

Individualized educational plan for deaf students who use spoken language using hearing technology: informational material for speech-language pathologists and audiologists

Plano educacional individualizado para escolares surdos oralizados usuários de tecnologia auditiva: material informativo para fonoaudiólogos

Plan educativo individualizado para estudiantes sordos orales utilizando tecnología auditiva: material informativo para logopedas

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Abstract

This methodological study aimed to develop an informational resource on the Individualized Educational Plan (IEP), specifically designed to support the work of speech-language pathologists (SLPs) with students who are deaf, use spoken language, and rely on hearing technology. The study was conducted in two stages: an integrative literature review followed by the development of an eBook. The review was carried out using the PubMed and Virtual Health Library (BVS) databases, initially identifying 92 studies. After screening and full-text analysis, five articles were included. Although none addressed the IEP directly, they provided insights into educational practices with this population, highlighting a gap in the literature—particularly concerning the use of hearing technologies. Based on these findings, an eBook was developed following the principles of Inclusive Graphic Material in Health, covering diagnostic assessment, goal setting, and educational strategies. The proposed resource aims to address a practical need by supporting SLPs in the construction of IEPs and promoting educational equity for students who are deaf and use spoken language in school settings.

Keywords: Hearing loss; Mainstreaming education; Education special; Self-Help devices.

Resumo

Este estudo metodológico teve como objetivo desenvolver um material informativo sobre o Plano Educacional Individualizado (PEI), voltado à atuação de fonoaudiólogos com estudantes surdos oralizados usuários de tecnologias auditivas. A pesquisa foi conduzida em duas etapas: uma revisão integrativa da literatura e, em seguida, a elaboração de um *eBook*. A busca foi realizada nas bases PubMed e Biblioteca Virtual em Saúde, com 92 estudos identificados inicialmente. Após triagem e leitura na íntegra, cinco artigos foram incluídos. Embora não tratassem diretamente do PEI, forneceram subsídios sobre práticas educativas com esse público, evidenciando uma lacuna na literatura, especialmente no que diz respeito ao uso de tecnologias auditivas. Com base nesses achados, elaborou-se um *eBook* segundo os parâmetros do Material Gráfico Inclusivo em Saúde, abordando avaliação diagnóstica, definição de metas e estratégias educacionais. O material busca suprir uma necessidade prática, oferecendo suporte aos fonoaudiólogos na construção de PEIs e promovendo a equidade educacional de estudantes surdos oralizados no contexto escolar.

Palavras-chave: Deficiência auditiva; Inclusão escolar; Educação inclusiva; Tecnologia assistiva.

Resumen

Este estudio metodológico tuvo como objetivo desarrollar un material informativo sobre el Plan Educativo Individualizado (PEI), orientado al trabajo de los fonoaudiólogos con estudiantes sordos orales que utilizan tecnología auditiva. La investigación se llevó a cabo en dos etapas: una revisión bibliográfica integradora y la elaboración de un libro electrónico informativo. La revisión se realizó en las bases de datos PubMed y la Biblioteca Virtual de Salud, y arrojó inicialmente 92 estudios. Tras la revisión y lectura completa, se incluyeron cinco artículos que no abordaban directamente el PEI, pero que brindaban apoyo en prácticas educativas con estudiantes sordos orales, lo que evidencia una brecha en la literatura sobre el PEI para este público objetivo, especialmente para aquellos que utilizan tecnologías auditivas. Con base en estos hallazgos, se desarrolló un libro electrónico según los parámetros del Material Gráfico Inclusivo en Salud, que abarca la evaluación diagnóstica, el establecimiento de objetivos y las estrategias educativas. El material propuesto busca cubrir una brecha práctica, permitiendo a los fonoaudiólogos actuar con mayor eficacia en la construcción del PEI y promover la equidad educativa para los estudiantes sordos orales en el entorno escolar.

Palabras clave: Pérdida auditiva; Integración escolar; Educación especial; Dispositivos de autoayuda.

Introduction

Inclusive education and the Individualized Educational Plan (IEP) are key components in ensuring access and participation for students with disabilities, including those with hearing loss. The IEP is developed by a multidisciplinary team to address each student's specific educational needs through curricular adaptations and specialized support. While the IEP is widely discussed in the literature related to various disabilities—such as intellectual disability and autism spectrum disorder—there remains a significant lack of studies and resources that focus on the unique needs of students who are deaf and use spoken language, particularly those who rely on hearing technology.

