedagogical and virtual activities in order to motivate hearing impairment children to develop their linguistics competences in L1 and L2 while, at the same time, they develop their regular subjects contents of their school curriculum, like: Mathematics, Natural Sciences,, Language and Communication, etc. It is being built a theoretical and practical proposal that according to Maria Angelica Ticona Varela “Huascar Cajías” School’s principal does not exist yet in our country.
- All this work could be a base to take into account for future research or development of theory, based on hearing impairment children linguistic needs.
- All this is supported by the Ley 070 "Avelino Siñani", of December 20 of 2010, in Article 1. (Constitutional Mandates of Education):
 "Todos tienen derecho a recibir educación en todos los niveles de una manera universal, productiva, gratuita, integral e intercultural, sin discriminación”.

5.3 Social Value

- This proposal will be for the benefit of children with hearing impairment, since this project aims also to develop and reaffirm an identity in the Bolivian deaf community from an early age, through the pertinent acquisition of mother tongue (Bolivian Sign Language) and learning of second language (written Spanish), all this to incorporate this community to the global community of the country.
- The proposal will provide support in the acquisition of the mother tongue sign language (LSB) and Spanish language (L2), which is designed especially for children who need to practice their mother tongue and a second language from an early age since they need to develop all their communication skills to obtain good opportunities in the future, whether in a workplace or for academic/study opportunities. Consequently, this will try to develop their linguistic and communicative skills.
- This technological bilingual/bicultural proposal will have a graphic interface design that will be easy to use and understand, being essential that be very attractive to children; besides, anyone with an Android phone will be able to download it for free.
- The knowledge acquired in the Linguistics and Languages Career will be implemented in this project as an opportunity to apply the relevant information to assist a population of the country that needs urgent pedagogical help.

5.4 Methodological Value

- This Project has the intention to provide teachers and parents a method that can be applied into their teaching styles since both will have the chance to access to this educational content through the mobile application (app) design
- In order to state this bilingual bicultural proposal, through research and fieldwork a SWOT analysis was written down from the chosen sample and it was found that students from primary grades of Huascar Cajías School had a low level of L1 (Sign language) and L2 (written Spanish), this as a result of the lack of educational supporting materials like: school sign language textbooks, graphic and printed material, etc.. There are no special educational materials with virtual characteristics. Therefore, this proposal is meant to help students to overcome their weaknesses of their linguistic competences through use and virtual practice of our pedagogical content´ proposal, which aims to incorporate and facilitate games for overcoming learning obstacles, mini-video clips, stories, photographs, virtual interactive characters, tools menu, etc. All this educational material which is part of the syllabus will be embodied into a visual/kinetics design for a mobile application´ interface to give students the possibility that try "self-teaching" as a virtual class that complements their traditional class, demonstrating, once again, that teachers are not the only pedagogical resource for these students.

5.5 Practical Value

- The building of interactive mobile applications applied to this field of study are not common in the country and according to the interview we made to Director Maria Angela Ticona Varela- "Huascar Cajías" School´s principal (watch <https://www.youtube.com/watch?v=vRjk9SoBWGs&t=2194s>)it does

not exist at all for the Bolivian sign language population, not even with similar characteristics running in the virtual platform. This implementation will help both the group studied and the Bolivian population in general to learn what is the culture and language of the hearing impairment community.

- This project's proposal will motivate others to learn about the culture and language of the hearing impairment community with thus facilitating the daily life of these people who have difficulty doing daily activities such as paying for electricity, water, and others in a bank because society is not yet adjusted to their needs.
- This project's proposal will motivate others to create similar mobile applications or modern technological tools that enrich visual-kinesics skills practice, not only for this sample that attends elementary school, but also for higher education.

6. OBJECTIVE

6.1 General Objective

- To develop the “Hybrid Sign Language Syllabus” in order to create an educational mobile application as a educational material support for the Bilingual Learning (LSB-L1/spanish-L2) through the Universal Design for Learning theory, for hearing impairment in children.

6.2 Specific Objectives

- To make a diagnostic assessment to determine the students' language acquisition needs.
- To design a situational/content-based syllabus for the development of the linguistics competences of the learners.

- To implement the Bolivian sign language (L1) in synchrony with the written Spanish (L2) into the syllabus content employing The Universal Design for Learning theory.
- To collect all the audio-visual material needed (multimedia) to complete the syllabus content.
- To develop the interface of the mobile application based on visual kinesics features according to multimedia materials and syllabus content.
- To test the final interface design to prevent possible bugs.

CHAPTER II THEORETICAL FRAMEWORK

1. SIGN LANGUAGE BACKGROUND

1.1 Sign Language

Sign language is the natural language of hearing impairment people. A language that, like any other, owns and complies with all linguistic laws and is learned within the hearing impairment community, which facilitates solving all the communicative and non-communicative needs of the human, social and cultural being. Sign languages are communicated through a gestural/visual rather than a vocal/auditory channel. Secondly, due to both genetics and educational policies, hearing impairment children and adults can be exposed to sign languages at different ages, ranging from birth (Perez, 2011).

The sign language origin occurs in 1620, Juan de Pablo Bonet made a publication considered the first modern treatise on phonetics and speech therapy, which proposed an oral teaching system for hearing impairment people, through the configured alphabetic signs use (“Reducción de las letras y arte para enseñar a hablar a los mudos”, Biblioteca Digital Hispánica, 2019). From this moment, it is proposed to improve the communication of this group of people. Throughout the investigation it was possible to notice that sign languages worldwide are not built the same in each country or region, it means that each country or culture has its own sign language, its own manual alphabet and each sign language has their own particular characteristics. The sign language of each country also depends on its culture for the realization of the manual figures or gestures.

1.2 Linguistic Conception about Sign Language

Professional linguists have studied many sign languages and found that they exhibit the fundamental properties that exist in all languages. (Klima, Edward, 1979). Sign languages, like spoken languages, organize elementary, meaningless units called phonemes into meaningful semantic units. They have a syntax that obeys the same general principles as the other natural languages, and they have some productive word formation mechanisms that allow affirming the existence of morphological processes. Also, there are stable communities of speakers, whose language has both dialect variations and idioms typical of each community. These are subject to the same type of linguistic change universally detected in all natural languages

1.3 Bolivian Sign Language (LSB) – Dactylogy or Fingerspelling

The Bolivian sign Language is based on a manual alphabet for the hearing impairment community and for it, it is needed the use of Dactylogy. According to Josefa Vilches Vilela (2005): "Dactylogy is the manual representation of each of the letters that make up the alphabet. Through it you can transmit any desired word to the deaf person communicate, however complicated it may be".

So, in a world where millions of people are deaf-mute, the application of Dactylogy, or the science of communication using hands and fingers (e.g., one-handed alphabet, two handed alphabet), is one of the, if not the only one, communication modalities that lets people with and without disability to express and send ideas and thoughts to each other. In fact, there are more than 120 distinctive sign languages used in various nations such as American Sign Language, Japanese Sign Language, French Sign Language, German Sign Language, Spanish Sign Language and more.

1.3.1 Dactylogy as a Method

In the US and Russia, Dactylogy was used as an educational method. At the time of spelling a word (by the manual alphabet), it articulated (orally) the same, in that way the two systems were used (in Russia the Russian Neo-oralism and in the US the Rochester method). In China (Puttong Chua) the syllabic alphabet made a qualitative leap in the education of the deaf. Something like the method mentioned.

In Bolivia, in the First Deaf Education Congress (La Paz, 1989) the typing was reviewed up to that point used, modifying the letter "t" and the letter "g", among other adaptations. This Review of the Dactylogy used by the LSB was one of the aspects revised within the process of preparing the First Book of Signs in Bolivia, subsequently published in 1992.

1.3.2 Uses of the Dactylogy/Fingerspelling

Fingerspelling is the letter representation of each of the twenty-six letters of the alphabet. The use of fingerspelling is limited in LSB. It is primarily used to communicate places and names when no formal recognized signs exist. Fingerspelling has very specific rules and only represents about 10 percent of the language's overall elements. Fingerspelling is the base of the sign language is used in all hearing impairment communication for example, it is useful when this kind of people introduce themselves spelling their own names. Other way to use fingerspelling is spelling acronyms and abbreviations such as products or company brands or for example social media slangs.

To have a proper use of this communication form, you must consider the following: first only one hand is used to spell a word (right or left hand depending on the dominant hand). Never both hands, the sign production is carried out in the space between the chin and the trunk, as can be seen in the image, and finally the spelling

is accompanied by the corresponding vocalization, an important complement on which the sign rests for its understanding.

1.4 Sign Language and Linguistics

Even though, sign languages are not related to oral languages, they are considered as natural languages.

Because even though hearing impairment children's adverse circumstances, they are equally capable of learning any native language and go through the same stages of acquisition as kids who are capable of hearing. So, when it happens that humans are incapable of hearing or speaking, they develop sign languages, using their hands and eyes to express themselves. Only in recent decades we have learned that any sign languages are truly natural human languages. All this happens naturally from a need to communicate.

Therefore, as Bolivian sign language is a natural language, it has the same linguistic properties as spoken languages. Bolivian sign language is a system of communication governed by rules. A language that ensures communication between users of a community, so, the speaker knows the minimum elements of a sentence and integrates them into larger units. The structure of language is given at different levels:

- Phonological
- Morphological
- Semantic and
- Syntactic.

So far, we know that Bolivian Sign Language is a language that uses physical means of communication, such as lip patterns and body language instead of oral sound or phonological characteristics of a regular language. Hearing impairment people, simultaneously, as they think, they also use their hands to show shapes, orientation and movement of the hands, arms, and facial expressions to communicate.

Bolivian Sign language like the other sign languages features:

- As language is a system, symbols are organized and used in a systematic way. Linguists oversee discovering the rules of this system. In Sign Language there are signs that are made with both hands. The sign made with both hands making the same movement has a meaning different from that of the sign made by moving only one of the hands.
- Not all but most of the words in Sign Language look like the concepts they designate. This may be because deaf people, due to their hearing impairment, develop more the sense of sight.
- The ability to produce sentences unlimitedly. As in any language, the sentences that can be produced using Sign Language are limitless. Signs can be combined with each other in many ways and produce new sentences.
- Symbols can be divided into smaller parts: words in the spoken language can be divided into smaller units like phonemes, morphemes; and these can be combined differently to form new words. Similarly, signs can be divided into smaller to form new words.
- The language can be used to refer to the past, future, or situations not immediate without being restricted to the present: it occurs in all languages and also in Sign Language. Verbs in the past are made with two signs: the sign of the verb and the sign of last.
- Signals and actions which need not necessarily have a relationship to what they are referring to just as in spoken language where everything does not go according to a set rule. Nor are they a visual version of an oral language. They have an extremely well-developed grammar and can efficiently discuss or debate on various types of abstract as well as precise topics.
- Common linguistic features of deaf sign languages are extensive use of classifiers, a high degree of inflection, and topic-comment syntax. Many only one of its kind linguistic features emerges from sign languages'

ability to produce meaning in different parts of the visual field simultaneously.

- The use of finger spelling can sometimes be a source lexicalized signs that consist of new signs. The sign language that has been developed specially for the deaf is not dependent on any spoken language and has been progressively developing based on its own norms.
- Languages change through time. The linguistic change occurs in every living language and occurs, equally in the sign languages.

Regarding Phonology, three different types of information were found that they allow you to identify a sign and differentiate it from the others:

- a) The place where the sign is made in relation to the body.
- b) The configuration of the hand or hands that make the sign.
- c) Movement or change in the configuration of the hand or hands.

The same sign made by changing any of this information makes change its meaning.

Thus, a system of oppositions is formed, similar to those phonological features. According to where the hands are oriented, the meaning. Towards me: he looks at me; towards you: looks at you.

1.5 Sign Language acquisition

Every language has its own sign language developed for and by people who are deaf in that particular language speaking community. Just as in spoken language where the place and culture have an impact, sign language also develops in the same manner influenced by these conditions. Thus, they learn to keep their identities intact, through time in roughly the same areas of influence as that of the locally spoken languages.

According to Ortíz Cabanillas in "Lenguaje y habla personal" it mentions that: "Language can be defined from many perspectives: as a system of linguistic signs, as a social communication system, as a psychic system cognitive and as a functional system of the brain" (2009; p.34).

Regarding language as a functional system of the brain, in both, hearing impairment people and the hearing, language is processed in the left hemisphere of the brain. The right hemisphere dominates the spatial relationships which are important in Sign Language for decoding and encoding. Besides, putting special attention in the case of Sign Language users, it was discovered that the right hemisphere is also active for language and that although if the person suffers an injury, his/her linguistic ability is not affected (Radetsky Peter, 2015).

1.6 The hearing impairment community in Bolivia

There are two conceptions about the Deaf person. The Socio-anthropology conception and the clinical conception. These conceptions are opposite to each other.

1.6.1 Socio-anthropological conception

From the biological and social perspective of the human being, this conception claims the right of the Deaf person to be communicate in your language (LSB). This right was recognized in the Salamanca Declaration of 1994, in the Convention of Rights of Persons with Disabilities of 2006, in the Political Constitution of the State of Bolivia and in Supreme Decree N°.0328 of October 14, 2009, among others.

1.6.2 Clinical conception

On the other hand, the clinical conception sees the deaf as a sick person, as a patient who must be "cured" to rehabilitate the ear damaged. Cancel the possibilities of developing in

the hearing impairment culture. This one must adapt to the educational methodology and not the methodology to the hearing impairment people needs.

From the biological and social conception of deafness, the Hearing impairment community is identified as a space in which they intervene several actors, the same ones who share a language: Bolivian Sign Language.

The Deaf Community comes from different places in a department or municipality, there is no neighborhood of Deaf, nor a Deaf area.

The Hearing impairment community is a living community in which they participate Deaf people and listeners: family and friends, teachers of Deaf, interpreters and, of course, hearing impairment people.

1.7 The hearing impairment education in Bolivia

In the first half of the 19th century, special education began in Bolivia. By Law of September 25, 1945, promulgated by the President Gualberto Villarroel, the National Patronage of blind and deaf and dumb, the same that became the Institute of blind and deaf and dumb, in 1946, naming Alberto Santander as Director of said Institute. In 1947 Alberto Santander, thanks to the support of Mrs. Teresa Suárez Teacher, traveled to the US under the Program Cooperative of Education with Bolivia where he studied in the Gallaudet College of Washington and obtained the master's degree in the Deaf children education. Upon his return he organized the first Center of educational attention of deaf children, in a land located in the Obrajes area donated by the Venezuelan government of that time. Professor Santander is considered the first professor of Deaf in Bolivia.

Subsequently, the congregation of the Rabasco mothers of “Corazón de Jesús” and Mary opened the boarding school for deaf girls. Based on the National Patronage of the Blind and Deaf, the National Department of Rehabilitation and Special Education in the government of Dr. Victor Paz Estenssoro on July 1, 1954. By determination of President Hernán Siles Zuazo, in November of 1956, an extension of 15,000 square meters of land for the construction of a modern building for the Institute of Special Education in the

Obrajes area. In 1957 Lucy Argandoña de Céspedes creates the Institute of Audiology in Cochabamba.

1.8 Bilingual Bicultural Learning

The term Bilingual Bicultural Learning was used for this project based on Colombian Educational proposal called EBBS (Educación Bilingüe Bicultural para Sordos) (Bilingual Bicultural Learning) made by Ministerio de Educación Nacional República de Colombia. The BBL is a complex educational system that deals with generating educational responses to the needs and potential of hearing impairment people through differentiated pedagogical proposals, according to deaf groups that exist in a given context.

The BBL refers to respecting the identity of hearing impairment people, this community has two languages, its first language is sign language and its second language is the Spanish, while learn two languages these people develop the learning of both cultures.

This Educational System develop the following aspects:

1. It demands the concept of education, starting from the early childhood of the deaf to adulthood; this means that Bilingual Bicultural Language proposes to open and support bilingual programs for children under five years of age.
2. Bilingual programs for pre-school or pre-school education.
3. Bilingual educational proposals bicultural for the deaf in which access to the maximum of degrees and levels of formal education.
4. Bilingual higher education educational institutions for the deaf or access to institutions of higher education in technical, technological, or professional careers.
5. Proposals for non-formal or formal education at the community level that allow deaf people to have training options for work, leadership or other needs of each context or group of deaf people.

