Information and Communication Technology in English teaching as a Foreign Language to the visually impaired population in America: a literature review

Juan Diego Lozano Triviño

María Fernanda Rivas Alvis

Research line: Educación, sociedad e inclusión.

Unidad Central del Valle del Cauca

Facultad de Ciencias de la Educación

Bachelor of Arts in Foreign Languages with Emphasis in English

Tuluá, Colombia

2025

Information and communication technology in English teaching as a foreign language to the visually impaired population in America: a literature review

Juan Diego Lozano Triviño

María Fernanda Rivas Alvis

Degree work presented to qualify for the title of: Bachelor of Foreign Languages with an emphasis in English

Director: Walter Vargas Urrego, Master (M.Ed.) of Bilingual Education

Unidad Central del Valle del Cauca

Facultad de Ciencias de la Educación

Bachelor of Arts in Foreign Languages with Emphasis in English

Tuluá, Colombia

2025

Dedication

Juan Diego Lozano Triviño: To my mother, who has been there every day despite the circumstances, supporting me unconditionally, shaping me, and guiding me along a path of excellence and integrity. Also, to my grandparents and uncles, who have looked after my well-being, becoming fundamental pillars in my life.

Maria Fernanda Rivas Alvis: I lovingly and gratefully dedicate this work to my mother, who has been a pillar throughout my university journey, inspiring me to be a committed person with vocation and a strong sense of self-improvement. I also thank my sister for her affection, understanding, and support during this challenging process; my grandfather and aunt for their wisdom, advice, and unconditional encouragement, which have been indispensable in the completion of this path. Thank you all for being an essential part of my professional development, accompanying me every step of the way, showing me that today's sacrifice is the foundation for tomorrow's success.

Acknowledgments

We are enormously grateful to God for granting us the strength, wisdom, and perseverance to complete this process. We also extend our sincere thanks to our advisor, Walter Vargas Urrego, for his guidance, dedication, and continuous support, as well as to the academic advisors whose recommendations, feedback, and knowledge greatly contributed to the development of this project. Each of you played a fundamental role in the attainment of this goal.

Table of content

Table Index

Index of Figures

Index of Appendices

Resumen

Esta investigación esboza una revisión bibliográfica la cual examina el uso de las Tecnologías de la Información y la Comunicación (TIC) en la enseñanza del inglés como lengua extranjera (ILE) a personas con discapacidad visual, particularmente en las Américas desde 2014 hasta 2024. El objetivo principal es identificar y analizar las publicaciones científicas de este período. Esta investigación adopta un enfoque cualitativo que se realiza a través de un diseño bibliográfico utilizando un alcance interpretativo, con el fin de caracterizar, clasificar, contrastar aquellas investigaciones científicas sobre el uso de las herramientas TIC en la educación. Este estudio destaca herramientas y recursos TIC como lo son audiolibros, lectores de pantalla como JAWS y la aplicación Eyeland, las cuales han sido reconocidas como herramientas fundamentales para apoyar en la enseñanza del inglés a estudiantes con discapacidad visual. En última instancia, los resultados buscan apoyar a los educadores e investigadores en el diseño de futuras estrategias pedagógicas y estudios, promoviendo una enseñanza del inglés más inclusiva y eficaz para los alumnos con discapacidad visual.

Palabras claves: Tecnologías de la Información y la Comunicación (*TIC), Discapacidad visual, Inglés como Lengua Extranjera (ILE).*

Abstract

This research outlines a bibliographic literature review examining the use of Information and Communication Technologies (ICT) in teaching English as a Foreign Language (EFL) to visually impaired individuals in the Americas from 2014 to 2024. The main objective is to identify and analyze scientific publications from this period. The study employs a qualitative approach, utilizing a bibliographic design with an interpretive scope to characterize, classify, and contrast research on ICT tools in education. This review highlights several ICT tools and resources, including audiobooks, screen readers such as JAWS, and the Eyeland app, which have proven essential for supporting English instruction for visually impaired students. Ultimately, the findings aim to support educators and researchers in designing future pedagogical strategies and studies, promoting more inclusive and effective English teaching for learners with visual impairments.

Keywords: Information and Communication Technologies (ICT), Visual Impairment, English as a Foreign Language (EFL).

Introduction

In the view of education, inclusion policies have emerged as a crucial aid and support in all subjects and scenarios within classrooms, ensuring equitable learning environments for all students regardless of their conditions, background, and needs. UNESCO (2020) provides an understanding of inclusive education, which aims to narrow the difficulties between students and their learning processes by removing barriers in educational contexts. Recent research also highlights the importance of equal educational opportunities, emphasizing particular strategies in pedagogy, curriculum, and classroom management, which is an important field to thrive in with the right accommodations in academic environments (Jackson-Summers et al., 2024).

Advances in Information and Communication Technologies (ICT) have changed education globally, providing new opportunities for inclusive and equitable academic development. Yet, Watts and Lee (2017) state that visually impaired populations continue to face considerable obstacles in accessing quality education, particularly in learning English as a Foreign Language. Given this, it becomes necessary to review the advances in this field, highlighting the discoveries and strategies that support the visually impaired population in academic contexts. In this vein, this project addresses the existing state of scientific production, which has concentrated on the use of ICT tools and resources to sustain English language teaching for visually impaired students on the American continent between 2014 and 2024.

This document is divided into multiple chapters that outline the research procedure. The first chapter, the Problem Statement, contextualizes the problem by underlining the lack of educational resources and tools for the visually impaired apprentices. Following that, the Rationale explains the matter of this project and the necessity for updated and suitable academic contributions in the area. Besides, the Objectives establish the general and specific goals that steer the research process across the steps that conduct its development.

The second chapter, the reference framework, presents the background reality, which is divided into international, national, and regional studies that have addressed similar topics in this research. Furthermore, the Theoretical Framework examines fundamental concepts related to English language teaching, ICT tools and resources, inclusive education, and visual impairment that support the theoretical foundation of this project.

The subsequent chapter contains the methodology section, which explains the approach, design, and scope of this study. It also outlines the instruments utilized for data collection and analysis, including the synthesis and contrast matrices, as well as the inclusion and exclusion criteria. Additionally, the data collection and analysis course is precisely described to provide a coherent guide to the methodological process implemented during research development.

The fourth chapter contains the results and discussion; the findings are offered through categories that arose during the analysis, providing views into current practices, gaps, and beneficial factors. Then, the discussion is presented, utilizing the triangulation process in which the research outcomes are contrasted against the reference framework and supported by the theoretical framework previously constituted.

The final section presents the research conclusions, emphasizing the need for further theoretical exploration that integrates ICT tools and resources to support visually impaired learners in their language learning process. Finally, the research concludes with recommendations, presenting suggestions for future studies and projects to consider regarding the implementation of ICT tools and resources for visually impaired learners in English language learning and teaching.

Chapter I: Problem statement

This chapter introduces and contextualizes the study through various sections, providing a broad overview of the structure and relevance of the crucial aspects considered in this research. The contextualization provides a closer look at the understanding of what surrounds the study, starting from a general perspective and gradually delving into more specific aspects, with the theoretical pillars and background being the problems faced by the visually impaired population in learning English, due to the scarcity of tools and resources related to Information and Communication Technology (ICT). This issue is addressed through the research question, which seeks to identify scientific publications made in this field between 2014 and 2024. In addition, the objectives of the research are focused on analyzing those publications that provide support to the affected population.

Finally, the rationale establishes grounds that expose a notable shortage of research promoted in the field from the Scopus, Google Scholar, and Semantic Scholar databases. Therefore, this gap becomes a possible reason that explains why various scenarios prevent the visually impaired population from advancing toward a learning process that is suitable and facilitated by technological tools and resources to support their educational needs.

Contextualization

Human life is built through experiences, which enable individuals to grow in the various facets that make up their social, personal, and cognitive development., among the five senses of human beings, sight plays a crucial role in how people interact with their environment, as it is the primary means by which they can capture images of how the world is structured and perceived. As stated by Dr. Llovet in his publication "The Sense of Sight: Importance and Care" (2021), the sense of sight is characterized as one of the most important traits since almost 50% of brain activity is focused on the processing of images that are perceived. Given this, it underscores that the lack of vision can affect the quality of life and hinder motor, emotional, linguistic, and cognitive development.

The decline in eyesight becomes a concern for modern societies, as it reduces living conditions for people; therefore, being mindful of this issue is key to addressing it. According to

the analysis by the World Health Organization (2019), it is estimated that at least 2.2 billion people worldwide have some type of visual impairment, either at short or long distances. In the context of the American continent, the World Health Organization (2019) presents statistical data on people residing in the Americas with various visual impairments, indicating that approximately 290 million people suffer from some form of visual condition. Narrowing the emphasis to a national level, Vision y Optica (2022) reports that approximately 2,000,000 Colombians (or 4% of the population) suffer from vision loss, which affects their ability to see and perform daily activities. Overall, this illustrates the scale of visual health challenges in near contexts, reflecting a situation that indicates a widespread influence extending from continental to national realities, underscoring the need to support this population in all domains.

From that situation, a considerable number of people on the American continent are affected in many domains due to the decrease in their visual ability. One critical area that has been compromised is education, Watts and Lee (2017) consider that educational contexts are not adequately equipped to offer quality education for the visually impaired community, as they lack inclusive measures to address their specific needs. Complementary to this, Gomez (2023) argues that visually impaired individuals face even greater challenges when learning English in academic settings, due to the scarcity of pedagogically inclusive materials and resources. These findings underscore the need to develop accessible English learning resources for individuals with visual impairments.

Despite these challenges, English remains a universal language essential for global communication and offers invaluable opportunities. Cárdenas and Inga (2021) emphasize that bilingualism plays a crucial purpose in ensuring intercultural bonds and fostering professional opportunities, as English works as a lingua franca that facilitates communication with the world. Nevertheless, people with visual impairments might be left behind due to the lack of interest in developing new strategies to promote their language learning, so obstacles must be overcome to contribute to the field.

In this context, it is vital to understand the most common barriers that disrupt the learning process of visually impaired learners when facing a foreign language. The lack of materials is already a known issue, but as Bonilla (2019) reveals, guidance is needed to reduce the

difficulties encountered in classroom environments, making teacher training in inclusive education critically important for meaningful development. Similarly, Kanchanasuttirak (2025) emphasizes that many institutions still rely on traditional methods along with standardized aids, which often fail to meet the needs of visually impaired students. While technological assistance is valuable, it is usually underdeveloped. Consequently, this academic landscape does not fully meet learners' needs for modern tools that adapt to their specific learning styles and attributes.

Medina (2020) highlights a gap in English phonetics resources, emphasizing that only traditional and unsuitable tools are available for visually impaired learners. Her research reveals a lack of pedagogical aids. It addresses this issue by implementing a strategy that utilizes a technological tool, specifically a screen reader called JAWS (Job Access with Speech), to enhance access to Adaptive English Phonetic Tools. Therefore, this common problem faced by the researcher is a typical challenge regularly encountered by the affected population within the educational field, suggesting new approaches to reinforce their learning pathways.

In response to the typical English challenges in that context, ICT becomes a great aid and is suitable for a modern school setting. This has been reflected in Siemens' (2005) theory of connectivism, which was based on the use of digital tools and technologies to facilitate understanding in different fields. Unlike traditional theories that emphasize strategies relying on outdated tools and materials, connectivism distinguishes itself in the use of emerging resources that enrich the learning process. This emerging theory has evolved into more beneficial aspects; inclusive education has benefited from new inventions that assist learners from diverse and valuable pathways, steering the formative path to better ways of teaching and learning (Watts and Lee, 2017).

Despite the evolution of emerging resources in the educational field and the advantages that come with the implementation of Information and Communication Technologies (ICTs) in classrooms, according to Busto (2018) the visually impaired population has been neglected in terms of advancements, they have not been exposed in favorable environments accompanied by technology and assets focused on English language learning. Thus, this generates doubts and concerns regarding the consistency and direction of how research has been developing over the last years.

Given this, the field has fallen behind due to new inventions and discoveries that could benefit it, as it has not been continually enriched with scientific publications. In response, this research aligns with the research area of education, society, and inclusion, aiming to support the field by analyzing current scientific production through a literature review. The goal is to deepen understanding of existing knowledge and promote meaningful awareness in this domain.

Research Question

This research has arisen to answer the following question: What scientific production has been published about Information and Communication Technology (ICT) to teach English as a foreign language to people with visual impairment in America from 2014 to 2024?

Objectives

General Objective

To analyze the scientific publications on the use of information and communication technology tools and resources to teach English as a foreign language to people with visual impairment from 2014 to 2024 in America.

Specific Objectives

-To characterize the scientific publications according to research components, such as methodology, objectives, population, instruments, and results.

-To classify the scientific publications according to research components, including methodology, objectives, population, instruments, and results.

-To contrast the scientific publications according to research components, such as methodology, objectives, population, instruments, and results.

Rationale

The concept of inclusion in education emerged during the 1990s as a response to the significant gap of marginalization experienced by populations segregated based on their physical, cognitive, and ethnic conditions. This vision has evolved over the last years, UNESCO (2020) envisions an inclusive paradigm based on a suitable pace, driven by strategies that transform standardized classrooms into equitable spaces for every individual. Consequently, educational

inclusion is regarded as a solution driven by principles of equality, fostering cooperative and meaningful learning (Echeita, 2013).

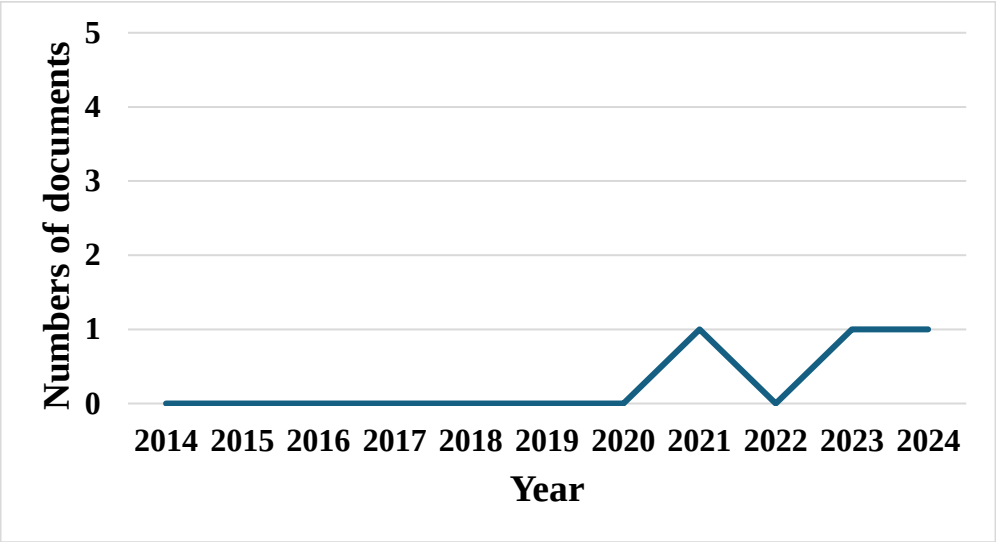
Despite this promising premise, established over 30 years ago, communities affected by this issue, such as students with visual impairments, still face challenges because progress in the field has been limited in terms of resources and tools driven by ICT for learning English as a foreign language. According to Jedynak (2023), there is limited pedagogical support available for visually impaired learners in foreign language classrooms. Still, growing advocacy for inclusive education has not been fully recognized. Jedynak (2023) argues that students with visual impairments struggle and face exclusion because the field has underdeveloped teaching strategies due to a general lack of research in the domain. That is why the concern outlined above leads to the identification and in-depth analysis of research focused on students with visual impairments in the development of English language learning.

Having clarified that, the under-researched field is demonstrated in this study through a literature review. Therefore, it is vital to highlight the findings related to scientific production, since they can reveal the current state of the field based on the number of publications, contributions, and insights that shape it. This research used results from three search engines: Scopus, Semantic Scholar, and Google Scholar, considering the following keyword filters: ICT, Visual Impairment, Blindness, and English learning. These were chosen because they enabled the collection of documents related to a context where visually impaired students learn English through ICT tools and resources.

Furthermore, scientific publications were considered only from the American continent to include a larger number of documents and to situate the research within a more relevant context. Lastly, a timeframe between 2014 and 2024 was established because, as Vergara et al. (2020) noted, technological resources can become outdated over time without proper updates, which may cause them to fail to meet new requirements in subsequent years. Hence, it is crucial to focus on recent documents, as tools and resources mediated by ICT often become ineffective over time, making them unsuitable for this research, which aims to establish itself as a reference for the field in general.

Figure 1

Documents found in Scopus

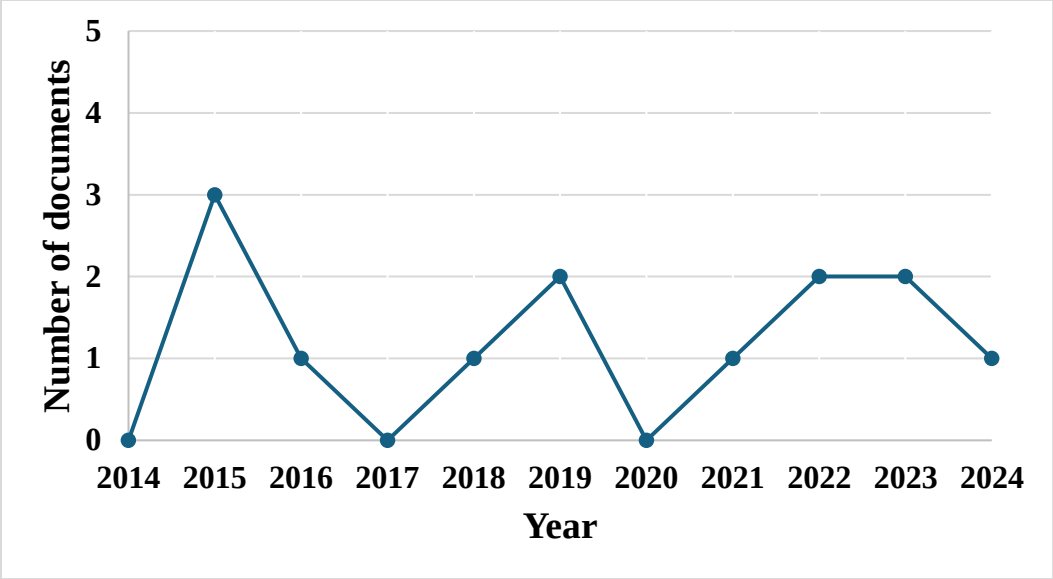


*Note***,** the figure depicts the lack of research from 2014 to 2024.

According to the image from the search engine Scopus, Figure 1 displays the number of projects over the years from 2014 to 2024. Additionally, before describing Figure 1, it is essential to note that initially, the search engine Scopus returned 24 general results. However, since these did not meet the study's inclusion criteria or were not relevant to the topic, they were excluded from the analysis. The x-axis in Figure 1 shows publication years, and the y-axis indicates the number of publications, ranging from 0 to 5. From 2014 to 2019, there were no results. In 2020, there was a slight rise, which peaked in 2021 with a record. The results dropped to zero in 2022, then increased again in 2023 and remained around one through 2024. The graph reflects low levels of scientific publication, as shown by this data from the search engine.

Figure 2

Documents found in Google Scholar results.

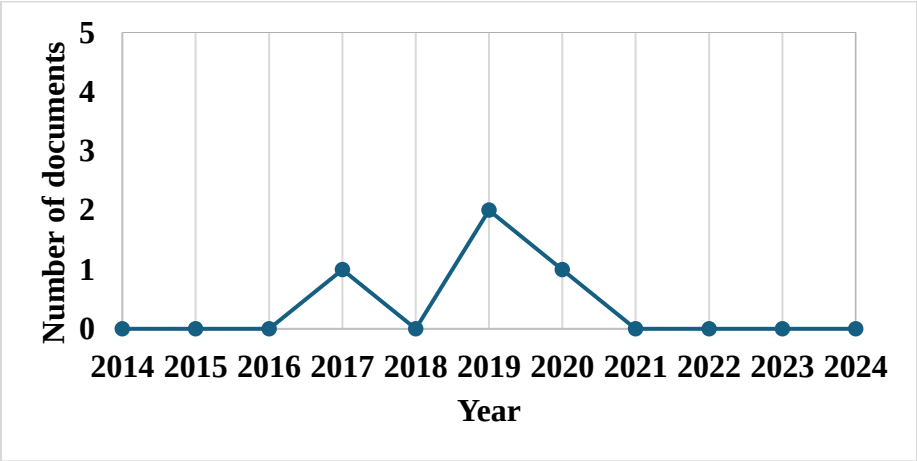


Note, Figure 2 was based on Google Scholar results from 2014 to 2024.

Based on Figure 2, the Google Scholar database initially recorded 151 entries. Although there were a considerable number of scientific works, the results had to undergo several filters, including the keywords already mentioned, the time period, open-access status, and location. As a result, only 13 documents out of 151 met all the criteria. Most of the discarded items originated from Asian and European countries, and some did not relate to English learning or teaching, nor did they involve the use of ICT tools and resources.

Figure 3

Documents found in Semantic Scholar results.



Note, Figure 3 was based on Semantic Scholar results from 2014 to 2024.

Figure 3 illustrates the results from the final database, Semantic Scholar, which showed fewer scientific output findings compared to Google Scholar, with a total of 143 results. However, these documents were reviewed and evaluated based on the criteria, and it was determined that only 4 scientific productions met the requirements to be included in this project.

Overall, the outcomes obtained from the databases reflect multiple factors that can indicate the actual state of this field in terms of research and progress. Therefore, there has been a lack of scientific output in the past decade due to the scarcity of records and studies that have driven advancements. This absence highlights the importance of this research by broadening understanding and exposing the gaps and inconsistencies in current needs.

In this way, this study has a considerable impact on the field due to its efforts to expose the current reality that has been occurring over the past decade. As stated by Kraus et al. (2022), standalone literature reviews have evolved beyond providing only a synthesis of documents, as they offer a strategic knowledge foundation that uncovers critical methodological aspects, theoretical and practical progress, and becomes a reference for the domain. Hence, this literature review serves as a valuable source of information, providing resources such as theoretical support, tools, and resources guided by ICT that can be tailored to the specific needs in the context.

In conclusion, the results of this research are particularly valuable in highlighting the current scarcity of publications in this field. The extensive literature gap highlights the need for deeper inquiry, as evidenced by a noticeable absence of research that explores and encourages the use of ICT tools and resources to enhance accessibility and the learning process for English learners with visual impairments. Understanding the importance of modern educational tools to foster inclusive learning spaces, it becomes relevant to compile and analyze the scientific literature that demonstrates teaching and learning tools and resources for visually impaired learners. By executing this, the study can serve as an illustration of knowledge and content related to this subject, paving the way for the development and implementation of more technological strategies that support visually impaired learners' English learning process.

Chapter II: Referential Framework

The second chapter entails a comprehensive overview of previous studies addressing a common factor, which is aiding learners with visual difficulties to excel at English learning with technological tools, and providing perspectives that help this study's development from international, national, and local perspectives. In addition, the theoretical framework is designed to serve as the base for concepts and theories that reinforce the foundation from different authors' standpoints and key concepts surrounding English Language Teaching (ELT), Information and Communication Technology (ICT), and Inclusive education. The legal framework is also described in this chapter, ensuring the study's validity from a legal perspective and highlighting inclusive laws, bilingual programs, and the proper use of technological assets in educational settings.

Backgrounds Studies

To support the present study, ten in-depth investigations were selected, contributing to the construction of knowledge through a holistic and nuanced lens. First, six international studies offer an extensive comparative framework, enabling the analysis of empirical trends and methodologies applied in heterogeneous contexts. Second, three national studies contextualize the findings by considering country-level policies and diverse integral settings. Ultimately, regional research offers a more localized perspective, illuminating the dynamics and challenges inherent to a specific area. Collectively, these investigations not only supply empirical evidence but also help shape a robust epistemological framework, contributing to a deep understanding of the current state of research in this field.

International Backgrounds

To understand the role of inclusive education and ICTs in teaching English to students with visual impairment, it is essential to rigorously review international research that explores various methodologies, approaches, tools, and results, with the aim of deepening our understanding of this issue. In this sense, the research developed by Cárdenas and Inga (2020) was considered relevant, as it addressed the lack of access to appropriate materials for teaching English to this population through a qualitative case study. The authors state that meaningful learning is enhanced when it is accompanied by pedagogical processes mediated by emerging

technologies. The results show that the use of ICTs significantly improves learning processes, as they facilitate inclusion by providing access to technological resources. Considering the above, the contribution of this study to the research is evident in its methodological proposal, which supports the notion that ICTs are an indispensable inclusive tool, facilitating pedagogical processes through access to adapted resources.

Similarly, Cárdenas and Inga (2021) developed another study that deepens the conclusions emerging from their previous research. This research was conducted from an interpretive approach, considering subjective data collected through surveys that sought to inquire more about methodologies and strategies in teaching English. The findings established that the use of ICT and typhlotechnology tools promotes and encourages inclusion. As for the contribution, this article helped to clarify the issue of the low productivity of tools and resources based on ICT to support the visually impaired community.

In previous research, the contribution of ICTs as tools that promote educational inclusion has been highlighted, as they facilitate access to resources adapted for people with visual impairments. However, it is pertinent to examine whether these tools not only promote accessibility, but also significantly improve the learning processes of this population, which is why Hashemi and Kew (2021) in their systematic and meta-analysis research addressed this need from a mixed approach, the authors focused on identifying the barriers from the implementation of ICTs in English language environments. Their results showed that exist 3 types of barriers, such as teacher training, institutional support and contextual difficulties. Hence, the aforementioned barriers were identified as challenges in teachers and institutional administrations to prevent using ICTs in the English language classroom.

The contribution of this study lies in recognizing the obstacles that hinder the implementation of technological strategies and tools to enhance the teaching and learning process for students with visual impairments. This approach not only validates the use of innovative technologies in education but also provides practical recommendations for their effective implementation in inclusive educational settings. In order to support the above and to investigate more about ICTs in education, the research conducted by Hoskin et al. (2022) addressed from a mixed approach the critical problem about the decrease in Braille literacy rates

among young people with visual impairment, it is known that ICTs significantly influence those learning processes, however in that research it was highlighted that there is a shortage of these tools and that is where the results showed that although the technologies have advantageous results, most of the scientific records had limitations, leading to an overall declining to moderate quality of evidence. However, features such as real-time auditory and tactile feedback were highlighted as useful.

This study makes a significant contribution to current research on ICT tools and resources for English language learning among students with visual impairments by providing a comprehensive review of assistive technologies specifically adapted for braille literacy. However, it also highlights certain limitations in their implementation, providing a more realistic overview of ICTs. In accordance with the above, the study developed by Grupo Accedo (2013) helps to expand this perspective. This research employed a mixed-methods approach to analyze tools such as the blue keyboard and braille displays, highlighting the benefits and challenges associated with their implementation in educational contexts. As a result, it was demonstrated that these tools not only significantly supported the learning process but also promoted inclusion, contributing to the notion that ICTs are essential in the teaching process, as they encourage inclusion, foster autonomous learning, and motivate students.

