DEVELOPING MATERIALS FOR SIGN AND WRITTEN LANGUAGE LITERACY

DESENVOLVIMENTO DE MATERIAIS PARA ALFABETIZAÇÃO
EM LÍNGUA DE SINAIS E NA ESCRITA

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ABSTRACT

This article focuses on the development of educational materials to support the bilingual literacy of deaf/hard of hearing children in Greece. Early exposure to Greek Sign Language (GSL) fosters the steady growth of linguistic skills and facilitates the acquisition of sign language literacy. The knowledge of GSL is also essential for the development of deaf and hard of hearing children's literacy skills on the written language of the larger hearing community. Innovative teaching practices and materials for the teaching of GSL as a first language are presented, including a grammar teaching program for preschool to fourth grade students, based on the National Curriculum of GSL. In addition, materials developed to support hearing families of deaf/hard of hearing children in learning signed languages (SLs) are described, incorporating basic vocabulary and communicative activities. All the presented materials emanate from action research conducted in schools for the Deaf. They are user-friendly, multimedia-based open educational resources and are versatile enough to be modified for various SLs.
Keywords: Greek Sign Language, multimedia, open educational resources, hearing parents, bilingual literacy.

RESUMO

Este artigo enfoca o desenvolvimento de materiais educacionais para apoiar a alfabetização bilíngue de crianças surdas/com deficiência auditiva na Grécia. A exposição precoce à língua de sinais grega (GSL) promove o crescimento constante das habilidades linguísticas e facilita a aquisição da alfabetização na língua de sinais. O conhecimento da GSL também é essencial para o desenvolvimento das habilidades de alfabetização das crianças surdas e com deficiência auditiva na língua escrita da comunidade ouvinte em geral. São apresentadas práticas e materiais didáticos inovadores para o ensino da GSL como primeiro idioma, incluindo um programa de ensino de gramática para alunos da pré-escola à quarta série, com base no Currículo Nacional de GSL. Além disso, são descritos os materiais desenvolvidos para apoiar as famílias ouvintes de crianças surdas ou com deficiência auditiva no aprendizado de línguas de sinais (LSs), incorporando vocabulário básico e atividades comunicativas. Todos os materiais apresentados são provenientes de pesquisa de ação realizada em escolas para surdos. Eles são recursos educacionais abertos de fácil utilização, baseados em multimídia e são versáteis o suficiente para serem modificados para várias LSs.
Palavras-chave: Língua de sinais grega, multimídia, recursos educacionais abertos, pais ouvintes, alfabetização bilíngue.

Deaf students' experience of language deprivation

Over the past two decades, even though deaf and hard-of-hearing (DHH) children have been identified early, utilized cochlear implants, and received intensive spoken language therapy, many still experience language deprivation (Hecht, 2020; Glickman & Hall, 2019; Davidson et al., 2011). Such deprivation impacts their literacy and higher cognitive functions (Gulati, 2019; Szarkowski, 2019; Hall et al., 2017). When there is a presence of signed language (SL) in their environment, often their caregivers and teachers are not proficient language users, and they may not consistently use SL, hindering language development (Caselli, Hall, & Henner, 2020). Relying solely on interpreters without additional educational support can further deepen the effects of language deprivation (Caselli, Hall, & Henner, 2020). Even in intervention programs where SL is applied, interactions with multilingual adults fluent in spoken, written, and SLs remain rare (Davidson, Lillo-Martin, & Pichler, 2014). Consequently, the majority of DHH children are not raised multilingually. They tend to grow up in environments with long-lasting inadequate language access, arriving at school language-deprived (Henner & Robinson, 2023) with scant knowledge of spoken and/or SL. They often become late first-language learners, which may result in them developing emergent writing skills as late as thirteen (Holcomb, Dostal, & Wolbers, 2023).

Defining sign literacy

UNESCO, (2017) defines literacy as "the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts". In this definition reference to printed and written materials is central. Traditionally, the term *literacy* was often linked with the acquisition of reading and writing skills in printed/typographic texts (Jacobs, 2013; Snoddon, 2012; Gee, 2008; Czubek, 2006). However, in contemporary times, literacy encompasses a wider spectrum, giving rise to terms such as *oral literacy*, *print literacy*, *visual literacy*, *sign literacy*, *digital literacy*, and more. Print literacy is particularly about accessing and expressing information through written language systems, delineating the mastery over a written language (Dudeney, Hockly, & Pegrum, 2014; McCarty, 2013). Much like print literacy, oral/sign literacy involves the capability to access, interpret, and employ an oral/SL, respectively. The emergence of SL literacy post the acknowledgment of SLs (Snoddon, 2012), compounded by advancements in multimedia technology, introduced a verbal (non-print) - either captured/video recorded or not- form of literacy (Mertzani 2022; Byrne, 2016; Czubek, 2006). The recorded SL resources -video/sign texts- mirror the conventional linguistic form and stand analogous to printed materials. The cognition required for understanding and interpreting signed texts is as profound as that for print literacy, since the used SL within these materials is editable and assumes academic characteristics (Mertzani 2022; Paul, 2018).