2. EDUCATION AND TECHNOLOGY

Nowadays most adults and adolescents in developed countries have mobile phones and media devices, and for many people in developing countries a mobile phone can offer the only means of sending long distance messages. In a parallel development to the spread of personal technology, since the early 1980s schools, colleges and universities have experimented with handheld technology for learning, including classroom response systems, data probes, and handheld writing tools. Universities allow students to bring laptop computers to lectures and some schools are now providing pupils with Personal Digital Assistants and tablet computers. As personal mobile technologies for learning become more widespread, studies are starting to show evidence of the value of incorporating mobile devices in teaching and learning (McFarlane, Triggs and Yee 2008; p.7) and substantial issues, including conflicts between informal learning with personal devices and traditional classroom education (Sharples, 2007). Children are developing new skills and literacies enabled by mobile devices, such as SMS texting, (writing diaries and weblogs on mobile devices) and mobile video creation. A new generation of location-aware mobile phones will offer further possibilities, of education services and educational media matched to the learner's context and interests. The complexity of these interactions between learners, educational settings and mobile technologies challenges the conventional view of education as imparting knowledge in a fixed location, inviting a more expansive possibility of ubiquitous learning supported by personal media communicators. Our aim is to propose a theory of learning for a society of ever-increasing personal and social mobility. It encompasses both learning supported by mobile devices such as cellular (mobile) phones, portable computers, and personal audio players, and also learning in an era characterized by mobility of people and knowledge (Rheingold 2002) where the technology may be embedded in fixed objects such as 'walk up and use' information terminals. For brevity we shall refer to these together as mobile learning.

2.1 Blended Learning definition

Learning requirements and preferences of each learner tend to be different. Organizations must use a blend of learning approaches in their strategies to get the right content in the right format to the right people at the right time. Blended learning combines multiple delivery media that are designed to complement each other and promote learning and application-learned behavior. Blended learning programs may include several forms of learning tools, such as real-time virtual/ collaboration software, self-paced Web-based courses, electronic performance support systems (EPSS) embedded within the job-task environment, and knowledge management systems. Blended learning mixes various event-based activities, including face-to-face classrooms, live e-Learning, and self-paced learning. This often is a mix of traditional instructor-led training; synchronous online conferencing or training, asynchronous self-paced study, and structured on-the-job training from an experienced worker or mentor.

For our project the blended is used as a guide for the creation of our Hybrid syllabus which we will explain later.

2.1.1 Blended Learning Characteristics

Blended Learning is a teaching method in which you can use personalized tutorials, videoconferences, chats, face-to-face classes, etc. Some professionals see this method as a delay in education and others more as an advance that allows to use the best of face-to-face education and online education.

The main characteristics of this training method are the following:

- Flexible training as well as personal and warm. The student gains more freedom in terms of time; therefore, a course becomes more flexible, and at the same time it is personal and warm as classes are included face to face in which the teacher can treat his student in a closest way.

- Expert conferences. Online classes and video conferences can be given in addition to by teachers, experts, and specialists in issues regardless of where they reside.
- Diversity in teaching techniques and methodologies. Here it is a combined traditional teaching with e-learning and, to enrich and facilitate learning here are face-to-face activities (face-to-face classes, laboratories, field studies), there are also online activities (chats, virtual meetings, reception of live events).
- Online and Offline Learning. There are several different blended learning programs now available, including flex programs and rotation courses.
- Instructor Involvement. These programs always require that an instructor be on hand to help students with all their needs. Students taking online classes inside a school setting will have a teacher in the classroom.
- Independent Learning. The biggest benefit to these programs is the independent learning in students. Some students have a difficult time in their classes because they learn differently than their peers do. They may do better in classes that require more hands-on interaction than they do in classes that require they sit and listen to a teacher talk. Blended allow students to learn on their own and to use the materials and resources presented to them in ways that work best for them.
- Support for Students. Nowadays most kids know how to do basic tasks on a computer, including surfing the web and use cellphone applications, they may need help evaluating online resources, finding the best materials, and putting together. Instructors working in these programs offer students all the help and support they need both through offline meetings and online contact.

Blended learning offers several benefits for students and help them do their work online. Some of the characteristics include offering technology and other types of support for students, helping them become independent learners and letting them interact with their peers.

2.1.2 Technology and Blended Learning

It can be started that Blended Learning is the combination of technologies and pedagogies. Friesen found that, in the early days of blended learning, the term could mean „almost any combination of technologies, pedagogies and even job tasks. Definitions might cover any instructional technology at all or restrict themselves to web-based technology; they might not mention technology specifically, but instead focus on blending different theoretical approaches. In addition, Procter defined blended learning as: “The effective combination of different modes of delivery, models of teaching and styles of learning”. According to (Norah et al., 2008): “Blended learning involves the combination of two fields of concern: education and educational technology”.

For Staker and Horn (2004), blended learning is: “A formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace and at least in part at a supervised brick-and-mortar location away from home”. Consequently, this definition emphasizes that content and instruction must be delivered online, meaning that a traditional face-to-face course in which students are encouraged to use the internet for research which does not qualify as blended learning. The phrase „supervised brick-and-mortar location“ means that the „face-to-face“ element need not necessarily consist of traditional classroom contact. ⁶

In addition, Kumi-Yeboah, A. and Smith, P. (2005) give an expanded version of Staker and Horn’s: “A formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or pace; at least in part in a supervised brick-and-mortar location away

⁶Staker, H. and B. Horn, M. (2002). *Classifying K–12 Blended Learning*. Cambridge, MA, Estados Unidos: INNOSigth institute.

from home; and the modalities along each student's learning path within a course or subject are connected to provide an integrated learning experience."⁷

2.1.3 Models of Blended Learning

The definitions of blended learning developed by Graham and Friesen, noted above, revolve around bimodal delivery, involving a face-to-face or 'co-present' element, and a computer mediated element. However, the ways in which these elements are used for different learning purposes, and the balance between the elements, allow for more than one model to be constructed consistent with these definitions.⁸

One early typology, suitable for the world of work-related training, was that of Valiathan. This divided blended learning models into three types: those which are skill-driven, aimed at the acquisition of specific knowledge and skills, where the instructor gives feedback and support; those which are attitude-driven, aimed at the development of new attitudes and behaviors, where peer-to-peer interaction and group work are central; and those which are competency-driven, aimed at capturing tacit knowledge, where learners must observe experts at work. This

Typology has been criticized for its mixed nature, as it is based on both learning objectives and on pedagogical methods.

A more influential approach is exemplified by Staker and Horn. They work with a typology of four models, reduced from an original six. The six original models were:

⁷Kumi-Yeboah, A. and Smith, P. (2005). Blended Learning in K-12 Schools: Challenges and Possibilities. 2014 January, de Researchgate Sitio web:https://www.researchgate.net/publication/281456928_Blended_Learning_in_K-12_Schools_Challenges_and_Possibilities

⁸Graham and Friesen. (2016). Blended learning: definition, models, implications for higher education. 2020, de Research gate Sitio web: https://www.researchgate.net/publication/303815166_BLENDED_LEARNING_DEFINITION_MODEL_S_IMPLICATIONS_FOR_HIGHER_EDUCATION

1. The face-to-face driven model, in which classroom learning is supplemented with online learning.
2. The rotation model, in which students rotate between working online and other classroom-based modalities.
3. The flex model, in which students study mainly online according to an individually customized schedule, and face-to-face support is provided by the teacher as needed.
4. The online lab model, in which students supplement their traditional studies by taking an additional online course on-campus.
5. The self-blend model, in which students supplement their traditional studies by taking an additional online course off campus.
6. The enriched virtual model, in which learning is mainly online with occasional visits to a brick-and-mortar setting for face-to-face tuition.⁹

2.1.4 Benefits of Blended Learning

Blended learning is important because it breaks down the traditional walls of teaching, ones that don't work for all students and now with access to present-day technologies and resources we can tailor the learning experience for each student. Blended learning also offers flexible time frames that can be personalized to each person, offering them the ability to learn at their own pace.

Teaching is less expensive to deliver, more affordable, and saves time. Blended learning offers flexibility in terms of availability. In other words, blended learning enables the student to access the materials from anywhere at any time while enjoying the benefits of face-to-face support and instruction.

Access to global resources and materials that meet the students' level of knowledge and interest. Self-pacing for slow or quick learners reduces stress, increases satisfaction, and

⁹Staker, H. and B. Horn, M. (2002). *Classifying K-12 Blended Learning*. Cambridge, MA, Estados Unidos: INNOSigth institute.

information retention. E-learning allows more effective interactions between the learners and their instructors by using emails, discussion boards and chat room.

Students can track their progress. Students can also learn through a variety of activities that apply to many different learning styles. E-learning could improve the quality of teaching and learning as it supports face-to-face teaching approaches.

Blended learning also improves other factors for the teacher including:

- More engaged students
- Better information and feedback on work
- Team teaching
- Extended time with students
- Focus on deeper learning
- Motivate hard to reach kids
- New options to teach at home
- More earning power

2.1.5 Advantages of Blended Learning for Students

This method offers a lot of advantages for the learner:

- Increase student interest: when technology is integrated into school lessons, learners are more likely to be interested in, focused on, and excited about the subjects they are studying. Subjects that might be monotonous for some – like math and science, while also increasing information retention.
- Keep students focused for longer: The use of computers to look up information & data is a tremendous lifesaver, combined with access to resources such as the internet to conduct research. This engagement and interaction with the resources keeps students focused for longer periods than they would be with books or paper resources, this engagement also helps develop learning through exploration and research.

- Provides student autonomy: The use of e-Learning materials increases a student's ability to set appropriate learning goals and take charge of his or her own learning, which develops an ability that will be translatable across all subjects.
- Instill a disposition of self-advocacy: Students become self-driven and responsible, tracking their individual achievements, which helps develop the ability to find the resources or get the help they need, self-advocating so they can reach their goals.
- Promote student ownership: Blended learning instills a sense of 'student ownership over learning' which can be a powerful force propelling the learning. It's this feeling of responsibility that helps the feeling of ownership.
- Allow instant diagnostic information and student feedback: The ability to rapidly analyze, review and give feedback to student work, gives the teacher the ability to tailor his teaching methods and feedback for each student while improving time efficiency.
- Enables students to learn at their own pace: Due to the flexibility of blended learning and the ability to access internet resources allows students to learn at their own pace, meaning a teacher can help speed up the learning process or give more advanced resources if necessary.
- Prepares students for the future: Blended learning offers a multitude of real-world skills, that directly translate into life skills, from: Research skills, Self-learning, Self-engagement, better decision making, it offers a larger sense of responsibility and Computer literacy.

2.2 MOBILE ASSISTED LANGUAGE LEARNING (MALL)

2.2.1 Definition of MALL

MALL deals with the use of mobile technology in language learning. Mobile-Assisted Language Learning (MALL) deals with the use of mobile technology in language learning. In contrast to classroom learning, in MALL there is no need for the learners to

sit in a classroom or at a computer to get learning materials. In fact, MALL can be considered an ideal solution to language learning barriers in terms of time and place.

Students do not always have to study a second language in a classroom. They may have the opportunity to learn it using mobile devices when they desire and where they are. Nowadays, mobile devices such as PDAs, phones, and other handheld devices, are used everywhere for doing everything ranging from voice calling to making short message, video chat, listening to audio (Mp3, Mp4, Mpeg), web surfing, shopping, and the like. Apart from these benefits, mobile devices have increasingly grown toward becoming tools for education and language learning, and all its users from teachers or students are getting used to this environment to make education as ubiquitous as possible. Moreover, the emerging of internet made open and distance learning a means of receiving education from all parts of the world. In a short period, the attractiveness of distance learning led to the realization that various mobile devices provide a very effective resource for education. This way, many researchers tried to make mobile devices a rich resource for teaching and learning.

2.2.2 MALL characteristics

Mobile learning is characterized by its potential for learning to be spontaneous, informal, personalized, and ubiquitous. Such learning is reinforced when people encounter shortage of free time as the result of working longer hours.

In such an environment, busy people tend to use portable devices to learn new materials rather than taking time for traditional classroom-based courses.

There are some factors having key roles in the use of mobile devices in learning environments. Physical characteristics of a mobile phone such as its size and weight as well as input and output capabilities such as keypad vs. touchpad and screen size and audio functions are among the factors which should be assessed in this respect. The learner skills and his/her prior knowledge and experience with mobile devices for learning, as well as the learner's attitude towards the learning through mobile phone play a crucial role in the output quality of such a mobile-based tasks.

Learning through the computer or e-learning enables the learners to learn in a non-classroom environment when they are at home in front of their personal computers online or offline. However, learning through the mobile phone or m-learning provides the learners with the opportunity to learn when they are in the bus, outside or at work doing their part-time jobs. In fact, they can learn every time and everywhere they are.

Two main characteristics of mobile devices are portability and connectivity. As for connectivity, designing the mobile system must have capability of being connected and communicated with the learning website using the wireless network of the device to access learning material ubiquitously including short message service (SMS) and mobile e-mail. Portability enables learners to move mobile devices and bring learning materials.

Klopfer and his colleagues (2007) state the following properties of mobile devices:

- Portability: such devices can be taken to different places due to small size and weight.
- Social interactivity: exchanging data and collaboration with other learners is possible through mobile devices.
- Context sensitivity: the data on the mobile devices can be gathered and responded uniquely to the current location and time.
- Connectivity: mobile devices can be connected to other devices, data collection devices, or a common network by creating a shared network.
- Individuality: activities platform can be customized for individual learner.

2.2.3 Classification of Mobile Learning apps

Mobile learning apps can be classified into:

- Workplace learning apps
- Skill building apps
- Educational apps

- Hobby apps

2.2.3.1 Workplace Learning (MALL)

The apps which are used for workplace learning focus on improving the productivity of the employees. Organization makes this mandatory for the employees to learn and train themselves using the workplace learning apps.

The main benefits of Workplace learning apps are:

- Teaching employees on the move
- For a quick refresher on certain topic
- For inform about a quick update to the employees

2.2.3.2 Skill Building apps

Skill building apps help the learners to build certain skills based on the area of interest. It can be a new topic of interest for the learner or a new area which the learner wants to explore. For example, if you want to learn a new skill like learning a new language, there are various popular language learning apps such as Duolingo. Some common areas where the learners use skill building apps are:

- Learning a new program
- Learning a new software
- Learning a new language
- Communication Skills
- Trading skills (stock market and share market) and so on.

2.2.3.3 Education apps for K – 12 classrooms

Educational apps help learners to educate themselves on academic topics and subjects. These apps are widely used from Pre schooling to college graduation and where the learner can use the app for various academic learning. Some of these apps to prepare for

entrance exams as well. As these apps are portable in nature it can be easily accessed from classroom and even at home thus making it convenient for the learner to learn at any time.

2.2.3.4 Apps for Hobbies

Hobbies applications are the applications which are used by the users to explore something and to pursue their passion. It might be learning a musical instrument, or learning how to dance, learning how to paint and a host of other hobbies, which one could learn with the help of these apps. As these works on handheld devices across multiple platforms it gives the power to the user to learn the hobbies at his spare time. These apps are designed in a manner to give a lot of practice to the learners and allowing them a complete freedom to learn what they want and how they want.

3. THE SELECTION OF A SYLLABUS FRAMEWORK

3.1 Definition of syllabus

A syllabus provides the students and the teacher a reference point that sets what it is going to be learnt throughout the course. By saying this, a syllabus can tell you nearly everything you need to know about how a course will be run and what will be expected of the students. “It will include course policies, rules and regulations, required texts, and a schedule of assignments” (Stanford Undergrad, 2019, first paragraph).

The process of designing a syllabus includes a lot of research and information according to the characteristics of how students learn. In the case of this project, children with hearing impairment are the subject of study, and we could not find a specific model or chart of a syllabus for improving children hearing impairments two languages skills (Bolivian Sign Language- LSB and Written Spanish). Nevertheless, between lots of different kinds of educational language acquisition syllabuses that exist and under the fact that all children, whether requiring special educational services, have basically the same needs of a non- impairment child, two syllabuses were combined for this purpose:

- Content Based Syllabus and
- Situational Syllabus.

3.2 Types of Syllabuses

According to Nunan (1988), almost all the language teaching syllabuses are amalgamations of two the types: Product-oriented and Process-oriented syllabuses.¹⁰

3.2.1 Product-oriented and Process-oriented syllabuses

According to Nunan (1988) that product-oriented syllabuses are those in which the focus is on the knowledge and skills which learners should gain, as a result of instruction (the product or the end), while process syllabuses are those which focus on the learning experiencing themselves (the processes toward the end).

In this line he proposes the following chart of the two types:

Product-oriented	Process-oriented
Structural/Formal	Tasked-based
Situational	Procedural
Lexical	Negotiated
Notional-Functional	Proportional
-	Content-based

Figure 1: Product oriented- Process oriented

Source: International Journal of Research Studies in Language Learning.

Nevertheless, there is another scope about this, Wilkins (1976) considers Synthetic Vs. Analytical syllabus dichotomy and suggest the two perspectives are better seen as points on a continuum rather than in binary opposition.

¹⁰Nunan, D. (1988): Syllabus design. Oxford: Oxford University Press.

3.2.2 Synthetic syllabuses Vs. Analytic

Wilkins (1976, p. 13) states that the synthetic syllabus is one in which the different parts of language are taught separately and gradually until the whole structure of language has been constructed. Therefore, learners acquire a language in parts, which means in structures and functions, and which also are independent of one another; besides to integrate, or synthesize, the pieces when the time comes to use them for communicative purposes.