In the same direction, the study by Naranjo et al. (2019) provides a complementary view, as they analyzed, through qualitative research, whether 3D printed didactic resources favor the learning process of this population. Their results showed that these resources were highly accepted, as they were considered valuable for improving understanding and inclusion. This is why their contribution is evident, as it reaffirms the value of these technologies by promoting meaningful learning and, in turn, reinforces the idea that they strengthen real inclusion in academic practices. Finally, the study conducted by Msafiri et al. (2023) offers a broader standpoint, as it analyzes the integration of assistive technologies in secondary education, exploring the challenges, benefits, and strategies through a qualitative and narrative approach. In their findings, they reaffirm that ICTs promote equitable access, facilitate more personalized teaching, and enhance student motivation. This background is valuable to the research as it provides an understanding that ICTs are a pillar tool for meaningful learning; however, it is

emphasized that these tools must be adapted to the needs of students, thus creating techniques applicable to the design of those pedagogical proposals that promote inclusion.

National Backgrounds

This section presents those scientific studies developed in Colombia. The review of this background establishes a fundamental pillar for the research, as it provides a contextualized overview of the country's educational, social, and technological realities. These investigations make significant contributions to the implementation of technologies in English teaching for individuals with visual impairment. Therefore, those methodological designs and the most relevant findings of the national research are highlighted, thus allowing to underline the contributions of each one of them to this study.

One of the first studies collected and analyzed in the national context was Bonilla (2019), which aimed to develop a learning strategy to enhance English language skills through technological tools. This strategy was tested with a student with a disability from SENA, approached from a qualitative perspective, allowing for in-depth analysis of those learning processes together with the student's perceptions. The results indicated a significant improvement in the student's oral competence in English, as well as an increase in her motivation and participation in class, supported by positive feedback. These findings contribute to the idealization of ICTs, since it is evident that an inclusive academic environment, accompanied by technologies, has a positive impact on the development of communication skills in English, as well as on her motivation and inclusion in the classroom.

Similarly, the research conducted by Robles et al. (2024) aimed to critically analyze mobile applications designed for foreign language learning for people with visual impairment. This analysis employed a mixed-methods approach, enabling the evaluation of both the effectiveness of mobile applications and the perceptions of the students. The results demonstrated that assistive technologies and e-accessibility features enable the usability of applications for people with visual impairments, while communicative skills such as speaking and listening benefited mainly; however, reading and writing still present significant challenges. The study provided a critical and detailed examination of the use of ICTs in language learning

for this population, and also offers guidelines on areas that need strengthening and adequate technological resources.

Culminating in this national context, Watts and Lee (2017) in their research focused on identifying theoretical references and their characteristics in relation to educational inclusion, recognizing the role of ICT as a tool that promotes inclusive environments. This research employed a qualitative approach, aiming to develop a theoretical framework on educational inclusion and subsequently collect the perceptions of students with disabilities through interviews and case analysis. The findings were enriching, since they indicated that ICTs favor autonomy and involvement, as previously mentioned in Bonilla's research (2019). In turn, it was consolidated as a valuable tool for inclusion; however, those limitations were recognized, particularly due to the lack of accessibility to specific systems and digital resources. Considering the relevance of this research to the study, it was evident that it offers a solid conceptual framework on inclusion, highlighting that ICTs are a valuable pedagogical resource for promoting collaborative learning in the classroom.

Regional Backgrounds

In addition to the international and national contexts, it is essential to consider studies conducted at the regional level, as these help analyze how educational inclusion mediated by ICTs has evolved in settings closer to where the current research is being carried out. At the regional level, a representative study by Betancourt and Sanchez (2018) was identified, which focused on implementing an interactive system called Pistacho with the goal of promoting phonological awareness development in children with visual impairment. The study focused on improving basic linguistic skills, with a particular emphasis on phonological awareness, considering it a key capacity in the initial reading process.

Considering the above, the results showed a significant improvement in the children's ability to recognize and decompose vowel phonemes. Finally, the contribution of this valuable study is that it clearly demonstrates how ICTs can be effectively adapted to support learning processes for people with visual impairments. When interactive technology is properly designed and adapted, it becomes possible to overcome specific educational barriers.

To complete this section, the review of each of the international, national, and regional antecedents enabled the construction of a broad, current, and contextualized synopsis of the use of these information and communication technologies in teaching English to the visually impaired population. The background demonstrated that the resources and tools supported by ICTs are beneficial for students' learning, motivation, and autonomy. At the same time, it is recognized that there are deficiencies in their implementation, as in some contexts, there is a lack of aids and teacher training regarding their use. However, it is emphasized that these tools create significant experiences of inclusion in the classroom. In conclusion, the background provides a solid foundation for understanding these trends, opportunities, and challenges in the field, supporting both the theoretical and practical references essential for analyzing and discussing this study.

Theoretical-Conceptual Framework

In this stage, the theoretical framework is designed to serve as the basis for concepts and theories that reinforce the foundation from different authors' standpoints and key concepts. In the first place, English teaching as a foreign language (EFL) is examined, highlighting the didactic principles that guide the teaching-learning pathway and the materials and tools used in English language teaching (ELT). Subsequently, ICT employment in English teaching is studied, centering on the leading technological tools that assist language learning. Lastly, inclusive education is analyzed in the English teaching environment, with particular attention paid to students with visual impairments. Likewise, adequate ICT tools and resources to aid visually impaired people in learning in the ELT classroom are discussed, highlighting their importance in ensuring equitable and accessible education.

English as a Foreign Language (EFL)

The conceptualization of learning English often differentiates between environments of full immersion and those where the language is approached more formally. Krashen (1982) provided a foundational framework, proposing two independent ways to achieve second language competence. The first path is called the acquired system, because it represents an approachable context where learners live in the target language community, making English a crucial means of persevering and thriving in that territory. This natural, subconscious uptake of language is typically cataloged as English as a Second Language (ESL). Conversely, Krashen

(1982) named “learning system” to characterize environments where the target language is external to the learners’ social context, defining English as a Foreign Language (EFL)

In such settings, individuals consciously engage with the linguistic mechanics of the language, focusing on grammar rules, punctuation, and orthography. Recent studies continue to validate Krashen’s theory, often elevating it to the status of a comprehensive theory, due to its broad scope and profound impact on language teaching methodologies (Yuan, 2018; Luoz, 2024).

In this sense, Byram (1997) expressed his beliefs that English as a foreign language is a further process than only witnessing and learning linguistic features of the target language because he believed that this term is related to the understanding of the cultural aspects that conform the native speakers intending to fully develop the capacity to communicate in different context settings. Therefore, Byram (1997) relates its reasoning to the learning system, in which sociocultural aspects, through which the message is transmitted, have greater relevance than grammatical aspects, supporting what Krashen (1982) established regarding contexts that do not contain the target language.

Despite the sociocultural aspects that enrich English as a foreign language, Pennycook (2017) criticizes English language teaching in the context of a foreign language, emphasizing its political and cultural implications. Hence, she contemplated this process as linguistic imperialism, which leads the target language to take over the learner's communication system. This posture contrasts with Byram’s (1997) conception because Pennycook (2017) believes that this learning process underappreciates the students’ background, due to the emphasis on understanding the customs and heritage of the foreign language. However, this analogy can be contradictory because, in order to excel at a foreign language, it is necessary to be fully immersed in that culture, which helps enrich learners’ sociocultural awareness while enhancing their English learning.

Overall, Brown (2021) presents a comprehensive view that synthesizes prior understandings of English as a foreign language (EFL), involving the identification of challenges that learners encounter during their learning process, particularly in contexts where the target language is not the dominant one. Therefore, EFL requires a different mentality regarding

strategies and methods, as students must learn rather than acquire, making sociocultural aspects predominant in English learning.

English Language Teaching (ELT). English has been established throughout the centuries as one of the most widely spoken languages in the world, making it an essential fact for modern society, as it is relevant to be competent in Anglophone communication. Krashen (1982) adds comprehensible input as a key factor, which aids the apprentice in acquiring and assimilating a language by providing concepts or linguistic themes that the learner can understand unconsciously. Thus, this concept involves immersing in many situations where the language is highlighted.

Nevertheless, a different view is presented; Ellis (1994) relates English language teaching to explicit instruction, unlike comprehensible input, her standpoint concerns the linguistic side of language structure and form, providing clarity and precision. Additionally, Ellis (1994) notes that Language learning is not a purely conscious stage, but rather a phase of interaction. Hence, while Krashen (1982) exposes an unconscious immersive system, Ellis (1992) considers that a mindful process can become more substantial in terms of improving language skills. So, ELT can be visualized from different cognitive perspectives that describe how consciously an individual can learn English.

On the other hand, Kachru (1991) notes that ELT can be categorized into three circles: the innermost one is in the leading countries, such as the United States, England, Australia, and others, where English is a native language. Additionally, Kachru (1991) states that the outer circle is established for nations where the anglophone language is promoted as a second language, such as in Asian and African countries. The expanding circle represents territories where English is used as a foreign language. This author adopts an ELT perspective from a sociolinguistic point of view, emphasizing that there is no single way to learn the anglophone language, as it has become global, meaning English should be viewed from the perspective of different countries.

In recent years, authors have developed new theories and conceptions that have evolved from past disputes. Harmer (2015) supports English language teaching as a learner-centered process, so the student becomes the primary focus of education, balancing their learning process

with sufficient exposure to the language and interaction. Therefore, Harmer (2015) has further developed the concept, building upon past theories that are important in creating a more concise theory. This development builds upon the work of Krashen (1982) and Ellis (1994), which emphasizes the importance of exposure to and interaction with the target language. For this reason, ELT has become a domain that must support students' learning experience with the right accommodations, depending on the context and the usage of English.

Didactics of English as a Foreign Language. Firstly, it is necessary to understand the term from the origins of the didactics of English as a foreign language, from the conception of some authors throughout the years. As Fries (1945, as cited in Ramos, 2014) established, English teaching was initially formed around language habits, with memorization and linguistic practice serving as the foundation for exercises and the learning process. Besides, Fries' (1945, as cited in Ramos, 2014) didactic conception fostered speaking environments where dialogues were key to assume and internalize structures to communicate successfully. Thus, this theory depicted the reality of language teaching, which centered on repetition in order to assimilate the language, and it showed that learners were guided through memorization to convey meaning rather than real communicative environments.

Also, 12 years later, Skinner (1957) conceived didactics as a behaviorist path, where the main idea of this learning method was to teach across stimulus-response patterns. The repetition was vital because it helped the learners to memorize certain communicative sequences. These two authors outlined didactics during that time as a systematic path composed of drills and habits, as Fries (1945, as cited in Ramos, 2014) and Skinner (1957) addressed learners' communicative skills through sequences and patterns with repetition to strengthen English understanding.

Afterward, the concept kept on growing and developing its structure and broader significance. The task-based approach was a new way to comprehend the didactics of English language teaching. Prabhu (1987) advocated this approach, which focuses on tasks where the target language is used for communicative purposes, thereby enhancing motivation for learners as they execute the tasks. The main idea of this practice was to generate some characteristics regarding language usage in relation to cognitive skills, such as problem-solving, to enhance the communicative competencies across the activities. Consequently, Prabhu (1987) agrees with a

different approach to teaching English, as it promotes better language usage through activities that involve interaction, setting aside the foundations established by Fries (1945, as cited in Ramos, 2014) and Skinner (1957).

As time passes, didactic practices tend to adapt their views in the modern age, as recent years are increasingly characterized by technology. Dudeney and Hockly's (2007) didactic conception was considered in the context of Computer Assisted Language Learning (CALL). They highlighted the importance of technology in English language teaching, citing the powerful stimulus that learners can receive, with a focus on interaction and conversational context. Therefore, it can be noted that CALL has evolved from Prabhu's (1987) didactic conception, aligning with and nourishing it through technological strategies that provide apprentices with activities that foster motivation.

Information and Communication Technologies (ICT)

ICTs have been a revolutionary concept that has transcended over the years due to the impact from the view of different fields and disciplines, such as education, economy, and culture. Consequently, the definition of this terminology has been subject to constant modification and change due to the diversity of perceptions.

One of the main authors, of the ICT conception, was Papert (1980) in his book "Mindstorms: Children, Computers, and Powerful Ideas*",* where it was highlighted that computers were not only a simple or plain tool but also a resource that allowed students to effectively and actively learn from experiencing and creativity. Therefore, it can be said that this case marked a critical moment, as computers transitioned from being objects to becoming teaching and learning tools. Despite that premise, Postman (1993) argues that technology entering the classroom can alter real learning since it does not promote critical debate but serves as a source of entertainment. Yet, technology in education was seen as a strategy that could only distract from students' cognitive progress, but it showed sparks of meaningful aspects when used correctly.

Moving on some years, the concept began to be broader due to advances in the field. Levy (1997) argued that ICT was the means of connection and interaction between individuals. Besides, Levy (1997) introduced 2 terms: cyberspace, which represents a space that facilitates

knowledge development and collaborative learning. The second term is collective intelligence, which refers to the capacity to share and utilize information across digital networks, emphasizing that ICTs are transforming the way we understand, comprehend, and share knowledge in the digital era. This improved conception goes beyond viewing ICT as mere entertainment; it emphasizes its true purpose by facilitating content through cyberspace and supporting collaborative learning.

Afterward, ICT was related to education and took an important role in that field. This was reflected in the work *"Computers as Mindtools for Engaging Learners in Critical Thinking"* developed by Jonassen et al. (2000) They proposed that ICTs were not only to be seen as means to access information but as cognitive tools that encouraged critical thinking and problem-solving, thanks to the significant learning and deeper cognitive competence development if this concept is correctly adapted. Thus, this contribution contrasts with Levy's (1997) conception and also expands it, as Jonassen et al. (2000) frame ICT as something more than just facilitating information, which promotes higher levels of cognitive skills through the use of emerging tools, such as computers.

In accordance with the above, Jacobs (2010) conceives ICT as the key factor in fostering learning adaptability, whilst this is incorporated within the classes and school context. Also, she stated that this term embarks on the possibility of promoting more significant experiences and educational equality. Thus, in recent times, ICT has evolved into a mechanism to encourage motivation through interactive tasks that utilize emerging technologies and digital information for enhancing the learning process.

In contrast with the importance of ICT in education, Selwyn (2016) agrees with the benefits that technology has provided to education in terms of information access and diversity of content. However, he states that as positive aspects come across helping teachers and learners, the negative points appear as well because inequalities tend to magnify due to the low accessibility that implies this novel resource, so this solution can attract more issues regarding its usage in an educational context.

Information and Communication Technology in English Language Teaching. As this modern concept has influenced various fields, ICT has also become a vital part of pedagogy in today's education, shaping how teaching and learning are conducted in classrooms by introducing engaging perspectives through technological tools and resources. However, it is essential to understand how this concept has evolved in academic environments.

The implementation of technologies in English language teaching occurred between 1960 and 1980, as evident in the research *"*Using Computer Assisted Instruction in an ESL Language Program". The authors Leidy et al. (1980) conceived it as a way to translate language complexity into a system where students can assimilate complex structures, thanks to software that breaks down grammar and linguistic features into more manageable terms.

The prior conception is also supported by Warschauer (1996) who emphasizes the use of ICTs in English language teaching, with a particular focus on computer-assisted learning (CALL) programs. These programs involve the use of grammar exercises to achieve positive language results from individual tasks. Additionally, Warschauer (1996) emphasizes that the effectiveness of ICTs in ELT is contingent upon their implementation being tailored to the educational context, which is why teachers must carefully plan and receive adequate training. This suggests that the effectiveness of ICT relies on the contextual settings that students and teachers possess, and it prioritizes individual development.

English language teaching through ICT tools and resources became a virtual world because of the meaningful activities. Dudeney et al. (2013) defined this technological term as digital literacy, which encompasses the characteristics of using ICT as a means of teaching and learning, emphasizing that learners interact critically through blogs and learning platforms for English language learning. Thus, while Warschauer (1996) considers the role of ICT from the introduction of computers with individualized exercises, which shows some limitations regarding its usage, Dudeney et al. (2013) expands the purpose to include an interactive and collaborative role of technologies, as he promotes digital literacy that serve as a critical use of technology in English language teaching.

Overall, this concept has been positively growing alongside technological advancements, and researchers and educators have been reflecting on this term as a great component in English language teaching. Alkamel and Chouthaiwale (2018) noted that ICT in education can aid in the

development of English proficiency across modern tools, categorizing this as a substantial aid in language teaching for educators, based on interactive and engaging tasks.

Main Information and Communication Technology Tools in English Language Teaching. In this section, it was essential to describe the specific ICT tools and resources that have made a positive contribution to the English language teaching field. The reason for their use is simple: ICT materials foster students' motivation, participation, and confidence. In relation to the anglophone language, certain factors enhance their competence through activities and content designed with modern resources to improve teaching-learning strategies (Robinson and Zaitun, 2006).

In the past, the first technological tools utilized in English teaching were guided by computers, some of which arose from computer-assisted instruction. According to Leidy et al. (1980), they implemented a software program called *PLATO* that reinforced grammar, spelling, and vocabulary drills, which was mediated by a computer that allowed learners to complete exercises through repetition. The first inventions in this field were primarily focused on computers as the central system to utilize technological resources.

The specific focus on computers led to a wider development of ICT tools and resources. According to Raval (2014), Web 2.0 has become essential in the field of language teaching due to the influence of incorporating digital resources into the classroom, including various communication devices such as computers and mobile phones. The most significant and engaging tools were based on blogs and social networking, as they focused on cooperative interaction between peers with the goal of sharing ideas and insights on any topic of interest, unlike the PLATO software program, which served as a linguistic development tool for improvement through grammar tasks, with a lack of communicative interaction.

Lastly, Madej (2017) highlights Raval's (2014) evolution of ICT tools, exposing modern resources such as podcasts, screencasts, virtual learning environments (VLEs), e-learning, and interactive online dictionaries, among others. He emphasizes that these tools are considered an effective and non-traditional form of teaching, as they encourage learners to participate actively in the learning process. In addition, these tools allow the incorporation of the senses along with entertainment, which enhances content learning and strengthens English skills. Moreover, he

mentions that by integrating these tools into the lesson plans, autonomous and motivational learning is promoted since they can be adapted to the pace of each student.

Inclusive Education

At the beginning of the 20th century, the concept of inclusion in education was different compared to the reasoning nowadays, but it is important to highlight the evolution. Specifically, in 1912, the psychologist Goddard (1912) considered students with disabilities or impairments as feeble-minded across his studies; he considered that it was necessary to prevent individuals with health issues from interacting in normal contexts. Therefore, he regarded inclusive education as a segregation space in which special institutions take on handicapped learners; this was mainly focused on stopping them from reproducing and damaging society.

On the contrary, UNESCO (1994) proclaimed that inclusive education must be a system where segregation is not an option. Otherwise, a space where all students can fit regardless of physical, cognitive, or linguistic differences. Hence, this statement contrasts with the prior conception because it shifted isolation and integration to inclusion, so the diversities do not become an argument to separate individuals, and this depicts a radical face of inclusion in 1912 compared to the conception in 1994, which goes thoroughly against the segregation posture.

In the same vein, thanks to the statement provided by UNESCO (1994), the inclusion in education started to improve and enhance the basis of institutions. This is contemplated by educators' and researchers' perceptions over the last years. Indeed, as Booth and Ainscow (2002) stated, inclusive education is seen as the process of approaching inequities with the objective of making sure that no children with socio-economic, cultural, racial, physical, or linguistic barriers can be the reason to be marginalized or excluded. Therefore, inclusive education must be a system that faces discrimination and segregation in school contexts, ensuring good patterns and practices to value equity.

Inclusive Education in the ELT Classroom. As mentioned in the previous section, inclusive education constitutes an approach that pursues the active participation of all learners in the teaching process, regardless of their special needs, intending to avoid exclusion and promote educational equality, as highlighted by Booth and Ainscow (2002). In the context of English language teaching, the authors argue that inclusion in the ELT classroom is based on curricular adaptations, differentiated strategies, and the promotion of active student participation. This approach ensures that every student has the right to learn English, thereby enabling the development of their language skills.

In contrast to the above, Hornby (2011) argues that the inclusive approach does not always prove to be the most appropriate for students with more complex needs. He asserts that, in the absence of adequate resources and training for teachers, they may be immersed in an overwhelming environment, which hinders their ability to effectively meet the demands of all students, resulting in lower quality teaching. Therefore, Hornby (2011) highlights the challenges that teachers face when the settings are not suitable for students with special needs. However, Booth and Ainscow (2002) clearly stated that for a proper inclusion in the ELT classroom, curriculum adaptation must be provided.

In this sense, the expected inclusive environments for students with special education needs are established once an overview is provided, allowing for accommodations and adaptations to facilitate their English learning process. Razmjoo and Sabourianzadeh (2018) argue that with the proper implementation of an inclusive strategy, students with disabilities can achieve better outcomes in English by boosting their self-esteem and positive attitudes through collaborative learning. Thus, this evolution presents promising methods and actions to address the challenges that students with special needs may face in the English learning environment; however, the authors emphasize that curriculum adaptations can be essential for creating a proper, inclusive ecosystem.

Visual Impairment. The general view during the 20th century about visual impairment was that it was a curse for society. According to Goddard (1912), the lack of vision or blindness was considered a disability related to gene deformation. Also, this circumstance could cause a big problem for society if the impaired individuals mixed with the normal population, because the newborns might be disabled as a result of the environment.

In this case, in 1980, a document was published that went against Goddard's impairment and disabilities vision because the radicalism noted in his work did not take the affected human beings as people who have all their rights to live with no discrimination. The opposition expressed the classification of diseases for people with impairments, disabilities, and handicaps. The objective of this document was to break down social barriers and misconceptions. For that reason. The World Health Organization (1980) defined visual Impairment as the state of any loss or abnormality in the sight capacity, so the visual function is diminished due to the anomaly.

In recent years, Castejon (2007, as cited in Arias, 2010) defines visual impairment as an effectuation either to a greater or lesser degree, also understood as the lack of vision. He emphasizes that it is not a disease, but rather the consequence of a combination of several conditions, which he defines as those that represent an individual's either total or partial limitations, as in the case of low vision. This statement also clarifies a distinction from what Goddard (1912) commented on and advocates for what the World Health Organization (1980) stated, as it is crucial to highlight the true meaning for someone identified as visually impaired.

Furthermore, as a result of previous statements and discussion regarding how a visually impaired person can be conceived. ONCE (2020) cataloged visual impairment as the total damage or the partial sight decrease that affects individuals who suffer from this condition. Besides, this is evaluated with some parameters, such as far and near reading capacity and visual field. Consequently, visually impaired people might encounter some issues regarding a lack of independence in some sites, like education and job contexts. This also expands the impact that causes sight decrease, as regular education can be encountered with multiple limitations; however, the definition and conceptions have helped provide more emphasis and support to those students with special needs.

In general terms, the evolution of this concept has been positively developed because of the recognition of circumstances that affect visually impaired people. Unlike the perception from the 19th century, nowadays, there is a broader view that has objectively comprehended the effects and limitations of this impairment, but instead of segregation, there are new strategies that help them raise their skills.

ICT Tools in ELT for Visually Impaired People. As has been exposed above, English language teaching is a complex process that can be molded depending on the learners' needs and issues. However, there can be some difficulties when there are students who have impaired senses, in this case, visual impairment, but this problem might be solved once it is linked with proper strategies. This solution can be related to ICT tools or resources that participate in the classroom as a facilitator and engaging way of learning.

In 2000, the tools that emphasized helping students with visual impairment were established by screen readers. As mentioned by Fichten et al. (2001), screen readers are software that provide helpful features for comprehensible material for those who cannot visualize it correctly, and this can be adapted for English language learning materials. Besides, these characteristics were options that delimited the portion of the screen to be read, making it a simpler process to aid the affected learners. On the other hand, the rise of these technological aids had a big impact on formation practices for people with visual impairment, as commented by Simon et al. (2010) this population can excel in any educational practice with the assistance of proper accommodation that facilitates their development such as ICT tools and resources or teaching methods.

Despite the benefits that several authors highlight about the implementation of ICT, there are still factors that show that this process has not been completed effectively. As Polok and Maślanka (2022) point out in their research on the effectiveness of these tools, several difficulties were identified both in teachers and in the use of ICT. One of the problems mentioned is that some teachers still perceive ICT as something that cannot be adapted to the needs of the learner. In addition, the lack of preparation of teachers is highlighted, as some do not know how to implement them or even how to use them properly. Nevertheless, in relation to ICTs, technical problems are also mentioned, such as poor Internet connection and websites that offer strategies that are not suitable for students with visual impairment.

From the problem described above, Revelo (2021) argues that screen readers can promote autonomy and variety in English language content for people with visual impairments by allowing them to regularly use resources on their devices, such as blogs, social networks, and informational web pages. Although Polok and Maślanka (2022) note that adapting language content remains challenging for visually impaired students, Revelo (2021) emphasizes the

importance of screen readers in enriching English resources through ICT to improve autonomy and language development. Hence, screen readers become an essential tool for educators to support the use of more content on platforms and web pages.

As a final point, the theoretical framework presented in this research provides a comprehensive view of English language teaching, the role of Information and Communication Technology (ICT), and inclusive schooling, particularly for the visually impaired population. Over time, English language teaching has experienced significant transformations, moving from traditional methods to more student-centered approaches. At the same time, the integration of ICT has provided new possibilities to improve educational processes, fostering motivation, autonomous learning, and the development of different competences.

In the field of inclusive education, there has been valuable progress in understanding visual impairment. Although it is a visual limitation, current perspectives aim to support that population with proper accommodations and assistance. Overall, these insights provide a solid foundation for the present project, emphasizing the importance of including pedagogical innovation, technology, and inclusive engagement to create accessible, high-quality learning environments.

Legal Framework

This literature review is backed by legal regulations that support the teaching of English as a foreign language to the visually impaired population through the use of ICT tools and resources.

First, the Constitución Política de Colombia (1991), in Article 13, states the principle of equity and non-discrimination, ensuring that all individuals, regardless of their physical condition, have access to the same opportunities. Therefore, this article represents the main basis of this project by highlighting an even-handed environment for everyone accessing the education system.

Regarding assistance to people with disabilities, Law 1346 of 2009, by which Colombia approves the Convention on the Rights of People with Disabilities (UN, 2006), underscores the obligation of the State to ensure an inclusive, accessible, and quality education. Likewise, Law

1618 of 2013 regulates the provisions to ensure the full implementation of the rights of this population, with emphasis on the use of technologies as a means of support.

Furthermore, Law 115 of 1994, also known as the General Education Law, acknowledges the students' diversity and promotes inclusive pedagogical practices. In accordance with this law, Decree 1421 of 2017 provides guidelines for educational support for students with disabilities, pointing out the importance of curricular adjustments and the use of technological tools.

In the area of technology, Law 1341 of 2009 sets out the guiding principles for the development of the information society, enabling access to ICTs as a pedagogical tool in inclusive environments. Therefore, this law aims to strengthen teaching and learning processes by the integration of modern aids and materials.

Finally, regarding the English language teaching, the National Bilingualism Program, implemented by the Ministry of National Education since 2004, and the Basic Standards of Competences in Foreign Languages (MEN, 2006), promote the English language learning as a fundamental competence in the students' education, which entails the need to adapt the teaching-learning procedures to the conditions and traits of all learners, including those with visual impairment.