The diversity of the deaf population in Brazil is wide-ranging and must be understood through an inclusive lens, recognizing the multiple pathways of identity formation defined by individuals and/or their families. In this context, it is essential to acknowledge that, alongside identities shaped through Brazilian Sign Language (Libras), there are also deaf students who primarily use oral communication, often supported by hearing technologies such as hearing aids (HA) and cochlear implants (CI). These students are frequently overlooked in educational policies and teaching practices. They challenge rigid, traditional definitions of deafness and call for a broader perspective that extends beyond the bilingual model.

According to the principles of the Care Network for People with Disabilities in the Brazilian Unified Health System (RCPD-SUS), the State must ensure access to technologies that promote audibility, in accordance with the biopsychosocial model. This study, therefore, focuses on students who are deaf and use spoken language, seeking to contribute to the development of individualized educational strategies (IEPs) that reflect their specific communicative and academic needs.

The lack of literature detailing pedagogical practices and auditory strategies adapted to the IEP of students who are deaf, and use spoken language supported by hearing technology, creates an obstacle for speech-language pathologists (SLPs), audiologists, educators, and other professionals involved in the inclusion of these students. Without clear and specific guidelines, the implementation of effective IEPs that integrate the use of hearing devices and resources, optimizing the communication

and learning capacity of these students, becomes a challenge for multidisciplinary teams.

The IEP is a planning tool aimed at individualizing the teaching and learning process by adapting the curriculum and methodologies to meet each student's specific needs. For students who are deaf and use spoken language, it is essential that the multidisciplinary team—including the speech-language pathologists (SLP) and audiologists—can identify both their challenges and strengths to support their inclusion and development within the school environment⁴.

However, the lack of literature describing pedagogical practices and auditory strategies tailored to the IEPs of this population—particularly those who use hearing technology—proposes a significant barrier for SLPs, audiologists, educators, and other professionals involved in their inclusion. In the absence of clear, targeted guidelines, designing effective IEPs that integrate hearing devices and support resources becomes a challenge, limiting the ability of multidisciplinary teams to optimize communication and learning outcomes for these students.

Aim

This study aimed to develop an evidence-based informational resource to guide SLPs and audiologists in the creation of IEPs for students who are deaf and use spoken language.

Methodology

This is a methodological study structured in two stages. This design was chosen to ensure that the content developed was evidence-based and aligned with the demands of SLPs and audiologists' practice in educational settings, with a focus on the development of IEPs for students who are deaf and use spoken language.

First stage: Integrative literature review

The first stage involved conducting an integrative literature review, following the methodological framework proposed by Mendes et al.⁵. This process included: (i) formulation of the guiding question; (ii) literature search; (iii) data collection; (iv) analysis and synthesis of results; and



(v) presentation of the integrative review. The guiding question defined for the review was: “*Are there guidelines on the development of the IEP for students who are deaf and use spoken language in the national literature?*”

The bibliographic search was conducted in the PubMed database and the Regional Portal of the Virtual Health Library (BVS), using Health Sciences Descriptors (DeCS/MeSH). The selected keywords were: “Special education,” “Inclusive education,” “Hearing loss,” and “Hypoacusis.” Boolean operators were applied—OR between synonymous terms and AND to combine different concepts—ensuring a comprehensive and targeted search strategy.

- The Inclusion criteria for article selection were as follows:
- Full-text articles published in national or international journals;
- Publications in Brazilian Portuguese;
- Studies addressing the proposed topic;
- Articles published within the last ten years (2014–2024).

Titles, abstracts, and keywords were initially screened, followed by full-text analysis of the selected studies. Each article was reviewed in full by an independent evaluator, who determined its inclusion or exclusion based on relevance to the research objective. The selected studies provided the theoretical foundation for the second stage of the study.

Second stage: Development of informative material

In the second stage, the informational material was developed based on the guidelines of the Inclusive Health Communication Design Framework (MGIS)⁶, which provides criteria for producing accessible educational content. The following dimensions were considered:

1. Content:

- Prioritization of essential information;
- Reduction of information overload to facilitate retention and comprehension;
- Clear and objective message structuring.

2. Language:

Simplified vocabulary and sentence construction;

- Logical flow between topics and ideas;
- Presentation of content in the practical order of use and application;
- Highlighted titles to facilitate information retrieval.

3. Typography:

- Use of both uppercase and lowercase fonts;
- Line spacing proportional to font size;
- Use of sans serif fonts to improve readability.