In contrast, analytic syllabuses are organized in terms of the purposes for which people intend to learn the language and the kinds of language performance that are necessary to fulfill those objectives.

In this line he proposes the following chart of the two types:

Product-oriented	Process-oriented
Tasked-based	Structural
Procedural	Situational
Notional-functional [According to Wilkins (1976)]	Notional-functional (According to Long & Crooks (1992))
Content-based	-
Negotiated	-

Figure 2:Product oriented- Process oriented

Source: International Journal of Research Studies in Language Learning.

3.3 Content Based Syllabus

Content-based syllabus is considered as a sub-category of process-oriented and an analytic syllabus (Nunan, 1988). Krahnke (1987, p. 65) defines content-based syllabus as the teaching of content or information in the language being learned with little or no direct or explicit effort to teach the language itself separately from the content being taught.¹¹

This content may come from other subjects on the school curriculum, such as science, history, environmental studies, or it might be generated from an analysis of students' interests and needs (Nunan, 2004, p. 130).

In a content-based approach, the activities of the language class are specific to the subject matter being taught and are geared to stimulate students to think and learn by using the target language. Such an approach lends itself quite naturally to the integrated teaching of the four traditional language skills.

The primary purpose of instruction, according to Reilly (n. d.) and Richards and Rodgers (2001) is to teach some content or information using the language that the students are also learning. The students are simultaneously language students and students of whatever content is being taught. The subject matter is primary, and language learning occurs incidentally to the content learning. The content teaching is not organized around the language teaching, but vice-versa.

In the first place, for young children, cognitive development and language development go hand in hand; language is a tool through which the child comes to understand the world. Language, cognition, and social awareness develop concurrently in young children. Integrated second language instruction seeks to keep these components of development together so that second language learning is an integral part of social and cognitive development in school settings. A second rationale behind integrating

¹¹Nunan, D. (1988): Syllabus design. Oxford: Oxford University Press.

language and content teaching is that language is learned most effectively for communication in meaningful, purposeful social and academic contexts. In real life, people use language to talk about what they know and what they want to know more about, not to talk about language itself. The academic content of the school curriculum can provide a meaningful basis for second language learning, given that the content is of interest or value to the learners.

3.3.1 Benefits of Content-Based syllabus

Merits Nunan (1988) sees these points as the advantages of content-based syllabuses:

- In comparison with analytic syllabuses which are little more than random collection of tasks, content-based syllabuses enjoy a logical and coherent selection and grading content.
- It shares the advantages of analytical syllabuses.
- Learners learn other aspects of school learning alongside language itself.
- It integrates all the four language skills.
- It actively involves students in the phase of learning.
- It involves authentic tasks.
- For all these reasons, it can raise motivation and heighten the engagement of the learner in his or her own learning process.¹²

3.4 Situational Syllabus

A situational syllabus is the one in which the language is taught through a collection of imaginary or real situations rather than different grammatical items, vocabulary topics, etc. (Lenmus, 1999). Thus, it is designed in such a way that we must select and make a sequence different realistic situation based on a communicative view of language. Besides, the situations are relevant to the present and future needs of the language learners, plus, hearing impairment children could have the possibility in training two

¹²Nunan, D. (1988): Syllabus design. Oxford: Oxford University Press.

languages according to the situations that we make up for this syllabus. Therefore, we as language designers will try to predict situations in which the hearing impairment learner will find him/herself, and applies these situations, for example: playing in the park, going to school, and meeting a new student. Palmer and Hornby believed that a grammatical or structural syllabus was neither efficient, nor effective for language learning since this model offers language samples outside their social and cultural contexts which makes transfer of learning from the classroom to the real world quite difficult. In fact, the limitations attributed to the structural syllabus led to an alternative approach where the point of departure became situational needs rather than grammatical units.

In the case for hearing impairment children, the situations are usually presented to the students in form of dialogs (usually at the beginning of the lesson, and it includes listening, memorization as well as provides the students models for student improvisation) and role plays (which are the students expected to create, supply, or fill in much of the language that occurs in the situation). The content of situation can be created by materials made by teachers or taken from real life.

3.4.1 Types of Situational Syllabus

Alexander (1976) differentiates three types of the situational syllabus based on type of information: **Limbo Situation:** In this type, the information of the specific setting is of little importance. For example, the topic of introducing someone at the setting of a dialogue taking place at the stadium. It can be said that the setting is considered irrelevant, i.e., unimportant, because the main important thing is the language focus. **Concrete Situation:** The information is about the specific and concrete setting and the language associated with it. For example: The topic of ordering a meal at a restaurant. **Mythical Situation:** The information depends on fictional story line, frequently with a fictional cast character in a fictional place.

3.4.2 Benefits of Situational Syllabus

It has the potential advantage of tapping students' knowledge of the world as an aid to learning, and of providing realistic, and hence motivating, materials. It also may serve the purpose of bridging cultural gap by various conversations and topics that are implied with typical social conventions and customs of the countries and people the learners are interested in. It is manageable to take situational syllabus as a foundation, upon which we can incorporate many other syllabus types, for instance, grammatical/structural, functional/notional syllabi, etc.

Situational syllabus will have a countless resource to utilize, to construct and design a variety of courses without worrying about repetition and boredom.

4. UNIVERSAL DESIGN FOR LEARNING (UDL)

4.1 Definition

To understand what Universal Design for Learning (UDL) is, it helps to understand what it is not. The word universal may throw you off. It may sound like UDL is about finding one way to teach all kids. But UDL takes the opposite approach.

Universal Design for Learning (UDL) is a way of thinking about teaching and learning that helps to give all students an equal opportunity to succeed. This approach offers flexibility in the ways students access material, engage with it and show what they know.

Developing lesson plans this way helps all kids, but it may be especially helpful for kids with learning and thinking differences.

The goal of UDL is to use a variety of teaching methods to remove any barriers to learning and give all students equal opportunities to succeed. It is about building in flexibility that can be adjusted for all student's strengths and needs. That is why UDL benefits all kids.

4.2 Main principles of UDL

UDL is a framework for how to develop lesson plans and assessments that is based on three main principles:

- **Representation:** UDL recommends offering information in more than one format. For example, textbooks are primarily visual. But providing text, audio, video, and hands-on learning gives all kids a chance to access the material in whichever way is best suited to their learning strengths.
- **Action and expression:** UDL suggest giving kids more than one way to interact with the material and to show what they've learned. For example, students might get to choose between taking a pencil-and-paper test, giving an oral presentation or doing a group project.
- **Engagement:** UDL encourages teachers to look for multiple ways to motivate students. Letting kids make choices and giving them assignments that feel relevant to their lives are some examples of how teachers can sustain students' interest. Other common strategies include making skill-building feel like a game and creating opportunities for students to get up and move around the classroom.

4.3 Learning and thinking differences and UDL

UDL helps all students. But here are some of the ways it may be especially helpful to kids with learning and thinking differences:

- Makes learning more accessible in general education classrooms, which is where most kids with learning and thinking differences spend most or allof the school day.
- Presents information in ways that adapt to the learner, instead of asking the learner to adapt to the information.
- Gives kids more than one way to interact with material. UDL builds in flexibility that can make it easier for kids to use their strengths to work on their weaknesses.
- Reduces stigma. By giving a variety of options to all students.

4.4 UDL Guidelines

The UDL Guidelines are a tool that can be used to design learning experiences that meet the needs of all learners. These Guidelines offer a set of concrete suggestions for applying the UDL framework to practice and help ensure that all learners can access and participate in meaningful, challenging learning opportunities.

4.4.1 UDL Guidelines organization

The UDL Guidelines are organized both horizontally and vertically. Vertically, the Guidelines are organized according to the three principles of UDL: engagement, representation, and action/expression. The principles are broken down into Guidelines, and each of these Guidelines have corresponding “checkpoints” that provide more detailed suggestions.

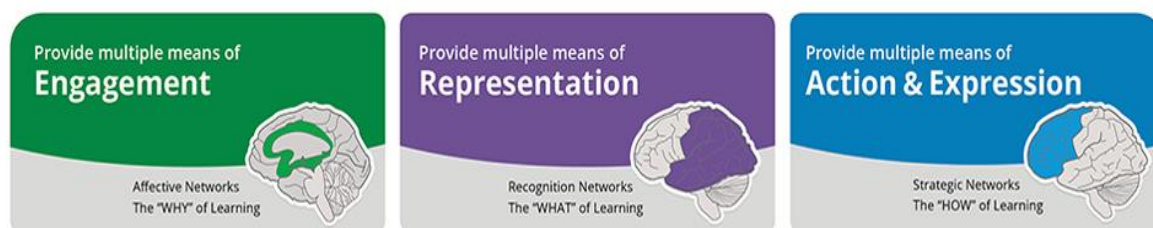


Figure 3: Principles of UDL

Source: CAST.org

The Guidelines are also organized horizontally. The “access” row includes the guidelines that suggest ways to increase access to the learning goal by recruiting interest and by offering options for perception and physical action.



Figure 4: Access

Source: CAST.org

The “build” row includes the guidelines that suggest ways to develop effort and persistence, language and symbols, and expression and communication.



Figure 5: Build

Source: CAST.org

Finally, the “internalize” row includes the guidelines that suggest ways to empower learners through self-regulation, comprehension, and executive function.



Figure 6: Internalize

Source:CAST.org

Taken together, the Guidelines lead to the goal of UDL: to develop “expert learners” who are, each in their own way, resourceful and knowledgeable, strategic and goal-directed, purposeful and motivated.



Figure 7: Goal

Source: CAST.org

5. HYBRID SIGN LANGUAGE SYLLABUS

The following theory is new, this is our proposal converted as a theory.

5.1 Aims and Learning Outcomes

The aims of this project are:

1. To have basic knowledge of Bolivian sign language and tech cellphone skills to be able to understand Bolivian sign language and written Spanish language.
2. To develop cultural and intercultural skills by using the app.
3. To explore the study of Bolivian Sign Language and culture as an integral part of the elementary regular education.
4. To promote the bilingual digital education interest.

This project's learning outcomes are:

1. **Knowledge**, learners will perform/ apply all the knowledge acquired into real life, and technological competence in order to understand human experience/behavior.
2. **Bilingual Communication**, learners will use Bolivian Sign Language (LSB) and written Spanish language to communicate effectively with diverse audiences they tend to meet, in a variety of settings and in a variety of purposes.
3. **Culture and identity**, learners will see themselves performing in a virtual world through the app. In addition, they will understand themselves which includes hearing impairment identities.

- 4. Social Responsibility**, learners will have knowledge of the principal rights and responsibilities a kid has in the Bolivian society they live in.

5.2 Characteristics

This syllabus is called "Hybrid" because it takes characteristics from the Situational Syllabus and Content-Based Syllabus to teach two languages, for this case, Bolivian Sign Language and Spanish written language. Even though, the characteristics of each syllabus are explained lines above, we must emphasize that it is very important that our learners feel a content-based learning while they are in a virtual context (situational).

Therefore, these 3 courses are designed for students with little or no previous knowledge of Bolivian Sign Language and written Spanish language. Students will acquire basic grammatical skills and vocabulary that will enable them to communicate in routine social situations within an authentic cultural context.

5.3 Methodological strategies

Virtual Methodology:

- The learner must begin the course through the acquisition of a CD/DVD or DEVICE which stores the mobile application.
- The student must develop the course that he/she thinks that belongs in order to go through the lessons that each thematic unit indicates.

On the number of lessons to develop:

- The student must develop the lessons specified in the content programming.

Each lesson has 3 learning stages:

- **Stage 1. Learn:** In this stage the learner develops activities that will allow him/her to learn new words, etc. that will enrich his/her vocabulary of the language.
- **Stage 2. Practice:** In this stage the learner practices what he/she learned.

- **Stage 3.** Apply: The learner will go through some learning exercises.

5.4 Didactic resources

Equipment:

- The student requires, in the case of installing it in a computer, the use of a computer with 512 MB or more of RAM, a 1.5 GHz single core processor. But if it is going to be installed in a cellphone it only needs 60 MB of storage.
- The computer requires a 512 Kbps Internet connection.
- The app does not need the use of headphones or microphone.

5.5 Learning assessment

For the learner to follow his/her development by using the app, there are going to be mini tests after each lesson. It is very important that the learner practice what he/she learnt constantly.

5.6 Visual/Kinesthetic Communication

The Hybrid syllabus is based on two main modalities or sensory styles of learning: visual and kinesthetic (touching, tactile).

Bolivian Sign Language is a visual language. With signing, the brain processes linguistic information through the eyes. The shape, placement, and movement of the hands, as well as facial expressions and body movements; all this differ from those used to produce and perceive spoken languages.

In this syllabus, there are being used photos, graphic designed characters, short videos, etc. to go along the sign language education. And for it, we address two factors that have important consequences for sign language acquisition:

- First, there are three types of lexical signs: one-handed, two-handed symmetrical, and two-handed asymmetrical.

- Second, the visual communication will follow “imitation strategies” to imitate signs. Learners will be mirroring (produce a mirror image of the modeled sign) the movements that they see through images or videos (sign models) to follow the lessons. So, this leads learners to produce inward–outward movements and palm orientation reversals.

Another characteristic of this syllabus is that it implements “Kinesthetic stimulation” to go along the lessons. Our learners will need to use some sort of physical activity to help themselves to learn, as the lessons are in mobile application. Learners’ interaction will depend on the use of their fingers to touch the cellphone screen to perform several activities. The app will also activate commands as “vibration of the screen” to stimulate the performing of the learners.

6. LEGAL FRAMEWORK

- **Constitución Política del Estado de Bolivia-CPE**
 - **Artículo 17.** Toda persona tiene derecho a recibir educación en todos los niveles de manera universal, productiva, gratuita, integral e intercultural, sin discriminación.

Interpretation:

This paragraph states that any person in Bolivia has the civil right to have access to education, mainly, that there is no discrimination in this right.

- **Ley 070 “Avelino Siñani”**
 - **Artículo 5 (Objetivos de la Educación).** Garantizar el acceso a la educación y la permanencia de ciudadanos en condiciones de plena igualdad y equiparación de condiciones.

Interpretation:

This paragraph explains that the education must be accessible and under equal conditions for everyone who has access to it.

- **Artículo 7 (Uso de idiomas oficiales y lengua extranjera).**La enseñanza del lenguaje en señas es un derecho de las y los estudiantes que lo requieran en el sistema educativo. La enseñanza del lenguaje de señas es parte de la formación plurilingüe de las maestras y maestros.

Interpretation:

Teachers must be prepared in bolivian sign language (LSB) to be able to teach the population that requires it. Like this, teacher will be able to teach the regular curriculum of the study plan.

- **Artículo 17 (Objetivos de la Educación Alternativa y Especial).** Incorporar el uso y la correcta aplicación de los métodos, instrumentos y sistemas de comunicación propios de la educación para personas con discapacidad, dificultades en el aprendizaje y talento extraordinario en el Sistema Educativo Plurinacional.

Interpretation:

People who are the head of the school as the teaching staff must work with specialized material to teaching children with hearing impairment. They must have everything set up to teach this population in specific. By this we meant that they must have specialized books, methods, between others.

- **Ley 223/2012- Ley General Para Personas con Discapacidad**

- **Artículo 5 (Definiciones)**

La educación debe dar respuesta a la diversidad mediante adaptaciones físicas, curriculares y personas de apoyo buscando mayor participación en el aprendizaje, las culturas y las comunidades para reducir la exclusión de la educación.

Interpretation:

For education to have successful results, it must be adapted to its student population. In this way, students will feel comfortable in continuing with their education.

- **Artículo 7 (Material Educativo y Comunicacional).** El Ministerio de Educación promoverá y orientará la producción y aplicación de materiales educativos y comunicacionales en el Sistema Educativo Plurinacional con enfoque inclusivo, destinados a estudiantes con discapacidad.

Interpretation:

The Bolivian state must be the engine for the production of specialized school material for the student population with disabilities.

CHAPTER III: METHODOLOGY

1. TYPE OF APPROACH

There are three ways of focusing research:

- The qualitative
- The quantitative and
- The mixed focus.

For Gomez: “Qualitative studies involve data collection using techniques that do not are intended to associate measurements with numbers (they are not intended to quantify), such as unstructured observation, open interviews, document review, evaluation of personal experiences, inspection of life stories, interaction with groups or communities, and introspection” (Gómez, 2006, p. 65).¹³

Thus , considering all above, this research adjusts as a qualitative focus and that is because this work pretends to recognize more about the “Huascar Cajías” school learning needs in Bolivian Sign Language (L1) and Spanish written language (L2), specifically, for the elementary grades of initial, first and second. All this to suggest

¹³Gómez, G. (2006). Tradición y Enfoques de la investigación cualitativa. En Metodología de la investigación cualitativa (156). Málaga, España: Editorial Aljibe.

a pedagogical technological material support and a new syllabus designed and based on those needs.

2. TYPE OF DESIGN

Gómez (2006, p. 65) states that through an analysis and observation, we can have important characteristics, properties of a determined phenomenon and those descriptive studies seek that. For that reason, the design for this work is a descriptive transversal one, in particular, a non-experimental design.