Chapter III: Methodological design

The third chapter outlines the methodological design of this study, related to analyzing the scientific publications on the use of information and communication technology tools and resources to teach English as a Foreign Language to people with visual impairments from 2014 to 2024 in America. The present study is composed of a qualitative approach, alongside a bibliographic design for compiling and analyzing the documentation, and an interpretative scope. The instruments are based on a synthesis matrix and contrast matrix for accommodating the key research components and providing an in-depth analysis. This section describes the data collection and analysis process, alongside the inclusion and exclusion criteria that set requirements for the population setting.

Approach

First of all, it was necessary to define the approach to establish the correlation between a methodological approach and the construction of the research. Thus, the qualitative approach, as defined by Creswell (2009), is a process of understanding a social problem based on the collection, analysis, and interpretation of non-numerical data in order to understand the research phenomenon.

According to Creswell in the previous paragraph, qualitative research is a process that strives to understand a phenomenon that transcends any social or academic field. That said, it is fundamental to make visible the phenomenon that constitutes the axis of this project: the lack of scientific publications that have been established in the last 10 years regarding the development of ICT resources and tools focused on the teaching of English to people with visual impairment.

For this reason, it became pertinent to establish the qualitative approach in the research, since it was intended to conduct an in-depth study taking into consideration non-numerical information, perspectives and subjective interpretations concerning the main characteristics that make up the 20 documents, which are the methodology, research objectives, instruments, population and results.

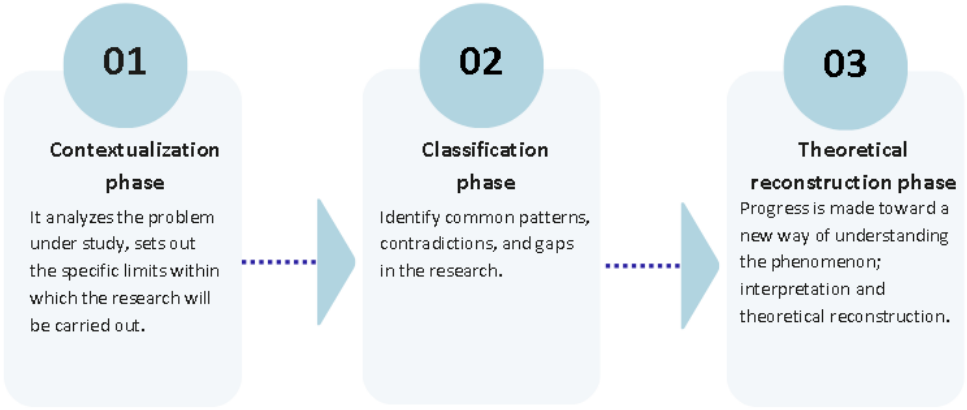
Design

In this regard, this research was performed as a bibliographic review since it allows to reach a better understanding of a topic little explored by the scientific community, so it can be a

positive research posture because it manages to awaken general interest in the field of study across the exploration of the unseen and unknown data. Consequently, according to Hoyos (2000), bibliographic research is an extensive form of inquiry, allowing an exhaustive analysis in which the essential characteristics are evaluated to expose and compile the theoretical support for the object of study.

Thus, once the general concept of bibliographic design was established, it was also essential to make known the structuring and basis for the conception of this literature review. Due to its complexity, a series of phases was established to develop an adequate study process.

Figure 4
Calvo's bibliographic phases



Note, the figure illustrates the three different phases involved in elaborating a bibliographic review. Source: Adapted according to Calvo's (1992, as cited in Guevara,2016) phases.

According to Calvo (1992, as cited in Guevara, 2016), the initial phase involves contextualization, which aims to analyze the problem by understanding the broader context to be developed, highlighting the most relevant aspects. Furthermore, Calvo (1992, as cited in Guevara, 2016) established search criteria to gather adequate documents by using parameters that entail specific limits to get appropriate results.

Based on the above, the initial phase of this research was demonstrated through the contextualization of the panorama, concerning individuals with visual impairments who are

exposed to ICT tools and resources as a strategy, because they tend to have a complex English learning process. Provided that, this permitted the obtention phase of the most pertinent publications, which were carried out thanks to the keywords and inclusion and exclusion criteria.

Once the records were obtained, they were organized within the synthesis matrix, enabling the characterization of the main attributes of the scientific publications uncovered, such as methodology, objectives, population, instruments, and results. This process facilitated the filtering of data into meaningful traits, highlighting essential information and providing structure to the comprehension of the research subject.

As a consequence of the above, when the general panorama of the problem was established together with the search criteria, the second phase began. As stated by Calvo (1992, as cited in Guevara, 2016), this stage was based on the classification of different scientific findings, emphasizing it as one of the most important. It is here that the theoretical basis and the meaning of the research were established through the collection of data for analysis and study of the problem.

Given the prior explanation, to complete the second phase, the information from the 20 studies was emphasized in the contrast matrix, which helped to visualize patterns and characteristics in a more specific way. The focus centered on examining each of the main characteristics (methodology, objectives, population, instruments, and results) separately, allowing a classification of the scientific production. Likewise, the prior process enabled the open and axial coding from the outcomes found in the contrast matrix based on those main characteristics. Henceforth, through the analysis, some emerging categories were conceived, discovering concepts and subcategories. This action facilitated a deeper comprehension and structured understanding of the data by labeling the content in a more convenient way to move beyond the basic information. As a result, this section opened the doors for a more in-depth interpretation of the phenomenon, laying the groundwork for the subsequent stage.

Moving forward, the last phase consisted of the interpretation and theoretical reconstruction addressing different conceptions and attributions of the scientific publications already collected, aiming at new hypotheses, theoretical, and practical approaches in order to set

out a new perception in the way in which the study phenomenon was conceived (Calvo, 1992, as cited in Guevara, 2016).

Correspondingly, the last phase of this project design was conducted by conceiving the emergent categories as an exploration step to facilitate the analysis process. To this extent, the final matrix enabled the contrast of the emergent categories, highlighting new conceptions, similarities, and distinctions. Additionally, this contrast facilitated a triangulation process, which encompassed the findings from the synthesis matrix alongside the theoretical framework and background. By ensuring cross-validation data from multiple sources, the reliability of the findings, the identification of biases, and the overall coherence of the study are improved.

Scope

Finally, once it was cleared out, the approach employed in this research was opportune to expose the scope of the research, which was interpretative, as it promoted critical analysis to convey inferences that raised new perspectives. As commented by Hoyos (2000), the interpretative scope implies the analysis of the phenomenon through hypotheses that contribute to a renewed vision for the understanding of the problem.

On this basis, this project, founded on a bibliographic review, aimed to synthesize and critically explore existing publications to recognize patterns, gaps, and emerging perspectives. By doing so, the contribution happened to be the academic discussion and provided a solid foundation on the topic. The interpretative scope marked the roadway to scrutinize the sampling of studies into understandable data for analysis. In that way, the methodological extent allowed exposure of procedures and executions of those documents for future researchers and teachers to overcome issues and augment the phenomenon construct.

Population

One of the most vital factors in this research was the population, as conceptualized by Pineda et al. (1994) as a set of individuals, medical records, laboratory samples, and scientific publications that meet specific characteristics for study.

Also, it was important to comprehend that this research was composed of a bibliographic design, so the need to collect proper documentation to fulfill a complex analysis was required.

Thus, the population that was taken care of during the document development was based thoroughly on scientific production about the field of study. In this sense, the groundwork arose from the process of document acquisition, where theories, experiences, and paradigms became a source of information to support any kind of research.

Consequently, scientific production should be pertinent to the research intention; otherwise, it is likely to hamper the process since it might arise from a lack of fundamental knowledge. As Gonzalez (2008) commented, population idealization must be clarified and settled in order to gather scientific documents according to the common characteristics previously established in the research.

So, in pursuit of an adequate population, the scientific documentation must meet specific criteria and requirements for consideration and analysis. These exigencies are related to the field of study, the range of time, and the type of knowledge-based papers due to research purposes. The documents should encompass a context in which the population was identified as visually impaired students or people who faced English learning, employing ICT tools to aid them in becoming competent in the anglophone language. In addition, the interval of time lays the foundation for classifying the proper sample; in this case, it was established a decade of study from 2014 to 2024, as a way to cover as many pertinent documents as possible. Henceforth, it was intended to localize scientific records from the thesis and articles as a means of expanding the search engine outcome, since few studies appeared and fit the criteria.

In the same way, databases are a source of information to oversee the advancements and developments of the field. Hence, it was fundamental to select the databases from which the population of papers was obtained. The selected sources included Scopus, Google Scholar, and Semantic Scholar. Additionally, the keywords implemented for the search were "ICT tools and resources", "visual impairment", "blindness", and "English language learning".

Table 1

Search results and selection in search engines

Search engine	Number of documents reviewed	Number of documents dismissed	Number of documents used
Scopus	24	21	3
Semantic Scholar	143	139	4
Google Scholar	151	138	13
Total documents	318	298	20

Note, the table was adapted according to the document results in the search engines.

Corresponding to the first path established above, it was adequate to expedite the proper description concerning the documentation that was used across the study. As was illustrated above, the table shows findings from the search engine Scopus, in which 3 scientific papers were discovered and accepted under the inclusion criteria. Furthermore, it dismissed a total of 21 documents from 24 results, following the exclusion parameters, since multiple outcomes were part of the Asian and European continents.

In light of the second item in Table 1, it illuminated the findings from Semantic Scholar, in which it was observed that a substantial number of documents were reviewed if they met the criteria for this study, so there were 139 articles and theses discarded. Also, only 4 documents were accepted to be part of the sample for the analysis throughout this chapter, and this sample meant a more positive outcome compared to Scopus.

For the last source of documents, Table 1 presents the document rate from the search engine Google Scholar, shedding light on the 13 selected scientific files. Also, the use of this search engine implied a lower rate of documentation compared to Semantic Scholar and Scopus. Besides, these results demonstrated that the aforementioned search engine stored the most significant scientific publications that accomplished the inclusion criteria and requirements set in this study.

For that reason, this research relied on a total of 20 documents composed of scientific articles and theses, functioning as the whole sample in which the data collection and analysis process were conducted during the project development. These records contained a context related to resources or tools that were guided by educational technology for English language schooling, alongside a concrete population of visually impaired people following a learning process to gain an understanding of the language supported by those essential aids.

Inclusion and exclusion criteria

The initial step to organizing and constituting the pattern of the research is related to setting up a series of criteria, as Nuñez and García (2016) argued this process is essential due to the quality that comes from the research items that support and ensure relevance to the scientific production used throughout the analysis and interpretation. The inclusion and exclusion criteria aim to gather the most suitable documents that meet the research criteria and exclude those that do not.

Therefore, as shown in Table 2, the inclusion criteria were used to determine what fits the research's purpose. Table 3 depicts the items that are not suitable for the research as the exclusion criteria.

Table 2

Inclusion criteria

Main object	Type of Study	Population	Location	Time Range	Language
Research that emphasizes English teaching as a foreign language, guided by ICT, for visually impaired students	Scientific articles and theses	Scientific production containing a context of visually impaired learners employing ICT tools and resources to facilitate English language learning	American continent	Scientific documents published from 2014 to 2024.	Documents written in English and Spanish

Note, the table sets the documents' compilation criteria for the sampling collection. Source: Own elaboration.

Table 3

Exclusion criteria

Main object	Type of Study	Population	Location	Time Range	Language
Research that does not emphasize English teaching as a foreign language, guided by ICT, for visually impaired students	Documents that are not considered scientific articles or theses.	Scientific production that does not contain a context of visually impaired learners employing ICT tools and resources to facilitate English language learning	Documents that are not located on the American continent	Scientific documents that were not published from 2014 to 2024.	Documents in other languages, different from English and Spanish

Note, the table shows the exclusion criteria that dismiss documents that don't meet the inclusion criteria. Source: Own elaboration.

The inclusion and exclusion criteria, as mentioned earlier, are illustrated by some scientific documents that fulfill the research pursuit. Also, the compilations supplied scientific publications that encompass environments where English teachers face the task of teaching the Anglophone language to visually impaired students, so it panned out to develop strategies, guided by ICT, to successfully overcome the learning difficulties. For that reason, this criterion was essential because it not only limited inappropriate documents but also supported the search for valuable teaching tools and resources.

Instruments

Data collection

One of the fundamental features of this kind of research, literature review, is the instruments which are based on easily aid the researcher to compile the scientific production in a scheme. Otherwise, collecting documents becomes difficult and time-consuming because of the

lack of items that establish possible correlations between investigations. Hence, to achieve the first specific objective, a synthesis matrix was used as the data collection instrument since the matrix assisted the process of characterization of the main characteristics from the sampling.

As mentioned, the synthesis matrix was crucial for this kind of research. As Carmona (2018) mentioned, this graphic or table is perfectly designed for analysis and information storage to compare similarities and variations. Thus, the objective of this instrument was good according to the literature review objective, which was to gather data on a more comprehensive basis.

For that reason, it was necessary to seek a synthesis matrix that fits the most with the research objective, so it was recognized multiple options that could excel in the research standards regarding the data collection instrument, and there was one matrix that stood out, which was discovered from Writing & Speaking tutorial services web page.

Table 4

Synthesis matrix guide for data analysis

	Source #1	Source #2	Source #3	Source #4
Main Idea A				
Main Idea B				

Note, the table shows the original matrix that was considered for this research before any adaptations. Source: North Carolina State University Writing and Speaking Tutorial Service (2006).

For the use of the synthesis matrix, the design previously established in the instructional web page was taken into account. This matrix has proven to be effective in data collection and analysis, fulfilling its purpose adequately. However, it was decided to make certain modifications since some of the items were not completely aligned with the specific objectives of this research. The aim was to conduct a literature review that considered key variables for a deeper analysis, which allowed a more solid understanding and illustration of the 20 documents.

Table 5

Synthesis matrix for data analysis

Research title, author and year	Type of document	Methodology	Objectives	Population	Instruments	Results

Note, the matrix was adapted based on the matrix shown in Table 4 previously mentioned.

Source: Own elaboration.

Therefore, the synthesis matrix was modified to facilitate the collection and organization of data, highlighting the most relevant information for the research and giving way to an effective analysis of the scientific production. In this manner, the matrix observed in Table 5 differs from the structure presented in Table 4, with some modifications to the items on the upper side. Vital information was added, such as research title, author, year, and the type of document, helping to specify elemental data from the sample. Also, the main characteristics for reviewing the 20 documents included the methodology, objectives, population, instruments, and results.

According to the above, Table 5 displays the instrument utilized to carry out the first specific objective of this project. This step involved the methodical organization and storage of papers to simplify a structured study. By accomplishing so, the table enabled a thorough comparison between scientific articles and theses, stressing both their similarities and dissimilarities. This approach not only ensured a clear classification of sources but also contributed to a deeper understanding of the research landscape, reinforcing the validity and relevance of the study (Ryan, 2000).

In addition, intending to accomplish research fomentation, it is crucial to develop a concise way to promote a better understanding and analysis of the information acquired from the scientific documentation. Therefore, the approach to take on the data must be performed employing a matrix, characterized by classifying and contrasting the information, which is why the contrast matrix was implemented due to its pertinence. As Miles and Huberman (1994)

stated, the matrix provides the researcher with several beneficial factors during data analysis, deepening the study and facilitating the comparison of similarities and differences, thereby leading to a contrast process alongside interpretation to examine the variables and patterns.

Table 6

Contrast matrix guide for contrast data.

Contrast matrix		
Document	Concepts	Contrast
1		
2		
3		
4		

Note, the table shows the contrast matrix considered as a guide for this research's contrast matrix. Source: This matrix was obtained from the study of Cano & Vergaño (2024).

Based on the instrument above, the classification process of the project was assisted by the contrast matrix because it sorts out the main characteristics of the documents in order to visualize them concisely. Once the first step is done, the patterns and differences found in the scientific papers were highlighted and shown by themselves due to the chart structure, allowing the analysis and contrast of the outcomes acquired from the process. Nevertheless, the structure of this instrument is closely linked to the research purpose, but it is not accurate enough; thus, one modification must be made, replacing the item “concepts” with the research components such as methodology, objectives, population, instruments, and results.

Table 7

Contrast matrix

Contrast matrix		
Documents	Key categories	Constrast

Note, the table reveals the contrast matrix designed for this research development. Source: Own elaboration.

Hence, the implementation of this matrix communicates the classification of the qualitative data by conceiving emerging categories from the research components (methodology, objectives, population, instruments, and results), and the contrast was accomplished by leaning on the similarities and distinctions from the emergent categories. Because of that proceeding, the final two (2) objectives were developed through the usage of the contrast matrix.

Data Analysis

In this section, after the document selection process is established, the synthesis matrix is populated according to the research components previously defined to categorize the data across scientific publications. In that regard, the characterization process was executed by reading vertically the elements collected in the synthesis matrix, revealing valuable information regarding the methodologies used, the objectives sought, the populations analyzed, the instruments used, and the results reported. Afterward, the contrast matrix was utilized to identify emerging categories regarding the research components (methodology, objectives, population, instruments, and results) and contrast them.

Concretely, the data analysis was taken as a procedure within the information collected from the matrices, so a codification process was needed to understand what was discovered. For that reason, this codification procedure encompasses the grounded theory developed by Strauss and Corbin in 2015 within their work, “Basic of Qualitative Research: Techniques and Procedures for Developing Grounded Theory”.

In this setting, Corbin and Strauss (2015) explained that the first phase, which involves grounded theory, is referred to as open coding. This step involves breaking down information from the object of study into fragments that highlight and label codes, letting the researcher understand line-by-line emerging concepts by making interpretations that lead to questions about the cause of the selected fragments. Then, those codes can be grouped into subcategories that share similarities, patterns, and meaning, making it a more effective option to gather the concepts.

After the first coding step, following the grounded theory, this study was guided towards the axial codification, which becomes the second step for completing the analysis. Nevertheless, it is necessary to understand that phase from the experts' insights, so the axial coding relates to restructuring the information by identifying links between the codes and subcategories. Likewise, this coding phase is described as a more organized phase, using a "paradigm model" to relate categories across their features and dimensions. The model stores components like conditions (what led to the cause) and context (specific situations) (Strauss and Corbin, 2015).

Moreover, it became valuable to comprehend the kind of category the project looked for during the coding process, since it could lead to a different stand. So, as stated by Vives and Hamui (2021) when categories and subcategories are selected before the data compilation process, they are identified as theoretical categories backing a deductive approach from reference frameworks. On the other side, categories that arise during data collection are comprehended as emergent categories since they follow an inductive approach that looks to acquire new postures from the data analyzed.

In this sense, this project was based on emergent categories because it focused on inductively examining the data from the contrast matrix rather than using predefined structures as theoretical categories. The emergent categories permitted a deeper understanding of the matter and a flexible use during the analysis, identifying relationships and differences between the scientific documents and exploring new concepts and subcategories that appeared from the coding process.

Finally, as stated before, the data analysis follows the grounded theory by employing open and axial coding, but it did not utilize the last phase, which is selective coding. Hence, throughout this process the outcomes led to comprehending beyond a basic look, because this attempted to categorize the data from a bigger perspective to a more specific face, thanks to the open and axial pathway, there is a central category that expands the origin of the phenomenon by assimilating what led to the phenomenon and how it was conceived.

Chapter IV: Analysis of the results and discussion

This chapter presents the data collection and analysis process, accomplishing the 3 specific objectives proposed. First, a characterization section is performed to establish the key research components (objectives, methodology, population, instruments, and results) in order to set out basic information from the 20 scientific publications, employing the synthesis matrix. Then, a classification is considered to sort out the research components, facilitating the open and axial coding with the contrast matrix. The contrast step focuses on deeply exploring the categories that arise, while deepening the study and generating new insights. Finally, this chapter concludes with the discussion of the analysis of results, guided by a triangulation process that facilitates an in-depth analysis of the research findings, contrasting background discoveries while being supported by theories and authors from the theoretical framework

Characterization

In this section, the study steered its course toward the discovery, comments, and interpretation of the information acquired throughout the data collection process. Thus, this part outlined the step-by-step process of information analysis as a means of divulgation, demonstrating what the research aimed to achieve and how it contributed to fulfilling the structured objectives.

In the same vein, it was necessary to recall the first specific objective, which consisted of characterizing the scientific publications on the use of ICT tools and resources. Bearing that in mind, the handling of the procedure was developed through the synthesis matrix, which worked as a facilitator for managing the information from the 20 documents found in the databases, and this data was sorted out according to the research components previously mentioned.

First, the synthesis matrix (see Appendix A) presents the basic data from the 20 documents, including title, authors, year of publication, methodology, objectives, population, instruments, and results. Considering that, the next subsections contextualize and translate the most significant key points found in the synthesis matrix already filled out.

Thereupon, according to the synthesis matrix, it was concluded and viewed in the item, publication date, that 2019 was the most standout date in terms of scientific records, where some authors published their work, specifically 4 documents, regarding the usage of ICT tools and

resources to teach English to visually impaired learners. Similarly, 2 different years obtained the same outcomes, 2023 and 2015, which equaled 3 records from each year.

Continuing with the remaining time range of 10 years, the number of documents began to decrease from now on, as it was discovered that there were 2 scientific records per year from 2024, 2022, and 2021. Additionally, this negative trend was reflected in the subsequent years, as evidenced by the common pattern of only one scientific paper published in 2016, 2017, 2018, and 2020. However, the single documents weren't the lowest point of movement in the records, since it turned out that in 2014, there was no trace of files that could accomplish these research requirements.

Moving forward with the next item, the document type was a simple point that classified the files as either articles or theses. The characterization disclosed that, out of the 20 documents, there were 6 articles and 14 theses.

Table 8

Methodology of documents

Documents' Methodology	
Qualitative approach	17
Quantitative approach	0
Mixed approach	3
Total of documents	20

Note, the chart reflects the methodological approaches from the 20 scientific documents.

Moreover, the methodological aspects across the synthesis matrix revealed several patterns that constituted the 20 files analyzed. The most common approach was the qualitative perspective, which was established in 17 documents as their primary methodological foundation. In contrast, the remaining 3 scientific records adopted a mixed methodological approach, which combines the lenses of qualitative and quantitative features, expanding the ways the problem can

be taken on. However, Table 8 showed that the quantitative approach had a zero impact on the sampling since 0 documents used it.

Bearing this in mind, these initial findings outline an apparent premise on which research is based, deriving methodological aspects from different natures, such as qualitative, quantitative, and mixed methods, that encompass the research development. According to Creswell and Creswell (2018), methodology refers to a structured plan that encompasses various strategies for inquiry and methods for data collection, analysis, and interpretation. Additionally, it outlines the study's foundations, including its conception and conduct, as well as the problem formulation and procedures used for analyzing the results. As the authors noted, this initial characterization phase of the methodology helps to understand the research foundations. Therefore, the dominance of qualitative approaches indicates a focus on understanding individuals' contexts, while there is a lack of quantitative viewpoints, showing little interest in measuring knowledge with numerical data. Although only three studies employed mixed methods, they provide valuable insights based on a combination of qualitative and quantitative data, yielding new observations.

Table 9

Classification of documents by number of objectives

Documents' objectives	
Documents that possess 1 objective	3
Documents that possess 1 general and 2 specific objectives	2
Documents that possess 1 general and 3 specific objectives	10
Documents that possess 1 general and 4 specific objectives	4
Documents that possess 1 general and 5 specific objectives	1
Total of documents	20

Note, the table shows the quantity of objectives per document.

The next item was the objectives of the documents; it was disclosed that the majority of files, in particular 10 projects, had 1 general and 3 specific objectives. Plus, there were 4 files that had 1 general and 4 specific objectives, and there was one single scientific paper that relied on 1 general and 5 specific objectives.

By the same token, there were 2 that only held 1 general and 2 specific goals in the files' development. To end this item, it was discovered that in 3 documents, they only stored one single overall objective for the whole research; these articles did not express the aims explicitly.

These initial discoveries reveal well-structured scientific documents with multiple inquiries aimed at achieving and answering a general objective. According to Hernandez et al. (2014), the objectives in research are crucial since they lay the groundwork for the study, serving as the entire framework on which the analysis is based. Additionally, the number of objectives in research reflects the complexity of understanding the core problem. A well-balanced set of goals, neither too few nor too many, ensures clarity and coherence in projects.

In this scenario, the initial findings reveal a wide variety of objectives, referring to the level of effort researchers dedicate to understanding the identified problem. Although the classification section emphasizes a deep understanding of the general objectives and intentions, it can be said that recognizing the set of research goals can help make assumptions about the clarity and coherence of the scientific documents.

Table 10

Classification of documents by level of education

Level of education	Number of documents by education level
Elementary school	2
High school	6
Technical studies	2
University	11
Others	4

Note, the table presents the scholarly level of the population encountered in the 20 scientific documents.

Table 10 presents the distribution of scientific records according to the level of education addressed during the research. Despite 20 documents being studied, the papers worked with a variety of participants, so some records qualified for more than 1 item. Therefore, university level was underlined as the most illustrated, with 11 appearances within the documents. Subsequently, High school education pursues six (6), while elementary school and technical studies are the least exhibited education level, with only two (2) appearances each. Lastly, four (4) documents were associated under the “others” level, which contains specialized institutes or unspecified educational settings.

This general data regarding the population encountered across various scientific documents indicates that learners operate in different contexts where a wide range of difficulties can arise depending on their level of education. Darling-Hammond et al. (2019) add that for an effective learning and teaching process, the educator must understand the student's prior knowledge and level to apply appropriate strategies that suit them. Therefore, identifying the educational level of the population provides a general idea of the challenges and difficulties they may face. This is related to this research, which suggests that visually impaired learners

encounter multiple realities and require different strategies depending on their level to solve their issues.

Table 11

Number of data collection instruments used

Data collection instruments	Number of appearances across the documents
Surveys	5
Interviews	15
Field notes	3
Observation guide	2
Tests	3
Questionnaires	3

Note, the table shows the data collection instruments used from the 20 documents.

Advancing on the next part of the matrix, the instruments were a vital part of the studies because they tended to guide the way the data was collected and analyzed. In general terms, the instruments that generalized the sample of 20 files were more commonly similar due to the relationship of the methodology that almost all the samples possessed. Those instruments were composed of surveys, interviews, field notes, observation guides, tests, and questionnaires.

According to the initial methodological findings, the dominance of the qualitative approach results in consistent data that show a greater reliance on data collection tools with a subjective nature. Additionally, this research strategy for gathering information illustrates how researchers plan to handle data from both qualitative and quantitative sources. As Medina (2023) commented, research instruments are vital for understanding different contexts, and selecting the appropriate data collection methods depends on the setting, leading to the collection of crucial data that represents the overall problem. Therefore, the instrument findings offer a broad overview of what researchers employed to explore their issue. Interviews were the most frequently used, showing that the population was inquired about their experiences to gain an understanding of their reality, while observation guides with few appearances reveal that a passive researcher's role was not the primary approach.

Table 12

Results considering the technological tools and resources.

Technological Tools & Resources	Results
JAWS, Netflix, Canvas, Moodle, Braille display, computers, smartphones, 3D materials, the audio game "AULIN", screen readers, educational capsules, Dabin dictionary, the application "Eyeland", and Vox Pops	-Increased accessibility and inclusion -Increased student participation -Increased interaction with digital content -Autonomy in learning

Note, the table represents the ICT tools and resources along with general results found in the 20 documents.