4. Layout:

- Horizontal orientation to support easier reading;
- Balanced distribution of elements;
- Strong contrast between dark fonts and light backgrounds;
- Adequate spacing between elements to enhance understanding.

5. Illustration:

- A cover clearly stating the material’s purpose;
- Use of photos, illustrations, and graphic lines to generate interest;
- Explanatory visuals incorporating arrows, labels, and pictograms;
- Images that reinforce and clarify the textual content.

The technical content was developed based on studies addressing the creation and implementation of the IEP, with emphasis on the core knowledge required for its effective application. Key references included research on individualized educational planning in inclusive education⁷, continuing professional development for educators⁴, and international frameworks for IEP implementation in various contexts, including Italy, France, the United States, and Spain⁸. These studies provided the theoretical and methodological foundation for material development.

The content was then structured into an eBook, produced with the support of a designer from the Educational Technology Department at the Bauru School of Dentistry, University of São Paulo (FOB-USP), ensuring that the material was both visually accessible and pedagogically effective.



Results

Integrative literature review

The flowchart in Figure 1 illustrates the process of article identification and selection for the integrative review. In the PubMed database, 1,601 articles were initially retrieved. After applying the established filters and eligibility criteria, 7 studies

remained; however, none were selected after title and abstract screening. In the Virtual Health Library (BVS) database, 5,450 articles were found. Following the application of filters, 85 studies remained, and 5 were selected based on the relevance of their titles and abstracts. Ultimately, 5 articles were included for full-text analysis, as presented in Chart 1.