Also, Sampieri (2005, p. 80) says: "descriptive studies gather the data as it appears in the reality, and they are useful for showing the exact features of a phenomenon, facts, community, or situation". In this regard, we carry out a direct observation in the "Huascar Cajías school", through attending classes with the children and seeing how their daily classes are, to understand their learning needs.¹⁴

3. POPULATION

In research, the population constitutes all the subjects that will be the object of study. According to Tintaya: "The population is the set of all elements that agree with a series of specifications" (Tintaya, 2009, p. 89). This implies that the subjects to study must have similar characteristics in common.¹⁵

Based on what the principal of the school "Huascar Cajías" (La Paz, Bolivia) stated in an interview made for this project, the population of the school is 9 teachers and 69 students. The sample for this project are 3 courses have been the focus of attention: Initial, first and second elementary grades (3 teachers and 26 students).

¹⁴Sampieri, R. Fernández, C. (2010) Metodología de la Investigación (fitfhprinting) México: McGraw-hill/ Interamericana editores, S. A. de C. V.

¹⁵Tintaya, P. (2009). " En Proyecto de Investigación: Cuaderno para el estudiante" (142). La Paz, Bolivia: Gráfica Singular.

4. INSTRUMENT

Another important aspect from the methodology is to determine the techniques and instruments of the investigation (Tintaya, 2008, p. 221). For this project, we used the open-ended questionnaire and the structured interview as instruments as detailed below.¹⁶

4.1 Open-ended questionnaire

This type of questionnaire was chosen since it has basic questions to gather information about the pedagogical characteristics of each course. It was open-ended because the teacher's personal point of view is required to elaborate their answers. The questions were made to analyze the way of learning, what pedagogical material support they have, the level of L1 of the students, etc. It was developed as detailed below in 12 questions:

QUESTIONS	OBJECTIVE
1. ¿Cuál es el rango de edad de los alumnos/as del curso?	To see if the students are in the level that they belong according to their age.
2. ¿Cuántos alumnos/as tiene cursando esta gestión?	To gather information about the number of students in the course.
3. ¿Cómo se introduce la enseñanza de LSB?	To know how the Bolivian sign language is introduced to the students.
4. ¿Qué es lo primero que los niños aprenden en este curso?	To gather information about what are the main subjects of the course.
5. ¿Qué materias llevan en este curso?	To gather information about what are all the subjects that students cover in the year.

6. ¿Desde qué etapa del curso se les enseña español escrito	To know how Spanish written language is introduced to the students.
7. ¿Cuál es el objetivo del curso?	To gather information about what the main purpose of the course is.
8. ¿Tienen un libro oficial para este curso?	To gather information about the pedagogical material they use.
9. ¿Con qué material adicional se ayuda el profesor(a) para reforzar el aprendizaje de sus alumnos/as?	To gather information about the pedagogical material they use.
10. ¿Cuáles son los principales problemas que tienen los alumnos/as en este curso?	To gather information about their pedagogical needs.
11. ¿Con qué nivel de LSB llegan los alumnos/as a este curso?	To gather information about their pedagogical needs.
12. ¿Qué métodos de enseñanza aplica?	To gather information about their pedagogical needs.

Figure 8: Open Ended questionnaire model

4.2 Structured Interview

Cariaga (2008, p. 28). Mentions that to gather information about the learning needs of the students, the interview is a useful instrument to get that. Therefore, this instrument was used to be aware of the teaching/learning style of L1 and L2, mainly. Profesor, María Angélica Ticona Varela who is the principal of "Huascar Cajias" school was the one who was interviewed. The interview was developed in four parts:

- Basic Questions
- Questions about Pedagogy
- Questions related to the project 'objectives
- Varied last questions

<p>Entrevista:</p> <ol style="list-style-type: none"> 1. ¿Qué niveles de enseñanza ofrece la institución? 2. ¿Qué idiomas se lleva en la institución? 3. ¿Qué es el lenguaje de señas boliviano y por qué se lo denomina como boliviano? 4. ¿Por qué se enseñan simultáneamente ambos idiomas?
--

Figure 9: Structured Interview

CHAPTER IV PROPOSAL

1. DESCRIPTION

For Barreras Gómez, A. (2004, p.27)¹⁷: “ An adequate method that reflects children’s needs and preferences helped them to learn”.

In this chapter, the new syllabus created is going to be introduced which is held in a mobile application. The informatic or software engineering background of its creation is not relevant or this linguistic project nevertheless, the complete interface of this mobile application can be found in Appendix B3 “User Manual”.

Also, it is important to mention that the work was done with the Schedule activities that were accomplished (Appendix 5. Schedule of Activities) to have the research done. Here, it is mentioned that it started in 2019 and it finished in the same year, but due to the pandemic and some issues that Linguistics career was having back then, it was finally presented between 2021 and this year, 2022. Also, it is important to emphasize that “Huascar Cajías” school was extremely willing to support our research in any way. Since the beginning, they were willing to fill questionnaires, to answer our interviews, to lend the educational material they use, to meet the student population as well as the teachers, to show the study environments and even they gave some classes in Bolivian

¹⁷Barreras Gómez, A. (2004). Vocabulario y edad: pautas para su enseñanza en las clases de inglés de educación primaria. España: Universidad de La Rioja

sign language. Trying to learn their language was very important to really try to understand the students' necessities. The existence of "Huascar Cajías" school is so important in the society.

All this theory and research is embodied in a mobile application that required software engineering work and graphic design, between others. This information is held in the last section of this project (Appendix B4. Stages of the Project). The elements and resources needed are mentioned there.

Therefore, the pedagogical format that the syllabus has is going to be explained. (which is embodied in the mobile application). This syllabus is called "Hybrid Syllabus" and it was born because of the needs analysis and research. It can be said that there are not so many methods designed to improve Bolivian Sign Language, specifically. Thus, the information gathered by the instruments was useful designing the syllabus and for suggesting and creating a mobile application called "LSBNIÑOS".

2. HYBRID SIGN LANGUAGE SYLLABUS

This new proposal of syllabus is called "Hybrid" because it takes characteristics from the Situational Syllabus and Content-Based Syllabus to teach two languages, for this case, Bolivian Sign Language and Spanish written language. It is relevant to say that; it is very important that the learners feel that they are getting a content-based learning while they are in a virtual context (situational). In addition, this syllabus proposal was a student-centered design because it was focused on the needs of the students. Besides, it is important to highlight that the themes were written down following the lines of the "PLAN ANUALTRIMESTRALIZADO" (PAT), which is an instrument used by the teachers of Bolivia to organize the curricular management for each year of schooling oriented to the planning and implementation of the curricular development.

Therefore, these 3 courses are designed for students with little or no previous knowledge of Bolivian Sign Language and written Spanish language. Students will acquire basic grammatical skills and vocabulary that will enable them to communicate in routine social situations within an authentic cultural context. The syllabus is made for the courses of:

- Initial (kindergarten)
- First grade (elementary)
- Second grade (elementary)

This syllabus is going to be displayed through a mobile application called "LSB NIÑOS". A tool that was created as a pedagogical technological support material to accomplish with the objectives of the project. More about this theory could be found in the theoretical framework section of this project.

3. HYBRID SYLLABUS SUBJECTS CONTENT

The planning covers subjects as Natural Sciences, Language and Communication, Mathematics and Social Sciences. We have to state that the criteria of the amount of the units and subjects for each course are based on the same contents that "Huascar Cajías" school applies to its curricula and this school follows the lines of the "PLAN ANUALTRIMESTRALIZADO" (PAT), which is an instrument used by the teachers of Bolivia to organize the curricular management.

Having said that the syllabuses are presented like this:

- **Initial:** Social Sciences 4 units, Natural Sciences 3 units, Language and Communication 3 units and Mathematics 1 unit.
Total number of syllabuses: 4.
- **First grade:** Social Sciences 1 unit, Natural Sciences 2 units, Language and Communication 1 unit and Mathematics 1 unit.
Total number of syllabuses: 4.

- **Second grade:** Social Sciences 2 units, Natural Sciences 2 units, Language and Communication 2 units and Mathematics 1 unit.

Total number of syllabuses: 4.

3.1 Initial (Kindergarten)

Language and Communication (Initial)

1. Course Information

School: "Huascar Cajías "school for special education	Course: Initial (Kindergarten)	Period: 1 quarter /2022
Subject: Language and Communication	Mode:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: Android Cell Phone	Module:1	Schedule: 30 minutes per day

2. Course Description

Learning the alphabet is fundamental for all children as it is their first approach to communication and their interaction with society. For this reason, in this course emphasis will be given to learning the alphabet of both languages LSB (Bolivian Sign Language) and written Spanish, and they will also learn useful signs for their interaction with the class using technology as the main learning tool.

3. Expected Goals

- To introduce children to the alphabet LSB (Bolivian Sign Language) as well as to the written Spanish alphabet so that they can begin to communicate with their social environment.
- Teach children how to spell their name in both languages.
- To get children to learn to say small phrases useful for their daily life.
- To concatenate the theory learned for its practice in real life so that the learner could describe basic colors, the alphabet and some basic verbs for their age.
- To apply of the use of dialogue in real life situations, based on all the linguistic skills acquired.

4. Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice finger spelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5. Methodological aspects

In this case, since the course is about teaching language to hearing impaired children, we based the content of the mobile application on the learning methodology used in the "Huáscar Cajías" school. Which deals with the repetition and memorization of both sign language and the letters of the alphabet in written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6. Didactic Resources

The mobile application "LSBNiños" created especially to meet the needs of children with hearing disabilities has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of real children from the Huáscar Cajías school performing sign language so that children can learn by watching and imitating other children and can create a memorized learning process.

7. Evaluative aspects

- The use of alphabet in real life situations, based on linguistic skills
- The description of basic forms of interpersonal dialogue in L1 and L2, simultaneously.
- Children's ability to spell their own name.

8. Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Initial / 1st Trimester			
Content	March	April	May
Alphabet	First part	Second Part	Third part
Daily activities	Play	Sleep	Go to the Bathroom

Figures	Lines	Go to	Variation of figures
---------	-------	-------	----------------------

9. Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18 ,33.

Social Sciences -Initial

1 Course Information

School: "Huascar Cajías "school for special education	Course: Initial (Kindergarten)	Period : 1 quarter /2022
Subject: Social science	Modality:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements:Androidcellphone	Module:1	Time : 30 minutes

		per day
--	--	----------------

2 Course Description

In this subject it is important develop social aspects for the interaction of children with their social community: Greeting (Everyday norms that regulate intrapersonal attitudes). Family (recognition, self-esteem and respect for family and community members). Emotions (recognition of basic / intrapersonal personality aspects). Values (Everyday norms that regulate intrapersonal and interpersonal attitudes).

3 Expected goals

- To promote the interest in bilingual digital education by designing an environment like a kindergarten course.
- To concatenate the theory learned for its practice in real life so that the learner achieves exemplary communication with their peers, family, etc.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice finger spelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching social sciences to hearing impaired children, we based the content of the mobile application on the learning methodology used in the school "Huáscar Cajías". Which is the repetition and memorization of both sign language and words such as greetings, emotions and others related to the subject in written Spanish. It should be noted that hearing

impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- The use of dialogue in real life situations, based on all the linguistic skills
- The use of new vocabulary in L1 and L2, simultaneously.
- The students must recognize the new vocabulary learned in the practical games of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curricular advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the advanced in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Social Science -Initial / 1st Trimester			
Content	March	April	May

Greetings	Good morning, hello, etc.	Farewells	Review
Family	Mother ,father	Brother,sister	Grandparents
Emotions	Happiness	Sadness and concern	Awe
Values	Thankyou and please	Yes and no	Apologies

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18.

Natural Sciences (Initial)

1 Course Information

School: "Huascar Cajías "school for special education	Course: Initial (Kindergarten)	Period: 1 quarter /2022
Subject: Natural science	Modality:Virtual	Sessions: According to the comfort of the

		child and his/her responsible guardian.
Requirements: Android Cell Phone	Module:1	Time : 30 minutes per day

2 Course Description

This subject is developed so that the child can learn about the environment in which they live for this reason touch topics like :Animals I (Knowledge of the main animals that are in their context). Human Body I (recognition of the main parts of the body). Food I (Knowledge of the main foods that learners could encounter in their context).

3 Expected goals

- To introduce a new way of learning natural sciences through digital reading in L1 and L2 to the learners.
- To promote the interest in bilingual digital education by designing an environment like a kindergarten course.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice fingerspelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching Natural Sciences to hearing impaired children, we based the content of the mobile application on the learning

methodology used in the school "Huáscar Cajías". Which is the repetition and memorization of both sign language and learning vocabulary related to the subject for example: animals, food and some parts of the human body. It should be noted that hearing impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- The use of dialogue in real life situations, based on all the linguistic skills
- The use of new vocabulary in L1 and L2, simultaneously.
- The students must recognize the new vocabulary learned in the practical games of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curricular advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the advanced in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Natural Science -Initial / 1st Trimester			
Content	March	April	May
Animals I	Pets	Farmanimals	Wild animals
Human body	Head	Trunk	Feet
Food	Meats	Liquids	Fruits

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación p 14-18.

Mathematics (Initial)

1 Course Information

School: "Huascar Cajías "school for special education	Course: Initial (Kindergarten)	Period: 1quarter/2022
Subject: Mathematics	Modality:Virtual	Sessions: According to the comfort of

		the child and his/her responsible guardian.
Requirements:Androidcellphone	Module:1	Time : 30 minutes per day

2 Course Description

This subject is developed so that the child can learn about numbers from 0-10.

3 Expected goals

- To acquire basic numbers knowledge and practice their
- To promote the interest in bilingual digital education by designing an environment like a kindergarten course.

4 Activities

- To acquire the basic numbers in L1 and L2 using the mobile application videos and didactic tools.
- To practice fingerspelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching mathematics to hearing impaired children, we based the content of the mobile application on the learning

methodology used in the "Huáscar Cajías" school. Which deals with the repetition and memorization of numbers from 1 to 10 in both sign language and written Spanish. It should be noted that children with hearing impairment learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- The use of numbers in real life situations based on all the linguistic skills....
- The students must recognize the numbers learned in the practical games of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Mathematics-Initial / 1st Trimester			
Content	March	April	May
Numbers	0- 5	6-10	Review

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación - Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18.

3.2 First Grade (Elementary)

Language and Communication (First grade)

1 Course Information

School: "Huascar Cajías "school for special education	Course: First Grade	Period:1 quarter /2022
Subject: Language and Communication	Mode:Virtual	Sessions: According to the comfort of the child and his/her

		responsible guardian.
Requirements: <ul style="list-style-type: none"> • Android Cell Phone • Language and communication initial level 	Module:1	Schedule: 30 minutes per day

2 Course Description

In this course students will learn to differentiate capital letters from lowercase letters in written Spanish and will learn classroom nouns so that they can identify their school materials in LSB (Bolivian Sign Language) and written Spanish.

3 Expected Goals

- To practice the use of nouns in a real-life dialogue.
- To promote attitudes of coexistence through a digital context by using new lexicon in nouns.
- Strengthening communicative skills by knowing noun.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice finger spelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological aspects

In this case, since the course is about teaching nouns to hearing impaired children, we based the content of the mobile application on the learning methodology used in the "Huáscar Cajías" school. Which deals with the repetition and memorization of both sign language and nouns in written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" created especially to meet the needs of children with hearing disabilities has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of real children from the Huáscar Cajías school performing sign language so that children can learn by watching and imitating other children and can create a memorized learning process.

7 Evaluative aspects

- The use of nouns in real life situations, based on all the linguistic skills
- The use of new vocabulary in L1 and L2, simultaneously.
- The students must recognize the new vocabulary learned in the practical games of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in

classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -First grade / 1st Trimester			
Content	March	April	May
Upper and lower case	First part	Second Part	Third part
Nouns	Scholl materials First part	Scholl materials Second part	Review
Written numbers	0-5	6-10	Review

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18 ,33.

Social Sciences -First Grade

1 Course Information

School: "Huascar Cajías "school for special education	CourseLevel: FirstGrade	Period : 1 quarter /2022
Subject: Social science	Modality:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: • Android Cell Phone • Social Sciences initial course	Module:1	Time : 30 minutes per day

2 Course Description

The importance of this course is that hearing impaired children can identify the rights they have in society and the duties they must fulfill both at home and at school.

3 Expected goals

- To concatenate the theory learned for its practice in real life so that the learner knows their social rights and duties as a child living in Bolivia.
- Children must understand the rights and duties they have in their social environment.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice finger spelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching rights and duties to hearing impaired children, we based the content of the mobile application on the learning methodology used in the school "Huáscar Cajías". Which is the repetition and memorization of both sign language and new vocabulary related to the theme "Rights and Duties" in written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- The students must recognize the rights and duties learned in the practical games of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Social Science -First grade/ 1st Trimester			
Content	March	April	May
Rights	Righttolife	Righttostudy	Review
Duties	Respect foroureldeers	Helping with house hold chores	Taking care of my health

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25, 26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18.