To conclude the synthesis matrix section, the last item, 'Results,' collected the most pertinent conclusions and revelations that comprehended how the ICT tools and resources performed during implementation. As Castro (2022) highlighted the importance of these assistive technologies allow learners to participate in multiple interactive activities, so they promote motivation and interest in interacting with the English language within an inclusive environment where people with visual impairment can effectively participate. Thus, the emergence of these tools and resources fosters better strategies to assist students in need, so they must be identified for understanding their impact and variety.

In this sense, it is vital to review the recognized tools and resources shown in Table 12, included screen readers such as JAWS (Job Access with Speech) and NVDA (Non-Visual Desktop Access), which convert on-screen text to speech or braille output, thereby making digital content easier to access. Similarly, Braille displays help convert virtual text into Braille characters, enabling learners to better understand the content. These were supported by computers and smartphones, which were the main devices used for accessing digital content and web pages through screen readers during classroom experiences.

Additionally, 3D materials were used to mold interactive braille books, emphasizing tactile learning experiences. Another tool identified was a device called the audio game "AULIN," which is based on an electronic system that uses music for English language learning. Similarly, the electronic board game "Eye" promotes vocabulary comprehension with pre-

recorded words in an engaging game format. Educational capsules provided audiovisual content featuring interactive activities designed to enhance listening skills. Lastly, the Dabin dictionary expanded concepts and translations through voice interaction, offering real-time definitions.

Furthermore, it was also found that ICT tools and resources are based on platforms and applications such as the application "Eyeland," a mobile app designed to enhance English learning through audible content with screen reader compatibility. Additionally, Netflix, a well-known platform that provides audio content for various language scenarios, is primarily used by visually impaired learners to access descriptive audio situations. Moodle is a virtual learning environment that a screen reader can use to facilitate access and explore various interactive listening activities. Finally, Vox Pops, a web page that features public interviews, exposes learners to real-life environments, promoting everyday language and expressions.

Based on the prior process, it was possible to recognize important factors that distinguish the sampling of documents. This characterization permitted the study to be deepened in terms of organizing the information to facilitate its synthesis and analysis. As a result, the remainder of this research was more significant, as it transitioned from a general view to a more specific stage, making it impactful to consider once the general data was condensed in the synthesis matrix.

Scientific documents classification

Then, to accomplish the study's second objective, a classification process was developed concerning the research components such as methodology, objectives, population, instruments, and results. These items were systematically sorted out and organized employing the contrast matrix (see Appendix B) which emphasizes the 20 scientific documents' research components. Consequently, it facilitated a vertical reading that allowed emerging categories to arise from the analysis. For that reason, it was fundamental to initiate this second approach with a stage beyond characterization, and this was gotten across open and axial coding, following the grounded theory by Strauss and Corbin (2015) in which the 20 projects were going to provide essential concepts and subcategories that led to a central category corresponding to the relationships that were encountered previously in the open coding phase.

Open and axial coding of methodological data. Initially, the 20 documents relate to studies involving individuals with visual impairment, whether total or partial, to evaluate tools or resources driven by ICT for teaching English. Therefore, in this classification process, considering the first item methodology, it was necessary to comprehend some characteristics of how the researchers executed their studies during the methodological development.

In this sense, the codes highlighted in green were taken from the contrast matrix (annex b), as it was the instrument that brought to light the most crucial facts of the studies according to the research methodology. In this regard, the following documents, identified as #4, 7, 8, 9, 12, 14, 17, 19, and 20, are associated with a specific code that relates to each other, as represented in the "case study".

Second, the code is "action research," which was tracked in the following papers: #5, 13, and 15 in the contrast matrix. Similarly, the term "ethnographic" was observed in only two projects, specifically in #3 and #6. As well as ethnographic, 2 documents had a methodological design "systematic", corresponding to #1 and 18. Finally, "cross-sectional", "phenomenological", "exploratory", and "sequential exploratory" were identified in the thesis and articles #2, 10,11, and 16, respectively.

According to the above, those open codes were sorted out into subcategories; this classification was taken into consideration in the study "An Applied Guide to Research Designs". Edmonds and Kennedy (2017) commented that methods can be grouped into qualitative, quantitative, and mixed approaches depending on the project's aims. This distinction can be distinguished by the collection and synthesis of information either in numerical or non-quantitative ways. Along with that, there are cases in which the method can involve both forms of assimilating the data, involving variables, trends, perspectives, and perceptions found in the data collection process.

For this reason, the subcategories of the open codes already identified were categorized as "qualitative", "mixed", and "quantitative"; however, the last one could not be further sorted because no study had applied the quantitative approach. Besides, there were cases in which some codes matched the qualitative and mixed subcategories since the studies utilized that design from a non-numerical perspective and quantitative and phenomenological perspectives.

In this sense, within the “qualitative” subcategory, the following codes were linked: systematic, ethnographic, action research, case study, cross-sectional, exploratory, and phenomenological. On the other hand, the “mixed” subcategory stored open codes like sequential exploratory and case study. Consequently, this coding process from the methodology was concluded with the axial coding, named “Methodological Approach”, encompassing the codes and subcategories from the initial step.

Open and axial coding of objectives. Having completed the methodology, it is necessary to proceed with a more in-depth study, considering the objectives set by the sample of 20 research studies stipulated for the development of this literary analysis. Understanding the nature of the objectives requires analyzing the verbs associated with them across the cognitive process; in this vein, the classification of Anderson and Krathwohl (2001) was considered. They stated 4 levels of knowledge that encompass factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge.

Considering the above, it was designed to classify verbs according to the cognitive process, differentiating those actions from a hierarchical structure. This form distinguishes the magnitude at which verbs will embark on tasks that allow a researcher to design a step-by-step process for accomplishing the main aim. So, the cognitive process was assembled by the following concepts: remembering, understanding, applying, analyzing, evaluating, and creating.

The extract was taken from the entire sample, highlighting some codes in orange that were obtained from the overall objectives. The initial idea was to group these verbs, which guide the research development, because it is the way it can show the purpose of any investigation. The next segment displayed the open codes along with the study they were taken from: "describe" was identified in research #1 and #16; “apply” in project #2; “investigate” in study #3; "propose" in research #4 and #9; "explore" in paper #5; "determine" in studies #6 and #8; "analyze" in projects #7, #11, #12, #19, and #20; "develop" in investigations #10, #14, and #18; "contribute" in scientific paper #13; "achieve" in study #15; and finally, "increase" was found in study #17.

Furthermore, the prior codes were grouped into subcategories, considering the cognitive process phases mentioned above. Thus, at the remembering level was the verb “describe”, then in applying level were “apply” and “determine”, analyzing level was identified as “investigate”,

“explore” and “analyze”, consequently in evaluating level was “propose”, ultimately in creating level “develop”, “contribute” “increase”, and “achieve”.

Eventually, since it was worked on in the open coding phase, it was possible to identify the codes and subcategories that formed the initial analysis. Therefore, it was appropriate to conclude this step by consolidating that phase into one category that highlighted its properties, called “Cognitive Process of General Objectives.”

Open and axial coding of the population. In this stage, the participants from different contexts across the 20 documents were inspected and explored, considering the scholarly level since it was a key point of observation for comprehending the population context. Hence, the open coding phase was highlighted with dark blue in the contrast matrix, representing concepts related to the education level of people with visual impairments. Similarly, some documents displayed a wide diversity in scholarly levels, as the research included individuals with various educational backgrounds.

First, the codes related to the education level were highlighted in blue, it was discovered that the code “university” arose in studies #1,4, 6, 12, 13, 16, 17, and 19. Subsequently, “high school” was identified in #3, 9, and 18. The concept “fifth grade” was found in projects #5 and 15, while “sixth and seventh grade” emerged in #5. Besides, “undergraduate” was noticed in #6 and 14, and “psychology student” was found in study #7. Additionally, “technical” was commented on in #8 and #14, while “foreign language teachers” were shown in #2. The term “secondary school” appeared in #10 and 14, and “professionals” were cited in #14. Finally, “specialized unit” and “association” were mentioned in studies #11 and 20.

As for the coding of the population by subcategories, this was based on the research developed by UNESCO entitled “International Standard Classification of Education”. UNESCO (2013) established a clear differentiation between the levels of schooling, describing their characteristics and functions, which allowed the previously defined educational levels to be structured and subcategorized appropriately.

Within this classification, the first level is “Early Childhood Education”, which includes educational programs designed to prepare children for primary education. Then, the “Primary

education” level corresponds to the first years of formal and obligatory education. Its duration varies between 4 and 7 years, with 6 years being the most common period.

According to the above, the “lower secondary education” level constitutes the first part of secondary education which has a duration between 2 to 5 years, however, the most common is usually 3 years, consequently, “upper secondary education” continues which is recognized as the final phase of this secondary level, its duration ranges between 2 to 5 years, Consequently, the “post-secondary non-tertiary education” level is situated between secondary and tertiary education, where technical or professional training is offered without a university degree; this level has a duration of between 6 months and 3 years.

In this sense, the “Short-cycle tertiary education” level continues, understood as higher education programs of short duration ranging between 2 and 3 years, in the same aspect, the “Degree in tertiary education or equivalent level” refers to those university programs which vary between 3 to 4 years or even more if accessed from high school. Consequently, at higher levels “master’s level, specialization or equivalent” as its name indicates are those postgraduate programs such as master's degrees and specializations, its duration can vary between 1 to 4 years, consequently, the level “Doctorate or equivalent” is recognized as one of the highest levels of education including doctorates and other advanced studies that have a minimum duration of 3 years.

Culminating with the levels of education, the “Not classified elsewhere” level highlights those programs that are not classified in the previously mentioned levels; these may be special training or some specialized programs that are not prevalent in the standard education system.

In this sense, the codes “fifth grade”, “sixth grade”, and "seventh grade” corresponded to the subcategory “primary education”. Additionally, “high school” and “secondary school” belonged to the subcategory “upper secondary education”, while “technical” was “post-secondary non-tertiary education”. Besides, “university”, “undergraduate”, “psychology student”, “foreign language teachers”, and “professionals” corresponded to the subcategory “Degree in tertiary education or equivalent level”. Finally, the remaining codes, “specialized unit” and “association,” fit within the last level of the UNESCO classification because these were institutions that took care of people with special needs; therefore, this subcategory was

labeled “not classified elsewhere.” Therefore, the axial category that encompasses the whole codes and subcategories was named “population scholarly level.”

Open and axial coding of instruments. In this category, a coding process was carried out for the classification and analysis of the various instruments that were implemented in scientific publications. This process was carried out using the contrast matrix, in which the color purple was assigned to facilitate the coding process and thus speed up the identification of the codes. Hence, this coding process was based on a study by Medina et al. (2023), which describes some research instruments and techniques used in projects. These techniques were observation, in which the researchers analyze and record the individuals’ behavior; surveys, utilized to collect data from participants; interviews, which facilitate a tight connection and wider understanding of the phenomena; then test techniques that aid in gathering data concerning the measurement of cognitive abilities and satisfaction from any process or context.

Considering the above, the first subcategory corresponds to “surveys," which represent the techniques in methodological development. This was assigned because the instruments used in the projects can be classified into these kinds of techniques. Specifically, those concepts are represented in “The Likert Scale survey “, “questionnaires”, “semi-structured survey”, and “structured survey.” The codes identified under this category were found in documents #1, 2, 3, 5, 9, 10, 11, and 18.

On the other hand, the second subcategory is “interviews”. This technique constituted an important feature for the collection of qualitative information since it allowed a closer connection between the researcher and the participant, facilitating the exploration of their perceptions, opinions, and behaviors in relation to the object of study in which the research was developed. In this sense, the codes were the following: “structured survey”, “unstructured interview”, and “semi-structured survey”, which correspond to studies #4, 5, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 19, and 20.

Also, the subcategory “observations” had some codes that were classified into that group, these concepts were “non-participatory observations”, “field notes”, “participatory observation”, “field journal”, “observation form”, and “observation guides”, these concepts were found in documents #3, 6, 7, 8, 11, 12, 17, and 20.

In this sense, the next subcategory was identified as “tests”, which was encompassed and composed of the next concepts, “diagnostic test of pre-knowledge, “pre-test and post-test”, “diagnostic test”, “final test”, and “DIALANG assessment system”, these codes were located across projects #4, 5, 8, 10, and 18. Finally, from the prior open coding process, concepts and subcategories were identified; thus, it had to be concluded with the axial coding alongside the general category that described the whole process, which was named “data collection techniques.”

Open and axial of results. From the results classification, it was observed in the “results” item from the contrast matrix some codes that molded different interpretations and facts in the way everything went after utilizing ICT tools and resources across the 20 projects selected. These fragments represented several codes that were tailored through 2 subcategories, embarking on the initial findings from the section.

First, it was cataloged in the subcategory “ICT tools and resources”, as Belloch (2012) mentioned Information and communication technologies are characterized by access, processing, and transmission of information in a variety of formats such as text, image, sound, among others, such ICT in the educational field have provided various computer tools that have facilitated both communication and access to data found online, aiding learned to thrive in their learning process.

Consequently, it was pertinent to showcase those codes discovered that were marked by a characteristic color, red, standing out from the part selected. The concepts emphasized were the following: “JAWS” (studies#1, 2, 8, 16), “braille reader” (#2), “smartphones” (#3), “laptops” (#3), “typhon-technological tools” (#4), “3D printings” (#5), “Moodle platform” (#6, and 7), “Kahoot” (#8), “educational capsules” (#9), “videos” (#8,10 13, 17), “digital dictionary Dabin” (#11), “electronic dictionary” (#12), “electronic translator” (#12), “websites” (#13, 14), electronic board game “eye” (#15), “Vox pops” (#17), “Netflix” (#17), “application “Eyeland” (#18), “audiobooks” (#20), “descriptive audios” (#10, 13), Canva #20, “Screen reader” (#20, 15) and “Symbaloo” (#20).

According to that, a certain variation of technological materials was found that aimed to aid visually impaired learners to thrive in the English learning process. Therefore, the

subcategory “ICT tools and resources” represented an approach to strengthening the teaching and learning roadway in the analyzed ecosystems. These tools and resources reflected a focus on accessibility, digital innovation, and interactive education.

Moving forward, the second subcategory obtained was called “outcomes from the tools and resources,” which depicted the panorama of results that were extracted from the 20 research projects. Those emerging technologies were used to address English learning issues throughout the implementation of those ICT tools and resources in the learning spaces.

In this sense, the mentioned subcategory was obtained from the sample of studies that revealed what was acquired and concluded after the finalization of the research process, so the following concepts show a couple of outcomes that expand the effect and reality of this process in educational contexts. Thus, there were multiple parts, colored in light green, that qualified in this subcategory such as: “teachers to be trained” (document #1), “training teachers” (#19), “support students” (#2), “foster meaningful learning” (#5), “institutions won’t have access to 3D tools” (#5), “strengthens listening skills” (#9, 14), “a closer interaction with vocabulary” (#20), and “it helped to develop the oral competence” (#8 and 18).

In general terms, the subcategories stored meaningful codes that described the process developed by the researchers. Initially, it outlined the positive amount and diversity of ICT tools and resources, and it was complemented by the second subcategory that commented on the different outcomes from the employment of those materials. Despite finding worthwhile and effective results, some codes described a problem, which was the lack of training for English teachers while utilizing the emerging tools that might limit the effectiveness. Finally, taking into consideration the open coding process, it was possible to tailor that procedure from a general view with the axial coding, and the category was named “effectiveness of ICT tools and resources”.

Contrast

Based on the previous classification, the project implemented an exhaustive exploration of how research components (methodology, objectives, population, instruments, and results) were structured. That process was comprehended from the grounded theory that involved organizing the information by categories and subcategories. For that reason, this contrast

procedure provided a comprehensive analysis of the classification, looking for similarities and distinctions that denoted patterns and insights within the information.

Category 1: Methodological approach. Firstly, it was observed from the classification of the 20 reviewed scientific documents that a clear dominance of the qualitative approach was evident, with a total of 17 documents. This relevant factor implied that most of the research steered their approach to understanding how individuals with visual impairment perform in English learning contexts with ICT tools and resources, leading to detailed results. This involved examining the experiences, perceptions, insights, and challenges that the participants faced within the established environment. Therefore, methodological designs like action research, case studies, ethnographic, and phenomenological studies facilitated the approach execution by emphasizing the phenomenon from qualitative data.

Meanwhile, it was noticed that three scientific papers followed the mixed approach, adopting both qualitative and quantitative items to examine contexts that expose ICT tools and resources to the visually impaired population. Besides, this methodological approach structured the projects thoroughly in terms of taking on the data from non-numerical and statistical perspectives, leading to an in-depth analysis by understanding students' perceptions and perspectives about the learning process, along with numerical information regarding their performance and effectiveness, that those learners and the ICT tools and resources provided. From this mixed approach, the 3 studies utilized case studies and sequential exploratory designs, which permitted them to reinforce the procedure and analysis encompassing numerical measurements and interpretation of results.

Concerning methodological designs, case studies (documents #4, 7, 8, 9, 12, 14, 17, 19, and 20) were highlighted as the most common method. This design showed deeper analysis and insights, making it appropriate to understand how ICTs were implemented into English teaching for visually impaired learners. Further, action research (#5, 13, and 15) helped in improving pedagogical strategies by allowing researchers to develop novel strategies and tools to overcome issues. Ethnographic design (studies #3, 6) provided better perspectives from social dimensions and cultural aspects of the visually impaired learners.

The systematic method (documents #1 and 18) used framework analysis to adapt it to their context and create new alternatives to face the problem. Also, cross-sectional (#2), emphasized one specific moment that happened during a teaching and learning moment, being specific by identifying patterns and relationships, while phenomenological (#10) tried to identify visually impaired individuals' experiences from emotions, challenges, and perceptions. Finally, the exploratory (#11) revealed emerging patterns, trends, and potential factors that complemented unexplored contexts like ICT tools and resources to learn English for people with visual impairment.

Furthermore, from the mixed approach, there were 2 designs, as mentioned above, that defined the 3 studies from this approach. First, sequential exploratory (#2) allowed to analyze and examine the statistical data, while opinions and experiences were important to understand teachers' and students' progress and insights about the proper ICT tools and resources for English teaching and learning. Finally, case studies (#9 and 14) were also part of the mixed approach; this design, when integrated into the mixed approach, allowed an in-depth understanding of the phenomenon, focusing on educational settings or a specific group, capturing the experiences of the educational actors, in turn measuring their cognitive performance, as shown in those two studies, they evaluated qualitative results and strengthening the results with quantitative data from tests and surveys.

For that reason, according to this study's purpose of encouraging more research in the field, it sought to understand the main features of taking on this subject. Therefore, from the methodological approach, it was interpreted that the mixed methodology played a more crucial role in examining the phenomenon in broader ways, comprehending the most crucial subjective aspects, whilst including numerical facts acquired from tests helped to understand if what was applied supported the process. However, the qualitative approach shortened its range since it only emphasized the participants' perceptions concerning emotions and opinions about their experience.

Nevertheless, it was important to note that the quantitative approach was not included in the projects, since, as highlighted in the description of qualitative and mixed methods, these approaches were more relevant to the nature of the study which was based on an in-depth analysis of how a specific population behaves in a specific situation. Therefore, a purely

quantitative approach would not be suitable for this type of study because it would only focus on numerical data and measurements, resulting in an inadequate analysis by ignoring participants' thoughts and perspectives.

Finally, understanding that a mixed approach was appropriate for a deeper understanding, it was also important to bear in mind that the method is as valuable as the approach since it determines the way the projects are taken and the data is handled. So, the most adequate designs were composed of case studies and action research because their model was about understanding a specific scenario to create and develop modern and emerging ICT tools and resources to overcome learning difficulties among the visually impaired population.

Category 2: Cognitive process of general objectives. As was described in the classification stage, it was stipulated that the general objectives of the projects could be understood within the 6 levels of the cognitive process. Still, the remembering level, applying level, analyzing level, evaluating level, and creating level were only identified, which helped to sort out the verbs in those subcategories.

In this sense, as described above, the remembering level from the open and axial coding procedure of this kind of cognitive level implied the mental step of recalling and recognizing information previously learned without interpreting or modifying it. Besides, this cognitive level looked to build up the foundations of knowledge since it became the first step of assimilating experiences through learning, but it did not require deep understanding. Given that, from the 20 documents, only one case was identified that represented this cognitive stage, which was "describe" (document #1). In that research, it attempted to recognize and express information about a methodological experience from teachers to visually impaired learners, so it indicated that with that verb, the research limited its objective to a simple description with no deep analysis.

Moving forward, the applying level involved the execution of knowledge in concrete situations, demonstrating the individual's ability to use what he/she has learned effectively and functionally in the resolution of real-life problems. Thus, the first code that appeared in this level was "apply" (#2), where the study aimed to implement effective strategies in English teaching to the visually impaired population, implying a direct action in educational practices from

theoretical knowledge to real-life situations. The second verb was “determine” (#6 and 8); both studies looked to establish an appropriate teaching strategy for the population in need, along with the positive and negative outcomes that arose during the strategy, not only compiling and remembering information but also applying different teaching methods to understand their effectiveness.

Additionally, the analyzing level focused on examining a situation deeply, identifying patterns, and establishing relationships to understand the causes and consequences of a phenomenon. The initial verbs identified in this cognitive level were “investigate” (#3) and “explore” (#5), within this paper it was seen two similar contexts in which the objective looked to gain an understanding of how smartphones and 3D technologies could be used as effective strategies, evaluating their features and outcomes. Besides, the most recurrent verb, “analyze” (#7, 11, 12, 19, and 20) implied the objective of comprehending the teaching and learning experiences along with the use of ICT tools and resources during their implementation, deeply exploring the functions and results given by the process.

Furthermore, in the evaluating level of the cognitive process, the studies pretended to make critical judgments based on the criteria set to assess procedures across arguments, comparisons, and justifications to prove the validity of those tested tools. Thus, within this stage, the verb “propose” (#4 and 9) was seen as the research addressed to evaluate and provide new strategies that looked to facilitate the visually impaired learners in those educational environments while verifying the effectiveness as well as the appropriateness of the plan of action.

Lastly, the creating level represents the highest order in Bloom’s taxonomy, where the individual must create new ideas, develop theories, and provide alternatives to overcome issues. This cognitive process level was visualized first in the verb “develop” (#10, 14, and 18) where these studies sought to integrate different factors like courses and ICT materials to make novel strategies or improve concepts, so they looked to create new ways to take on the usual complications in these kinds of environments. Moreover, the verbs “contribute” (#13), “achieve” (#15), and “increase” (#17) were part of this cognitive level since they sought to improve inclusion along with participants’ participation during the learning process, besides it was also produced an ICT resource that fostered interest and the improvement of English skills.

In conclusion, evaluating and creating levels of cognitive processes were the most effective ways to address this field, which needs new innovations and plans to overcome the lack of exploration. Despite the different contexts that appeared across the 20 scientific publications, all of them were relevant because they addressed the needs of individuals. However, in terms of expanding horizons with new ICT tools and strategies, some research focused not on developing these tools but on analyzing experiences. Therefore, creating and evaluating level approaches helps to generate materials while assessing their usefulness.

Category 3: Population scholarly level. From the analysis of the 20 documents reviewed, a diversity of educational levels in the population with visual impairment was identified in subcategories, from "primary education" (documents #5 and 15), upper secondary education (#3, 9, 18, 10, 14), "post-secondary non-tertiary education" (#8 and 14), "degree in tertiary education or equivalent level" (#1, 2, 4, 6, 7, 12, 13, 14, 16, 17, 19), and not classified elsewhere (#11 and 20). To evaluate these results, it was key to examine the dissimilarities and parallels in each educational level, as it was related to the cognitive process developed by students with visual impairment.

The last level, "not classified elsewhere" meant a stage in which the institutions did not represent any kind of classification within UNESCO's document. However, it was important to note that documents #11 and 20 counted these individuals from associations and units specialized in aiding visually impaired learners, emphasizing their care and help in English learning.

In contrast, a peculiarity was determined since the 20 studies had a marked population that covered up to 5 different education levels. This differentiation generated conclusions about how widely visually impaired learners faced their English learning process because it encompassed almost all scholarly stages. Besides, it was detected that in one study, its participants differed in age and competencies, such as document #1,4, which counted learners from secondary school, technical education, and undergraduate students. This particular situation could influence the way the study was developed since the individuals had different cognitive abilities in terms of development and assimilation.

From the classification of the population above, it was noticed that a greater number of documents contained individuals whose scholarly level ranged from post-secondary non-tertiary education and degree in tertiary education, precisely 12 studies. Thus, this recurrent sample was considered cognitively sufficiently mature, but it turned out that most of the studies suggested they needed more ways to soothe English learning. Despite their adulthood, they seemed to be as vulnerable as younger visually impaired learners, questioning the premise that teenage students are naturally more helpless.

Finally, the analysis of the selected studies revealed that the documents primarily emphasized higher education when addressing the needs of students with visual impairment, highlighting the importance of inclusive education in technical and university contexts. Nevertheless, a considerable gap exists in primary and secondary education research practices. Remarkably, none of the 20 scientific papers stressed the early childhood level, perhaps because of the limited adaptation and original ICT tools and resources for young children, whose sensory and cognitive abilities are still in development. Therefore, this lack of research might lead to few opportunities regarding the earliest stage of students while learning a new language like English.

Category 4: Data collection techniques. Now, it was pertinent to develop a contrast between the data collection techniques implemented, highlighting their characteristics and validating which were the most appropriate for the collection of information. In the first instance, surveys were identified, which allowed data collection in a structured manner through various instruments, such as questionnaires, thus facilitating a statistical analysis. Plus, interviews were used along with their variants, concerning structured, semi-structured, or unstructured, allowing a deeper exploration by collecting information on the experiences and perspectives of individuals.

Consequently, observation, involving either participatory or non-participatory observation, was based on the systematic recording of individuals' behaviors within their natural context, using various instruments over a given period. Finally, tests, such as pre-tests, post-tests, and diagnostics, enabled the measurement of individuals' knowledge and skills, as well as the evaluation of the changes that they experienced following a specific intervention.

Deepening the contrast, it was figured out across the distinction of the 20 documents that the most frequent data collection technique was interview; specifically, 13 scientific productions employed it as the source of subjective data from students. Besides, the survey was conducted in 7 documents, looking for understanding how satisfied the visually impaired population felt about the implementation of ICT tools, resources, and the English learning process, such as studies #1 and #2, which approached understanding students' opinions. In addition, as surveys, the observation technique was utilized in 7 papers, aiming to recognize the educational environment across guides and journals employed by teachers.

Likewise, as the most recurrent technique was important to mention, it was valuable to distinguish the least utilized data collection technique, which happened to be tests. This technique helped measure student performance through interpretations and qualitative criteria; however, for this sample of 20 documents, it was not widely applied, as only 5 scientific papers utilized this kind of instrument.

On that basis, it was understood that interviews were the most used since it was discovered that the majority of research encompassed a qualitative study, so that technique became popular due to its phenomenological emphasis through encounters and aligning with the most employed approach, qualitative. On the other side, tests, although being related to quantitative data, it was only used by qualitative studies, standing #4, 5, 8, 10, 18, that took on the results from subjective criteria and interpretations, diminishing the numerical data. Despite 3 mixed studies being identified, those documents did not apply that kind of data collection technique, so the quantitative data from tests were not the primary preoccupation of the research.