Understanding the concept of sign literacy leads us to evaluate the significance of oral, verbal, and signed forms of communication and their pivotal roles in shaping thought processes.

The significance of oral discourse, verbal (non-print) or signed (uncaptured) on literacy development

Literacy, in all its forms, predicates the evolution of *literate thought*, an essential process for interpreting accessed and assimilated information (Paul, 2018). As Olson (1994, p. 280-281) states, "Literate thought can be, indeed is to some degree, embedded in the oral discourse of a literate society or in

sign discourse or in other forms of captured information." The adeptness to engage in literate thought stems from individuals' prowess in absorbing and reflecting on complex information, regardless of the medium: oral, print, signed, or other. Achieving this level of sophisticated thought entails (a) proficiency in an oral or SL, (b) understanding and application of metalanguage, and (c) the capability to interpret decontextualized data (Paul, 2018). Print literacy originates from spoken language expertise (Mertzani, 2022; Allen & Morere, 2020), while captured SL literacy evolves from non-captured – through-the-air (Paul (2018) – SL knowledge (Snoddon, 2012). The underlying competence of either spoken or visual languages bolsters early literacy skills, whether in print or sign (Allen & Morere, 2020). Just as the comprehension and expression of spoken language are crucial for reading and writing skills, a DHH individual's ability to interpret and produce signed video-texts rests on their grasp of SL. This mastery transcends mere signing; it encompasses all language aspects: phonology, lexicon, syntax, morphology and pragmatics. To truly evolve sign literacy skills, the focus for DHH individuals should be further expanded on developing an explicit linguistic knowledge about their language (Hoffmeister, Karipi, & Kourbetis, 2022; Mertzani 2022; Paul, 2018), which also includes accessing and interpreting decontextualized information (Paul, 2018).

Having established the foundational relationship among SL and sign literacy it's essential to delve deeper into the specific role of SL in enhancing the print literacy of DHH children.

The role of SL in deaf children's access to print literacy

Extensive literature supports the positive and mutually dependent relationship existing between SL knowledge and written language development in DHH children (for ASL and English see: Holcomb, Dostal, & Wolbers, 2023; Holcomb 2023; Hoffmeister et al., 2022; Scott, 2022; Allen & Morere 2020; Andrews et. al., 2016; Hrastinski & Wilbur, 2016; Scott & Hoffmeister, 2016; Allen et al., 2014; Hoffmeister & Caldwell Harris, 2014; Novogrodsky et al., 2014; for SSL and Swedish see Rudner et al., 2015). Following the idea of *a deaf norm,* SL plays a central role in reading and writing development following a visual rather than a phonological process for reading comprehension (Beaujard & Perini, 2022).

Linguistic competency in SL aids DHH students' print literacy, reading, and writing skills (Holcomb, 2023, Rudner et al., 2015). The application of DHH students' linguistic (signed) resources becomes evident in their emergent writing features (Holcomb, Dostal, & Wolbers, 2023). DHH children with robust SL skills can mirror the developmental stages in early language and writing acquisition observed in hearing children (Williams & Mayer, 2015). DHH students' knowledge of ASL - aged four to 18 - drives the enhanced reading outcomes (Novogrodsky et al., 2014). Even in cases where DHH children grow up in hearing families, early exposure to SL has proven to lead to age-level English vocabulary growth (Caselli, Pyers, & Lieberman, 2021). Well-developed ASL skills in DHH students at preschool age, regardless of their family's hearing status, enhance their emergent reading skills and expedite their writing development. Thus, signing skills fortify students' capacities to grasp the cognitively demanding skills essential for reading and writing development (Morere, 2020).

As the crucial relationship between SL and literacy - signed and print- becomes apparent, the educational landscape has to be adapted to support bilingual development, especially in schools, reinforcing signed language acquisition.

School - two-way-bilingual programs

In two-way-bilingual programs, where both languages are supported, hearing learners have been found to attain higher academic achievements and language proficiency in the dominant language of the larger community compared to one-way-bilingual programs (Serafini, Nadine, & Adam, 2022). In these programs, a student's native language (L1) is taught systematically so that they become bilingual and biliterate in both languages. Classroom teachers in such programs actively utilize and rely on students' L1 to facilitate their academic development and success, teaching learners about their home language. However, while hearing students often arrive at school with their L1 already acquired, many DHH students begin their education language-deprived (Holcomb, Dostal, & Wolbers, 2023; Henner, Robinson, 2021; Caselli, Hall, & Henner, 2020; Hecht, 2020; Davidson, Lillo-Martin, & Pichler, 2014; Davidson et al., 2011). For these students, the acquisition of a SL has to precede any formal teaching of that language. Thus, "schooling must create an environment in which learning a SL is necessary prior to learning about a SL" (Hoffmeister, Karipi, & Kourbetis, 2022, p. 503).

DHH children with limited initial proficiency in a SL can rapidly improve upon entering pre-K and kindergarten, especially when exposed to more fluent SL models (Hernandez, Allen, & Morere, 2022). Early exposure to SL in schools appears to compensate for a lack of parental SL knowledge at home. This results in DHH children enhancing their initially limited SL skills and growing their proficiency over time.