Natural Sciences (First Grade)

1 Course Information

School: "Huascar Cajías "school for special education	Course: First Grade	Period: 1 quarter /2022
Subject: Natural science	Modality:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: <ul style="list-style-type: none"> • Android Cell Phone • Natural Scienceinitialcours e 	Module:1	Time : 30 minutes per day

2 Course Description

This course aims to allow children to relate to the environment in which we live so they can identify parts of nature such as: mountains, flowers, day and night. In addition, they will continue learning about the human body.

3 Expected goals

- To introduce a new way of learning natural sciences through digital reading in L1 and L2 to the learners.
- To promote attitudes of coexistence with nature through a digital context trying to emulate a real social environment. Strengthening communicative skills.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice fingerspelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching Natural Sciences to hearing impaired children, we based the content of the mobile application on the learning methodology used in the school "Huáscar Cajías". Which is the repetition and memorization of both sign language and learning the environment in which we live and parts of the human body in written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- The students must recognize the new vocabulary about nature environment and human body learned in the practical evaluations of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Natural Science -First grade / 1st Trimester			
Content	March	April	May
Natureenvironment	Day and night	Outdoornature	Review
Human body II	Firstpart	Secondpart	Review

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of

Riberalta(December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18.

Mathematics (First Grade)

1 Course Information

School: "Huascar Cajías "school for special education	Course: First Grade	Period: 1 quarter /2022
Subject: Mathematics	Modality:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: Android cellphone	Module:1	Time : 30 minutes per day

2 Course Description

This subject is developed so that the child can learn about geometry, addition and subtraction.

3 Expected goals

- Students will be able to recognize geometric shapes in both L1 and L2.
- You will learn to add and subtract.

4 Activities

- To acquire the basic numbers in L1 and L2 using the mobile application videos and didactic tools.
- To practice fingerspelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching mathematics to hearing impaired children, we based the content of the mobile application on the learning methodology used in the school "Huáscar Cajías". Which deals with the repetition and memorization of geometric figures, addition and subtraction in both sign language and written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, which means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- Students' ability to perform addition and subtraction in practical exercises on the mobile application.
- Students should be able to recognize geometric figures in their daily life and identify them in both LSB (Bolivian Sign Language) and written Spanish.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Mathematics-Initial / 1st Trimester			
Content	March	April	May
Mathematics	Geometry	Sum	Subtract

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta(December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18.

3.3 Lesson Plan for Second Grade (Elementary)

Language and Communication (Second grade)

1 Course Information

School: "Huascar Cajías "school for special education	Course: Second Grade	Period: 1 quarter /2022
Subject: Language and Communication	Mode:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: <ul style="list-style-type: none"> • Android Cell Phone • Language and communication First grade	Module:3	Schedule: 30 minutes per day

2 Course Description

For this course, students who have already completed the initial and first grade levels have the ability to form sentences that will be useful for their communication with people who have no knowledge of sign language, and will also learn about personal pronouns.

3 Expected Goals

- To implement the theory learned for its practice in real life so that the learner could have effective communication in his/her context.
- To learn grammar structure for Spanish written and LSB (fingerspelling) according to each unit.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice finger spelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological aspects

In this case, since the course is about teaching simple sentences and personal pronouns to hearing impaired children, we based the content of the mobile application on the learning methodology used in the "Huáscar Cajías" school. Which is the repetition and memorization of the new vocabulary learned in both sign language and written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, which means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" created especially to meet the needs of hearing impaired children has graphics and eye-catching characters so that children can identify with them and thus facilitate learning. It also has videos of real children from the Huáscar Cajías school performing sign language so that children can learn by watching and imitating other children and can create a memorized learning process.

7 Evaluative aspects

- The use of nouns in real life situations, based on all the linguistic skills
- The use of new vocabulary in L1 and L2, simultaneously.
- The students must recognize the new vocabulary learned in the practical evaluations of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Second grade / 1st Trimester			
Content	March	April	May
Simple sentences	First part	Second Part	Review
Personal pronouns	First part	Second Part	Review

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.

- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18 ,33.

Social Sciences -Second Grade

1 Course Information

School: "Huascar Cajías "school for special education	CourseLevel: SecondGrade	Period : 1 quarter /2022
Subject: Social science	Modality:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: • Android Cell Phone • Social Sciences initial course	Module:3	Time : 30 minutes per day

2 Course Description

In this course the children will learn about the departments that make up the country as well as the patriotic symbols of Bolivia so they can learn a little more about their own culture.

3 Expected goals

- To concatenate the theory learned for its practice in real life so that the learner knows the departments and national symbols in Bolivia.
- To learn grammar structure for Spanish written and LSB (fingerspelling) according to each unit.
- They will learn to communicate the acquired vocabulary in Sign Language and written Spanish.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice finger spelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching rights and duties to hearing impaired children, we based the content of the mobile application on the learning methodology used in the school "Huáscar Cajías". Which is the repetition and memorization of both sign language and new vocabulary related to the theme "Rights and Duties" in written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSB Niños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- The ability to recognize the departments of Bolivia and the patriotic symbols in the practical evaluations of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Social Science -Second grade/ 1st Trimester			
Content	March	April	May
National Symbols	Coatofarms, flag	Scarapela ,kantuta	Review
Bolivia departments	East	West	Altiplano

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25, 26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta

(December 2010). "Curso de enseñanza de la lengua de señas boliviana".
La Paz, Bolivia: Ministerio de Educación, p 14-18.

Natural Sciences (Second Grade)

1 Course Information

School: "Huascar Cajías "school for special education	Course: Second Grade	Period: 1 quarter /2022
Subject: Natural science	Modality:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: <ul style="list-style-type: none"> • Android Cell Phone • Natural Science first grade course 	Module:3	Time : 30 minutes per day

2 Course Description

In this course, children will learn about new animals and will be able to recognize the different seasons in order to understand the climatic changes of the environment in which they live.

3 Expected goals

- To introduce a new way of learning natural sciences through digital reading in L1 and L2 to the learners.
- To promote attitudes of coexistence with nature through a digital context trying to emulate a real social environment. Strengthening communicative skills.

4 Activities

- To acquire new vocabulary in L1 and L2 using the mobile application videos and didactic tools.
- To practice fingerspelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5 Methodological Aspects

In this case, since the course is about teaching Natural Sciences to hearing impaired children, we based the content of the mobile application on the learning methodology used in the school "Huáscar Cajías". Which is the repetition and memorization of new vocabulary learned in both sign language and written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, this means that they have to see and perform the movement to learn.

6 Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7 Evaluative Aspects

- The students must recognize the new vocabulary about seasons and new animals learned in the practical evaluations of the mobile application.

8 Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curriculum advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the progress made in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Natural Science -Second grade / 1st Trimester			
Content	March	April	May
Seasons	Autumn ,winter	Summer, spring	Review
Animals II	Firstpart	Secondpart	Review

9 Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta

(December 2010). "Curso de enseñanza de la lengua de señas boliviana".
La Paz, Bolivia: Ministerio de Educación, p 14-18.

Mathematics (Second Grade)

1 Course Information

School: "Huascar Cajías "school for special education	Course: Second Grade	Period:1 quarter /2022
Subject: Mathematics	Modality:Virtual	Sessions: According to the comfort of the child and his/her responsible guardian.
Requirements: Android Cell Phone	Module:3	Time : 30 minutes per day

2 Course Description

This subject is developed so that the child can learn about how to form large numbers.

3 Expected goals

- To increase the mathematical skills through written and fingerspelling practice of the theory.

4 Activities

- To acquire the basic numbers in L1 and L2 using the mobile application videos and didactic tools.
- To practice fingerspelling dialogue through the videos.
- To put in practice the theory learned with playful exercises

5. Methodological Aspects

In this case, since the course is about teaching mathematics to hearing impaired children, we based the content of the mobile application on the learning methodology used in the "Huáscar Cajías" school. Which deals with the repetition and memorization of the new numbers learned both in sign language and written Spanish. It should be noted that hearing impaired children learn in a visual and kinesthetic way, which means that they have to see and perform the movement to learn.

6. Didactic Resources

The mobile application "LSBNiños" is quite didactic and was created especially for the needs of hearing impaired children. It has graphics and eye-catching characters so that children can identify with them and thus facilitate their learning. It also has videos of children from the Huáscar Cajías school performing sign language so that children learn by watching other children and can create a memorized learning process.

7. Evaluative Aspects

- Students' ability to form tens and identify them in practical evaluations of the mobile application.

8. Schedule

This schedule is based on the new "Hybrid syllabus" that merges technology in this case the mobile application as support material in the curricular advancement of the school "Huáscar Cajías". What is expected for effective learning is that the parent or guardian of the child who acquires this application can devote 30 minutes at any time of day to review the advanced in classroom classes, it would be advisable that 20 minutes are for a review of the progress and another 10 minutes for the evaluation found in the application.

Schedule of activities -Mathematics-Initial / 1st Trimester			
Content	March	April	May
Mathematics	Numbersofthe 11 to 20	Dozens	Review

9. Bibliography

- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez "070 (articles 25,26,27). Ministerio de Educación: Plurinational State of Bolivia.
- Ministerio de Educación- Bolivian Federation of the Deaf, Amazonian foundation for the development of the deaf, "arca" project of Riberalta (December 2010). "Curso de enseñanza de la lengua de señas boliviana". La Paz, Bolivia: Ministerio de Educación, p 14-18.

4. Evaluation and conclusions

All the syllabus described above are implemented in a mobile application called "LSBNIÑOS" which is our pedagogical support material. When the learner open the mobile application, he/she will decide the times in which he/she will go through the units, perform the exercises, etc. Of course, at the end of each task there is the possibility that the learner repeats it if he/she did it wrong or not, a score will be shown also at the end of each evaluation. Finally, the learner can take the courses the times she/he wants it.

CHAPTER V CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

Having already stated the objectives, it can be said that the necessity of innovative supporting material for learning Bolivian Sign Language (specialized for children) is urgent because hearing impairment children of "Huascar Cajías" School do not have only just one book designed especially for them per course.

With the whole design of the project finished, the conclusions are:

- The pedagogical-technological material support called "LSB-NIÑOS" (mobile application) will work as an educational material support for both, mother tongue (Bolivian sign language-L1) and second language (written Spanish-L2) through the teaching of Mathematics, Natural Sciences, Social Sciences and Language and Communication as subjects. Specifically, for beginning learners with hearing impairment issues (initial, first and second grades of elementary school "Huascar Cajías"). The teaching technological tool includes characteristics of a syllabus which reunites situational and content-based features and follows the approaches: Blended Learning, MALL (Mobile Assistant Languages) and UDL (Universal Design for Learning) to reach with its purpose.

- This mobile application will be useful as an educational material support for the bilingual learning process of students. This tool can be used at home or where the learner decides to be at. In addition to it, it is a free, easy to use or handle and portable tool that can be used as many times as the student wants and at any time of the day.
- This technological and educational content is a contribution that expands the technological material storage of the special education center "Huascar Cajías".

Besides, to determine the needs of students with hearing disabilities, apart from the research carried out, a diagnosis was made for the teachers of the institution where an important contribution to the project was made known, which is the age of the students by level. As indicated to us in the diagnosis, children with hearing disabilities have a level of cognitive delay, which makes it difficult for them to learn, Because of this, there are students who study a level different from the cognitive capacity they have, for example, there are cases of 13-year-old in third grade of elementary school. Throughout the research a suitable bus chair was looked for our mobile application with the aim of teaching LSB (Bolivian Sign Language) and to guide in the learning skills of students who are visual-kinesthetic. This is how the situational content based syllabus was designed in which children are put in visual interactive situations with a learning theme that they must develop. When testing the app in the target population, it was possible to notice that the situational / content-based syllabus is better suited to their learning needs. Another important aspect in the building of our mobile application was to make it bilingual (written Spanish and LSB). To make it compatible with the learning reality of our target population, as the children second language is Spanish written. Therefore, to achieve all the mentioned, we applied the UDL (Universal Design for Learning) approach which eliminates any barrier of learning by developing learning methods tailored to the needs of your target audience. For a hybrid syllabus that brings together new methods focused on children with hearing disabilities was created and is a fusion of other methods such as Blended Learning and MALL.

For all this, it can be stated that:

- The following elements were accomplished: the design, building and collection of multimedia material such as: photographs, videos, characters' design, and virtual sets. All the material is contextualized to be attractive to the user / student, in terms of colors, quality, dynamics of movements, buttons and virtual kinesthetic-visual perception. With this tool, students no longer, necessarily, or only, use stationery, photocopies, etc. and teachers have another technological option apart from TV, radios, computers, classroom projectors, etc.
- It was accomplished the structural and functional building of a pedagogical mobile application for the use of hearing impairment kids. It means that it specializes in promoting the visual-kinesics communication skills of the users. This means that, this app impulses non oral verbal behavior from the users because it implies that the users constantly use the fingers to choose options, write (haptics), etc. The interface also includes features like "vibrating alert" to notify if the user is not choosing the correct answer, "motivational pop ups" when the user is accomplishing very well the tasks and others. The app is also designed for the user to have a visual engagement along the use of the app. Here the design of the interface was meant to catch the attention of the user for that he/she thinks that is playful and enjoyable to learn all the content.
- The mobile application was tested several times through several types of cellphones to check that the running of the app does not have problems for the users. For it, also it was created a "LSB-NIÑOS User Manual" (Appendix B3.User manual) which is intended to give assistance to users to comprehend how and what is needed for the app to run properly in their cellphones.
- This whole project already runs and Maria Angela Ticona Varela- principal of "Huascar Cajías" school already has it. The mobile application was

delivered this year 2022 on January, at the new address of the school, Indaburo street in front of the Contraloria UE (La Paz- Bolivia). As a prove of it there are photos of her receiving “LSBNiños” Mobile Application (Appendix B6. Photos “LSBNiños” mobile application final submission).

5.2 RECOMMENDATIONS

Considering our acquired experience and knowledge during the piloting period it is important to suggest the following:

- The student population of the Linguistics and Languages Career - UMSA is recommended to create more technological tools/material that could pedagogically help as educational material support or reinforce the academic education of children with different abilities (hearing impairment children, etc.).
- The creation of a similar tool/material is recommended to be built but, for higher levels of school education or others (middle or high school).
- The updating of the pedagogical material of a technological nature provided by the institution, must be a constant need. The school or schools in general, should keep opening its doors to students with the intention of enhancing their technological educational storage.

BIBLIOGRAPHY

- Alan, D. andatherine,E. (2004). "The handbook of applied linguistics. EE. UU: Blackwell publishing ltd.
- Asamblea Legislativa Plurinacional (2012). "Ley general para personas con discapacidad". Estado Plurinacional de Bolivia: ley de 2 de marzo de 2012 Evo Morales Ayma.
- Barreras Gómez, A. (2004). Vocabulario y edad: pautas para su enseñanza en las clases de inglés de educación primaria. España: Universidad de La Rioja
- Biser, R. and Toscano, C. (2007). "Bending the rules: when deaf writers leave college. american annals of the deaf". EE. UU: University of Chicago.
- Bersin, J. (2004). "The blended learning book". 989 market street, San Francisco, CA 94103-1741: pfeiffer.
- Brown, R. (1981). "Psicolingüística: algunos aspectos acerca de la adquisición del lenguaje". México D.F: trillas.
- Calveti, J. (2014). "Diseñando apps para móviles". Libro Vínculos.
- Gangaiamaran, R. and Madhumathi, P. (2017). "Review on use of mobile apps for language learning". Tamil Nadu, India: Research India publications.
- Gómez, G. (2006). Tradición y Enfoques de la investigación cualitativa. En Metodología de la investigación cualitativa (156). Málaga, España: Editorial Aljibe.
- Nunan, D. (1988): Syllabus design. Oxford: Oxford University Press.
- Staker, H. and B. Horn, M. (2002). Classifying K–12 Blended Learning. Cambridge, MA, Estados Unidos: INNOSigth institute.
- Ministerio de Educación (2013). " Discapacidad auditiva-investigación educativa comprensión de la discapacidad iv". Viceministerio de educación superior y formación profesional: dirección general de formación de maestros La paz-Bolivia.
- Ministerio de Educación (2010). Educación especial. en ley de la educación "Avelino Siñani Elizardo Perez"070 (artículos 25,26,27). Ministerio de Educación: Estado Plurinacional de Bolivia.

- Ministerio de Educación de Bolivia- Federación Boliviana de Sordos, fundación amazónica para el desarrollo de los sordos, proyecto “arca” de Riberalta. (diciembre 2010). “Curso de enseñanza de la lengua de señas boliviana”. La Paz, Bolivia: ministerio de educación, p 14-18 ,33.
- Mohammadi, H. (2019). International Journal of Research Studies in Language Learning. ScienceGate, Vol 8(2), 89. october 23rd 2021, from Springer data base.
- Pinto,W. (2017). “Alcaldía da libros de señas y Braille para 200 estudiantes”. Página siete - La Paz, p1.
- Sampieri, R. Fernández, C. (2010) Metodología de la Investigación (fitfhprinting) México: McGraw-hill/ Interamericana editores, S. A. de C. V.
- Tintaya, P. (2009). “ En Proyecto de Investigación: Cuaderno para el estudiante” (142). La Paz, Bolivia: Gráfica Singular.