Considering the above, to encourage the increase of studies in this field, it is necessary to establish how scientific records should be conducted, according to adequate approaches and instruments for data collection, whether quantitative, subjective, or a combination of both. As was stated before, mixed-approach research was comprehended as the most polyvalent since it includes objective and qualitative perceptions. But the necessity of proving and understanding the learning process concerning the individuals along with the tools and resources implemented due to their crucial results, it is important to mix them in one termination to magnify how impactful the implementation was from numerical data according to ICT tools and resources,

while obtaining subjective information from the learners' perceptions and experiences about the process.

For that reason, from the instrument's side, according to the results uncovered from the sampling, it could be concluded that interviews, surveys, and observation showed a personal reality of what was lived, experienced, and perceived by all the participants in those scientific environments. While tests approach to quantify information from what the student has learned and acquired during the learning experiences, the 5 documents that employed that technique led to converting the numerical data into subjective information across qualitative rubrics and interpretations. Therefore, it stands out that a predominance was on how the processes were handled, prioritizing perceptions rather than acquiring clear and verified quantified results from what the visually impaired learners had accomplished with the use of those technological tools and resources.

Ultimately, ongoing studies should be encompassed by an integration of qualitative and quantitative findings to outline more in-depth and resounding results. Thus, to achieve that, it demands the application of suitable data collection techniques that supply both width and conciseness. Besides, the prior can be obtained across interviews, tests, or an integration of techniques that assemble both types of data, allowing a well-rounded and substantial breakdown by evaluating the effectiveness of the ICT tools and resources along with the visually impaired individuals' standpoints.

Category 5: Effectiveness of ICT tools and resources. To effectively deliver English teaching to learners, many circumstances are considered that shape the classroom environment. One of these relates to building substantial rapport with students and teachers, encouraging learners to participate actively in the learning process. However, if this participation occurs without any improvement in understanding, it indicates that something additional is needed to enhance the learning experience for students, specifically, special materials. Consequently, these materials cannot be developed from a regular base but one inclusive foundation that aids people with visual impairment, and modern technology in education makes learning smoother, so ICT tools and resources play a huge role in diminishing the difficult and bumpy road in English learning for the disadvantaged individuals.

According to that line of reasoning, this category involved identifying the ICT tools and resources used across the 20 scientific papers, along with the overall results derived from using the technological tools. For that reason, it was important to contrast what was used the most and least during the processes, leading to conclusions and renditions that could expand the general knowledge of these valuable tools and resources for people with visual impairment in contexts that involve English teaching and learning.

In this sense, among the ICT tools and resources employed within the sampling, JAWS (Job Access with Speech) and screen readers were the most frequently used in the research. This assistive technology helped to make digital information more available for individuals with visual impairment, as well as transforming unworkable resources into functional material from the technological devices, multiple studies #1, 2, 8, 14, 15, 16, and 20 showed how the application JAWS or screen readers became essential to support accessibility to the modern world, communication gap, and English listening skills of learners.

Regardless of these positive results, research #1 also showcased an inconvenience: the teachers had issues and challenges while using screen readers due to inadequate and insufficient training. Consequently, that lack of expertise restricted the ICT tool’s impact and effectiveness, stopping it from exploiting all the great traits that visually impaired students could use to facilitate their English learning process.

Furthermore, the use of listening resources was key to awakening the listening competence of visually impaired participants. Also, as the visual ability is dismissed within the ICT tools and resources it was vital to enhance the auditory ability across appropriate aids. Therefore, most of the research utilized videos (#8, 10, 13, and 17), descriptive audios (10 and 13), audiobooks (20), Vox Pops (17), and Netflix (17), encompassing the objective of exposing learners to spoken English from different contexts and nourishing students' vocabulary. As expressed in research #10, 13, and 17, this ICT resource exposed students to native speakers and developed speaking skills across the repetition of words once they listened to them within videos, audiobooks, and content from the streaming platform Netflix, emphasizing the right pronunciation by going backward and forward without losing any piece of extract.

Similarly to the resources above, education capsules were developed, specifically in document #9, whose approach consisted of developing different sequences that involved English exercises to help visually impaired learners with a more engaging method of learning. These lessons from the capsules were based on listening skills, so the exercises employed were designed and optimized audio that fit the learners' needs, being descriptive and detailed for a better understanding.

Moving forward, the ICT tools and resources also centered on platforms and websites that prioritized the learners' guidelines along with playful activities. These modern instruments were identified as Moodle (#6, 7), Kahoot (#8), Symbaloo (20), and educational websites (#13 and 14) that depicted a structured course based on materials, English resources and content that allowed learners to enhance their language competences by utilizing this ICT resource. Likewise, the results showed students were able to improve their listening and speaking skills while encouraging them to keep using the resource since the accessibility was ideal for the population, as exhibited in studies #6, 8, and 13.

Equally important, there were ICT tools that characterized their use by a tactile and manipulative material: smartphones (#3) and laptops (#3) were complemented with the use of screen readers in order to use resources previously explained as videos, podcasts, or audiobooks, while using it as the way of sharing and listening to content between peers. More, an electronic dictionary (#12), an electronic translator (#12), and a digital dictionary Dabin (#11) were technological devices used to expand the vocabulary and grammar structure of English. Lastly,

3D printing (#5) fostered motivation and meaningful learning since visually impaired learners were exposed to handy material, awakening their interest in learning by experiencing a tale composed of braille. Despite this outcome, it was stated that most institutions would struggle to obtain resources for 3D printers, due to their accessibility.

The previous ICT tools and resources have shown a particular meaning between each other, which consists of aiding visually impaired populations, overcoming their limitations with modern materials that allow them to thrive in English learning environments. However, it has been kept until the end, 2 ICT tools were highlighted due to the originality and creativity behind them were created by the researchers, Audio Juego Institucional "Aulin" (#15) was composed of two components: a remote control per student and an application mobile/web managed by the teacher. This application stores in a database 1000 songs distributed in levels, modules, units, and English lessons to play one per class, allowing the learners to retain information from cheerful songs. The results showed that songs encouraged them to participate and improve their language competencies, but it required repetition to answer correctly; also, some students were distracted at the beginning of songs due to only instrumental melodies.

Likewise, the second original ICT tool was the application Eyeland (#18), which focused on hearing and tactile methods, ensuring adaptability with screen readers. Also, this application was equipped with the enhancement of audio and description for images, emphasizing visually impaired learners' experience and English improvement while using the application. This research demonstrated improvements, particularly in reading and listening skills, and from an inclusive perspective, it fostered collaborative learning among peers.

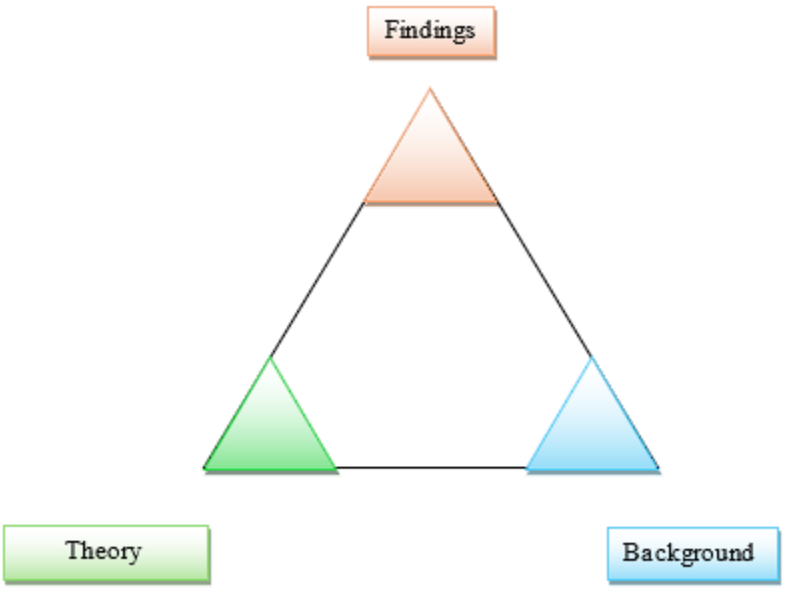
Finally, among the ICT tools and resources studied, listening-based resources, screen readers, the Eyeland application, and dynamic learning platforms were found to be the most accessible and effective for visually impaired students. These emerging tools and resources efficiently support English grasping by serving hearing and multisensory demands. Contrarily, while visionary, 3D materials and Audio juego institucional Aulin face accessibility obstacles that decrease their application in most educational contexts since their implementation would require a high cost and monetary resources, which many educational institutions don't have. Future research development should focus on strengthening teacher knowledge for screen

readers such as JAWS and enriching the availability of affordable ICT tools and resources to optimize learning adventures for visually impaired apprentices.

Discussion

This section describes the triangulation process used in this research to support the validity and credibility of the results. According to Santos et al. (2020), triangulation is an essential strategy in qualitative and mixed-methods research, as it enhances the integration of multiple sources of information and analytical perspectives from results, background, and theoretical support. This approach helps reduce potential biases and increases the trustworthiness of the findings. Thus, this methodological strategy's purpose is to obtain a more exhaustive and meticulous understanding of the studied phenomenon, backing the information interpreted from a multifaceted perspective, so it leads to a broader comprehension of the scientific document produced in the last 10 years.

Figure 5
Data triangulation process



Note, the figure depicts the triangulation process, which involves a dialogue between this research's findings, discoveries from the background, and theoretical support. Source: Own elaboration.

Figure 5 illustrates the triangulation strategy from three correlated extents. First, the findings from this research are essential to discuss, as they reveal the emergent perspectives and conclusions derived from this research development. Then, these outcomes are compared with previous background studies, providing broader insights and incorporating various sources of evidence. Finally, this discussion is supported by theory as it consolidates and validates the interpretations.

Starting with the first category, denominated "Methodological approach," findings demonstrated that most studies employed a qualitative approach, specifically 17. In contrast, a mixed approach appeared in only 3 studies, indicating a significant predominance of subjective perspectives, and it was also revealed that the quantitative paradigm had no implications due to its nonexistence. These findings are correlated to the background research developed by Robles et al. (2024), whose results align with the most commonly utilized approach, which was qualitative, representing a total of 13 studies. Additionally, there were three quantitative studies, and the mixed approach appeared only once from the 17 scientific records analyzed. Therefore, these results demonstrated an increase in the use of a mixed approach, while a decrease in quantitative methodologies. Also, the qualitative approach showcased a high preference for researchers to develop new research to comprehend the phenomenon.

Despite the notorious impact of the subjective perspective, Grupo Accedo (2013) presents a new view of the background dimension, where mixed approaches are gaining momentum and expanding their usage because this methodology allows for the evaluation of performance through numerical data and the assessment of learners' feelings via subjective information. Additionally, the mixed methods approach provides a well-founded method for conducting research, reducing biases and confusion in the findings, and addressing steps from both numerical and non-numerical perspectives (Robles et al., 2024).

From the findings, despite high qualitative use, it is advisable to consider that the most effective approach for gaining a broader understanding of the phenomenon is the mixed approach, as it provides an in-depth analysis from both objective and qualitative dimensions, which benefits the field. The theoretical framework supports the use of a mixed approach due to its flexibility in various research settings. According to Creswell and Creswell (2018), combining qualitative and quantitative methods helps strengthen comprehensive insights, which is

especially useful when evaluating educational tools and resources and assessing the research experience of both participants and researchers.

Secondly, within the category called “Cognitive process of general objective,” results disclosed that most of the scientific records studied in this research focused on the cognitive process, “analyzing level”, which encompassed research in exploring different educational cases that dealt with issues related to the affected population in English language teaching contexts. Therefore, most scientific papers delimited their progress into investigating rather than creating and evaluating emerging ICT tools and resources to overcome educational issues.

From the background, Msafiri et al. (2023) argued that their sample addressed the matter by investigating how ICT tools were implemented into the learning context and describing features, advantages, and disadvantages that those technological resources conveyed across their application toward the educational environments. Given this, Msafiri's (2023) research shared similar results to this study, depicting a sample that was established on the analyzing level process, so the scientific publications did not emphasize developing and designing new pathways to address the main issue investigated.

From the theoretical conception, Anderson and Krathwohl (2001) noted that the previous cognitive level focused on exploring the landscape and understanding the participants, as well as the factors that influenced them in specific contexts where the studies were conducted. However, this study’s findings revealed that scientific publications with higher cognitive objectives yielded more concise outcomes in terms of evaluating the efficiency of ICT tools and resources, as well as innovating through the creation of emerging technologies, with the aim of supporting the education of visually impaired learners. Anderson and Krathwohl (2001) support this by outlining higher cognitive levels, such as evaluating and creating, which demonstrate a more complex cognitive process that entails a more detailed and reflective approach.

Moving forward, the third category, called “Scholarly population level” aimed to analyze the education stage in which visually impaired students participated. In the present study, it was found that most of the documents involved participants in post-secondary non-tertiary education and degree in tertiary education, specifically 12 scientific publications. The minority were part of primary and secondary education, and there were no learners from early childhood education.

Nevertheless, the background study developed by Hoskin et al. (2022) demonstrated that most studies had participants at the kindergarten level, and the remaining research ranged from primary to secondary education.

Therefore, there was a clear contrast between the present study and the research by Hoskin et al. (2022), as it highlighted how some of the sampling focused on early childhood education, while others focused on higher education. Despite this, it created a context where researchers included all kinds of visually impaired populations, but visually impaired learners from primary and secondary education were not as well represented as those from other levels, highlighting a group in need of further development.

From a theoretical perspective, Simon et al. (2010) agree that visually impaired learners can excel in any educational setting, provided they have access to the right tools, resources, accommodations, and effective teaching methods. Consequently, this study and Hoskin et al.'s (2022) research depict a thriving educational environment for people with visual impairments, highlighting efforts in research that support the affected population in learning English and utilizing ICT tools and resources to facilitate visually impaired apprentices' learning paths.

From the fourth category, "Data collection techniques", a comprehensive panorama of the instruments employed by 20 documents during their research is depicted. This study uncovered that interviews were the most recurrent technique for data collection, principally due to the qualitative core of most publications. Consequently, this technique focused on exploring visually impaired students' experiences and insights regarding the implementation of ICT tools and resources, supplying rich, detailed data to draw meaningful conclusions from what was applied. Conversely, the background study from Hashemi and Kew (2021) revealed that surveys were the primary data collection technique, with a predominance of a quantitative nature. Surveys collected numerical data from a large sample, identifying the barriers from the people who were directly involved in the use of ICT in English language teaching.

Within the framework of this literature review, when examining the use of ICTs in educational processes for learners with visual impairment, it was essential to consider the students' own experiences. Medina et al. (2023) argue that interviews allowed for the exploration of likes, dislikes, perceptions, and difficulties within the teaching-learning process. Medina et al.

(2023) also noted that the application of a quantitative technique, such as a survey or a test, enabled a more accurate and objective measurement of apprentices' performance. Therefore, the joint use of data collection techniques with a quantitative and subjective nature was pertinent since it enabled approaching the analysis from a broader standpoint, integrating both subjective elements and some objective aspects of the ICT-mediated educational journey.

Following the last category, "the effectiveness of ICT tools and resources," a wide set of components was identified in the 20 scientific records. The present research identified screen readers as an excellent way to transform ordinary digital content into essential materials that help visually impaired learners interact with more ICT tools and resources. However, it was observed that a lack of teachers' training limited their usage. On the other hand, listening-based resources, such as Netflix, descriptive audio, and educational capsules, proved to be vital technological aids for visually impaired learners to develop listening skills and vocabulary acquisition through English exposure, while being affordable for their implementation. Finally, there were creative and original technological sources developed by their researchers, including Application Eyeland and Audio Juego Institutional "Aulin", assisting visually impaired apprentices to strengthen English skills.

Similarly, Robles et al. (2024) observed similar results, as screen readers like JAWS, NVDA, and MELDICT were the most frequently used in their sample of 17 documents. They demonstrated positive outcomes in listening skills, enabling students to access more sources and empowering the use of MALL (Mobile Assisted Language Learning). Theory aligns with that outcome, as Fichten et al. (2001) and Revelo (2021) agree that implementing screen readers in educational practices for people with visual impairments helps learners participate more effectively in digital environments.

However, this study's findings, along with those of Robles et al. (2024), demonstrate a lack of training and capacity to utilize this ICT tool in educational environments, thereby reducing the effectiveness and impact that those technological resources can offer. In this sense, Bonilla. (2019) advocates that pedagogical guidance is needed to orient and utilize the capacities of visually impaired learners; otherwise, their learning process can be impacted.

Despite the issues encountered, these findings demonstrated that ICT tools and resources were ideal for neglected contexts such as apprentices with visual impairment in education, since these modern and technological sources aimed to empower visually impaired learners' traits while reinforcing their weaknesses. A background study developed by Betancour and Sanchez (2018) underscored the importance of implementing emerging technologies within contexts that involve visually impaired students learning English, as they require better ways to leverage their abilities through alternative means. These results can be consolidated by the theoretical framework view from the remark that ICT in education can aid English proficiency development across modern tools, cataloging this as a substantial assistant for educators based on interactive and engaging tasks (Alkamel and Chouthaiwale, 2018).

Conclusions and recommendations

Conclusions

This literature review aimed to answer the research question: What scientific production has been published about Information and Communication Technology (ICT) to teach English as a foreign language to people with visual impairment in America from 2014 to 2024? highlighting its relevance in addressing the gap evidenced in the scientific literature on the inclusion of ICTs. Therefore, the following conclusions were drawn in order to provide a solution to the specific objectives and the research question established:

Once the information had been compiled, the characterization of the scientific publications was consolidated as a fundamental stage in the methodological approach, since it allowed the data to be organized in a structured manner. This characterization showed that some studies adopted a qualitative approach and others a mixed approach. Regarding the methodological designs, several were found, such as case study, action research, ethnographic, phenomenological, cross-sectional and sequential exploratory. Likewise, the data collection instruments used in the studies were interviews, surveys, observations, tests, questionnaires and others. This characterization allowed highlighting that the research has a solid structure, with well-defined general and specific objectives, thus denoting its investigative scope according to the cognitive process. Regarding the target population of the studies, it was possible to visualize that the investigations focused on both basic and higher educational levels, finally, the results reflected a wide variety of technological tools used in the teaching of English such as JAWS, NVDA, Braille displays, typhotechnological tools and auditory resources. To conclude this first objective, the characterization process was a pillar, allowing a clear and structured view of the information, facilitating the identification of patterns, differences between studies and consolidating a solid base for the classification and contrast processes.

In relation to the classification process, it allowed for a more detailed and structured analysis of the research, by rigorously organizing the information gathered from the research components. This classification allowed for the open and axial coding of each of the research components, which made it possible to establish five fundamental emerging categories for the

contrast of the information. As for the methodological component, the category “Methodological Approach” was established, which integrated both the designs and the methodological approaches of the studies. The research objectives were categorized in “Cognitive Process of General Objectives”, which made it possible to identify the cognitive levels involved and to evaluate more precisely the scope of the studies, while the population was grouped in “Population Scholarly Level”, making it possible to visualize the educational levels addressed in the studies. The data collection instruments were organized in “Data Collections Techniques”, which consolidates those tools and data collection techniques. Finally, the results were classified as “Effectiveness of ICT Tools and Resources”, as it encompasses the technological resources used as well as the perceptions collected from teachers, students and researchers. This process not only facilitated a deep understanding of the research components, but also provided a solid basis for contrasting the findings.

Finally, the process of contrast revealed significant patterns and differences among the studies analyzed. Regarding the category “Methodological Approach”, it was identified that most of the researches adopted a qualitative approach focused on exploring the students' perceptions and experiences, prioritizing the subjective aspects of learning over the objective evaluation of the effectiveness of ICT tools. In the category “Cognitive Process of General Objectives”, a trend towards higher order cognitive processes such as analysis and creation were evidenced, which is reflected in the formulation of objectives oriented to the design of innovative ICT strategies, methodologies and resources. In regard to the category “Population Scholarly Level”, the contrast showed that most of the studies concentrated on higher education students, neglecting the preschool, primary and secondary levels. As for the category "Data Collection Techniques", the predominant use of interviews, surveys and observations as data collection instruments, suitable for capturing qualitative experiences, was confirmed. Finally, the contrast in the category "Effectiveness of ICT Tools and Resources" showed that screen readers such as JAWS and NVDA, as well as auditory resources, were the most used and valued for their ability to foster communicative skills in English, promote educational inclusion and increase the motivation of students with visual impairment.

Overall, it is important to recognize that these information and communication technologies perform an important role for the inclusion and significant development of

communicative skills in English, since they foster the teaching and learning processes in education. However, in the research developed, the lack of scientific research that addresses this problem was evident, which suggests the need to promote future research, both quantitative and mixed, that not only studies the student's experience but also evaluates its effectiveness, thus contributing to close the gap that has been evidenced.

Recommendations

Based on the findings obtained in the development of this literature review, several limitations and opportunities were identified that allow us to project new research on the teaching of English to people with visual impairment mediated by ICT. Therefore, the following recommendations are proposed as a response to the difficulties encountered during the study, with the aim of guiding future researchers interested in deepening this line of study:

- One of the main challenges was the limited scientific production on the subject. Although valuable research was identified through Scopus, Google Scholar and Semantic Scholar, it is pertinent to expand the search sources in other databases, which would allow access to more extensive, relevant and beneficial information for the study of this problem.
- The qualitative approach provided a rigorous and detailed collection and analysis of the information; however, objective validation was neglected. It is suggested that future research adopt more solid methodological designs, such as systematic reviews or meta-analyses, as well as mixed approaches that combine qualitative and quantitative data to make the results more robust.
- Regarding technological resources, the findings evidenced a positive and significant impact on teaching processes. However, some of these resources presented economic barriers. For this reason, it is recommended that future research should focus on accessible and free tools, such as the Eyeland application and Educational Capsules, which proved to be viable and easily adaptable for this population.

References

Alkamel, M. A. A., & Chouthaiwale, S. S. (2018). The use of ICT tools in English language teaching and learning: A literature review. *Veda's Journal of English Language and Literature (JOELL), 5*(2), 29–33. https://www.researchgate.net/publication/330986788

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman. https://haqaa2.obsglob.org/wp-content/uploads/2020/11/2001_Anderson_A-taxonomy-for-learning-teaching-and-assessing.-A-Revision.pdf

Arias, M. E. (2010). *Relaciones interpersonales entre niños con discapacidad visual y sus compañeros videntes en el contexto educativo regular* [Specialization thesis, Universidad de Cuenca, Facultad de Filosofía, Letras y Ciencias de la Educación]. https://dspace.ucuenca.edu.ec/bitstream/123456789/2835/1/te4148.pdf

Avergano, J., & Cano, J. (2023). *Análisis de la implementación de estrategias pedagógicas en la enseñanza del inglés como lengua extranjera en estudiantes de secundaria* [Undergraduate thesis, Universidad Central del Valle del Cauca]. https://repositorio.uceva.edu.co/bitstream/handle/20.500.12993/4609/TG-avergano-jcano.pdf?sequence=1&isAllowed=y

Belloch, C. (2012). *Las tecnologías de la información y comunicación en el aprendizaje* [Teaching material]. Departamento de Métodos de Investigación y Diagnóstico en Educación, Universidad de Valencia. http://www.uv.es/bellochc/pedagogia/EVA1.pdf

Betancourt, N. C., & Sánchez, I. Z. (2018). *Creación de sistema interactivo para apoyar el desarrollo de la conciencia fonológica de niños ciegos entre 5 y 7 años en el Instituto de Niños Ciegos y Sordos del Valle del Cauca* [Undergraduate thesis, Universidad Autónoma de Occidente]. https://red.uao.edu.co/bitstream/handle/10614/10547/T08221.pdf

Bonilla, O. S. C. (2019). *Ambiente de aprendizaje mediado por TIC: Una estrategia didáctica para mejorar la competencia comunicativa en inglés* [Master's thesis, Universidad de La Sabana]. https://intellectum.unisabana.edu.co/handle/10818/36093

Booth, T., & Ainscow, M. (2002). *Index for inclusion: A guide to school development led by inclusive values* (2nd ed.). Index for Inclusion Network. https://www.ph-noe.ac.at/fileadmin/root_phnoe/Forschung/Migration/Index_curriculum_pages.pdf

Brown, D. (2001). *Teaching by principles: An interactive approach to language pedagogy* (2nd ed.). Cambridge University Press. https://octovany.wordpress.com/wp-content/uploads/2013/12/ok-teaching-by-principles-h-douglas-brown.pdf

Brown, D. (2021). *Principles of language learning and teaching* (6th ed.). Pearson Education, Inc. https://away.vk.com/away.php?rh=8fc79fc2-4c2b-44d0-85d4-f388c6fde084

Busto Osorio, P. A. (2018). *Semiótica de la ablepsia en la novela "Ensayo sobre la ceguera" de José Saramago* [Undergraduate thesis, Universidad La Gran Colombia]. Repositorio Institucional UGC. https://repository.ugc.edu.co/items/b214cd15-b36a-4bb9-8c09-dbb41fb32d92

Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. NetLibrary. https://spada.uns.ac.id/pluginfile.php/253332/mod_resource/content/1/ICC%20Byram.pdf

Cárdenas, J., & Inga, E. (2020). Novel approach for teaching English language using emerging information and communication technologies for visual impairment students. *Enfoque UTE, 11*(4), 75–88. https://www.redalyc.org/journal/5722/572262052004/html/

Cárdenas, J., & Inga, E. (2021). Methodological experience in the teaching-learning of the English language for students with visual impairment. *Education Sciences, 11*(8), 379. https://www.semanticscholar.org/reader/7ead3c11cff00909f9c28ad2525268d37ec493b5

Castro, G. J. V. (2022). *Didactic practices for students with visual difficulties in the EFL context* [Master's thesis, Universidad Libre de Colombia]. Repositorio Institucional Unilibre. https://repository.unilibre.edu.co/handle/10901/24536

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). SAGE Publications. https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications. https://spada.uns.ac.id/pluginfile.php/510378/mod_resource/content/1/creswell.pdf

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2019). Implications for educational practice of the science of learning and development. *Applied Developmental Science, 24*(2), 97–140. https://doi.org/10.1080/10888691.2018.1537791

Dudeney, G., & Hockly, N. (2007). *How to teach English with technology*. Pearson Education Limited. https://content.fimsschools.com/ebooks/English%2003/How%20To%20Teach%20English%20With%20Technology%20Book.pdf

Dudeney, G., Hockly, N., & Pegrum, M. (2013). *Digital literacies: Research and resources in language teaching*. Routledge. https://api.pageplace.de/preview/DT0400.9781317860303_A23913365/preview-9781317860303_A23913365.pdf

Echeita, G. (2013). *Inclusión y exclusión educativa: De nuevo "voz y quebranto"*. Universidad Autónoma de Madrid. http://web.uam.es/personal_pdi/stmaria/sarrio/DOCUMENTOS.pdf

Edmonds, W. A., & Kennedy, T. D. (2017). *An applied guide to research designs: Quantitative, qualitative, and mixed methods* (2nd ed.). SAGE Publications. https://ndl.ethernet.edu.et/bitstream/123456789/48430/1/19.pdf