For DHH children, it's vital to develop a SL foundation before delving into the intricacies of the language and acquiring linguistic knowledge. Using SL in educational settings, provides access to content across all subjects. Moreover, learning about the language not only cultivates sign literacy skills but also supports DHH students' development of print literacy in the language of the hearing community.

While schools work to enhance SL and literacy skills, it's imperative to employ innovative teaching methods and materials that can further aid this educational endeavour. Moving from the importance of SL acquisition to the practicalities of instruction, we explore innovative teaching strategies and materials.

Innovative teaching practices and materials for enhancing the learning of GSL as a first language

Drawing from the aforementioned theoretical framework regarding the significance of SL acquisition for DHH children's access to both sign and print literacy, and postulating that early exposure to Greek Sign Language (GSL) stimulates the gradual maturation of the language, the advancement of sign language literacy, and the cultivation of reading and writing skills in Greek, we dedicated the past two decades to the creation of innovative teaching materials and practices for learning GSL as a first language.

The sections below present an in-depth exploration of the development and application of four educational resources, tailored specifically for students up to the fourth grade of elementary school, entitled:

- *Vlepo kai Mathaino* (in Greek, Βλέπω και Μαθαίνω; in English, Seeing and Learning) GSL Educational Material for Kindergarten (Kalogridi, Karapanagiotou, Karipi, 2015);
- *Koita me kati sou leo* (in Greek, Κοίτα με κάτι σου λέω; in English, Look at me, I am saying something) GSL Educational Material for First and Second Grade Elementary Education (Karipi, 2015);

- *Sinthetodas to puzzle tis glossas mou* (in Greek, Συνθέτοντας το παζλ της γλώσσας μου; in English, Putting together the puzzle of my language) GSL Educational Materials for Third and Fourth Grade Elementary Education (Karipi, 2022; Hatzopoulou, 2022);
- *Mathaino ta Prota mou Noimata*: Odigos didaskalias gia Kofous Glossika Protypa (in Greek, Μαθαίνω τα Πρώτα μου Νοήματα Οδηγός για Κωφούς Γλωσσικά Πρότυπα; in English, Learning my First Signs: Teaching Guide for Deaf Language Models - DLMs) (Karipi, Bekiari, Krikoni, 2022).

All materials emanate from action research undertaken in schools for the Deaf and are meticulously designed to cultivate GSL as a first language (Kourbetis, 2019), thereby promoting bilingual education. They are multimedia-based open educational resources facilitating effective teaching and learning, being versatile enough to be modified for various SLs. Guided by the benchmarks of the GSL Curriculum published in 2004 by the Greek Pedagogical Institute (2004), our aspiration is to stimulate growth in both signed and written languages for the DHH students.

Following, the methodology of teaching GSL using signed texts and phrases is explored, highlighting the utilisation of user-friendly interface, which is made to facilitate the principles of comparative grammar, enhancing understanding and mastery of grammar and syntax in both languages. Moreover, we present the application of the same methodologies in an instructional manual, successfully used by Deaf Language Models (DLMs) for training hearing parents of DHH children to establish and enhance communication with their children. Lastly we conduct an analysis of the impact of these pedagogical tools and strategies, emphasising their role in fostering inclusivity in education, improving the quality of education for DHH students, and their potential for effecting positive linguistic, academic, and social growth.

Guiding principles of the GSL educational material

Aiming for a Differentiated Instruction approach that can be shaped by the learning profile of DHH students, we have designed and developed materials and educational resources that nurture GSL as a first language, thereby promoting bilingual education. The ultimate goal is to foster the holistic development of both signed and written languages and, in turn, overall linguistic competence. GSL is viewed as a target language that is cultivated systematically, just as spoken language is for hearing students.

The consistent juxtaposition of the two languages contributes to: (a) recognizing the morphosyntactic and literary differences between the languages; (b) systematic learning of SL; (c) the development of sign literacy skills; and (d) the cultivation of written and spoken language skills.

Serving as methodological guides and pedagogical tools for educators teaching GSL as a first language, the educational materials align with the objectives of the GSL Curriculum published in 2004 by the Greek Pedagogical Institute (2004). The GSL curriculum not only marked the first GSL publication as an L1 in Greece but also introduced multimedia educational material for the language. Additionally, the produced GSL materials adhere to the specifications of the project titled "Design and Development of Accessible Educational Materials for Students with Disabilities," also known by its acronym *Prosvasimo* (Kourbetis, 2013).

Figure 1: The signed text alongside its written form

Overall, a set of fundamental guiding principles was stringently followed for all educational materials with the paramount one to be the implementation of GSL independently of spoken Greek. A particular emphasis pertains to vocabulary instruction, where learners are immersed in understanding both the denotative and connotative nuances of words, synonyms and antonyms, as well as hypernyms and hyponyms, all within the context of their functional applications. Grammar is not taught in isolation. Instead, it is seamlessly woven into the broader tapestry of language instruction, to match the communicative needs of the students. The intricate interplay between vocabulary, grammar, and syntax, applies a holistic approach to language learning. Furthermore, it's crucial to note that the translation process, when needed for the incorporation of Greek vocabulary, phrases and texts, was undertaken with the utmost care and precision. The vocabulary and meaningful phrases translated into GSL were entrusted to qualified and seasoned native signers. These professionals are not just experts in their field but are also members of the Deaf community, proudly carrying a robust Deaf identity.