DIGITALBIBLIOGRAPHY

- CAST (2018). Universal Design for Learning Guidelines version 2.2. Retrieved from:<http://udlguidelines.cast.org>
- Graham and Friesen. (2016). Blendedlearning: definition, models, implications for higher education. 2020, de Researchgate Sitio web: https://www.researchgate.net/publication/303815166_BLENDED_LEARNING_DEFINITION_MODELS_IMPLICATIONS_FOR_HIGHER_EDUCATION
Retrieved from: <http://appdesignbook.com/es/contenidos/presentacion/>
- Kumi-Yeboah, A. and Smith, P. (2005). Blended Learning in K-12 Schools: Challenges and Possibilities. 2014 january , de Researchgate Sitio web: https://www.researchgate.net/publication/281456928_Blended_Learning_in_K-12_Schools_Challenges_and_Possibilities
- Mendoza, S. (2006). “Deficiencias Sensoriales Auditivas”. Retrieved from: http://ponce.inter.edu/cai/bv/Sordos_2006EP.pdf

- National Institute on Deafness and other Communication Disorders (2010). "Etapas del desarrollo del habla". March 6th, 2017. From Centro de Información del NIDCD. Retrieved from:
<https://www.nidcd.nih.gov/es/espanol/etapas-del-desarrollo-del-habla-y-el-lenguaje#2>
- Evelin,C. Norah,J. and David,T(2008) "Critical Review of the Blended Learning Models based on Maslow's and Vygotsky's Educational Theory"
from:https://www.researchgate.net/publication/36379238_Critical_Review_of_the_Blended_Learning_Models_Based_on_Maslow's_and_Vygotsky's_Educational_Theory
- Stanford,Undergrade(2019) pag41Retrieved from:
<https://advising.stanford.edu/current-students/advising-student-handbook/what-syllabus>

APPENDIXES

Appendix B1. Questionnaire

CUESTIONARIO



El presente cuestionario está elaborado para recaudar información necesaria en la realización de un trabajo de investigación dirigido a su Centro Educativo y desarrollado en la carrera de lingüística de la Universidad Mayor de San Andrés (UMSA). Por lo cual le rogamos su colaboración respondiendo las siguientes preguntas:

Curso en el que dicta clases: 1º PRIMARIA Colegio: Huascar Cajías
Gestión: 2019

PREGUNTAS

1.- ¿Cuál es el rango de edad de los alumno/as de este curso?

R.- 6 a 8 años

2.- ¿Cuántos alumno/as tiene cursando esta gestión?

R.- 6

3.- ¿Cómo se introduce la enseñanza del LSB?

R.- a partir de la práctica - diálogo - objetos etc

4.- ¿Qué es lo primero que los niños aprenden en este curso?

R.- Identidad.

5.- ¿Que materias llevan en este curso?

R.- todas las áreas correspondiente al nivel primario.

6.- ¿Desde qué etapa del curso se les enseña español escrito?

R.- Desde que conocen ~~los~~ identifican señas escenciales.

Todo ello depende del desarrollo y estilo de aprendizaje del alumno estudiante.

7.- ¿Cuál es el objetivo del curso?

R. Fortalecer la adquisición de la L1 para incluir en el proceso de aprendizaje de la L2, a su vez proyectar y preparar al estudiante para la educación inclusiva

8.- ¿Tienen un libro oficial para este curso?

R. Sí, la cual es adoptada

9.- ¿Con que material adicional se ayuda el profesor (a) para reforzar el aprendizaje de sus alumno/as?

R. El material depende del contenido a avanzar desde material reciclado hasta videos educativos

10.- ¿Cuáles son los principales problemas que tienen los alumno/as en este curso?

R. La atención y disciplina, concentración. Como el aprendizaje de lectura-escritura / matemáticas. (Solo algunas)

11.- ¿Con que nivel de LSB llegan los alumno/as a este curso?

R. Ingresan con señas básicas como saludo / diálogo poco. conocen también algunas frutas, animales extraños, algunos verbos.

12.- ¿Que métodos de enseñanza aplica?

R. La metodología varía según al estilo de aprendizaje de cada estudiante, siendo el método global el más aplicado.

Appendix B2. Interview-Qualitative Method

ENTREVISTA

DATOS DE LA ENTREVISTA

Fecha de la entrevista: miércoles, 14 de abril de 2021.

Duración: 46:45

Medio: Plataforma Zoom.

Localización: ciudad de La Paz- Bolivia.

Entrevistadora: Vania Alejandra Butron Luna- Univ. Carrera de Lingüística e Idiomas/UMSA.

Apoyo Técnico: Karen Sofia Candia Ramos- Univ. Carrera de Lingüística e Idiomas/UMSA.

Entrevistada: Lic. María Angélica Ticona Varela.

SIGLAS DE IDENTIFICACIÓN

- E= entrevistadora.
- MA= nombre de la entrevistada.

INICIO:

E: Buenas noches, este es el modelo de entrevista mediante el método cualitativo para el proyecto de grado:

“Hybrid sign language syllabus as an educational material support for bilingual learning through the universal design for learning theory for hearing impairment children of elementary grades of the Huascar Cajias School”

El objetivo de la siguiente entrevista cualitativa es la de abordar el tema del Lenguaje de Señas Boliviano, bajo el contexto educacional de la ciudad de La Paz. El contexto pedagógico actual de la relación entre los planes de estudio de una educación formal con el uso de lenguaje de señas y el español escrito, la adaptación de los alumnos y profesores. La capacitación y habilidades que debe tener un profesor enfocado a este

segmento. Las características físicas que debe tener un establecimiento de enseñanza especial. Las deficiencias de normativa, apoyo social, etc.

E: Buenas noches directora, muchas gracias por acceder a la entrevista. Vamos a empezar con las preguntas. La primera ronda de preguntas son las preguntas básicas. Esta es la primera, ¿cuál es su nombre?

MA: Bien, buenas noches Vania. Mi nombre es María Angélica Ticona Varela.

E: ¿Cuál es su profesión?

MA: Bueno, soy maestra. Mi formación inicial es ser maestra, luego hice también Pedagogía en la Universidad Mayor de San Andrés. Luego, hice un Post-Grado en “Educación Especial”. Entonces, de esa manera es que me fui formando, tratando de mejorar mi desempeño como docente en lo que es el trabajo con educación especial.

E: Muy bien, actualmente ¿Dónde trabaja?

MA: En el “Centro Especial Huáscar Cajías”.

E: ¿Cuál es la dirección de la escuela?

MA: El centro de educación especial está ubicado en la calle Indaburo, justo frente a la contraloría. Muy cerquita a la Plaza Murillo.

E: Muy bien, ¿en que se especializa tal institución y como se llega a fundar?

MA: Ya, el “Centro de Educación Especial Huáscar Cajías” trabaja y atiende a estudiantes con discapacidad auditiva. Aparte de ello, atendemos también a estudiantes con discapacidad múltiple pero que tengan un agregado a la sordera. El “Centro Huáscar Cajías”, en principio estaba funcionando antiguamente con el CEA- “Erick Boulter”. Pero, con la inquietud de los padres de familia, de buscar una formación más especializada para sus hijos, es que decidieron salir de ese establecimiento y fundar este centro de educación especial con la directora Elsa Mostacedo. Con quien fundaron el “Huáscar Cajías”, que también al principio era CEA (centro de educación alternativa).

Cuando ya nos fuimos a la zona de KilliKilli, ahí se estableció unos dos años, luego nos fuimos a la (calle) Diego de Peralta, ahí es que ya pasamos de ser CEA a CEE (centro de educación especial). Bueno, de ahí el trayecto ha sido un poco largo. No tenemos un establecimiento propio. Entonces, hemos estado trasladándonos muy seguido. Nos fuimos a la zona de Sopocachi, luego a la Illimani, luego a la prolongación Tejada Sorzano, luego nos fuimos a la Plaza San Martín y de ahí, actualmente, estamos ya consolidados en lo que es una unidad educativa propia de la Alcaldía. Entonces, ya no estaremos con eso de terminar de pagar el alquiler o que la casa este en venta y demás. Entonces, nos constituimos ahí y estamos pues en miras de una nueva construcción, que esperamos que la Alcaldía, si o si, cumpla lo prometido y se haga así la construcción para el “Centro Huáscar Cajías”.

E: Muy bien, ¿cuántos años de vida tiene la institución?

MA: Eh, 15 años. Justamente este mes, el 11 de abril es que recordamos el aniversario del centro. Este año cumplimos 15 años. Ha sido fundado el 15 de abril del 2006. Entonces, estamos cumpliendo 15 años ya.

E: ¿Cuál es su puesto de trabajo dentro de la institución?

MA: Eh, el mío, Bueno, actualmente estoy como directora del centro de educación especial.

E: Ok, ¿por cuánto tiempo ya se desempeña en esta institución siendo directora?

MA: En dirección (puesto laboral) ya sería el 7mo año. Así que, cada 3 años nos postulamos nuevamente. Damos examen y todo ello y (ahora) nuevamente, fui convocada a esta gestión. Entonces, afortunadamente aprobé, me ha ido bien en la calificación de méritos y todo. Entonces, me estoy quedando esta gestión más.

E: ¿Cuántos alumnos y cuántos docentes tienen la institución actualmente?

MA: Actualmente, estamos con 9 docentes y 69 estudiantes. Cuando ingresé a trabajar al centro, teníamos 23 o 24 estudiantes. Hemos aumentado la población estudiantil del

centro, no puedo decir, “afortunadamente” digamos, porque la discapacidad en muchos casos se la toma de esa manera. Como algo negativo. Pero, nosotros decimos: “afortunadamente ha crecido la población” porque muchos papás se han concientizado. Las personas están acudiendo al centro para escolarizar a sus hijos y eso es un aspecto muy importante y valorable porque en años pasados veíamos que los niños no asistían a la escuela porque tenían los papás ese pensamiento de que: “como tiene discapacidad para que va a estudiar” ¿no? Pero vemos que, los chicos con discapacidad auditiva solamente tienen ese problema, la comunicación. Entonces, ellos pueden desempeñarse como cualquier otro estudiante que no tiene discapacidad.

E: Dentro de la ciudad de La Paz ¿el colegio “Centro Huáscar Cajías” es la única institución especializada para enseñar a niños o existe otro?

MA: Eh, acá en La Paz bueno, habían dos centros: “Erick Boulter” y “Huáscar Cajías” pero el primero, atendía tal vez a una población más diversa que tenían discapacidad múltiple, habían adultos y demás. Entonces, ahora estamos solamente nosotros (“Huáscar Cajías”) porque “Erick Boulter” se convirtió en un centro que atiende discapacidad intelectual. Entonces, nosotros (Huáscar Cajías) en La Paz, somos los únicos que directamente tenemos una currícula que trabaja con la educación regular, trabajamos con ello. Entonces, somos una institución estatal-fiscal y es un centro donde los chicos, al cumplir toda la currícula reciben libreta, pueden ser incluidos en la educación regular. Entonces, prácticamente somos el único centro a nivel La Paz.

E: Entonces, ¿la escuela es de carácter fiscal?

MA: Es de carácter fiscal.

E: ¿En qué turnos se trabaja en la institución?

MA: Bueno, estamos con los dos turnos. Mañana y tarde, pero por este tiempo de la pandemia y todo ello, estamos trabajando por Zoom en turno tarde. Pero la parte administrativa, va al establecimiento en la mañana también. Bueno, entonces, lo que nosotros tenemos como la carga horaria de los docentes no cubre solamente trabajar

turno tarde. Entonces, lo que se hace es trabajar en la mañana dos días mas. Aparte que, también esos dos días son utilizados también para dar apoyo educativo a los estudiantes que están incluidos en unidades educativas regular. Entonces, los chicos de regular que pasan su clase en la tarde vienen en la mañana a hacer el apoyo educativo y también en la mañana para las materias de técnicas. Entonces, se trabaja en ambos turnos, pero por ahora se trabaja en el turno tarde.

E: La siguiente pregunta es ¿cuál es el objetivo principal de la institución?

MA: Tenemos visión/misión y como objetivo para esta gestión también tenemos en nuestro plan de gestión bueno, en principio trabajar lo que es la parte pedagógica. Tener siempre una buena coordinación con los docentes y padres de familia. Realizar un trabajo planificado en lo que es el desarrollo mismo de la curricula. Hacer la inclusión educativa en unidades educativas regulares. Tenemos también como objetivo, coordinar y hacer convenios con instituciones pueden ser gubernamentales, de la Alcaldía, universidades. Entonces, tratar de que el LSB sea difundida al dar continuidad a los cursos de lengua de señas para las diversas familias y público en general que quiera aprender. Aparte de ello, estamos gestionando la infraestructura propia para el centro.

E: ¿Bajo qué modalidad o requisitos se aceptan nuevos alumnos?

MA: Trabajamos con la modalidad directa e indirecta. En la directa, están los estudiantes que vienen al centro para trabajar en los programas. La modalidad indirecta son los chicos que vienen de colegios regulares para hacer el apoyo educativo y nosotros también apoyamos a los profesores de las unidades educativas, inclusive.

E: ¿Bajo qué modalidad se aceptan también nuevos docentes?

MA: Mm, nuevos docentes dependiendo. Si tenemos una afección, entonces, tenemos que hacer las gestiones necesarias para conseguir un nuevo docente para que el distrito lance la convocatoria y se presentan a “compulsa”. Entonces, de esa manera es que se integra un nuevo docente al centro.

E: Como el centro es de carácter especial, el docente también tiene que ser acoplado a este carácter, ¿verdad? ¿O cualquier docente puede adaptarse al “Centro Huáscar Cajías”?

MA: Mm, no. Hay requisitos que se deben cumplir. En principio el docente tiene que tener pertinencia. Entonces, como todo está registrado en el sistema y si un docente, por decir, quiere entrar al centro a trabajar y no es pertinente, si no tiene conocimiento del LSB o no tiene tal vez cursos realizados en educación especial, el sistema mismo no lo acepta. Entonces, tiene que presentar su RDA, entonces si ahí dice que es docente de otra área, digamos filosofía o psicología, no da porque primero debe ser: uno, de “primaria” y dos, “de educación especial”. Entonces como psicólogo, está destinado a trabajar en secundaria. Entonces, uno no puede, de secundaria, pasar a trabajar a primaria. Entonces, hay requisitos para ingresar a trabajar en el centro.

E: Muy bien, hemos terminado con las preguntas básicas. Ahora vamos a entrar a las preguntas sobre pedagogía, ¿qué niveles de enseñanza ofrece la institución?

MA: En los niveles estamos con el nivel Inicial, el nivel Primario y también tenemos los programas. El programa de estimulación temprana para los estudiantes de 0 a 3 años. También, tenemos el programa Integral para estudiantes sordos que están fuera del margen de edad escolar y también está el programa del taller productivo y para los estudiantes que tienen multi-discapacidad también está el programa de independencia personal e independencia social.

E: ¿Qué idiomas se lleva en la institución?

MA: Bueno lo que se utiliza en el centro en principio, bueno, los maestros tienen que saber el LSB y el castellano. A los estudiantes se los tiene que formar en el uso de la L1 y L2. Ya que ellos vienen con lenguas básicas. Generalmente, la lengua materna de ellos es el lenguaje de señas, pero en la institución, lo que se les enseña es la lengua de señas boliviana. Entonces, ellos tienen que aprender la lengua de señas boliviana y el castellano.

E: Muy bien, ¿qué es el lenguaje de señas boliviano y porque se lo denomina como boliviano?

MA: La lengua de señas boliviana es la forma de comunicación que el estudiante tiene, utilizando las señas. La lengua de señas tiene su propia sintaxis al igual que el castellano. Entonces, el estudiante maneja la lengua de señas boliviana porque son señas que...mmm, en principio todas las señas vienen de lo que son la lengua de señas americana, ¿no? Pero acá en Bolivia, por el mismo contacto que tenemos, la ASORPAZ, que es la asociación de sordos de La Paz, es la que se ha encargado de oficializar las señas. Oficializarla de manera que son “señas boliviana” pero como les digo tiene una raíz americana. Por eso, cuando una persona se comunica en lenguaje de señas puede entender lo que son las señas norteamericana y mexicana. Entonces, hay una facilidad de comunicación porque tiene una raíz. Pero, nosotros por nuestro mismo contexto tenemos nuestra seña que es propiamente boliviana.

E: Muy bien, la siguiente pregunta es, ¿porque se enseñan simultáneamente ambos idiomas?