Ellis, R. (1994). *The study of second language acquisition*. Oxford University Press. https://drive.uqu.edu.sa/_/malehyani/files/Rod-Ellis-The-Study-of-Second-Language-A.pdf

Fichten, C. S., Asuncion, J. V., Barile, M., Fossey, M., & De Simone, C. (2000). Access to educational and instructional computer technologies for post-secondary students with disabilities: Lessons

from three empirical studies. *Journal of Educational Media, 25*(3), 179–191. https://doi.org/10.1080/1358165000250302

Goddard, H. H. (1912). *The Kallikak family: A study in the heredity of feeble-mindedness*. University of St. Michael's College. https://ia600905.us.archive.org/17/items/kallikakfamilyst00godduoft/kallikakfamilyst00godduoft.pdf

González M., R. D. (2005). *Aspectos básicos del estudio de muestra y población para la elaboración de los proyectos de investigación* [Undergraduate thesis, Universidad de Oriente]. Repositorio Institucional de la Universidad de Oriente. http://ri2.bib.udo.edu.ve/bitstream/123456789/2421/2/TESIS_RGyFS--%5B00600%5D--%28tc%29.pdf

Gómez S., G. A. (2023). *Educational capsules of audiovisual content for the development of listening skills in visually impaired students at Daniel Reyes High School* [Undergraduate thesis, Universidad Técnica del Norte]. Repositorio Digital Universidad Técnica del Norte. https://repositorio.utn.edu.ec/handle/123456789/14503

Guevara Patiño, R. (2016). El estado del arte en la investigación: ¿Análisis de los conocimientos acumulados o indagación por nuevos sentidos? *Folios, 44*, 165–179. https://doi.org/10.17227/01234870.44folios165.179

Grupo Accedo. (2013). Utilización de las TIC por parte de los alumnos con discapacidad visual como elemento de apoyo al aprendizaje de la lectoescritura. *Integración: Revista Digital sobre Discapacidad Visual, 62,* 7–31. https://www.once.es/dejanos-ayudarte/la-discapacidad-visual/revista-red-visual/numeros-anteriores-revista-integracion/2013-integracion-62/Utilizacion-de-las-TIC-por-parte-de-los-alumnos-con-discapacidad-visual-como-elemento-de-apoyo-al-aprendizaje-de-la-lectoescritura

Harmer, J. (2015). *The practice of English language teaching* (5th ed.). Pearson Longman. https://fliphtml5.com/lijqd/ixsf/The_practice_of_English_Language_Teaching_%285th_Edition%29_%28Harmer%2C_Jeremy%29_%28z-lib.org%29

Hashemi, A., & Kew, S. N. (2021). The barriers to the use of ICT in English language teaching: A systematic literature review. *Journal of Information and Communication Technologies*, *3*(1), 77–88. https://scispace.com/pdf/the-barriers-to-the-use-of-ict-in-english-language-teaching-5fqsjbl4bc.pdf

Hernández, R., Fernández, C., & Baptista, P. (2014). *Metodología de la investigación* (6.ª ed.). McGraw-Hill Education. https://www.esup.edu.pe/wp-content/uploads/2020/12/2.%20Hernandez,%20Fernandez%20y%20Baptista-metodología%20Investigacion%20Cientifica%206ta%20ed.pdf

Hornby, G. (2011). Inclusive education for children with special educational needs: A critique. *International Journal of Disability, Development and Education, 58*(3), 231–241. https://doi.org/10.1080/1034912X.2011.598678

Hoskin, E. R., Coyne, M. K., White, M. J., Dobri, S. C. D., Davies, T. C., & Pinder, S. D. (2022). Effectiveness of technology for braille literacy education for children: A systematic review. *Disability and Rehabilitation: Assistive Technology, 19*(1), 120–130. https://doi.org/10.1080/17483107.2022.2070676

Hoyos Botero, C. (2000). *Un modelo para investigación documental: Guía teórico-práctica sobre construcción de estados del arte con importantes reflexiones sobre la investigación.* Señal Editora. https://es.scribd.com/document/406768006/Un-Modelo-Para-Investigacion-Documental-Consuelo-Hoyos-Botero

Jackson-Summers, A. G., Mrakovcich, K. L., Gray, J. P., Fleischmann, C. M., Emami, T., & Page, E. J. (2024). A systematic review of inclusive pedagogical research using the CIRTL inclusive pedagogy framework: Multidisciplinary and STEM perspectives, current trends, and a research agenda. *Discover Education.* https://doi.org/10.1007/s44217-024-00093-y

Jacobs, H. H. (2010). *Curriculum 21: Essential education for a changing world.* ASCD. https://repository.bbg.ac.id/bitstream/607/1/Curriculum_21_Essential_Education_for_a_Changing_World.pdf

Jedynak, M. (2023). Current issues in FL learning and teaching in the context of the visually impaired learners. In M. Baran-Łucarz, A. Czura, M. Jedynak, A. Klimas, & A. Słowik-Krogulec (Eds.), *Contemporary issues in foreign language education* (Vol. 32, pp. 129–142). Springer. https://doi.org/10.1007/978-3-031-28655-1_8

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research, 1*(2), 112–133. https://www.researchgate.net/publication/235413072_Toward_a_Definition_of_Mixed_Methods_Research_Journal_of_Mixed_Methods_Research_1_112-133

Jonassen, D., Carr, C., & Yueh, H. (2000). Computers as mindtools for engaging learners in critical thinking. https://www.researchgate.net/publication/245753708_Computers_as_Mindtools_for_engaging_learners_in_critical_thinking

Kachru, B. B. (1991). *World Englishes and applied linguistics.* https://files.eric.ed.gov/fulltext/ED347805.pdf

Kanchanasuttirak, P. (2025). Assistive technologies for English language learning in visually impaired individuals. *World Journal of Advanced Research and Reviews.* https://doi.org/10.30574/wjarr.2025.25.3.0841

Kraus, S., Breier, M., Lim, W. M., Dabić, M., Kumar, S., Kanbach, D., Mukherjee, D., Corvello, V., Piñeiro-Chousa, J., Liguori, E., Palacios-Marqués, D., Schiavone, F., Ferraris, A., Fernandes, C., & Ferreira, J. J. (2022). Literature reviews as independent studies: Guidelines for academic practice. *Review of Managerial Science, 16*(8), 2577–2595. https://doi.org/10.1007/s11846-022-00588-8

Krashen, S. D. (1982). *Principles and practice in second language acquisition.* Pergamon Press Inc. https://www.sdkrashen.com/content/books/principles_and_practice.pdf

Leidy, M., Merkel, H., & Burke, H. (1980). Using computer assisted instruction in an ESL language program. *NALLD Journal.* https://journals.ku.edu/iallt/article/view/9074/8568

Levy, P. (1997). *Collective intelligence: Mankind's emerging world in cyberspace.* Perseus Books. https://www.tandfonline.com/doi/abs/10.1207/S15326993ES3101_4

Llovet, F. (2021, January 14). *El sentido de la vista: importancia y cuidados.* Clínica Baviera. https://www.clinicabaviera.com/blog/el-sentido-de-la-vista/

Lonergan, J. (1984). *Video in language teaching.* Cambridge University Press. https://archive.org/details/videoinlanguaget00lone

Luo, Z. (2024). A review of Krashen's input theory. *Journal of Education, Humanities and Social Sciences.* https://doi.org/10.54097/3fnf5786

Madej, P. (2017). The use of ICT tools for teaching foreign languages in the military sector. *Security and Defence Quarterly.* https://securityanddefence.pl/pdf-103191-36136?filename=The%20use%20of%20ICT%20tools%20for.pdf

Manzano Núñez, R., & García Perdomo, H. A. (2016). Sobre los criterios de inclusión y exclusión. Más allá de la publicación. *Revista Chilena de Pediatría*, *87*(6), 463–464. https://www.scielo.cl/scielo.php?script=sci_arttext&pid=S0370-41062016000600015

Medina Gonzalez, Y. M. (2020). *Teaching American English sounds to blind and low vision learners using assistive technology* [Master's thesis, Michigan State University]. MSU ScholarWorks. https://d.lib.msu.edu/etd/48631

Medina, M., Rojas, R., Bustamante, W., Loaiza, R., Martel, C., & Castillo, R. (2023). *Metodología de la investigación: Técnicas e instrumentos de investigación.* Instituto Universitario de Innovación Ciencia y Tecnología Inudi Perú. https://doi.org/10.35622/inudi.b.080

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Sage Publications, Inc. https://vivauniversity.wordpress.com/wp-content/uploads/2013/11/milesandhuberman1994.pdf

Msafiri, M. M., Kangwa, D., & Cai, L. (2023). A systematic literature review of ICT integration in secondary education: What works, what does not, and what next? *Discover Education, 2*, Article 44. https://doi.org/10.1007/s44217-023-00070-x

Naranjo, D. B. A., Banchón, M. J., & Martínez, B. C. A. (2019). Recursos didácticos 3D para el aprendizaje significativo para estudiantes con discapacidad visual. *Revista Boletín REDIPE.* https://revista.redipe.org/index.php/1/article/view/938/882

North Carolina State University Writing and Speaking Tutorial Service. (2006). *Writing a literature review and using a synthesis matrix.* Wayne State University. https://engineering.wayne.edu/industrial-systems/pdfs/ncsu_writing_and_speaking_tutorial_service2006writing_a_literature_review_and_using_a_synthesis_matrix.pdf

ONCE. (2020). *Características de la discapacidad visual y ceguera.* https://www.once.es/dejanos-ayudarte/la-discapacidad-visual

Papert, S. (1980). *Children, computers, and powerful ideas.* Basic Books, Inc. https://worrydream.com/refs/Papert_1980_-_Mindstorms,_1st_ed.pdf

Pennycook, A. (2017). *The cultural politics of English as an international language.* Routledge. https://bayanebartar.org/file-dl/library/Linguistic1/The_Cultural_Politics_of_English.pdf

Pineda, B., De Alvarado, E. L., & De Canales, F. (1994). *Metodología de la investigación: Manual para el desarrollo de personal de salud* (2nd ed.). Organización Panamericana de la Salud. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjlgvfVqN6NAxVASDABHUtcPOkQFnoECBgQAQ&url=http%3A%2F%2F187.191.86.244%2Frceis%2Fregistro%2FMetodologia%2520de%2520la%2520Investigacion%2520Manual%2520para%2520el%2520Desarrollo%2520de%2520Personal%2520de%2520Salud.pdf&usg=AOvVaw3pL9ODqnohV0d_5NH4N06R&opi=89978449

Polok, K., & Maślanka, A. (2022). The use of new technology in teaching English to visually impaired students. *Człowiek – Niepełnosprawność – Społeczeństwo*, *1*(55), 33–47. https://doi.org/10.5604/01.3001.0015.8511

Prabhu, N. S. (1987). *Second language pedagogy*. Oxford University Press. https://gustavorubinoernesto.com/wp-content/uploads/2020/09/N.S.-Prabh-Second-Language-Pedagogy.pdf

Ramos, M. (2014). *Metodología de la enseñanza de la lengua inglesa* [Undergraduate thesis, Universidad de Valladolid]. Repositorio UVA. https://uvadoc.uva.es/bitstream/handle/10324/8310/0.pdf?sequence=1

Raval, D. R. M. R. (2014). Use of ICT in English language teaching. *International Journal of Research in All Subjects in Multi Languages*. https://www.raijmr.com/ijrsml/wp-content/uploads/2017/11/IJRSML_2014_vol02_issue_02_07.pdf

Razmjoo, S. A., & Sabourianzadeh, N. (2018). An exploration of practices adopted by EFL teachers for learners with low-incidence disabilities in inclusive classes. *Applied Research on English Language*, *7*(1), 89–110. https://doi.org/10.22108/are.2018.110687.1283

Revelo Trujillo, J. E. (2021). *Teachers and visually impaired EFL students' experience and perceptions about using screen readers at an English institute in an Ecuadorian university* [Master's thesis, Universidad Técnica del Norte]. https://repositorio.utn.edu.ec/handle/123456789/10895

Richards, J. C., & Rodgers, T. S. (2001). *Approaches and methods in language teaching* (3rd ed.). Cambridge University Press. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi83vyfm96NAxUmfTABHdGfMA0QFnoECAoQAQ&url=https%3A%2F%2Favys.omu.edu.tr%2Fstorage%2Fapp%2Fpublic%2Fdbuyukahiska%2F134963%2FApproaches-and-Methods-in-Language-Teaching.pdf&usg=AOvVaw3x8bT0f--DjczxzBTmiL99&opi=89978449

Robinson, J., & Zaitun, A. (2006). The utilization and integration of ICT tools in promoting English language teaching and learning: Reflections from English option teachers in Kuala Langat

District, Malaysia. *International Journal of Education and Development Using ICT*. http://ijedict.dec.uwi.edu/viewarticle.php?id=161

Robles, H., Perez, A., Villalba, K., Delgado-Cañas, M. C., Villanueva, E., Keogh, C., & Jimeno, M. (2024). Language learning apps for visually impaired users: A systematic review. *Research and Practice in Technology Enhanced Learning*, *19*, Article 012. https://doi.org/10.58459/rptel.2024.19012

Ryan, G. W., & Bernard, H. R. (2000). Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 769–802). Sage Publications. https://qualquant.org/wp-content/uploads/text/2000%20Ryan_Bernard.denzin.pdf

Sánchez Carmona, M. L. (2018). Las matrices o tablas de doble entrada: Una aplicación práctica en las investigaciones de diseño (No. 3, pp. 107–112). Universidad Autónoma Metropolitana, Unidad Azcapotzalco, Coordinación de Posgrado de Ciencias y Artes para el Diseño. https://core.ac.uk/download/pdf/289121173.pdf

Santos, K. D. S., Ribeiro, M. C., Queiroga, D. E. U., Silva, I. A. P. D., & Ferreira, S. M. S. (2020). The use of multiple triangulations as a validation strategy in a qualitative study. *Ciencia & Saúde Coletiva*, *25*(2), 655–664. https://doi.org/10.1590/1413-81232020252.12302018

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology & Distance Learning*. https://www.scirp.org/reference/referencespapers?referenceid=102338

Selwyn, N. (2016). *Is technology good for education?* (1st ed.). Wiley. https://www.perlego.com/book/1535949/is-technology-good-for-education-pdf

Simon, C., Echeita, G., Sandoval, M., & López, M. (2010). The inclusive educational process of students with visual impairments in Spain: An analysis from the perspective of organization. *Journal of Visual Impairment & Blindness*, *104*(9), 583–595. http://dx.doi.org/10.1177/0145482X1010400909

Skinner, B. F. (1957). *Verbal behaviour*. Prentice-Hall, Inc. https://www.bfskinner.org/wp-content/uploads/2014/05/2014_05_P_003.pdf

Strauss, A., & Corbin, J. (2015). *Basics of qualitative research: Grounded theory procedures and techniques*. Sage Publications. http://library.atu.kz/files/50909.pdf

UNESCO. (1994). *The Salamanca statement and framework for action on special needs education*. World Conference on Special Needs Education: Access and Quality. https://www.european-agency.org/sites/default/files/salamanca-statement-and-framework.pdf

UNESCO. (2013). *International Standard Classification of Education: ISCED 2011*. UNESCO Institute for Statistics. https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-sp.pdf

UNESCO. (2020). *Global education monitoring report 2020: Inclusion and education: All means all*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000373718

Ur, P. (1996). *A course in language teaching: Practice and theory*. Cambridge University Press. https://sacunslc.wordpress.com/wp-content/uploads/2015/03/penny-ur-a-course-in-language-teaching-practice-of-theory-cambridge-teacher-training-and-development-1996.pdf

Vergara, D., Extremera, J., Rubio, M. P., & Dávila, L. P. (2020). The technological obsolescence of virtual reality learning environments. *Applied Sciences*, *10*(3), 915. https://doi.org/10.3390/app10030915

Visión y Óptica. (2022). La población con discapacidad visual logra mayor independencia y autonomía. https://visionyoptica.com/la-poblacion-con-discapacidad-visual-logra-mayor-independencia-y-autonomia/

Vives Varela, T., & Hamui Sutton, L. (2021). La codificación y categorización en la teoría fundamentada, un método para el análisis de los datos cualitativos. *Investigación en Educación Médica*, *10*(40), 97–104. https://doi.org/10.22201/fm.20075057e.2021.40.21367

Warschauer, M. (1996). Computer-assisted language learning: An introduction. In S. Fotos (Ed.), *Multimedia language teaching* (pp. 3–20). Logos International. http://www.ict4lt.org/en/warschauer.htm

Watts, M. C. E., & Lee, L. L. (2017). Las TIC como herramientas de inclusión educativa. *Acta Scientiæ Informáticæ*, *1*(1). https://doi.org/10.32719/2617-9245.2017.1.1.5

Wilkins, D. A. (1976). *National syllabuses: A taxonomy and its relevance to foreign language curriculum development*. Oxford University Press. https://www.scribd.com/doc/66790485/Notional-Syllabus-D-a-Wilkins

World Health Organization. (1980). *International classification of impairments, disabilities, and handicaps*. World Health Organization. https://iris.who.int/bitstream/handle/10665/41003/9241541261_eng.pdf?sequence=1

World Health Organization. (2019). *World report on vision*. https://iris.who.int/bitstream/handle/10665/328717/9789241516570-eng.pdf

Yuan, F. (2018). An English-language multimedia teaching model based on Krashen's theory. *International Journal of Emerging Technologies in Learning*, *13*, 198–209. https://doi.org/10.3991/IJET.V13I08.9051

Appendices

Appendix A
Synthesis Matrix

Research title, author and year	Type of document	Methodology	Objectives	Population	Instruments	Results
#1Methodological Experience in the Teaching-Learning of the English Language for Students with Visual Impairment by Jorge Cárdenas and Esteban inga in 2021	Article	Approach: Qualitative Desing. Systematic Scope:	General Objective: To describe the methodological experience in the teaching-learning process of the English language based on a best practices methodology for students with visual impairments. Specific Objectives: To systematize the methodology applied in the teaching-learning process of the English language for students with visual impairments. To categorize the stages of the methodological process developed according to the skills and competencies required in the English language using assistive technologies for the visually impaired. To determine the roadmap that enables the management of the method implemented in the learning of the English language for students with visual impairments.	The study population was 13 students with visual impairment during the eight academic periods at Salesian Polytechnic University of Ecuador in Quito.	Likert Scale Surveys	Based on the experience acquired during this process, it can be mentioned that there is an urgent need for teachers to be trained in the use of emerging and alternative tools. This means that their "disciplinary, didactic and pedagogical knowledge" is not enough; it is also necessary to incorporate in their training the technological knowledge and management of typhlo-technical tools such as JAWS.
#2 EFFECTIVE STRATEGIES FOR EFL TEACHERS OF VISUALLY IMPAIRED LEARNERS: A RESEARCH SYNTHESIS by Rodriguez in 2023	Thesis	Approach: Mixed Design: Exploratory sequential Scope:	General objective: To apply effective strategies in students with visual disabilities in the process of teaching English as a foreign language. Specific objectives: -To identify strategies that allow teachers to train visually impaired students of teaching English as a foreign language. -To propose a set of guidelines for teaching a foreign language based on effective strategies. -To determine support resources for the teaching process of a foreign language to	The population of this study counted with a total of 55 foreign language teachers who have had or are currently teaching languages to learners with any type of visual impairments as identified in this research case.	Structured survey: The primary data collection instrument was a structured survey consisting of 6 questions aimed at gathering specific information about the teaching of a foreign language to students with visual impairments.	This study indicated that technological resources like JAWS and Brialle display should be used in reading and writing activities to support students with visual impairments. Consequently, technological resources allow learners with visual impairments to access reading and writing exercises in a more accurate, timely and independent manner through speech synthesizers.
#3 Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations by Miriam Sester Retorta and Vera Lúcia Lopes Cristovão in 2017	Article	Approach: Qualitative Desing: ethnographic Scope: interprettive	General Objective: - To investigate how smartphones could be used as assistive technologies to teach the English language to visually-impaired students. Specific Objectives: -search for new apps for smartphones that could be used for English-language learning - investigate how the blind students use smartphones to communicate and learn English -Evaluate the learning process of using smartphone apps in order to learn English.	The population involved in the research "Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations" consisted of 15 visually impaired students. In relation to their educational backgrounds, four had high school degrees and two were still in high school. The older ones (four of them), over 40 years of age, lived in the Blind Institute of Curitiba until high school.The remaining students had special tutoring at the Blind Institute of Curitiba or the Visually Impaired Association of Paraná for a part of the day. Then they went to regular schools for the other part.	The use of non participative observations, podcasts, and written exercises prepared in Google Form (Google, Inc.); two questionnaires were used	ICTs, more specifically smartphones, are radically transforming how we access our shared knowledge sources by keeping us constantly connected to near-infinite volumes of data and information. The project revealed that both undergraduate and visually-impaired students were taken by a sense of self-determination, collective collaboration, and personal development. Through the use of smartphones and their interface with PCs and laptops, we could determine that it is totally feasible to teach visual-impaired people to speak English.
#4Novel Approach for Teaching English Language using Emerging Information and Communication Technologies for Visual Impairment Students by Cardenas and Inga in 2019	Article	Approach: Qualitative. Design: Case study scope:	General Objective: To propose and evaluate a novel methodological strategy that incorporates meaningful learning and emerging technologies to enhance the teaching-learning process of the English language for students with visual impairments. Specific Objectives: To identify the challenges and limitations faced by teachers and students with visual impairments in the teaching-learning process of the English language. To develop a roadmap of good practices for implementing meaningful learning strategies and emerging technologies to foster visually impaired students' active, meaningful, and autonomous participation in the English language acquisition process.	The population included 10 students (eight from various university majors and two external students) with visual disabilities who participated in an English teaching program at the Salesiana Polytechnic University.	Structured Interviews, theoretical and written diagnostic test of pre-knowledge	The second indicator is about ICTs, they mention the importance that they have had in the VIS within their process and academic development and digital coexistence in the acquisition of the English language in a learning environment. By means of using of ICTs, specifically typhotechnological tools, the VIS have reduced the pe-dagogical communication gap in English language learning by a large percentage and have allowed them to move towards new proposals for real work, performance of tests and examinations.

#5 3D Teaching resources for meaningful learning of students with visual impairment by Bertha Alice Naranjo, Danny Javier Banchón and Carlos Alberto Martínez in 2019	Article	Approach: qualitative Design: Action research Scope: Descriptive	Objetivo general Explorar el uso de tecnologías 3D, en particular de los recursos didácticos en 3D con el fin de determinar si generan un aprendizaje significativo en los estudiantes con discapacidad visual	La población de la institución es de 25 estudiantes correspondiente a los cursos: Quinto, sexto y séptimo año de educación básica	Se usaron además técnicas de investigación como la entrevista y encuesta. La entrevista no estructurada consta de 6 preguntas, todas de tipo abierta, y fue aplicada a la Directora de la institución, así se obtuvo. información de las necesidades de recursos didácticos en 3D que requería la institución. La encuesta usó dos cuestionarios, uno para docentes y otro para estudiantes. El cuestionario para docentes incluyó 7 preguntas. Los cuestionarios pre-test y post-test para los estudiantes constaron de 4 preguntas cada uno.	Los resultados de las encuestas tanto de docentes y estudiantes coinciden en que los recursos impresos en 3D, fomentan el proceso de aprendizaje significativo, despiertan interés y motivación en los estudiantes en relación con los materiales tradicionales usados para el diseño de recursos didácticos como fomix y cartón. La desventaja es que no todas las instituciones pueden acceder a los equipos tecnológicos para crear este tipo de recursos impresos en 3D por el alto costo de los mismos.
#6 Learning to "see" again: Overcoming challenges while teaching English to visually impaired students by Villalba in 2022	Article	Approach: Qualitative Desing: ethnographic scope:	To determine the pedagogical and emotional challenges and the teaching strategies implemented in face-to-face complementary tutorial sessions requested by visually-impaired students (VIS) learning English as a foreign language in a virtual undergraduate course whose graphic nature diminishes their opportunities.	It focused on two visually impaired students who received face-to-face tutoring due to the difficulties they faced with online activities in a virtual undergraduate course	Transcripts of tutorial sessions, field notes and the author's personal reflection, organized and analyzed qualitatively under codes that represented the challenges and strategies identified.	Moreover, by questioning the students, I could promote their leading role in their learning process and learn from them while maintaining dialogues. Another conclusion from the endless questions I addressed was that one tutorial session per week was not enough to help my blind students. I planned to work with him every Thursday for 2 hours to use the Moodle platform exercises as well. To guarantee time efficiency, I selected the following strategies based on the answers given by the blind students: translating instructions from Moodle to L1 and describing each virtual environment in detail (screen description) would be helpful for them. Finally, listing the steps to follow and eliciting from their visual residue (trusting what they remember when they could see before losing their sight) helped me to contextualize them quickly and give meaningful examples of the lessons or tasks given.
#7 How a visually impaired student learns English in the context of online courses at UNAD University by Karen Ramon in 2015	Thesis	Approach: Qualitative research Desing: case study Scope:	General Objective ✓ Analyze the English teaching and learning process of a visually impaired student in the context of online courses at UNAD. Specific Objectives □ Identify the learning strategies that visually impaired student resort to in order to learn English in the context of online courses at UNAD. □ Analyze the characteristics of the materials used in the context of the online courses at UNAD □ Analyze the teacher´s mediation to teach a visually impaired student to learn English in the context of online courses at UNAD. □ Identify the classroom discourse patterns found in the tutorial English session with a visually impaired student in the context of online courses at UNAD.	1 visually-impaired psychology student	Participatory Observation, unstructured interview four sessions that were recorded with a video camera and a voice recorder	the analysis of the course in Moodle opens the doors to new tools that can be adapted to the VIS needs, such as the lab, the accessibility to different links, recordings and settings. In addition, it might be concluded that the implementation of new technologies and devices to special education and second language learning is a question of installing the appropriate software, acquiring specialized tools and improving little by little the methodology that should be used while having students with distinctive necessities.
#8 Ambiente de Aprendizaje mediado por TIC: Una estrategia didáctica para mejorar la competencia oral en inglés en un estudio de caso con Discapacidad Visual by Sindy Carolina Bonilla Orjuela in 2019	Thesis	Approach: qualitative Desing: Case Study scope: interpretative	Objetivo General Determinar el aporte de una estrategia didáctica mediada por TIC para mejorar la comunicación oral en inglés en un sujeto con discapacidad visual vinculado al SENA. Objetivos Específicos □ Diagnosticar el nivel de comunicación oral (escucha y habla) en inglés que presenta un sujeto con discapacidad visual vinculado al SENA antes y después de la implementación del Ambiente de Aprendizaje mediado por TIC. □ Describir el diseño y la implementación de una estrategia didáctica mediada por TIC para mejorar la habilidad oral en inglés en un sujeto con discapacidad visual vinculado al SENA. □ Identificar el avance del nivel comunicativo en inglés de un sujeto con discapacidad visual vinculado al SENA y el alcance de la estrategia didáctica aplicada.	Una alumna del Sena con Discapacidad Visual Estudia un programa Técnico en Asistencia Administrativa	Prueba de diagnóstico, entrevistas semiestructuradas con los participantes y los profesores, diario de campo, prueba final.	El ambiente de aprendizaje mediado por TIC con Videos, Kahoot, and JAWS ayudó a fortalecer la competencia comunicativa oral en la participante de la investigación, en cuanto a que adquirió vocabulario y expresiones que desconocía de una manera eficaz, entretenida y al uso de las mismas en contextos comunicativos reales y concretos. Su aprendizaje no solo radicó en el fortalecimiento de la competencia comunicativa; sino también lexical; así como, en el uso de elementos tecnológicos y multimediales que permitieron que la experiencia fuese interesante, llamativa y de interés para la audiencia objeto de estudio.