All resources are offered in both print and electronic formats. The print version provides a comprehensive guide to the GSL teaching methodology tailored specifically for first to fourth-grade primary education. Meanwhile, the electronic format provides a multimedia application of the teaching material. It includes video files, editable tasks and tables, and a wealth of auxiliary resources like teacher's manuals and installation guides. In the realm of bilingual pedagogy, juxtaposing the signed content with its written analog is indispensable, facilitating a comparative study of both languages (Figure 1).

The signed phrases and narratives produced are rendered in video format and transcribed into written Greek via glosses at the level of meaning, a common practice in bilingual education and sign language research (Slobin et al., 2001; Baker et al., 1999; Baker-Shenk & Cokely, 1981). Glosses relating to sign phrases and signs are distinguished from Greek text by capitalization. Moreover, to highlight their distinct nature, the transcribed SL appears in blue, thereby distinguishing it from written Modern Greek (Figure 2).

Figure 2: Glosses in Greek presented in capital blue letters

Βήμα 1

Προετοιμασία επίσκεψης στη λαϊκή αγορά της γειτονιάς.

Ο/η νηπιαγωγός προετοιμάζει τους μαθητές για μια βόλτα στη λαϊκή αγορά δείχνοντας φωτογραφίες ή ακόμα και μικρά βιντεάκια από το Διαδίκτυο σχετικά με τη λαϊκή αγορά. Εξηγεί στα παιδιά ότι θα επισκεφθούν τη λαϊκή αγορά της γειτονιάς, για να αγοράσουν φρούτα και να φτιάξουν μια φρουτοσαλάτα.

Οι οδηγίες που δίνει στους μαθητές είναι:

ΕΜΕΙΣ ΛΑΙΚΗ ΠΑΜΕ (Θα πάμε στη λαϊκή)

ΕΚΕΙ ΛΑΙΚΗ ΕΜΕΙΣ ΤΙ-ΚΑΝΟΥΜΕ; (Τι θα κάνουμε στη λαϊκή;)

ΕΜΕΙΣ ΦΡΟΥΤΑ ΑΓΟΡΑΖΟΥΜΕ (Θα αγοράσουμε φρούτα)

ΦΡΟΥΤΑ ΑΓΟΡΑΖΟΥΜΕ ΤΙ; (Τι φρούτα θα αγοράσουμε;).

Οι μαθητές προετοιμάζονται μέσα από παιχνίδι ρόλων για το τι πρόκειται να επακολουθήσει. Παίζουν με τον/τη νηπιαγωγό το μανάβικο, παίρνουν ρόλους και αναπαριστούν το διάλογο μεταξύ μανάβη και πελάτη.

Ο/η νηπιαγωγός εξηγεί στα παιδιά:

ΕΓΩ ΤΙ-ΚΑΝΩ; ΕΓΩ ΦΡΟΥΤΑ ΠΟΥΛΑΩ (Τι κάνω εγώ; Εγώ πουλάω φρούτα), ΕΓΩ ΔΟΥΛΕΙΑ ΜΑΝΑΒΗΣ ΠΟΥΛΑΩ (Εγώ είμαι ο μανάβης)

ΕΣΥ ΕΡΧΕΣΑΙ-ΤΞ-1 ΦΡΟΥΤΑ ΕΣΥ ΑΥΤΑ ΔΙΑΛΕΓΕΙΣ (Εσύ έρχεσαι για να διαλέξεις φρούτα), ΕΣΥ ΛΕΦΤΑ-ΠΛΗΡΩΝΕΙΣ (Πληρώνεις).

Μαθητής: ΜΗΛΑ ΔΥΟ ΚΙΛΑ ΕΓΩ ΘΕΛΩ (Θα ήθελα δύο κιλά μήλα)

2

Seeing and Learning - GSL educational material for kindergarten

Based on the fact that early exposure to SL at school improves DHH children's restricted SL skills, compensating for the lack of SL input at home (Hernandez, Allen, & Morere, 2022), the development of SL materials for kindergarten is extremely important. The GSL language pedagogical material, entitled Vlepo kai Mathaino (Seeing and Learning) (Figure 3), aims to address the issue of DHH children's limited knowledge of signed and/or written language, entering school language-deprived. It serves dual purposes as a pedagogical tool for language development, as instructional material for imparting early concepts, and an assessment tool.

Figure 3: The GSL educational material Vlepo kai Mathaino

Its construction is underpinned by the MacArthur Communicative Development Inventory (CDI) (Fenson et al., 1994). The inventory is designed to assess vocabulary production and offers two forms, for infants aged 8-16 months and toddlers aged 16-30 months respectively. The adapted MacArthur CDI for GSL (Kourbetis, 2005) is a tool enabling parents and teachers to measure early vocabulary development of DHH children acquiring GSL. While the version for younger children might cover infants' complete known expressive vocabulary, for toddlers it does not encapsulate all the signs/words a child may produce. The MacArthur CDI for GSL, as the ASL-CDI (Anderson & Reilly, 2002; Caselli, Lieberman, & Pyers, 2020), includes a representative sample of children's early lexicon, and its primary purpose is to provide a comparative analysis of a DHH child's early vocabulary production with the vocabulary of a DHH child of deaf parents of the same age (Kourbetis, 2005).