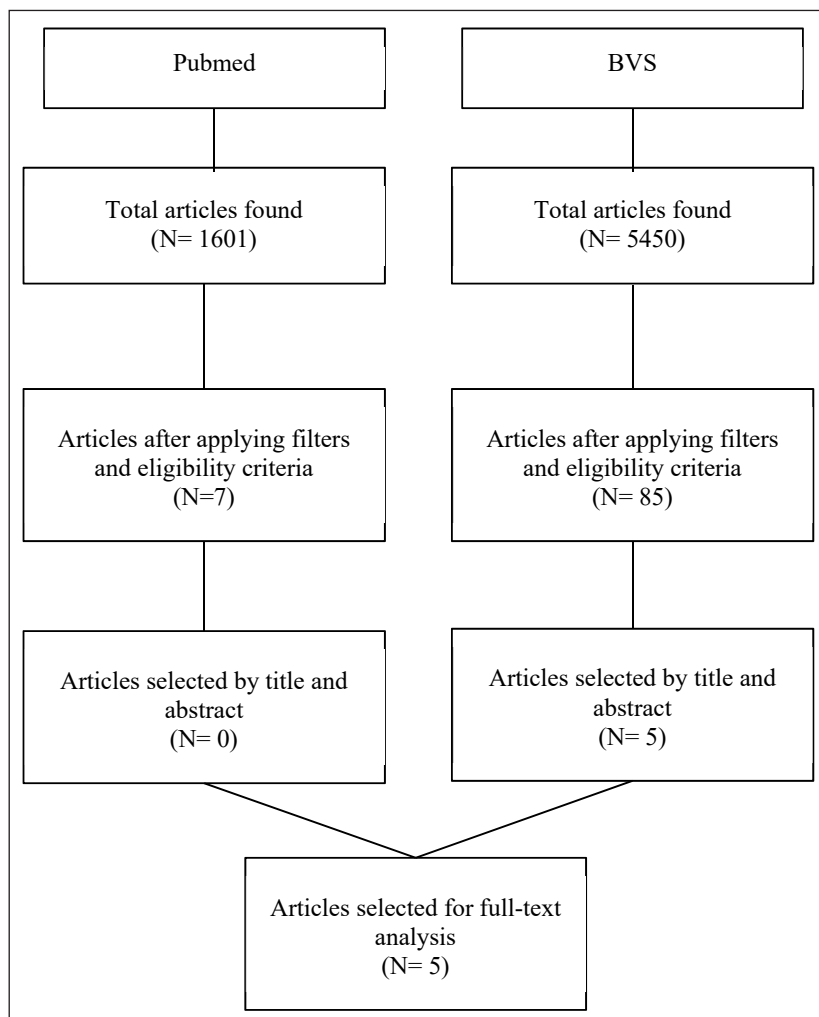


Figure 1. Flowchart for selecting articles in the PubMed and BVS databases

Chart 1. Studies included in the integrative literature review

AUTHOR(S) (YEAR)	STUDY TITLE	GOALS	METHOD	MAIN RESULTS
Pieczkowski TMZ (2021) ¹⁹	A REPORT ON THE EDUCATION OF DEAF STUDENTS IN THE MUNICIPALITY OF CHAPECÓ (SC)	Highlight the education of deaf people in the municipality of Chapecó (SC) between 1996 and 2016.	Interviews with three education secretaries; documentary analysis of educational practices; discourse analysis based on Foucaultian references.	1980-1990: Predominance of oralism; 2000-2010: Introduction of bilingualism and use of Libras; 2010 onwards: School inclusion with multifunctional resources and teacher training.
Silva C et al. (2018) ²⁰	SCHOOL INCLUSION: SCHOOL PROFESSIONALS' CONCEPTIONS ABOUT DEAF PEOPLE AND DEAFNESS	Understand the role of Libras in education according to school professionals.	Semi-structured interviews; field observations; historical and social analysis of educators' speeches.	Ambiguous vision of professionals: clinical-therapeutic models versus cultural appreciation of the deaf; significant barriers due to a lack of adequate training of educators.
Fiorini MLS, Manzini EJ (2018) ²¹	STRATEGIES OF PHYSICAL EDUCATION TEACHERS TO PROMOTE THE PARTICIPATION OF STUDENTS WITH hearing loss IN CLASSES	Analyze successful strategies for including students with hearing loss in classes.	Observation of Physical Education classes in 19 schools; filming and transcription of interactive episodes; validation by teachers.	Identification of five categories of inclusive strategies: previous strategies, assistance from peer tutors, adapted teaching, response to the actions of students with LD, and communication strategies; example: strategic positioning of the teacher and use of FM systems.
Nunes S da S et al. (2015) ²²	DEAFNESS AND EDUCATION: INCLUSIVE AND/OR BILINGUAL SCHOOLS?	Discuss educational approaches and propose solutions for the schooling of deaf people.	Theoretical review of clinical-therapeutic and socio-anthropological approaches; analysis of public policies for deaf education.	Proposal for bilingual and inclusive education, focusing on the use of Libras and strengthening the identity and social belonging of the deaf; need for public policies for inclusion.
Silva CM da et al. (2014) ²³	INCLUSION AND SCHOOLING PROCESSES: NARRATIVES OF DEAF PEOPLE ABOUT TEACHING PEDAGOGICAL STRATEGIES	Understand the perception of deaf people about the pedagogical strategies used.	Semi-structured interviews with six deaf high school students; analysis of school experiences.	Importance of Libras and image resources for academic success; deaf teachers as a significant influence; urgency of educational policies that promote bilingual and inclusive schools.

The analysis of the selected articles revealed that educational inclusion is a recurring topic in literature, with a particular focus on teaching strategies tailored to the needs of deaf students who use spoken language. The studies emphasized the dominant role of Brazilian Sign Language (Libras) and the importance of bilingual approaches, while also underscoring the need for specific training for educators working with this population. Furthermore, the findings highlighted the value of collaborative work among education professionals to foster an inclusive environment that respects the cultural and communicative specificities of students with hearing loss.

However, a significant gap remains: the diversity within the deaf population is rarely addressed in a comprehensive manner. This includes variations in identity, communication modes, and particularly the specific needs of students who use hearing technologies—such as HA and CI—yet do not use Libras and rely instead on speechreading, oral communication, and amplification devices.

As a result, no articles explicitly addressing the IEP were identified. Therefore, none of the studies met the inclusion criteria or were considered sufficiently relevant to answer the guiding question of this literature review.

Since 2010, with the mandatory implementation of Neonatal Hearing Screening (NHS) for all live births in Brazil—guaranteed by Law No. 12,303 of August 2, 2010⁹—the diagnosis of hearing loss has occurred at increasingly earlier stages. Brazilian legislation defines hearing loss as a long-term hearing limitation—whether total or partial, unilateral or bilateral—that, in interaction with one or more barriers, restricts a person's full and effective participation in society on an equal basis with others¹⁰. This scenario reinforces the need for an inclusive educational model aimed at ensuring equal opportunities and access to education for individuals with hearing loss.

Law No. 9,394 of December 20, 1996¹¹, which establishes the Guidelines and Bases of National Education, defines as a guiding principle the guarantee of equal conditions for access to and continuity in school (Art. 3). In 2008, Decree No.