#9 Educational capsules of audiovisual content for the development of listening skills in visually impaired students at Daniel Reyes high school by Alexandra Gomez in 2023	Thesis	Approach: Mixed Desing: Case study Scope:	General Objective Propose the use of educational capsules of audiovisual content platforms as a pedagogical tool to enhance the development of listening skills in a second-grade student with visual impairment at "Daniel Reyes" high school in San Antonio de Ibarra during the 2022-2023 academic year. Specific Objectives □ Conduct bibliographic research to establish a framework for teaching the English language to visually impaired students and identify effective strategies for strengthening their listening skills. □ Determine the listening skills level of the participant in the study. □ Design educational capsules based on audiovisual content to promote the development of listening skills in English for visually impaired students	This case study will be conducted with the participation of Allan Yahir Benítez Rosero, a student of "Daniel Reyes" High School	These instruments were structured differently; the survey followed a structured format, while the interview adopted a semi- structured approach. Both instruments focused on the main objective of the proposal, which is to collect relevant information that will contribute to the design and development of the proposal.	Educational capsules adapted to this sequential approach are especially beneficial for visually impaired students, as they improve their comprehension and communication skills in the language. The integration of these educational capsules strengthens their listening skills and provides them with a valuable tool for their language development.
#10 A proposal of a basic english teaching course a1 as a foreign language aimed visual impairment students at the secondary level from "Joc Bolivia" (Juventud Obrera Cristiana) La Paz city by Maariela Calle and Milenka Mejia in 2023	Thesis	Approach: Qualitative Desing: Cross-sectional Scope: Descriptive	General objective -To develop a teaching program course A1 of English as a foreign language for secondary visual impairment students from JOC Bolivia in La Paz city. Specific Objectives -To identify the teaching needs of the English language to secondary visual impairment students from JOC Bolivia in La Paz city. -To determine the tools for teaching the English language to secondary visual impairment students from JOC Bolivia in La Paz city. -To create and adapt an A1 level book for teaching English as EFL to secondary visual impairment students from JOC Bolivia in La Paz city. -To apply for a teaching English program course as a foreign language to secondaryvisual impairment students from JOC Bolivia in La Paz city.	6 students who assists in secondary school	The Instrument used to assess the student's language skills is based on the DIALANG ASSESSMENT SYSTEM and the second was questionnaires	Furthermore, using descriptive audio and videos made it possible to understand the correct pronunciation of words and form mental images, resulting in students internalizing the information. Also, now that technology and the internet are easy to access and there are some programs which help to read, describe and understand the learning we suggest that online materials can be also developed since they would be available any time of the day and will be helpful to reinforce the process of learning. Thus, developing online material to visual impairment can be another innovative academic work for linguistic students.
#11 ESTUDIO DEL IMPACTO DE LA UTILIZACIÓN DE SOFTWARE EN LA ENSEÑANZA DEL IDIOMA INGLÉS BÁSICO A PERSONAS CON DISCAPACIDAD VISUAl by Cevallos in 2015	Thesis	Approach: cualitativo Desing: Exploratorio. Scope: Descriptivo	Objetivo General.- Analizar las herramientas de software educativo para la enseñanza del idioma Inglés para personas con discapacidad visual de la Asociación de Discapacitados visuales "18 de Mayo" de la ciudad de La Maná. Objetivos Específicos. □ Examinar la situación actual de la enseñanza del idioma Inglés a personas con discapacidad visual. □ Determinar las caracteristicas de las herramientas del software educativo para la enseñanza del idioma Inglés. □ Desarrollar un análisis comparativo detallado entre la situación actual de aprendizaje del idioma y aquella mediante software educativo aplicado a la enseñanza del idioma Inglés.	La investigación se centró en personas con discapacidad visual de la Asociación de Discapacitados Visuales "18 de Mayo" en La Maná, Cotopaxi, Ecuador. Esta población incluia 28 personas con ceguera total como aquellas con baja visión. Sin embargo no especifica las edades de los participantes.	Entrevista semi-estructurada Además se direcciona hacia la validación de la información obtenida mediante la aplicación de las herramientas de recolección de datos, tanto de la encuesta como de la ficha de observación del fenómeno, finalizando con la demostración de la hipótesis inicialmente propuesta.	El uso del Dabin Diccionario Ingles/Español digital para personas ciegas permitió mejorar aspectos críticos que mantienen las personas con déficit visual al momento de ingresar a esta tipologia de educación. Tambien la mejora en problemáticas como sustitución de palabras por similitud, el verbalismo y las repeticiones por audio y escucha.
#12 Prácticas Educativas en la Enseñanza y el Aprendizaje de Lenguas Extranjeras a Estudiantes con Discapacidad Visual en una Universidad Pública Mexicana by Veronika de la Cruz in 2015	Thesis	Approach: Cualitativo Desing: Estudio de caso Scope:	El objetivo general del estudio fue: Analizar las prácticas educativas que convergen en la enseñanza y el aprendizaje de lenguas extranjeras a estudiantes con discapacidad visual en la Universidad Juárez Autónoma de Tabasco. Objetivos especificos -Describir las prácticas educativas de los profesores en la enseñanza de la lengua extranjera a estudiantes con discapacidad visual en lo referente a lo educativo. - Especificar las prácticas educativas relacionadas con el aspecto educativo de las y los estudiantes con discapacidad visual para aprender una lengua extranjera. -Caracterizar de las prácticas educativas de los profesores y las y los estudiantes con discapacidad visual en lo concerniente a lo social en el proceso de aprender una lengua extranjera en los estudiantes con discapacidad visual.	Los sujetos de estudio fueron tres estudiantes universitarios de lenguas extranjeras con discapacidad visual, siete profesores quienes les han impartido las asignaturas de inglés, francés e italiano y dos coordinadores	Entrevistas estructurada, guias de observacion.	En relación al aprendizaje de la lengua, las prácticas que impactan en la misma, son la organización y planeación para el estudio, así como el empleo de recursos tecnológicos, como la computadora, y los traductores electrónicos para el desarrollo de las cuatro habilidades de la lengua. En lo referente al vocabulario y las estructuras gramaticales, la estrategia principal de las y los estudiantes con discapacidad visual, involucra el uso del diccionario electrónico y los audios.

#13 MATERIAL DIDÁCTICO EN BRAILLE PARA ESTUDIANTES CON LIMITACIONES VISUALES EN EL CURSO DE HABILIDADES INTEGRADAS EN INGLÉS I DE LA LICENCIATURA EN LENGUAS EXTRANJERAS (INGLÉS-FRANCÉS) DE LA ESCUELA DE CIENCIAS DEL LENGUAJE EN LA UNIVERSIDAD DEL VALLE by JOSÉ OSWALDO HORTÚA GARCÍA in 2016	Thesis	Approach: Cualitativo Desing: Investigación-action Scope: Exploratorio	GENERAL Contribuir a la materialización efectiva de las políticas de inclusión de los estudiantes con limitaciones visuales en el curso de Habilidades Integradas en Inglés de la Licenciatura en Lenguas Extranjeras (inglés-francés) de la Escuela de Ciencias del Lenguaje en la Universidad del Valle (ECLUV). ESPECÍFICOS -Facilitar la inclusión de los estudiantes invidentes / con limitaciones visuales en las dinámicas propias del aula vidente en la ECLUV. -Determinar los materiales que se pueden diseñar para desarrollar las habilidades de lectura y escritura para estudiantes con limitaciones visuales del curso de Habilidades Integradas en Inglés I de la Licenciatura en Lenguas Extranjeras de la ECLUV. -Elaborar materiales en sistema braille que faciliten el buen desempeño de los estudiantes con limitaciones visuales.	Se realizó con un estudiantes que estuvo en el primer semestre de Licenciatura en Lenguas Extranjeras en la Universidad del Valle.	Entrevista semi-estructurada	La implementación de audios, videos desde paginas web, facilitó el desarrollo de las clases y el fortalecimiento de habilidades comunicativas en inglés como la escucha, al desarrollar diversas actividades como completar textos o relacionar, basándose en contextos de la vida cotidiana, sirvió como andamiaje para el mejoramiento del inglés.
#14 Teaching American English sounds to blind and low vision learners using assistive technology by Yeimy Medina in 2020	Thesis	Approach: Mixed Desing: Action Research Scope:	General Objetive:to develop sets of tactile materials appropriate for visually impaired learners of English to help them learn IPA symbols and the sounds they represent in American English. Specific Objetives: -to design an accessible companion website following UDL guidelines to be used by learners in conjunction with the tactile materials. -to test the pedagogical efficacy of this multisensory (auditory and tactual) input with a visually impaired learner population.	There were 21 participants. With regard to their educational level, six of them had completed secondary school, eight had completed technical education in different fields, five were professionals, and two were undergraduate students.	Structured interview	In general, perceptions were positive. All participants affirmed that they had improved their listening skills although they recognized they should practice more. In terms of speaking skill development. The majority of students said they were planning to continue developing their skills using diverse materials, including the website for this project although no specific frequency was mentioned. The companion website provided excellent support for this project. It is completely accessible and it can be the first step in creating an ambitious plan to develop more courses with enough accessibility for all kinds of learners, even people with disabilities
#15 AUDIO JUEGO DESTINADO AL APRENDIZAJE DE INGLÉS PARA ESTUDIANTES CON CEGUERA EN AULAS INCLUSIVAS "AULIN" by Caroline Julieth Moreno Rodriguez and Gabriela Ojeda Castañeda in 2018	Thesis	Approach: Cualitativo Desing: Investigación-action Scope:	Objetivo General. Lograr la inclusión en el aula de clase mediante una herramienta lúdica y sonora que despierte la sensibilidad auditiva del idioma inglés en niños invidentes, con baja visión y videntes de 10-12 años. Objetivos Específicos. ● Diseñar una herramienta que motive a los niños al aprendizaje del idioma inglés en el aula de clase. ● Aprovechar los canales de percepción más desarrollados de los niños con ceguera para promover la retención de información utilizando la música. ● Proponer un sistema adaptable al aula de clase para que el docente refuerce y evalúe los temas respectivos de la clase. ● Poner en igualdad de condiciones a estudiantes con discapacidad visual y normovisuales durante la dinámica. ● Hacer evidente que si es posible la inclusión estudiantil por medio del juego y el diseño.	Worked with 35 students, 3% of whom had some type of visual impairment, belonging to the Republic of China School and are in the fifth grade of primary school, with ages between 10 and 12 years old.	Entrevista no estructurada	La estrategia de enseñanza del inglés combina tecnologia, actividades lúdicas y recursos sensoriales para fomentar la inclusión y motivación de estudiantes normovisuales y con discapacidad visual. El uso de herramientas tecnológicas como lectores de texto y material en Braille facilita la adaptación del contenido, mientras que el juego permite la participación igualitaria y el desarrollo de habilidades competitivas y de autoevaluación. Además, el uso de musica con el juego de mesa electronico "eye" ayuda a la retención de vocabulario. Esta metodologia inclusiva, que aprovecha el canal auditivo en niños ciegos y fortalece las habilidades de escucha en los normovisuales, mejora el aprendizaje y promueve un ambiente educativo integrador.
#16 Teachers and visually impaired efl students' experience and perceptions about using screen readers at an english institute in an ecuadorian university by Rebelo in 2021	Thesis	Approach: qualitative Desing: phenomenological scope:	1.4.1. General objective. □ To describe teachers and English Foreign Language (EFL) visually impaired students' experience and perceptions about using screen readers in English classes. 1.4.2. Specific objectives. □ To explore students' experience about using screen readers in English class. □ To elucidate teachers' experience and perceptions working with visually impaired students who use screen readers in class. □ To reveal the main benefits that teachers and visually impaired students attribute to the use of screen readers in English class.	Three visually impaired university students	semi-structured interviews	Bladi also supported this idea mentioning that "What has now been chosen is the use of the computer with the program called JAWS that is a screen reader that allows us to read and write in English and to develop listening, too."
#17 Teaching Languages to students with vision impairment in higher education: a case study by Gladis Morúa in 2019	Thesis	Approach: Qualitative Desing: Case study Schope:	General objective The general objective of this research is to increase participation, achievement and independence of students with vision impairment through language teaching. Specific objectives - to provide the second language teacher the necessary resources to help these learners - -to determine how students with VI learn a second language -to establish what obstacles they face; in order to assist them in developing skills	This qualitative study concentrated in one student only. She is currently majoring in English Language Teaching at the Faculty of Languages of the BUAP (Benemerita university of puebla).	Structured interviews , observation , and field notes were used to gather data	Technological tools allow apprentices access information, represent, interpret and organize those previously learnt facts, information, and skills. It was possible to improve the participant's linguistic and digital competences by incorporating them. Furthermore, some apps like Vox pops, videos, and Netflix gave the participant the opportunity of interacting with native speakers. That was particularly beneficial because it upgraded cultural knowledge.

#18 Eyeland: A Visually-Impaired Accessible English Learning Application Using a Design-Based Research Framework KAREN VILLALBA LEONARDO VERGARA 1,MIGUEL JIMENO 2,(Senior Member, IEEE), HEYDY ROBLES1, 2,CAMILO SINNING 2,LEONARDO LIZCANO BREYNNER HURTADO 2,ANDWILSONNIET O 2 in 2024	Article	Approach: Cualitative Design: Systematic Scope:	The main objective is to develop inclusive tools that facilitate the teaching of English to students with visual impairments, thus promoting an inclusive and accessible educational environment for all students in the classroom.	12 high school students between 14 and 17 years old	collect data through a pre and post-test and survey	it is concluded that the visually impaired learners who received the app "eyeland" support demonstrated significant improvement, particularly in the areas of reading and listening, although there was minimal evidence of improvement in writing. In terms of speaking and vocabulary, both types of learners improved, with visually impaired pupils scoring higher in speaking than sighted learners
#19 Didactic practices for students with visual difficulties in the EFL context by July Castro in 2022	Thesis	Approach: Qualitative Desing Case study Scope:	General objective To analyze the didactic practices of a group of seven teachers from a private university and their influence on learning with students with visual difficulties when teaching English. Specific objectives • To identify the current English didactic practices in a group of seven professors from private universities regarding EFL students with a visual impairment. To contrast the data gathering concerning English didactic practices of a group of professors from a private university. • To characterize the didactic practices of a group of ten professors from a private university.	7 private university professors	The data collection instruments were semi-strcutured interviews and a focus group to socialize different didactic practices used with students with visual disabilities during the English classes.	The study concluded that the use of technology and interactive activities can help meet the needs of students with visual difficulties, but more work is needed in terms of training teachers and improving the use of assisted technology systems.
# 20 Blended Learning as an Active Approach for Improving the Speaking Skill of Visually Impaired Students by Adriana Flores and Jose Marchado in 2024	Thesis	Approach: Qualitative, Desing: case study scope:	General objective To analyze the effectiveness of using the Blended Learning Approach for improving the speaking skills of Visually Impaired Students at Unidad Educativa Especializada "Dr. Luis Benavides" during the academic period August 2023- July 2024. Specific objectives • To identify the speaking level of students with visual impairment under traditional teaching methods. • To determine the active methodologies best suited for teaching speaking skills to Visually Impaired Students. • To design activities based on Blended Learning that allow students with visual impairment to develop oral production. • To apply Blended Learning activities and establish the influence in oral production with Visually Impaired Students.	The population for this study is made up of 4 students of different levels at "Unidad Educativa Especializada Dr. Luis Benavides".	Four techniques will be used in the research, each one with its own instrument. Observation guide, structured interview.	Taking advantage of the features of Canva, it was possible to create activities with a simple operation system, so the students could use the computer by themselves to perform the tasks; additionally, more than 12 virtual spaces were created for the students to practice pronunciation, intonation, fluency, and others, these spaces were compatible with screen reader technology for ease of use; furthermore, two platforms were created in the Symbaloo application where the students and teacher could find meaningful resources; finally, in the computer lab, audiobooks, word banks, songs, and original self-created tales were installed. [...] After the application of the six classes with Blended Learning, students progressively demonstrated improvement in the amount of vocabulary gained, better word pronunciation, adequate intonation and stress, fewer errors in agreement and syntax [...]

Appendix B
Contrast Matrix

Methodology

Contrast Matrix		
Documents	**Methodology**	**Contrast**
#1Methodological Experience in the Teaching-Learning of the English Language for Students with Visual Impairment by Jorge Cárdenas and Esteban inga in 2021	Approach: Qualitative Design Systematic Scope:	Purely **quantitative** approaches were **absent**, as **research aimed** to capture **subjective experiences** rather than solely numerical data. The **mixed approach** was deemed most **effective**, integrating **qualitative** insights with **quantitative** validation to assess the efficacy of ICT tools.
#2 Effective Strategies for EFL Teachers of Visually Impaired Learners: a Research synthesis by Rodriguez in 2023	Approach: Mixed Design: Exploratory sequential Scope: descriptive	
#3 Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations by Miriam Sester Retorta and Vera Lúcia Lopes Cristovão in 2017	Approach: Qualitative Desing: ethnographic Scope: interpretative	
#4Novel Approach for Teaching English Language using Emerging Information and Communication Technologies for Visual Impairment Students by Cardenas and Inga in 2019	Approach: Qualitative. Design: Case study scope:	
#5 3D Teaching resources for meaningful learning of students with visual impairment by Bertha Alice Naranjo, Danny Javier Banchón and Carlos Alberto Martínez in 2019	Approach: qualitative Design: Action research Scope: Descriptive	
#6 Learning to "see" again: Overcoming challenges while teaching English to visually impaired students by Villalba in 2022	Approach: Qualitative Desing:ethnographic scope:	
#7 How a visually impaired student learns English in the context of online courses at UNAD University by Karen Ramon in 2015	Approach: Qualitative research Desing:case study Scope:	
#8 Ambiente de Aprendizaje mediado por TIC: Una estrategia didáctica para mejorar la competencia oral en inglés en un estudio de caso con Discapacidad Visual by Sindy Carolina Bonilla	Approach: qualitative Desing: Case Study scope: interpretative	
#9 Educational capsules of audiovisual content for the development of listening skills in visually impaired students at Daniel Reyes high school by Alexandra Gomez in 2023	Approach: Mixed Desing: Case study Scope:	
#10 A proposal of a basic english teaching course a1 as a foreign language aimed visual impairment students at the secondary level from "Joc Bolivia" (Juventud Obrera Cristiana) La Paz city by Maariela Calle and Milenka Mejia in 2023	Approach: Qualitative Desing: Cross-sectional Scope: Descriptive	
#11 ESTUDIO DEL IMPACTO DE LA UTILIZACIÓN DE SOFTWARE EN LA ENSEÑANZA DEL IDIOMA INGLÉS BÁSICO A PERSONAS CON DISCAPACIDAD VISUAl by Cevallos in 2015	Approach: cualitativo Desing: Exploratorio. Scope: Descriptivo	
#12 Prácticas Educativas en la Enseñanza y el Aprendizaje de Lenguas Extranjeras a Estudiantes con Discapacidad Visual en una Universidad Pública Mexicana by Veronika de la Cruz in 2015	Approach: Cualitativo Desing: Estudio de caso Scope:	

#13 MATERIAL DIDÁCTICO EN BRAILLE PARA ESTUDIANTES CON LIMITACIONES VISUALES EN EL CURSO DE HABILIDADES INTEGRADAS EN INGLÉS I DE LA LICENCIATURA EN LENGUAS EXTRANJERAS (INGLÉS-FRANCÉS) DE LA ESCUELA DE CIENCIAS DEL LENGUAJE EN LA UNIVERSIDAD DEL VALLE by JOSÉ OSWALDO HORTÚA GARCÍA in 2016	Approach: Cualitativo Desing: Investigación-action Scope: Exploratorio
#14 Teaching American English sounds to blind and low vision learners using assistive technology by Yeimy Medina in 2020	Approach: Mixed Desing: case study Scope:
#15 AUDIO JUEGO DESTINADO AL APRENDIZAJE DE INGLÉS PARA ESTUDIANTES CON CEGUERA EN AULAS INCLUSIVAS "AULIN" by Caroline Julieth Moreno Rodriguez and Gabriela Ojeda Castañeda in 2018	Approach: Cualitativo Desing: Investigación-action Scope: Exploratorio
#16 Teachers and visually impaired efl students' experience and perceptions about using screen readers at an english institute in an ecuadorian university by Rebelo in 2021	Approach: qualitative Desing: phenomenological scope:
#17 Teaching Languages to students with vision impairment in higher education: a case study by Gladis Morúa in 2019	Approach: Qualitative Desing: Case study Scope:
#18 Eyeland: A Visually-Impaired Accessible English Learning Application Using a Design-Based Research Framework KAREN VILLALBA LEONARDO VERGARA 1,MIGUEL JIMENO 2,(Senior Member, IEEE), HEYDY ROBLES1, 2,CAMILO SINNING 2,LEONARDO LIZCANO BREYNNER HURTADO 2,ANDWILSONNIETO 2 in 2024	Approach: Cualitative Design: Systematic Scope:
#19 Didactic practices for students with visual difficulties in the EFL context by July Castro in 2022	Approach: Qualitative Design Case study Scope:
# 20 Blended Learning as an Active Approach for Improving the Speaking Skill of Visually Impaired Students by Adriana Flores and Jose Marchado in 2024	Approach: Qualitative, Design: case study scope:

Objectives

Contrast Matrix		
Documents	**Objectives**	**Contrast**
#1Methodological Experience in the Teaching-Learning of the English Language for Students with Visual Impairment by Jorge Cárdenas and Esteban inga in 2021	General objective To describe the methodological experience in the teaching-learning process of the English language based on a best practices methodology for students with visual impairments.	Five levels of Bloom's taxonomy—remembering, applying, analyzing, evaluating, and creating—were found in the reviewed studies, according to the cognitive processes analysis. The majority of studies concentrated on higher-order thinking abilities, specifically assessing and creating, with the goal of identifying and developing creative ICT-based learning strategies for visually impaired students. Few studies used lower-level processes, such as applying or remembering. Verbs like analyze, develop, propose, and contribute were frequently employed, indicating a tendency toward critical thinking and creativity. The results indicate that the best way to address inclusive education using technology-enhanced methods is to create and evaluate levels.
#2 Effective strategies for EFL teachers of visually impaired learners: A RESEARCH SYNTHESIS by Rodriguez in 2023	General objective To apply effective strategies in students with visual disabilities in the process of teaching English as a foreign language.	
#3 Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations by Miriam Sester Retorta and Vera Lúcia Lopes Cristovão in 2017	General objective To investigate how smartphones could be used as assistive technologies to teach the English language to visually-impaired students.	
#4Novel Approach for Teaching English Language using Emerging Information and Communication Technologies for Visual Impairment Students by Cardenas and Inga in 2019	General objective To propose and evaluate a novel methodological strategy that incorporates meaningful learning and emerging technologies to enhance the teaching-learning process of the English language for students with visual impairments.	
#5 3D Teaching resources for meaningful learning of students with visual impairment by Bertha Alice Naranjo, Danny Javier Banchón and Carlos Alberto Martínez in 2019	Objetivo general Explorar el uso de tecnologías 3D, en particular de los recursos didácticos en 3D con el fin de determinar si generan un aprendizaje significativo en los estudiantes con discapacidad visual	

#6 Learning to "see" again: Overcoming challenges while teaching English to visually impaired students by Villalba in 2022	General objective To determine the pedagogical and emotional challenges and the teaching strategies implemented in face-to-face complementary tutorial sessions requested by visually-impaired students (VIS) learning English as a foreign language in a virtual undergraduate course whose graphic nature diminishes their opportunities.
#7 How a visually impaired student learns English in the context of online courses at UNAD University by Karen Ramon in 2015	General objective To Analyze the English teaching and learning process of a visually impaired student in the context of online courses at UNAD.
#8 Ambiente de Aprendizaje mediado por TIC: Una estrategia didáctica para mejorar la competencia oral en inglés en un estudio de caso con Discapacidad Visual by Sindy Carolina Bonilla Orjuela in 2019	Objetivo general Determinar el aporte de una estrategia didáctica mediada por TIC para mejorar la comunicación oral en inglés en un sujeto con discapacidad visual vinculado al SENA.
#9 Educational capsules of audiovisual content for the development of listening skills in visually impaired students at Daniel Reyes high school by Alexandra Gomez in 2023	General objective To propose the use of educational capsules of audiovisual content platforms as a pedagogical tool to enhance the development of listening skills in a second-grade student with visual impairment at "Daniel Reyes" high school in San Antonio de Ibarra during the 2022-2023 academic year.
#10 A proposal of a basic english teaching course a1 as a foreign language aimed visual impairment students at the secondary level from "Joc Bolivia" (Juventud Obrera Cristiana) La Paz city by Maariela Calle and Milenka Mejia in 2023	General objective To develop a teaching program course A1 of English as a foreign language for secondary visual impairment students from JOC Bolivia in La Paz city.
#11 ESTUDIO DEL IMPACTO DE LA UTILIZACIÓN DE SOFTWARE EN LA ENSEÑANZA DEL IDIOMA INGLÉS BÁSICO A PERSONAS CON DISCAPACIDAD VISUAl by Cevallos in 2015	Objetivo general. Analizar las herramientas de software educativo para la enseñanza del idioma Inglés para personas con discapacidad visual de la Asociación de Discapacitados visuales "18 de Mayo" de la ciudad de La Maná.
#12 Prácticas Educativas en la Enseñanza y el Aprendizaje de Lenguas Extranjeras a Estudiantes con Discapacidad Visual en una Universidad Pública Mexicana by Veronika de la Cruz in 2015	Objetivo general Analizar las prácticas educativas que convergen en la enseñanza y el aprendizaje de lenguas extranjeras a estudiantes con discapacidad visual en la Universidad Juárez Autónoma de Tabasco.
#13 MATERIAL DIDÁCTICO EN BRAILLE PARA ESTUDIANTES CON LIMITACIONES VISUALES EN EL CURSO DE HABILIDADES INTEGRADAS EN INGLÉS I DE LA LICENCIATURA EN LENGUAS EXTRANJERAS (INGLÉS-FRANCÉS) DE LA ESCUELA DE CIENCIAS DEL LENGUAJE EN LA UNIVERSIDAD DEL VALLE by JOSÉ OSWALDO HORTÚA GARCÍA in 2016	General objective Contribuir a la materialización efectiva de las políticas de inclusión de los estudiantes con limitaciones visuales en el curso de Habilidades Integradas en Inglés de la Licenciatura en Lenguas Extranjeras (inglés-francés) de la Escuela de Ciencias del Lenguaje en la Universidad del Valle (ECLUV).
#14 Teaching American English sounds to blind and low vision learners using assistive technology by Yeimy Medina in 2020	General objetive: To develop sets of tactile materials appropriate for visually impaired learners of English to help them learn IPA symbols and the sounds they represent in American English.
#15 AUDIO JUEGO DESTINADO AL APRENDIZAJE DE INGLÉS PARA ESTUDIANTES CON CEGUERA EN AULAS INCLUSIVAS "AULIN" by Caroline Julieth Moreno Rodriguez and Gabriela Ojeda Castañeda in 2018	Objetivo general. Lograr la inclusión en el aula de clase mediante una herramienta lúdica y sonora que despierte la sensibilidad auditiva del idioma inglés en niños invidentes, con baja visión y videntes de 10-12 años.
#16 Teachers and visually impaired efl students' experience and perceptions about using screen readers at an english institute in an ecuadorian university by Rebelo in 2021	General objective. To describe teachers and English Foreign Language (EFL) visually impaired students' experience and perceptions about using screen readers in English classes.
#17 Teaching Languages to students with vision impairment in higher education: a case study by Gladis Morúa in 2019	General objective To increase participation, achievement and independence of students with vision impairment through language teaching.
#18 Eyeland: A Visually-Impaired Accessible English Learning Application Using a Design-Based Research Framework KAREN VILLALBA LEONARDO VERGARA 1,MIGUEL JIMENO 2,(Senior Member, IEEE), HEYDY ROBLES1, 2,CAMILO SINNING 2,LEONARDO LIZCANO BREYNNER HURTADO 2,ANDWILSONNIETO 2 in 2024	General objetive To develop inclusive tools that facilitate the teaching of English to students with visual impairments, thus promoting an inclusive and accessible educational environment for all students in the classroom.
#19 Didactic practices for students with visual difficulties in the EFL context by July Castro in 2022	General objective To analyze the didactic practices of a group of seven teachers from a private university and their influence on learning with students with visual difficulties when teaching English.
# 20 Blended Learning as an Active Approach for Improving the Speaking Skill of Visually Impaired Students by Adriana Flores and Jose Marchado in 2024	General objective To analyze the effectiveness of using the Blended Learning Approach for improving the speaking skills of Visually Impaired Students at Unidad Educativa Especializada "Dr. Luis Benavides" during the academic period August 2023- July 2024.