MA: Los estudiantes, como les decía en principio, vienen con las señas maternas que son señas comunes digamos que el papa o la mama le ha podido enseñar en la casa para comunicarse, ¿no? Pero no son señas oficiales. Al hacer nosotros lo que es el manejo de la lengua de señas al mismo tiempo, el estudiante tiene que aprender a leer y a escribir. Entonces, al tener esa relación al aprender la comunicación también tiene que aprender la comunicación escrita. Entonces, si dejamos de lado o si nos dedicamos solamente a las señas y dejamos de lado la parte escrita, no hará esa conexión de “relacionar”. Si yo tengo una seña, por decir, “casa”, entonces, la realizo y tengo que mentalizar eso. Tengo que deletrear. Entonces, tengo que relacionar con la imagen y con la seña que estoy aprendiendo y tengo que escribir. Entonces, son procesos que tienen que ir concatenados para que haya, digamos, “producción”. Si las separamos es un poco más difícil e incluso doble trabajo para el estudiante, porque, por un lado, va aprender solo señas pero no va poderlas relacionar talvez en la forma de comunicación escrita, ¿no ve? Por eso es por lo que se trabaja así.

E: Muy bien directora, ¿el alumnado, con que nivel de ambos idiomas llega a la escuela?

MA: Bueno, a la escuela llegan con lo básico, básico. Como les digo solo señas convencionales de la casa, pero ya estando en el establecimiento es que recién, recién tienen esa relación de... tienen la facilidad de relacionar la palabra-seña-deletreo. Como en casa, como les digo tienen señas convencionales que el papá o la mamá le han enseñado. Por eso es bien importante que el estudiante entre al establecimiento y sea escolarizado en la edad correspondiente. A veces, vienen niños al centro y ya tienen 10 años o 12 años y no han sido escolarizados, entonces, se perdió mucho tiempo para que el estudiante pueda aprender. Entonces, se debe siempre trabajar en razonamiento lógico, ahí estamos empezando tarde y se avanza poco a poco. Entonces, cuando el niño es escolarizado en el tiempo específico o mucho más antes con la escolarización temprana, ayuda mucho a que este estudiante puede desenvolverse fácilmente y pueda agarrar lo que son las señas y relacionarla ya con lo que es el castellano escrito.

E: ¿Qué materias se llevan en el nivel inicial?

MA: Todas las materias del sistema regular, en inicial y primaria. Por eso decimos que nos basamos en la currícula de educación regular. No llevamos otra currícula, es la misma que se lleva en educación regular.

E: Muy bien, ¿trabajan con libros especializados? Si fuera así, ¿puede mencionar algunos?

MA: Mas que todo, las maestras lo elaboran. Tal vez, el libro de sociales, por ejemplo, que nos da la Alcaldía, es lo que estábamos utilizando. Aparte de ello, alguna editorial que alguna maestra pueda utilizar, ¿no? Pero más que todo es material que elabora la maestra. Ahora, por ejemplo, existen los textos del Ministerio de Educación. Entonces de la plataforma del Ministerio de Educación es que se ha extraído también el material porque desde el ministerio ya se nos dijo que los contenidos deben ser dosificados. Entonces ellos han elaborado también el material. Y, por otro lado, las maestras también buscan (material), porque en cada aula los chicos no tienen un aprendizaje “homogénico”. Entonces, muchas veces se tiene que preparar una adaptación distinta

para estos estudiantes. Por eso les digo que no tenemos un texto oficial, digamos que se trabaja con el que se pueda. Aparte de ello, los papás son de escasos recursos, entonces, para ellos comprar un texto que cueste 90 o 100 Bs es un poco difícil. Porque aparte de tener un hijo con discapacidad, tienen otros hijos más. Entonces, tenemos que velar por ese lado también. La parte económica de los papás porque no solamente es llevarlos (a los niños) a la escuela, también deben llevarlos a terapias, a fonoaudiología, tienen que hacer una infinidad. Es decir, necesitan dar un tiempo extra al estudiante que tiene discapacidad y planificar también económicamente. Por eso siempre se dice que las maestras elaboran el material. Ellas están conscientes de que, como el aula no es homogéneo, entonces, prefieren elaborar el material.

E: Muy bien directora, ¿se usan recursos o herramientas de pedagogía aparte de los textos? Por ejemplo ahora se están usando las plataformas virtuales ¿verdad? , ¿Cómo lo están usando? , ¿Cuáles usan?

MA: Ya ahora estamos con herramientas virtuales, se está utilizando... aparte de elaborar los materiales que son las cartillas, las profesoras elaboran los videos. Entonces como se hacen las clases por zoom no todos pueden acceder aparte de que...de que tienen que elaborar el material que son las cartillas dan la clase por zoom, pero hay chicos que no pueden ingresar justamente porque tal vez no tiene una Tablet o un teléfono inteligente entonces lo que ellas hacen es ir a dejar el material a sus casas o si no al establecimiento y del establecimiento recogen las cartillas.

Los videos lo mismo se graban en cd y lo puede difundir en la casa el papá o la mamá y eso es bueno también pueden retroalimentar el tema avanzado. Por otro lado lo que se está trabajando también es por Classroom y con la plataforma del ministerio. Eso es lo que se está trabajando, no tenemos una plataforma propia del centro.

E: ¿Cuán habituada estaba la institución con la tecnología, antes de la pandemia?

MA: Bueno con la tecnología sí, lo que antes se utilizaba... los videos se los hacía mucho más antes, las cartillas también las elaborábamos tal vez no con el formato que exigía el ministerio ahora, pero las cartillas cada maestro lo elaboraba y el material

también, cada profesora siempre elabora un material específico porque como los chicos son de un aprendizaje visual entonces cada tema realizado no puedes dársela como en colegio regular ¿no? No puede la maestra solamente utilizar la pizarra y ¿Qué sé? Dar el tema, tiene que haber un material específico para utilizar y tiene que hacer una adaptación necesaria entonces al contenido.

Entonces las maestras elaboran el material, pero sí lo que nos ha costado poquito es... por ejemplo enseñar a los chicos el uso de la herramienta zoom, enseñar a los papás también. Teníamos que hacer videos tutoriales el año pasado para que los chicos aprendan ahora es practico porque los chicos son más independientes, ya saben se les manda el link, ellos se conectan y dan sus evaluaciones por zoom porque hay herramientas para dar evaluaciones como el “Quizizz” por ejemplo, entonces lo hacen de manera divertida, pero sí ha costado hacer por ejemplo la edición de videos. Tal vez la hacíamos muy...que sé...no tan elaborado, pero ahora las maestras se han vuelto rápidas para hacer la elaboración de videos y van haciendo más dinámica la clase cosa que se manda a los grupos y los papás pueden retroalimentarse a través del video lo que se avanza en clase.

E: Muy bien, puedo entender que los docentes se auto-capacitaron, su nivel de tecnología se superó ya que usted me dice que han sido creativos, etc. Esto introduce a mi siguiente pregunta, entonces la Educación virtual dio beneficios a la enseñanza del alumnado o tal vez también hubo debilidades por el uso de la educación virtual, si ambos fueran así ¿podría explicarnos acerca de eso?

MA: Tiene sus pros y sus contras ¿no? A nosotros nos ha ayudado bastante porque hemos podido digamos ampliar conocimientos en lo que es las nuevas tecnologías y usar nuevas herramientas incluso tener relación más cercana con los papás a través de la distancia por así decirlo porque hay más conexión con ellos también porque el momento que el estudiante se conecta el papá también está ahí al lado entonces incluso la maestra puede coordinar con él las tareas.

Lo que también ha sido perjudicial es ese aspecto en el momento que el niño está dando la evaluación los papás también están y ahí tal vez hay un desfase porque dejan de ser un poco independientes los chicos y están mirando al papá para ver si están dando una respuesta correcta. He sentido algo tal vez contra producente con las evaluaciones, por otro lado, la dificultad está en que los estudiantes no todos tienen la herramienta para entrar a las clases entonces el horario en muchos casos se ha cambiado porque el papá va al trabajo y se lleva el celular entonces cuando llega el papá recién puede acceder a la clase. Por otro lado, la maestra también tiene que ajustar su horario al estudiante, tal vez no puede pasar con los 7 o 8 estudiantes al mismo tiempo porque uno de ellos tal vez no tiene la herramienta entonces coordina con el papá le dice: “Cuando usted llegue a la casa se conecta así yo voy a pasar solo con su hijo”.

Entonces son muchas cositas que han influido, pero se ha dado continuidad eso es lo más importante y que ahora hay estudiantes que no tiene todavía la habilidad eso estamos gestionando con otros lados para conseguírselos también para ellos porque realmente vemos que son personas de escasos recursos y aparte de eso que con esto del Covid muchos papás están tal vez con la esposa y el esposo enfermos ¿no? Es entonces complicado algunos han perdido el trabajo, hay muchas, muchas situaciones, pero más importante es que hay la voluntad tanto como de los estudiantes y padres de familia de continuar y eso es lo que se está haciendo, el proceso educativo va adelante.

E: Muy bien directora, tengo entendido que el centro se maneja en tres niveles: inicial, primario, ¿intermedio? ¿Es correcto?

MA: Inicial y primaria, tenemos inclusión en secundaria.

E: ¿Cuál es la población estudiantil que tal vez le cuesta un poco más de trabajo acostumbrarse a esta nueva modalidad de educación virtual?

MA: Tal vez a los chicos que tiene multi-discapacidad porque los más pequeños están pasando las clases en ese curso tenemos por ejemplo una maestra sorda ¿no? Entonces con ella la comunicación es más fluida están aprendiendo no hay dificultad. En primaria hay un poquito de dificultad en la conexión solamente. En multi-discapacidad se

necesita siempre tener una atención personalizada ahí los estudiantes tienen atención dispersa, no pueden entrar justo a tiempo porque ellos solitos no manejan la herramienta ahí está un poquito complicado. La maestra se da también los modos hay días en el que viene al establecimiento con un solo estudiante y hace el trabajo educativo ahí otros días va a su casa también.

E: Muy bien licenciada, vamos a entrar a la ronda final, estas preguntas que vienen son relacionadas con nuestro proyecto de grado que ya tiene conocimiento desde hace un año más o menos, vamos a empezar si usted quiere puede responderlas de manera cerrada o abierta.

La primera pregunta es ¿Existe en el país alguna aplicación móvil que reúna material de enseñanza escolar adaptado a niños menores de 9 años?

MA: Bueno no tengo conocimiento de ello, había en la universidad salesiana he escuchado que lo estaban haciendo, también la persona que lo estaba haciendo vino al centro algunas veces a hacer alguna entrevista, pero no sé si lo ha dejado o lo ha concluido, pero por ahí estaba haciendo, pero no tengo otro conocimiento.

E: Bien, siguiente pregunta ¿Sería de gran contribución la existencia de una app como la que acabamos de mencionar adaptada a niños menores de 9 años?

MA: Es necesario e importante también porque los estudiantes ahora con la nueva tecnología, nuevas herramientas siempre están ellos con el celular, la Tablet es aquello lo que llama la atención porque es de la actualidad el contexto, me parece que es fundamental adaptar lo que tenemos nosotros al contenido, al momento en que vivimos la necesidad del estudiante es muy importante.

E: Dentro de las aplicaciones móviles abocadas a la pedagogía de diferentes tipos le pregunto:

Si sería buena idea, si existiera una aplicación móvil que reúna la enseñanza escolar basada en diferentes materias como se lleva de manera regular y tal vez también de

acuerdo a cada nivel y a parte que reúna ambos idiomas que también son parte de la escuela, que son LSB y el español ¿Usted cree que es buena idea que exista algo así?

MA: Sería interesante que sea por niveles y que sea por áreas de conocimiento porque sería profundizar un poquito más de contenido que haya un poco más de los contenidos, haya mayor vocabulario para que el estudiante pueda desenvolverse con más facilidad para organizar ideas de acuerdo al área que están avanzando.

E: También le pregunto ¿Si sería buena idea que aparte de las características ya mencionadas para una aplicación móvil de estas características también tenga una temática de uso de animación tal vez para atraer de manera visual a los niños tal vez que incluya personajes virtuales que simulen como profesores de aula y tal vez que también reúna links virtuales de enseñanza del idioma LSB adaptado para este tipo de población? ¿Sería una buena idea directora?

MA: Sí, toda herramienta que utilicen especialmente para los chicos sordos siempre tiene que tener: mucha imagen, mucho color. Esa parte si es fundamental porque como todo es visual ellos relacionan mucho, o sea son más detallistas, entonces al ver una imagen y al ver que tiene colores o algo que brille o algo que le llame la atención o que le haga reaccionar es fundamental. Entonces me parece que sí todo trabajo, toda herramienta tiene que ser siempre con esa mentalidad de que tiene que ser para un estudiante que la información le va entrar más que todo por los ojos y no tanto como a nosotros ¿no? Escuchando ya agarramos la información.

E: Muy bien ¿Cree que habría un apoyo muy importante a la educación escolar de niños principalmente de 6 a 8 años con una herramienta de estas características? Tal vez como apoyo aparte de la educación que ya reciben en la escuela.

MA: Sí, me parece importante porque se puede relacionar, de 6 a 8 años ya tiene que entrar a un proceso de lecto-escritura por eso decía que sería bueno que se pueda dividir: para inicial otro tipo de actividades, para primaria de primero a tercero hay que consolidar muchos aspectos cognitivo, lateralidad y ya de cuarto para sexto ya es más la

producción de textos y demás. En ese sentido hay que aprender a diferenciar para que los chicos tengan un mejor aprendizaje.

E: Muy bien ¿Usted cree conveniente que también se pueda evaluar a los estudiantes que usen esta aplicación?

MA: Sí, puede hacer la evaluación, pero no formal como la que generalmente se hace como sacar una hoja de papel. Tendría que ser una evaluación más dinámica y ver ¿Cómo ha agarrado la herramienta? ¿Cómo responde a lo que ha resuelto? Pero sí me parece que debe haber una evaluación ahí uno se da cuenta si realmente la herramienta sirve o esta tal vez descontextualizada o las señas no están bien o hay que cambiar colores por eso la evaluación es fundamental.

E: Muy bien ¿Si existiera una aplicación con tales características su plantel docente podría designar el uso de esta aplicación como una herramienta de uso pedagógico?

MA: Sí, porque con los estudiantes de educación especial con discapacidad auditiva no hay una metodología específica ni una herramienta, ni un texto que sea oficial, con lo que tienen aprenden. Sí hay una app que puede contribuir a que el estudiante aprenda es bienvenido.

E: Muy bien, ya vamos a terminar directora paso a unas preguntas más ¿Cuál es la edad en la que generalmente se gradúan los alumnos en esta institución?

MA: De sexto hemos tenido estudiantes que... el sistema educativo por ejemplo en educación especial nos da dos años más, sí un estudiante en regular entra a inicial con 5 años nosotros podemos recibirlo hasta con 7 años. Entonces ha habido casos en nuestros estudiantes que no entran con la edad correspondiente hay estudiantes que a los 15 años han terminado entonces a los 16 están entrando a secundaria o 17. En muchos casos se ha tenido que hacer convenio con un “CEA” o colegio nocturno donde se hace la inclusión cuando los aceptan.

E: ¿Con qué nivel de enseñanza en ambos idiomas (LSB/español escrito) se gradúan los alumnos de la institución?

MA: En LSB ellos manejan de muy bien a excelente, pero donde siempre va haber dificultad es en el castellano escrito, siempre va tener una persona sorda dificultades en ese sentido no les puedo decir al 100% tienen una comunicación escrita, pero si tienen una comunicación que se puede entender con oyentes que no manejan LSB, puede escribir y hacer composiciones cortas.

E:Directora, esta es la última pregunta y es muy importante ¿Existen cursos dentro la institución para el apoyo en el idioma LSB para padres de familia y la población en general?

MA: Sí. hemos abierto esa posibilidad para difundir el LSB y también fortalecer lo que es la comunicación de la lengua de señas boliviana con los padres de familia entonces prácticamente el curso se abrió desde hace tres años atrás y los padres están comprometidos y obligados a aprender LSB. Pero este curso no solamente se ha limitado ahí, sino que abrió para profesores hasta universitarios y público en general que quiera aprender lenguaje de señas lo más importante es que lo dan maestros que conocen el lenguaje de señas y prácticamente es gratis el curso.

E: Muy bien gracias directora muchísimas gracias por su tiempo y agradecerle también por la labor que usted desempeña es una labor muy importante y en el que también nosotras hemos tratado de involucrarnos y apoyar a la escuela, con mucho cariño, con mucha delicadeza para poder crear material apropiado para los estudiantes.

MA: Gracias a ustedes por confiar en el centro y por empatizar con la persona con discapacidad auditiva y me alegra mucho que estén innovando nuevos materiales, nuevas herramientas, nuevas apps que los chicos puedan utilizar y también los maestros ¿no? Es fundamental que se pueda compartir y difundir el trabajo que ustedes están realizando felicidades.

E: Listo, muchas gracias directora.