Vlepo kai Matheno encompasses a collection of 600 initial concepts presented to infants through organised activities, supplemented by visual aids such as pictures, photographs, abstract sketches, and GSL videos. The conceptual categories encompass environmental objects, animals, clothing, toys, furniture, rooms, food, beverages, actions, daily activities, personal attributes, relationships, emotions, quantitative and temporal expressions.

Figure 4: The content of the educational material Vlepo kai Matheno.
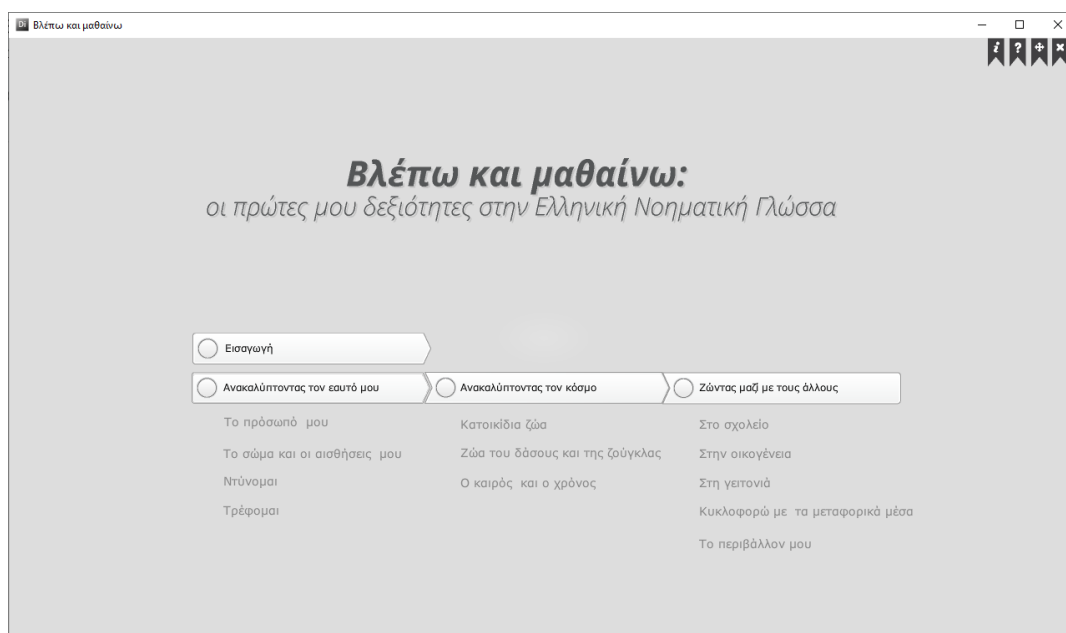
The content of Vlepo kai Matheno incorporates three major themes (Figure 4). The first theme, DISCOVERING MYSELF, delves into personal discovery and self-awareness. It begins with an exploration of "My face" and transitions into the comprehension of "My body and my senses." Subsequently, it touches upon daily activities like how "I dress" and how "I feed myself." Next, the theme of DISCOVERING THE WORLD broadens the horizon to the world outside. Here, learners get introduced to "Pets" and the varied "Animals of the forest and jungle." They also gain insight into the "Weather and time" and how they influence the world around us. Lastly, the theme LIVING WITH OTHERS fosters a sense of community and understanding of our surroundings. This segment commences with life "At school," progressing to familial ties with "In the family." The learning continues as we explore the broader community with "In the neighbourhood." It also provides knowledge about "Getting around by transport" and cultivates a sense of environmental responsibility with "My environment."

Koita me kati sou leo - GSL educational material for first and second grade elementary education

Koita me kati sou leo (Figure 5), a material designed for teaching GSL as an L1 to primary school students, was published in 2015 under the Prosvasimo project (http://www.prosvasimo.gr/el/koita-me--kati-sou-leo). This material is an innovative endeavor in creating pedagogical resources for GSL teaching, targeting the implementation of bilingual bicultural educational programs in Greece.

The uniqueness of this material lies in its design, emphasising the comprehension of grammatical--syntactic elements of GSL as a target language for the first time. Created by experienced Deaf native signers and aligned with the objectives of the GSL Curriculum, this material presents GSL through authentic, natural communication scenarios akin to those in the Deaf community. It encompasses a wide array of grammatical rules at the phonological, morphological, and syntactic levels, including mouth actions, classifiers, time axes, use of space, among others. "Koita me kati sou leo" is structured into 12 modules, with each module subdivided into four sub-modules. Each segment lays out progressive objectives and suggests indicative activities to enhance GSL instruction (Figure 6).