Population

Contrast Matrix		
Documents	**Population**	**Contrast**
#1Methodological Experience in the Teaching-Learning of the English Language for Students with Visual Impairment by Jorge Cárdenas and Esteban inga in 2021	The study population was 13 students with visual impairment during the eight academic periods at Salesian Polytechnic University of Ecuador in Quito	The examination of 20 documents revealed that students with visual impairments were represented at all educational levels, primarily in post-secondary non-tertiary and tertiary education. Adults were the subject of the majority of studies, which showed that even with their increased cognitive maturity, these learners still had a difficult time learning English using ICT. Few studies focused on elementary and secondary education, and none took early childhood into account. This indicates a lack of research on inclusive teaching methods for younger students. The need for more specialized approaches at all educational levels was brought to light by the participants' varied academic backgrounds.
#2 EFFECTIVE STRATEGIES FOR EFL TEACHERS OF VISUALLY IMPAIRED LEARNERS: A RESEARCH SYNTHESIS by Rodriguez in 2023	The population of this study counted with a total of 55 foreign language teachers who have had or are currently teaching languages to learners with any type of visual impairments as identified in this research case.	
#3 Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations by Miriam Sester Retorta and Vera Lúcia Lopes Cristovão in 2017	The population involved in the research "Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations" consisted of 15 visually impaired students. In relation to their educational backgrounds, four had high school degrees and two were still in high school. The older ones (four of them), over 40 years of age, lived in the Blind Institute of Curitiba until high school. The remaining students had special tutoring at the Blind Institute of Curitiba or the Visually Impaired Association of Paraná for a part of the day. Then they went to regular schools for the other part.	
#4Novel Approach for Teaching English Language using Emerging Information and Communication Technologies for Visual Impairment Students by Cardenas and Inga in 2019	The population included 10 students (eight from various university majors and two external students) with visual disabilities who participated in an English teaching program at the Salesiana Polytechnic University.	
#5 3D Teaching resources for meaningful learning of students with visual impairment by Bertha Alice Naranjo, Danny Javier Banchón and Carlos Alberto Martínez in 2019	La población de la institución es de 25 estudiantes correspondiente a los cursos: Quinto, sexto y séptimo año de educación básica	
#6 Learning to "see" again: Overcoming challenges while teaching English to visually impaired students by Villalba in 2022	It focused on two visually impaired students who received face-to-face tutoring due to the difficulties they faced with online activities in a virtual undergraduate course	
#7 How a visually impaired student learns English in the context of online courses at UNAD University by Karen Ramon in 2015	1 visually-impaired psychology student	
#8 Ambiente de Aprendizaje mediado por TIC: Una estrategia didáctica para mejorar la competencia oral en inglés en un estudio de caso con Discapacidad Visual by Sindy Carolina Bonilla Orjuela in 2019	Una alumna del Sena con Discapacidad Visual Estudia un programa Técnico en Asistencia Administrativa	
#9 Educational capsules of audiovisual content for the development of listening skills in visually impaired students at Daniel Reyes high school by Alexandra Gomez in 2023	This case study will be conducted with the participation of Allan Yahir Benítez Rosero, a student of "Daniel Reyes" High School	
#10 A proposal of a basic english teaching course a1 as a foreign language aimed visual impairment students at the secondary level from "Joc Bolivia" (Juventud Obrera Cristiana) La Paz city by Maariela Calle and Milenka Mejia in 2023	6 students who assists in secondary school	
#11 ESTUDIO DEL IMPACTO DE LA UTILIZACIÓN DE SOFTWARE EN LA ENSEÑANZA DEL IDIOMA INGLÉS BÁSICO A PERSONAS CON DISCAPACIDAD VISUAl by Cevallos in 2015	La investigación se centró en personas con discapacidad visual de la Asociación de Discapacitados Visuales "18 de Mayo" en La Maná, Cotopaxi, Ecuador. Esta población incluía 28 personas con ceguera total como aquellas con baja visión. Sin embargo no especifica las edades de los participantes.	
#12 Prácticas Educativas en la Enseñanza y el Aprendizaje de Lenguas Extranjeras a Estudiantes con Discapacidad Visual en una Universidad Pública Mexicana by Veronika de la Cruz in	Los sujetos de estudio fueron tres estudiantes universitarios de lenguas extranjeras con discapacidad visual	
#13 MATERIAL DIDÁCTICO EN BRAILLE PARA ESTUDIANTES CON LIMITACIONES VISUALES EN EL CURSO DE HABILIDADES INTEGRADAS EN INGLÉS I DE LA LICENCIATURA EN LENGUAS EXTRANJERAS (INGLÉS-FRANCÉS) DE LA ESCUELA DE CIENCIAS DEL LENGUAJE EN LA UNIVERSIDAD DEL VALLE by JOSÉ OSWALDO HORTÚA GARCÍA in 2016	Se realizó con un estudiantes que estuvo en el primer semestre de Licenciatura en Lenguas Extranjeras en la Universidad del Valle.	

#14 Teaching American English sounds to blind and low vision learners using assistive technology by Yeimy Medina in 2020	There were 21 participants. With regard to their educational level, six of them had completed secondary school, eight had completed technical education in different fields, five were professionals, and two were undergraduate students.
#15 AUDIO JUEGO DESTINADO AL APRENDIZAJE DE INGLÉS PARA ESTUDIANTES CON CEGUERA EN AULAS INCLUSIVAS "AULIN" by Caroline Julieth Moreno Rodriguez and Gabriela Ojeda Castañeda in 2018	Worked with 35 students, 3% of whom had some type of visual impairment, belonging to the Republic of China School and are in the fifth grade of primary school, with ages between 10 and 12 years old.
#16 Teachers and visually impaired efl students' experience and perceptions about using screen readers at an english institute in an ecuadorian university by Rebelo in 2021	Three visually impaired university students
#17 Teaching Languages to students with vision impairment in higher education: a case study by Gladis Morúa in 2019	This qualitative study concentrated in one student only. She is currently majoring in English Language Teaching at the Faculty of Languages of the BUAP (Benemerita university of puebla).
#18 Eyeland: A Visually-Impaired Accessible English Learning Application Using a Design-Based Research Framework KAREN VILLALBA LEONARDO VERGARA 1,MIGUEL JIMENO 2,(Senior Member, IEEE), HEYDY ROBLES1, 2,CAMILO SINNING 2,LEONARDO LIZCANO BREYNNER HURTADO 2,ANDWILSONNIETO 2 in 2024	12 high school students between 14 and 17 years old
#19 Didactic practices for students with visual difficulties in the EFL context by July Castro in 2022	7 private university professors
# 20 Blended Learning as an Active Approach for Improving the Speaking Skill of Visually Impaired Students by Adriana Flores and Jose Marchado in 2024	The population for this study is made up of 4 students of different levels at "Unidad Educativa Especializada Dr. Luis Benavides"

Instruments

Contrast Matrix		
Documents	**Instruments**	**Contrast**
#1Methodological Experience in the Teaching-Learning of the English Language for Students with Visual Impairment by Jorge Cárdenas and Esteban inga in 2021	Likert Scale Surveys	Because of their suitability for qualitative approaches, the analysis showed that interviews were the most frequently used data collection method among the 20 studies, appearing in 13 documents. In order to comprehend learners' perceptions and learning environments, surveys and observations were used in seven different studies. Only five studies used tests, which were frequently interpreted qualitatively rather than for statistical analysis. This implies a strong inclination toward experience exploration over performance evaluation. The results emphasize the value of integrating qualitative and quantitative methods to gain a more thorough grasp of ICT use in visually impaired students' English language learning.
#2 EFFECTIVE STRATEGIES FOR EFL TEACHERS OF VISUALLY IMPAIRED LEARNERS: A RESEARCH SYNTHESIS by Rodriguez in 2023	Structured survey: The primary data collection instrument was a structured survey consisting of 6 questions aimed at gathering specific information about the teaching of a foreign language to students with visual impairments.	
#3 Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations by Miriam Sester Retorta and Vera Lúcia Lopes Cristovão in 2017	The use of non participative observations, podcasts, and written exercises prepared in Google Form (Google, Inc.); two questionnaires were used	
#4Novel Approach for Teaching English Language using Emerging Information and Communication Technologies for Visual Impairment Students by Cardenas and Inga in 2019	Structured Interviews, theoretical and written diagnostic test of pre-knowledge	
#5 3D Teaching resources for meaningful learning of students with visual impairment by Bertha Alice Naranjo, Danny Javier Banchón and Carlos Alberto Martínez in 2019	Se usaron además técnicas de investigación como la entrevista y encuesta. La entrevista no estructurada consta de 6 preguntas, todas de tipo abierta, y fue aplicada a la Directora de la institución, así se obtuvo. información de las necesidades de recursos didácticos en 3D que requería la institución. La encuesta usó dos cuestionarios, uno para docentes y otro para estudiantes. El cuestionario para docentes incluyó 7 preguntas. Los cuestionarios pre-test y post-test para los estudiantes constaron de 4 preguntas cada uno.	
#6 Learning to "see" again: Overcoming challenges while teaching English to visually impaired students by Villalba in 2022	Transcripts of tutorial sessions, field notes and the author's personal reflection, organized and analyzed qualitatively under codes that represented the challenges and strategies identified.	
#7 How a visually impaired student learns English in the context of online courses at UNAD University by Karen Ramon in 2015	Participatory Observation, unstructured interview four sessions that were recorded with a video camera and a voice recorder	
#8 Ambiente de Aprendizaje mediado por TIC: Una estrategia didáctica para mejorar la competencia oral en inglés en un estudio de caso con Discapacidad Visual by Sindy Carolina Bonilla Orjuela in 2019	Prueba de diagnóstico, entrevistas semiestructuradas con los participantes y los profesores, diario de campo, prueba final.	
#9 Educational capsules of audiovisual content for the development of listening skills in visually impaired students at Daniel Reyes high school by Alexandra Gomez in 2023	These instruments were structured differently; the survey followed a structured format, while the interview adopted a semi-structured approach. Both instruments focused on the main objective of the proposal, which is to collect relevant information that will contribute to the design and development of the proposal.	
#10 A proposal of a basic english teaching course a1 as a foreign language aimed visual impairment students at the secondary level from "Joc Bolivia" (Juventud Obrera Cristiana) La Paz city by Maariela Calle and Milenka Mejia in 2023	The Instrument used to assess the student's language skills is based on the DIALANG ASSESSMENT SYSTEM and the second was questionnaires	
#11 ESTUDIO DEL IMPACTO DE LA UTILIZACIÓN DE SOFTWARE EN LA ENSEÑANZA DEL IDIOMA INGLÉS BÁSICO A PERSONAS CON DISCAPACIDAD VISUAl by Cevallos in 2015	Entrevista semi-estructurada Además se direcciona hacia la validación de la información obtenida mediante la aplicación de las herramientas de recolección de datos, tanto de la encuesta como de la ficha de observación del fenómeno, finalizando con la demostración de la hipótesis inicialmente propuesta.	

#12 Prácticas Educativas en la Enseñanza y el Aprendizaje de Lenguas Extranjeras a Estudiantes con Discapacidad Visual en una Universidad Pública Mexicana by Veronika de la Cruz in	Entrevistas estructurada, guias de observacion.
#13 MATERIAL DIDÁCTICO EN BRAILLE PARA ESTUDIANTES CON LIMITACIONES VISUALES EN EL CURSO DE HABILIDADES INTEGRADAS EN INGLÉS I DE LA LICENCIATURA EN LENGUAS EXTRANJERAS (INGLÉS-FRANCÉS) DE LA ESCUELA DE CIENCIAS DEL LENGUAJE EN LA UNIVERSIDAD DEL VALLE by JOSÉ OSWALDO HORTÚA GARCÍA in 2016	Entrevista semi-estructurada
#14 Teaching American English sounds to blind and low vision learners using assistive technology by Yeimy Medina in 2020	Structured interview
#15 AUDIO JUEGO DESTINADO AL APRENDIZAJE DE INGLÉS PARA ESTUDIANTES CON CEGUERA EN AULAS INCLUSIVAS "AULIN" by Caroline Julieth Moreno Rodriguez and Gabriela Ojeda Castañeda in 2018	Entrevista no estructurada
#16 Teachers and visually impaired efl students' experience and perceptions about using screen readers at an english institute in an ecuadorian university by Rebelo in 2021	semi-structured interviews
#17 Teaching Languages to students with vision impairment in higher education: a case study by Gladis Morúa in 2019	Structured interviews , observation , and field notes were used to gather data
#18 Eyeland: A Visually-Impaired Accessible English Learning Application Using a Design-Based Research Framework KAREN VILLALBA LEONARDO VERGARA 1,MIGUEL JIMENO 2,(Senior Member, IEEE), HEYDY ROBLES1, 2,CAMILO SINNING 2,LEONARDO LIZCANO BREYNNER HURTADO 2,ANDWILSONNIETO 2 in 2024	collect data through a pre and post-test and survey
#19 Didactic practices for students with visual difficulties in the EFL context by July Castro in 2022	The data collection instruments were semi-strcutured interviews and a focus group to socialize different didactic practices used with students with visual disabilities during the English classes.
# 20 Blended Learning as an Active Approach for Improving the Speaking Skill of Visually Impaired Students by Adriana Flores and Jose Marchado in 2024	Observation guide, structured interview.

Results

Contrast Matrix		
Documents	**Results**	**Contrast**
#1Methodological Experience in the Teaching-Learning of the English Language for Students with Visual Impairment by Jorge Cárdenas and Esteban inga in 2021	Based on the experience acquired during this process, it can be mentioned that there is an urgent need for teachers to be trained in the use of emerging and alternative tools. This means that their "disciplinary, didactic and pedagogical knowledge" is not enough; it is also necessary to incorporate in their training the technological knowledge and management of typhlo-technical tools such as JAWS.	The analysis found that, despite difficulties brought on by teachers' lack of training, screen readers like JAWS were the most popular ICT tools for helping visually impaired students learn English. To improve auditory skills, listening-based resources like videos, audiobooks, and descriptive audios were also widely used. Participation and language development were encouraged by educational websites and interactive platforms like Moodle, Kahoot, and Symbaloo. Additional tactile and vocabulary support was provided by devices like smartphones, electronic dictionaries, and 3D printing. Aulin and Eyeland, two cutting-edge resources, demonstrated encouraging outcomes but struggled with cost and accessibility. All things considered, the most successful tools were easily accessible, multisensory, and intuitive.
#2 EFFECTIVE STRATEGIES FOR EFL TEACHERS OF VISUALLY IMPAIRED LEARNERS: A RESEARCH SYNTHESIS by Rodriguez in 2023	This study indicated that technological resources like JAWS and Brialle display should be used in reading and writing activities to support students with visual impairments. Consequently, technological resources allow learners with visual impairments to access reading and writing exercises in a more accurate, timely and independent manner through speech synthesizers.	
#3 Visually-Impaired Brazilian Students Learning English with Smartphones: Overcoming Limitations by Miriam Sester Retorta and Vera Lúcia Lopes Cristovão in 2017	ICTs, more specifically smartphones, are radically transforming how we access our shared knowledge sources by keeping us constantly connected to near infinite volumes of data and information. The project revealed that both undergraduate and visually-impaired students were taken by a sense of self-determination, collective collaboration, and personal development. Through the use of smartphones APPS (Whatsapp, Facebook, Google drive) and their interface with PCs and laptops, we could determine that it is totally feasible to teach visual-impaired people to speak English.	

#4Novel Approach for Teaching English Language using Emerging Information and Communication Technologies for Visual Impairment Students by Cardenas and Inga in 2019	The second indicator is about ICTs, they mention the importance that they have had in the VIS within their process and academic development and digital coexistence in the acquisition of the English language in a learning environment. By means of using of ICTs, specifically typhotechnological tools, the VIS have reduced the pe-dagogical communication gap in English language learning by a large percentage and have allowed them to move towards new proposals for real work, performance of tests and examinations.
#5 3D Teaching resources for meaningful learning of students with visual impairment by Bertha Alice Naranjo, Danny Javier Banchón and Carlos Alberto Martínez in 2019	Los resultados de las encuestas tanto de docentes y estudiantes coinciden en que los recursos impresos en 3D, fomentan el proceso de aprendizaje significativo, despiertan interés y motivación en los estudiantes en relación con los materiales tradicionales usados para el diseño de recursos didácticos como fomix y cartón. La desventaja es que no todas las instituciones pueden acceder a los equipos tecnológicos para crear este tipo de recursos impresos en 3D por el alto costo de los mismos.
#6 Learning to "see" again: Overcoming challenges while teaching English to visually impaired students by Villalba in 2022	Moreover, by questioning the students, I could promote their leading role in their learning process and learn from them while maintaining dialogues. Another conclusion from the endless questions I addressed was that one tutorial session per week was not enough to help my blind students. I planned to work with him every Thursday for 2 hours to use the Moodle platform exercises as well. To guarantee time efficiency, I selected the following strategies based on the answers given by the blind students: translating instructions from Moodle to L1 and describing each virtual environment in detail (screen description) would be helpful for them. Finally, listing the steps to follow and eliciting from their visual residue (trusting what they remember when they could see before losing their sight) helped me to contextualize them quickly and give meaningful examples of the lessons or tasks given.
#7 How a visually impaired student learns English in the context of online courses at UNAD University by Karen Ramon in 2015	the analysis of the course in Moodle opens the doors to new tools that can be adapted to the VIS needs, such as the lab, the accessibility to different links, recordings and settings. In addition, it might be concluded that the implementation of new technologies and devices to special education and second language learning is a question of installing the appropriate software, acquiring specialized tools and improving little by little the methodology that should be used while having students with distinctive necessities.
#8 Ambiente de Aprendizaje mediado por TIC: Una estrategia didáctica para mejorar la competencia oral en inglés en un estudio de caso con Discapacidad Visual by Sindy Carolina Bonilla Orjuela in 2019	El ambiente de aprendizaje mediado por TIC con Videos, Kahoot, and JAWS ayudó a fortalecer la competencia comunicativa oral en la participante de la investigación, en cuanto a que adquirió vocabulario y expresiones que desconocía de una manera eficaz, entretenida y al uso de las mismas en contextos comunicativos reales y concretos. Su aprendizaje no solo radicó en el fortalecimiento de la competencia comunicativa; sino también lexical; así como, en el uso de elementos tecnológicos y multimediales que permitieron que la experiencia fuese interesante, llamativa y de interés para la audiencia objeto de estudio.
#9 Educational capsules of audiovisual content for the development of listening skills in visually impaired students at Daniel Reyes high school by Alexandra Gomez in 2023	Educational capsules adapted to this sequential approach are especially beneficial for visually impaired students, as they improve their comprehension and communication skills in the language. The integration of these educational capsules strengthens their listening skills and provides them with a valuable tool for their language development.
#10 A proposal of a basic english teaching course a1 as a foreign language aimed visual impairment students at the secondary level from "Joc Bolivia" (Juventud Obrera Cristiana) La Paz city by Maariela Calle and Milenka Mejia in 2023	Furthermore, using descriptive audio and videos made it possible to understand the correct pronunciation of words and form mental images, resulting in students internalizing the information. Also, now that technology and the internet are easy to access and there are some programs which help to read, describe and understand the learning we suggest that online materials can be also developed since they would be available any time of the day and will be helpful to reinforce the process of learning. Thus, developing online material to visual impairment can be another innovative academic work for linguistic students.
#11 ESTUDIO DEL IMPACTO DE LA UTILIZACIÓN DE SOFTWARE EN LA ENSEÑANZA DEL IDIOMA INGLÉS BÁSICO A PERSONAS CON DISCAPACIDAD VISUAl by Cevallos in 2015	El uso del Dabin Diccionario Ingles/Español digital para personas ciegas permitió mejorar aspectos críticos que mantienen las personas con déficit visual al momento de ingresar a esta tipología de educación. Tambien la mejora en problemáticas como sustitución de palabras por similitud, el verbalismo y las repeticiones por audio y escucha.

#12 Prácticas Educativas en la Enseñanza y el Aprendizaje de Lenguas Extranjeras a Estudiantes con Discapacidad Visual en una Universidad Pública Mexicana by Veronika de la Cruz in 2015	En relación al aprendizaje de la lengua, las prácticas que impactan en la misma, son la organización y planeación para el estudio, así como el empleo de recursos tecnológicos, como la computadora, y los traductores electrónicos para el desarrollo de las cuatro habilidades de la lengua. En lo referente al vocabulario y las estructuras gramaticales, la estrategia principal de las y los estudiantes con discapacidad visual, involucra el uso del diccionario electrónico y los audios.
#13 MATERIAL DIDÁCTICO EN BRAILLE PARA ESTUDIANTES CON LIMITACIONES VISUALES EN EL CURSO DE HABILIDADES INTEGRADAS EN INGLÉS I DE LA LICENCIATURA EN LENGUAS EXTRANJERAS (INGLÉS-FRANCÉS) DE LA ESCUELA DE CIENCIAS DEL LENGUAJE EN LA UNIVERSIDAD DEL VALLE by JOSÉ OSWALDO HORTÚA GARCÍA in 2016	La implementación de audios, videos desde paginas web, facilitó el desarrollo de las clases y el fortalecimiento de habilidades comunicativas en inglés como la escucha, al desarrollar diversas actividades como completar textos o relacionar, basándose en contextos de la vida cotidiana, sirvió como andamiaje para el mejoramiento del inglés.
#14 Teaching American English sounds to blind and low vision learners using assistive technology by Yeimy Medina in 2020	In general, perceptions were positive. All participants affirmed that they had improved their listening skills although they recognized they should practice more. In terms of speaking skill development. The majority of students said they were planning to continue developing their skills using diverse materials, including the website f and JAWS or this project although no specific frequency was mentioned. The companion website provided excellent support for this project. It is completely accessible and it can be the first step in creating an ambitious plan to develop more courses with enough accessibility for all kinds of learners, even people with disabilities
#15 AUDIO JUEGO DESTINADO AL APRENDIZAJE DE INGLÉS PARA ESTUDIANTES CON CEGUERA EN AULAS INCLUSIVAS "AULIN" by Caroline Julieth Moreno Rodriguez and Gabriela Ojeda Castañeda in 2018	La estrategia de enseñanza del inglés combina tecnología, actividades lúdicas y recursos sensoriales para fomentar la inclusión y motivación de estudiantes normovisuales y con discapacidad visual. El uso de herramientas tecnológicas como lectores de texto y material en Braille facilita la adaptación del contenido, mientras que el juego permite la participación igualitaria y el desarrollo de habilidades competitivas y de autoevaluación. Además, el uso de musica con el Audio juego institucional "aulin" ayuda a la retención de vocabulario. Esta metodología inclusiva, que aprovecha el canal auditivo en niños ciegos y fortalece las habilidades de escucha en los normovisuales, mejora el aprendizaje y promueve un ambiente
#16 Teachers and visually impaired efl students' experience and perceptions about using screen readers at an english institute in an ecuadorian university by Rebelo in 2021	Bladi also supported this idea mentioning that "What has now been chosen is the use of the computer with the program called JAWS that is a screen reader that allows us to read and write in English and to develop listening, too."
#17 Teaching Languages to students with vision impairment in higher education: a case study by Gladis Morúa in 2019	Technological tools allow apprentices access information, represent, interpret and organize those previously learnt facts, information, and skills. It was possible to improve the participant's linguistic and digital competences by incorporating them. Furthermore, some apps like Vox pops, videos, and Netflix gave the participant the opportunity of interacting with native speakers. That was particularly beneficial because it upgraded cultural knowledge.
#18 Eyeland: A Visually-Impaired Accessible English Learning Application Using a Design-Based Research Framework KAREN VILLALBA LEONARDO VERGARA 1,MIGUEL JIMENO 2,(Senior Member, IEEE), HEYDY ROBLES1, 2,CAMILO SINNING 2,LEONARDO LIZCANO BREYNNER HURTADO 2,ANDWILSONNIETO 2 in 2024	it is concluded that the visually impaired learners who received the app "eyeland" support demonstrated significant improvement, particularly in the areas of reading and listening, although there was minimal evidence of improvement in writing. In terms of speaking and vocabulary, both types of learners improved, with visually impaired pupils scoring higher in speaking than sighted learners
#19 Didactic practices for students with visual difficulties in the EFL context by July Castro in 2022	The study concluded that the use of technology and interactive activities can help meet the needs of students with visual difficulties, but more work is needed in terms of training teachers and improving the use of assisted technology systems.

# 20 Blended Learning as an Active Approach for Improving the Speaking Skill of Visually Impaired Students by Adriana Flores and Jose Marchado in 2024	Taking advantage of the features of Canva, it was possible to create activities with a simple operation system, so the students could use the computer by themselves to perform the tasks; additionally, more than 12 virtual spaces were created for the students to practice pronunciation, intonation, fluency, and others, these spaces were compatible with screen reader technology for ease of use; furthermore, two platforms were created in the Symbaloo application where the students and teacher could find meaningful resources; finally, in the computer lab, audiobooks, word banks and original self-created tales were installed. [...] After the application of the six classes with Blended Learning, students progressively demonstrated improvement in the amount of vocabulary gained, better word pronunciation, adequate intonation and stress, fewer errors in agreement and syntax [...]	