FIN DE LA ENTREVISTA

AppendixB3. User Manual

LENGUAJE DE SEÑAS BOLIVIANO PARA NIÑOS



APLICACIÓN MOVIL PARA ANDROID

MANUAL DE USUARIO

CONTENIDO

I. INTRODUCCIÓN

- Objetivo
- Requerimientos

II. OPCIONES DE SISTEMA

- Ingreso al sistema
- Registro de datos
- Menú
- Ventana corrediza
- Actividades
- Evaluaciones

III. SOLUCIÓN DE PROBLEMAS

IV. PREGUNTAS FRECUENTES

V. LINKS DE APOYO

I. INTRODUCCIÓN

Objetivo

Fortalecer el aprendizaje bilingüe (Lenguaje de Señas Boliviano y español) en los estudiantes de inicial, primero y segundo grado de primaria del Colegio Huáscar Cajías, La Paz –Bolivia.

Requerimientos

- Para poder descargar la aplicación se necesita un celular Android de cualquier marca (pero no para móviles IOS).
- Capacidad de memoria de 450 Mb de espacio en el celular.
- El usuario (niño o niña) debe estar acompañado de un adulto o tutor responsable (padres de familia, profesor, etc.).
- Conexión a Internet.

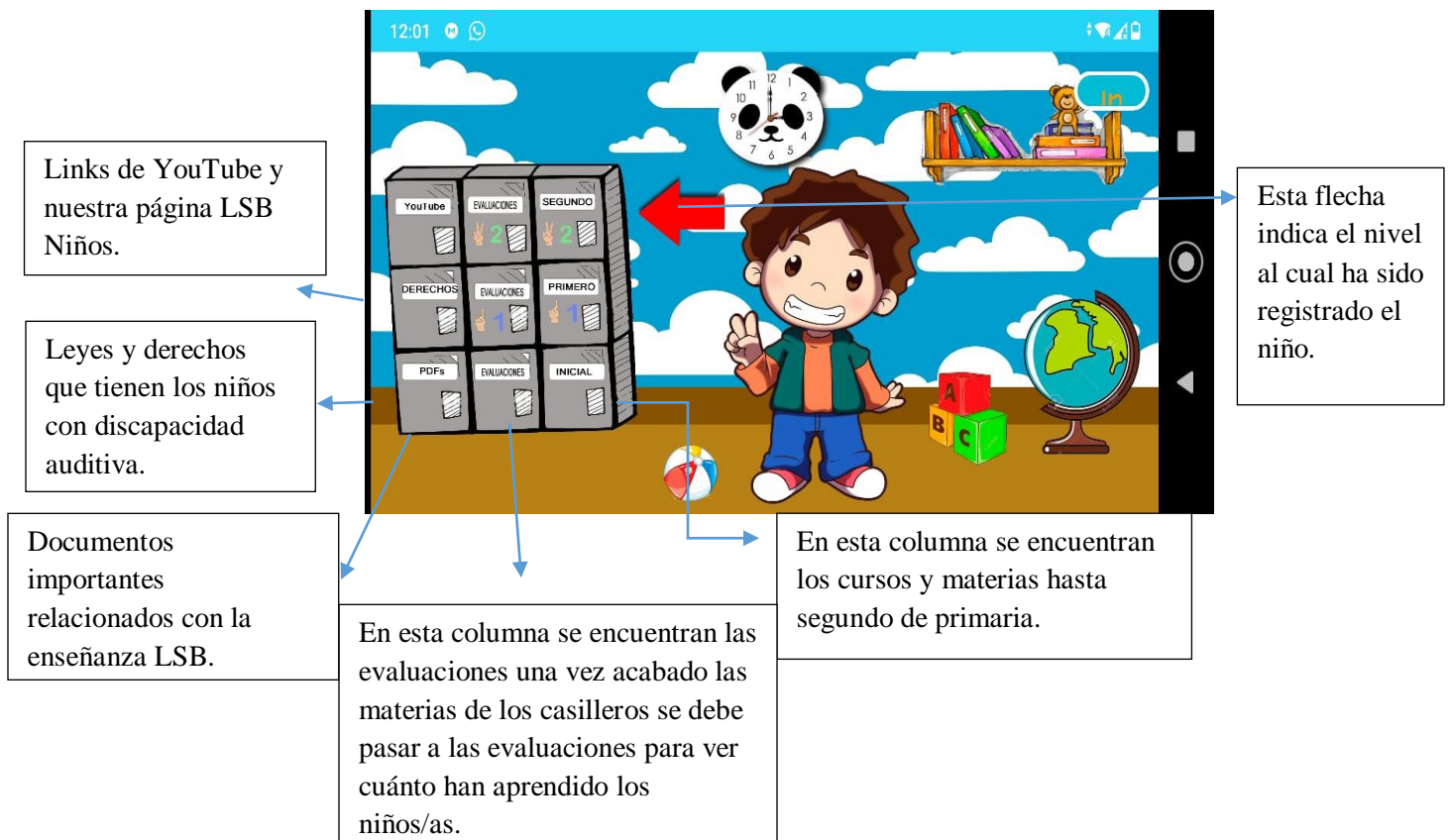
En esta sección se debe registrar los datos del niño o niña con ayuda de los padres o algún adulto responsable.

The screenshot shows a registration screen for 'NiñosLSB' with the following elements and callouts:

- Header:** 'Bienvenidos a NiñosLSB' in yellow text on a blue background.
- Form:**
 - Question: '¿Como te llamas?' with a text input field labeled 'Nombre'.
 - Question: '¿Que edad tienes?' with a numeric keypad showing '0' and '+' signs.
 - Section: 'Selecciona tu nivel' with three radio button options: 'Inicial', 'Primero', and 'Segundo'.
 - Button: A large orange 'Listo' button at the bottom.
- Callouts:**
 - Top-left: 'Aquí se debe registrar el nombre del niño o niña.' (Points to the 'Nombre' field)
 - Top-right: 'Deslizando el dedo hacia izquierda o derecha se aumenta o rebaja la edad del niño.registrad' (Points to the numeric keypad)
 - Bottom-right: 'En estas casillas se debe seleccionar el nivel al que pertenece el niño o niña.' (Points to the level selection options)
 - Bottom-left: 'Una vez finalizado todo el registro se apretar el botón de "LISTO" para pasar a la casilla de menú.' (Points to the 'Listo' button)

- **Menú**

- 1) Una vez acabado el registro de datos la aplicación los mandará directamente al menú donde se puede ver los niveles donde se encuentran las materias (sociales, lenguaje, ciencias naturales y matemáticas), evaluaciones por cada nivel, Derechos que tienen las personas con discapacidad auditiva, PDFs de apoyo y canales de YouTube relacionados con el Lenguaje de señas incluido nuestro canal de YouTube llamado “LSB Niños”.



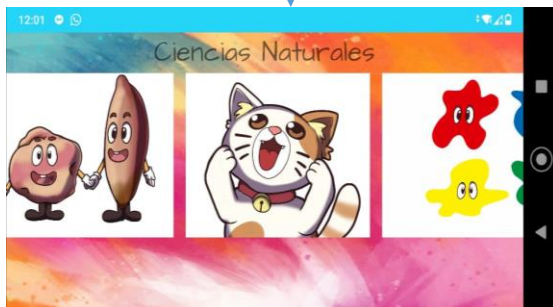
- 2) Ingresando al curso escogido se puede observar otro menú de libros el cual indica las materias que pueden ser elegidas deslizando el dedo de arriba abajo.



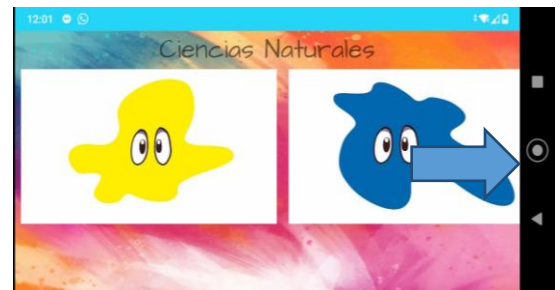
- **Ventana corrediza**

Al ingresar a cualquiera de los libros de materias se ingresará a la ventana corrediza para que deslizando el dedo de izquierda a derecha pueda elegir la actividad que más le interesa.

Esta es la ventana corrediza principal al elegir una actividad se pasará a otra ventana con imágenes para elegir.

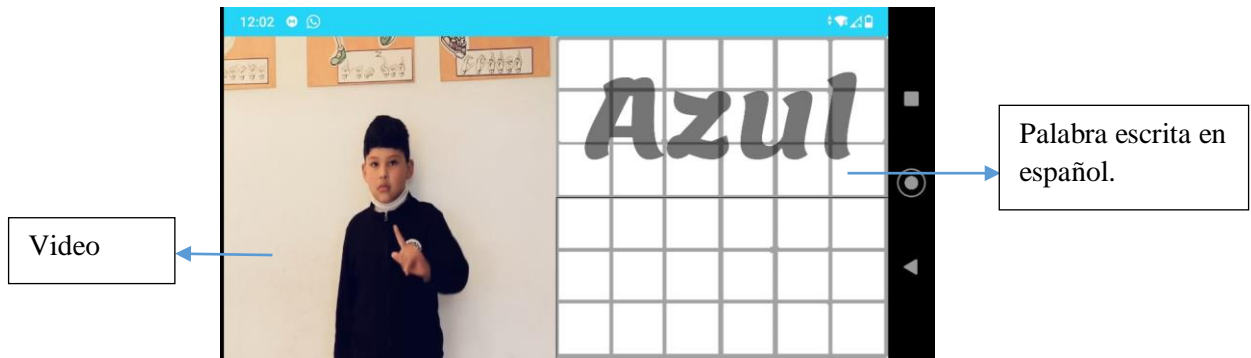


Después de elegir una imagen se pasará a la ventana de actividades.



- **Actividades**

- 1) En las actividades se puede observar un video indicando la seña de la imagen elegida en la ventana corrediza y al lado hay una ventana que indica la palabra escrita en español, debajo de esto se puede observar un espacio vacío donde el niño o niña debe imitar la palabra escrita arriba.



- 2) Existen otros tipos de actividades donde se presenta una portada donde el niño o niña debe tocar donde más le atraiga así inmediatamente saldrá la ventana de la palabra con video de la seña y la palabra escrita en español.





- **Evaluaciones**

Las evaluaciones de cada curso y de las materias se encuentran en la columna indicada la imagen.



Al ingresar a los casilleros de evaluación aparecerá el menú de materias para que deslizando el dedo de abajo a arriba el niño o niña pueda elegir con que quiere iniciar su evaluación.



Las evaluaciones son de opción múltiple en su mayoría donde el niño debe elegir la opción correcta después de ver un video de la seña. Si el niño o niña realiza la respuesta correcta saldrán serpentinas en caso de error el celular vibrará.

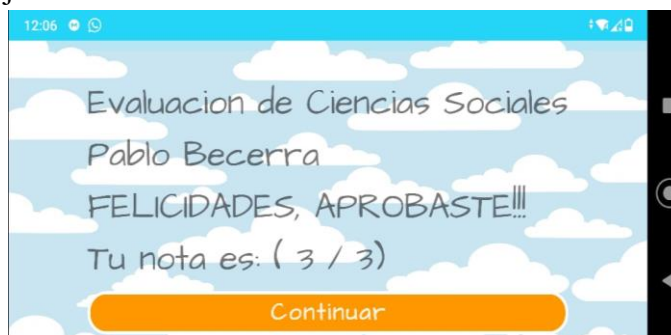
Video seña.

Instrucción de la actividad.

Ejercicio de opción múltiple.

Resultado correcto.

Al acabar las actividades de evaluación por cada materia se mostrará sus aciertos y el puntaje.



Al acabar todas evaluaciones de las materias se mostrarán las notas finales.



VI. SOLUCIÓN DE PROBLEMAS

1. En caso de no haber registrado sus datos adecuadamente.



Apretando este botón el usuario puede ver su información de registro y notas de evaluaciones.



Apretando en estos botones se puede ver las notas de evaluación del usuario por niveles.

VII. PREGUNTAS FRECUENTES

¿A quién está dirigido este Manual?

Este manual está dirigido a niños con discapacidad auditiva de cursos inicial a segundo de primaria, también puede ser utilizado para personas que desean aprender el lenguaje de señas boliviano.

¿Dónde se encuentra el manual de usuario?

Se encuentra en el casillero de PDFs del menú.

¿Cómo se puede descargar la aplicación móvil?

Obteniendo el link de descarga gratuita a través del colegio "HuascarCajias", La Paz-Bolivia.

V. LINKS DE APOYO

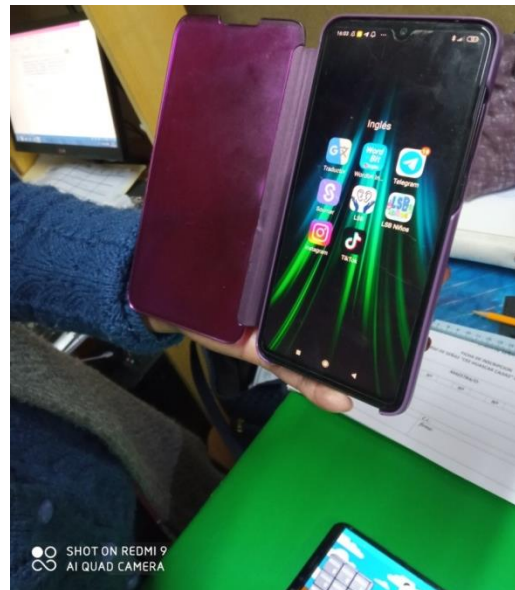
- LSB NIÑOS (2020). Recuperado de https://www.youtube.com/channel/UCTFdNC2Gf4EQgDdFqLDBK3g?view_as=subscriber
- Alvaro Sanabria (2018). Recuperado de <https://www.youtube.com/channel/UCEHAj2eVA22wWb0VZRkl-FA>
- "Dilo en Señas - Bolivia" (2017). Recuperado de <https://www.youtube.com/channel/UC4YwTQucIQMHWeN4icPI-Kg/about>
- CARES LA PAZ (2013). Recuperado de <https://www.youtube.com/channel/UCM6RtnxwVhfAdzPTASMMmJg/videos>

Appendix B4. Stages of the Project

STAGES OF THE PROJECT	ACTIVITIES	HUMAN RESOURCES	MATERIALS	COST
Field Study in the “Centro de educación Huáscarcajías “	-Define the main needs of students. -Interviews and questionnaires.	Ownresources .	Pencils, pens and paper.	-
Syllabus design divided by levels: Inicial(kindergarten) First of primary Second of primary	-Locate the subjects of the curriculum. -Objectives of the course. -Course contents. -Methodology.	Own resources.	Laptop.	-
Elaboration of audio / visual material	-To take photographs. -Video recording and editing. -Audio recording.	Own resources.	-Cámara Cannon T7i -Laptop. -Softwares: Photoshop Light room (photo) and Adobe premiere (video).	5000 Bs
Graphic Design of the Application	-Logo design. -Menu design. -Character design. -Typography. -Digital illustration.	Own resources.	-Tablet Wacom -Software Adobe Illustrator.	1000 Bs

<p>Development of the mobile application</p>	<ul style="list-style-type: none"> -Panel and Canvas Design. -Code Writing. -Insertion of photos in RAW quality. -Insertion of Visual Resources. -Final Interface Design. 	<ul style="list-style-type: none"> - SystemsEngineering. 	<ul style="list-style-type: none"> -Computer processor Core i5/7th generation. -Java programming and visual studio. -Platforms: Unity 2018.3 f164bits 	
--	--	---	---	--

Appendix B5. Photos “LSBNiños” mobile application final submission



The mobile application was delivered in January 2022 at the Huascar Cajías school currently located on Indaburo Street in front of the Contraloría general UE (La Paz – Bolivia). The people that appear in the photograph are the General Director of the “Huascar Cajías” school Maria Angela Ticona and the President of the educational Council Sonia Loza.

Appendix B6. Schedule of Activities

SCHEDULE OF ACTIVITIES		FEBRUARY				MARCH				APRIL				MAY				JUNE				JULY				AUGUST			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	DIAGNOSTIC SECTION AND CHAPTER I																												
2	CHAPTER II-PROPOSAL SECTION																												
3	CHAPTER III- THEORETICAL FRAMEWORK																												
4	CHAPTER IV- PROPOSAL DEVELOPMENT																												
5	-Project procedures																												
6	CHAPTER V- SYLLABUS GRAPHIC DESIGN																												
7	-Activities and virtual material collecting and development (Videos, photos, games etc.)																												
8	CHAPTER V- MOBILE APPLICATION BUILDING																												
9	-Illustration Design: Logo, menu, characters, typography, etc.																												
10	-Design of the Mobile App: Canvas Panels, boards, code writing, insertion of Raw Photo designs, insertion of visual sources.																												
11	-Final Interface Design																												
12	CHAPTER V- CONCLUSIONS																												
13	CHAPTER VI- BIBLIOGRAPHY																												
14	ANNEXES																												