Figure 5: The GSL educational material Koita me kati sou leo

Figure 6: Content overview of Koita me kati sou leo

The digital version of the material includes signed narratives, texts or phrases signed by Deaf native signers, and a range of tasks that educators can employ to meet their teaching objectives. The signed narratives, dialogues, vocabulary development exercises, and grammar structure lessons are meticulously designed to introduce new vocabulary, highlight specific syntactic and grammatical facets, direct the class towards standard conversational behaviours, and acquaint learners with the cultural values of the Deaf community (Figure 7).

Figure 7: Phonological rules: teaching the 5-Handshape

Especially for beginner students, the material employs simple, easily comprehensible conceptual texts and dialogues, signed by two signers to ensure: a) heightened emphasis on individual grammatical elements, b) exposure to diverse signing styles, and c) demonstration of effective communication techniques.

Repeated usage of specific grammatical phenomena and new vocabulary in SL is highly encouraged. Indicative activities include video exercises of varying lengths and complexity, video presentations in GSL by students, video editing, pantomime of day-to-day activities, electronic interactive games, and role-playing daily tasks.

All exercises are curated to provide students opportunities for natural communication in nearly real conditions, enabling discussions, expressing opinions, and more. Within the classroom, teachers act as assistant-facilitators for the outlined activities, offering additional explanations or assistance when students face challenges.

Building upon the foundation laid by "Koita me kati sou leo," the "Sinthetodas to puzzle tis glossas mou" (Putting together the puzzle of my language) material takes the educational journey a step further.

Sinthetodas to puzzle tis glossas mou - GSL educational materials for third and fourth grade elementary education

The "Sinthetodas to puzzle tis glossas mou" GSL educational material for the third and fourth grade elementary education was published under the Prosvasimo project (https://iepx.iep.edu.gr/static/apps/ENG-GD/index.html) too, in 2022, seven years after the "Koita me kati sou leo" educational material for the first and the second grade, constituting its continuation.

It is designed to expand students' GSL knowledge, grammar learning and sign literacy. Its content follows a spiral development and is presented through an updated design interface, which similarly to "Koita me kati sou leo" assists the implementation of the bilingual approach in teaching deaf and hard-of-hearing students (Figure 8). The interface functions as a primary tool, allowing a direct comparison between GSL signed and written Greek texts, and promoting the application of comparative grammar and the development of meta-linguistic knowledge. To impart and assimilate grammar and the morpho-syntactic rules of GSL, the creation of new meaningful sign texts and phrases by Deaf signers and the existing GSL literature was leveraged.

Figure 8: The interface of Sinthetodas to puzzle tis glossas mou for the Third and Fourth Grade Elementary Education
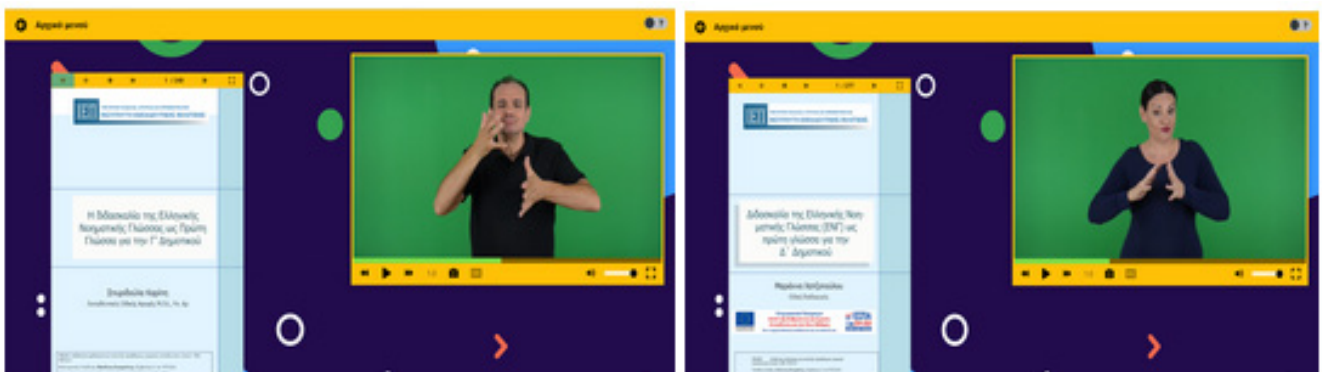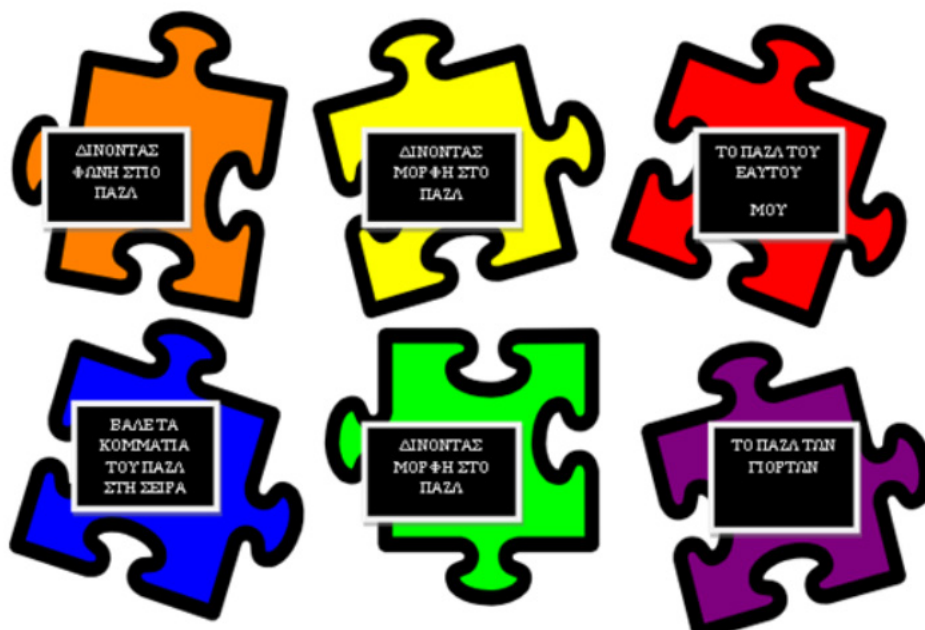