6,571¹² amended this law to expand the provision of specialized educational services. It mandates that education systems must enroll students with disabilities, global developmental disorders, and high abilities or giftedness in regular schools, while also offering Specialized Educational Services (AEE, in Portuguese) as part of the support structure.

According to the *Operational Guidelines for Specialized Educational Services in Basic Education*¹³, the objective of AEE is to identify, develop, and organize pedagogical and accessibility resources to ensure student participation, based on their specific needs. AEE is conducted by teachers qualified in the area, primarily in the school's own Multifunctional Resource Room or in another regular school, during the opposite shift to regular classes. It may also be offered in specialized educational service centers—public or non-profit private institutions—under agreement with the Department of Education¹³.

The *Brazilian Law for the Inclusion of Persons with Disabilities*¹⁴, known as the Statute of Persons with Disabilities, was enacted in 2015 to guarantee and promote, on equal terms, the exercise of fundamental rights and freedoms by people with disabilities, ensuring their social inclusion and citizenship. However, an integrative review of national literature on the IEP¹⁵ highlights that although students with disabilities have been formally included in regular classrooms, their effective participation in teaching and learning processes remains limited, hindering full educational inclusion¹⁵. Based on the studies reviewed, the authors emphasize the IEP as a key tool to promote educational accessibility¹⁵.

The IEP is a student-centered pedagogical tool, designed as a curricular planning document that defines specific academic and functional goals for each student with a disability. It must consider the student's current performance level, as well as short- and long-term educational objectives aligned with the regular education curriculum. Furthermore, the IEP should outline teaching strategies aimed at facilitating and enhancing learning, which must be continuously evaluated and updated as needed¹⁶.

The development of the IEP requires the involvement of a multidisciplinary team. This collaborative approach is essential to ensure that the plan comprehensively addresses the students' needs and supports their educational progress. All professionals involved in the student's development and support play an active role in both the design and ongoing evaluation of the IEP¹⁷.

In the context of hearing loss, the SLP and audiologist are the professionals responsible for implementing interventions that minimize the impact of auditory limitations. The SLP carries out prevention and early detection of hearing loss, facilitates the adaptation of electronic hearing devices, and provides auditory rehabilitation and specialized therapeutic monitoring¹⁸.

Development of informational material

The development of the informational material on the IEP for students who are deaf, and use spoken language, was guided by the specific needs of its target audience, SLPs and audiologists. The eBook (Figure 2) was designed to provide comprehensive guidance on IEP preparation, outlining the key steps for its implementation and emphasizing the importance of collaboration among members of the multidisciplinary team.

The material underscores the central role of SLPs and audiologists within the IEP team. Their contributions are highlighted across several core areas, including:

- Conducting comprehensive hearing and educational assessments;
- Establishing individualized educational objectives and goals;
- Implementing instructional and therapeutic strategies that support the development of auditory and language skills in students who are deaf and use spoken language.

Thus, the eBook aims not only to serve as a practical guide but also to reinforce the value of collaborative practices in enhancing inclusion and improving the quality of the educational experience for this population.

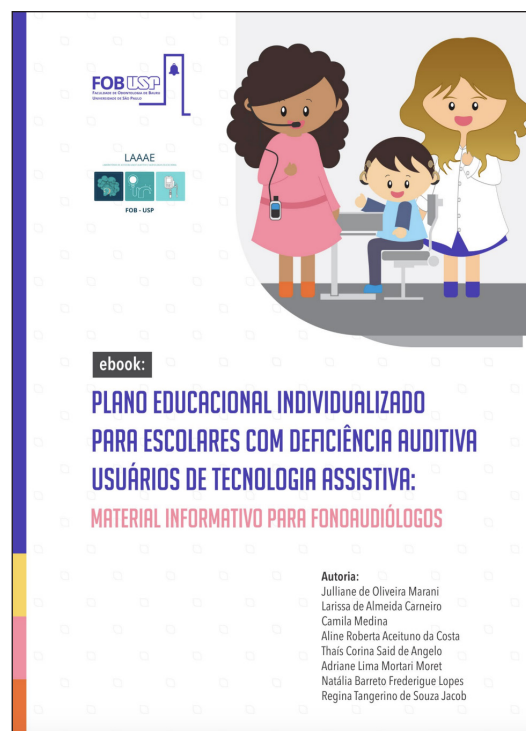


Figure 2. Cover of the eBook *Individualized Educational Plan for Students Who Are Deaf and Use Spoken Language: Informational Material for Speech-Language Pathologists and Audiologists*. The full version is available at: <https://sites.usp.br/laaaed/materiais-informativos/>.