Figure 9: The six module structure of Sinthetodas to puzzle tis glossas mou for the 3rd and 4th grade

The content of Sinthetodas to puzzle tis glossas mou includes six modules per grade. For each grade the first module is about the phonological structure of GSL. The second and third modules are dedicated to the morphological structure of GSL, and the fourth deals with the study of specific GSL syntactic rules, such as the word order, the syntactic use of space, the different ways for stating the sentence subject, topicalization etc. The fifth module emphasises the application of language in real-life contexts, being dedicated to the pragmatic use of GSL. Lastly the sixth module addresses both the culture of the Deaf community and the development of the Deaf identity (Figure 9).

Figure 10: Learning my First Signs: Teaching Guide for Deaf Language Models
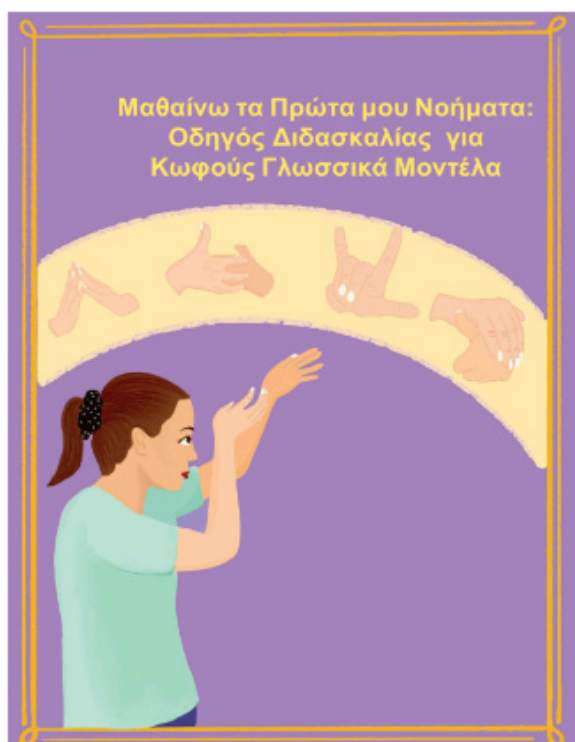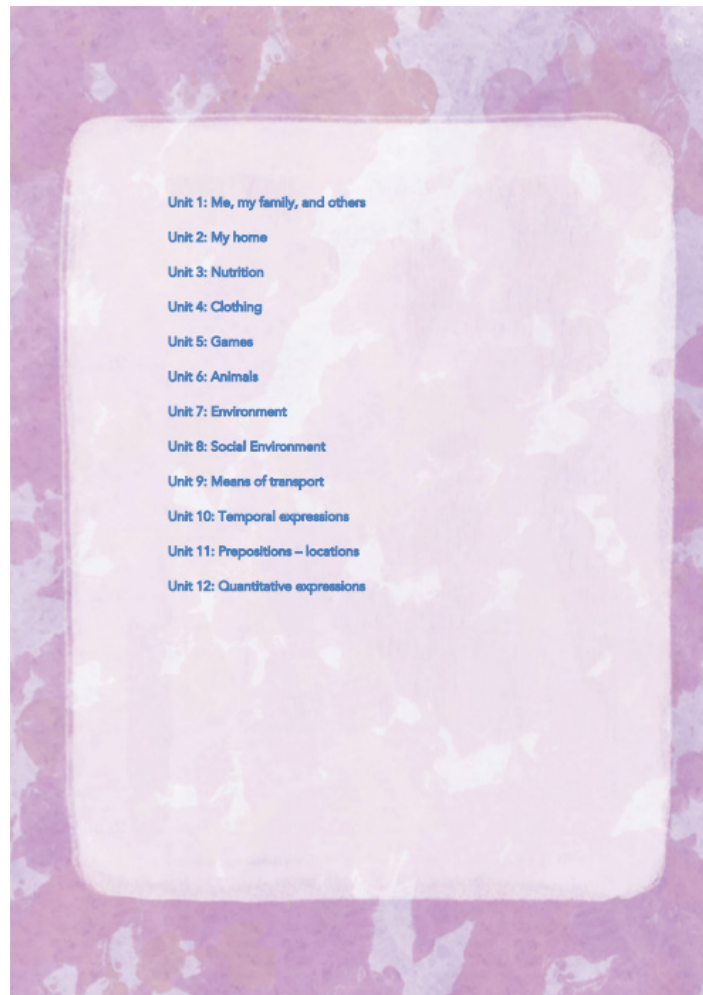