Discussion

Inclusive education, as both a policy and a practice, aims to accommodate the diversity of students with disabilities by ensuring equal opportunities within the school context. Achieving this requires individualized tools—such as the IEP—that address specific learning needs.

This study highlights a critical gap in Brazilian literature and educational practice regarding the application of the IEP for students who are deaf, use spoken language, and rely on HAs and CIs. The integrative review revealed a lack of studies specifically focused on the development of IEPs for

this population (Table 1)^{19–23}. Although inclusive strategies for deaf students are broadly discussed, the prevailing focus on Libras and the bilingual model often marginalizes those who rely on oral communication and auditory devices, exposing persistent challenges to full inclusion.

The review was conducted from a health perspective, using DeCS/MeSH descriptors in PubMed and BVS. A limitation was the non-use of the TBE, which may have restricted access to educational publications addressing the IEP. Given that the IEP is widely debated in the field of Education, future research would benefit from incorporating education-specific descriptors and databases. Even so, the findings presented contribute to the practices of SLPs and audiologists by clarifying IEP development within an interprofessional framework.

Students who are deaf and use spoken language depend on the effective use of HAs, CIs, and favorable classroom acoustics—all essential components that should be addressed in the IEP. Assistive technologies such as remote microphone systems play a key role in enhancing auditory access and supporting communication in school environments.

Despite technological advances, barriers to effective inclusion persist. A study in Pernambuco identified obstacles such as denial of enrollment, unprepared school personnel, bullying, low academic performance, and lack of AEE. These challenges are linked to weak coordination between public health and education systems and to limited awareness among education professionals regarding the specific needs of this group²⁴.

This gap is reinforced by a study assessing teachers' knowledge of hearing loss and assistive technologies. Most had limited understanding of key tools: none could use the remote microphone system correctly; 61.5% did not know about HAs; and 76.9% were unfamiliar with CIs. Many also failed to adapt teaching strategies for students who use spoken language, often assuming Libras was the only viable communication method²⁵.

These students face distinct challenges overlooked in studies centered on Libras. Their reliance on strategies such as speechreading and auditory devices highlights the need to address classroom acoustics and ensure access to technologies like remote microphone systems, which improve sound clarity and reduce ambient noise.

The lack of educator training in the use and support of HAs, CIs, and remote microphone

systems further restricts educational inclusion. Teachers must be prepared to adapt their practices to accommodate both oral and visual communication. Visual resources and classroom adaptations are essential for fostering a genuinely inclusive environment, recognizing that these students, though not users of Libras, require accessible education aligned with their auditory and communicative profiles.

The absence of a clear legal framework for implementing the IEP in Brazil aggravates the problem. Although laws like the Brazilian Inclusion Law (Law No. 13,146/2015) promote inclusive education, no specific national regulations guide how the IEP should be developed and applied. Confusion between the IEP and PAEE is common. While PAEE is often planned solely by the AEE teacher, the IEP requires collaboration among educators, SLPs, audiologists, families, and other professionals^{4,15}.

The SLP plays a key role in this multidisciplinary process. In both clinical and educational contexts, the SLP supports the development of auditory and language skills through diagnostic evaluations, monitoring the use of HAs and CIs, and defining individualized goals and strategies¹⁸.

To help address this gap, this study developed an eBook to support SLPs and audiologists in building effective IEPs. Following principles from MGIS⁶, the material promotes accessible, inclusive communication and offers both theoretical and practical guidance on IEP implementation.

It is important to note that this study focused on the initial development of the material and did not aim to validate it. The eBook represents a preliminary phase centered on organizing content relevant to the role of SLPs and audiologists in IEP construction. Future stages should involve validation of both content and practical application, engaging professionals in the field to ensure the material's clarity, effectiveness, and usefulness in real-world settings.

Conclusion

There is an urgent need for greater academic, legislative, and professional attention to the IEP for students who are deaf and use spoken language. The absence of specific guidelines and resources for this group creates significant barriers to implementing truly inclusive educational practices. This gap af-



fects not only learning outcomes but also the equitable participation of these students in school life.

The e-book proposed in this study represents a concrete step toward addressing this need. By offering clear, practical guidance, it equips SLPs and audiologists to contribute effectively at every stage of IEP development—from diagnostic assessments to goal setting and the use of strategies that support academic achievement. Future efforts in research and policy must ensure access, inclusion, and educational equity.

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