In relation to content, a series of activities have been meticulously crafted with specific objectives in mind. Initially, participants are introduced to the nuances of eye contact, understanding its paramount significance within the context of GSL. This is closely followed by instruction on the four basic parameters of GSL, encompassing position, movement, palm orientation and direction, as well as non-manual elements such as facial components: eyes, eyebrows, and mouth. This knowledge is further enriched by an exploration of various grammatical categories, including but not limited to verbs, nouns, and adjectives and the ways of altering sign meaning by modifying some of the sign's elements as position, movement and facial expression. Activities also encompass understanding the basic types of questions in GSL, and the specific methods to express negation. Delving deeper, participants are acquainted with the diverse types of classifiers, recognizing their pivotal role as verbs of movement and position within GSL. Another pivotal aspect is the understanding and application of the timeline in GSL. The series culminates with learners delving into sentence structure, where they engage in the analysis of the constituent parts of sentences in GSL.

Following the of "Koita me kati sou leo" and "Sinthetodas to puzzle tis glossas mou," another groundbreaking resource: "Learning my First Signs: Teaching Guide for Deaf Language Models (DLMs)" have been developed, for the purpose of reinforcing early sign language acquisition within the family context.

Learning my First Signs: teaching guide for deaf language models

"Learning my First Signs: Teaching Guide for Deaf Language Models (DLMs)" (Figure 10) was developed within the project "Deaf Adults as Role Models for the Hearing World: Links of the Same Chain" abbreviated as "Sign Links" (https://signlinks.eu/) for training DLMs.

Figure 11: The twelve units of the material Learning my First Signs: Teaching Guide for Deaf Language Models

Unit 1: Me, my family, and others

Unit 2: My home

Unit 3: Nutrition

Unit 4: Clothing

Unit 5: Games

Unit 6: Animals

Unit 7: Environment

Unit 8: Social Environment

Unit 9: Means of transport

Unit 10: Temporal expressions

Unit 11: Prepositions – locations

Unit 12: Quantitative expressions

The Instructional Manual for DLMs acts as an educational guide that facilitates the teaching and exposure of DHH children born to hearing parents to GSL. It was intended to be utilised by DLMs tasked with teaching elementary linguistic concepts to hearing parents, guardians, and caregivers who desire to learn basic SL concepts to communicate with a DHH family member. Designed for use by Deaf adults serving as SL Models (DLMs) and Deaf Role Models (DRM), it is only available in written form having no video texts included. Its aim is to assist hearing individuals, such as adult parents, guardians, and caregivers and professionals involved in the education of DHH infants and toddlers across Greece. An English adaptation is available for use in other countries, adaptable to meet specific national requirements.

While the manual's primary objective is to facilitate teaching GSL to adults interacting with DHH children, its structure and content (using activities, materials, media, etc.) predominantly aim to educate children. DHH children are the ultimate beneficiaries of language instruction. Over the past three years, the structure of the teaching Guide has been successfully implemented, first in Greece and then expanded to Malta and Bulgaria, and was positively assessed by Deaf adults and hearing parents of DHH children who participated in the "Sign Links" project.

Following the "Vlepo kai Mathaino" structure, the instructional manual for DLMs includes 600 items, organised in different conceptual categories, creating 12 distinct teaching units for (1) Self, Family, and Others, (2) The Domestic Environment, (3) Nutrition (4) Apparel (5) Recreational Activities,(6) Fauna (7) Environment (8) Societal Interactions (9) Modes of Transportation (10) Temporal Expressions (11) Prepositions and Locations (12) Quantitative Expressions (Figure 11). Most of the 600 items are nouns, verbs and adjectives, while fewer are prepositions, pronouns, conjunctions, temporal, quantitative and interrogative concepts and auxiliary verbs.

For vocabulary development a multi-dimensional pedagogical approach for learning is adopted. It is advocated for one to begin by playing with real objects, images, and photographs, making them alive with accompanying descriptions and captions. By placing images or photographs in a sequential manner, students can trace narratives or events, enhancing their comprehension and retention. Physical interaction with objects further solidifies understanding, as does participation in described real life activities. As in the previously analysed resources, the power of narrative texts and storytelling is emphasised as a significant pedagogical approach. Engaging in dialogues, particularly in a question--and-answer format, is suggested to stimulate critical thinking. Furthermore, interaction with students is described to take varied forms, from games (Figure 12), role-plays, improvisations and guided or natural discussions to immersive hands-on experiences/visits such as Deaf clubs, sport events, youth festivals. Supervised repetition exercises ensure that the content is deeply ingrained, and an element of fun and challenge added in language games increases satisfaction during interaction and language understanding. This comprehensive approach ensures a holistic learning experience for all involved.

Figure 12: Language games

Concluding Remarks

The intention behind the development of the multimedia materials transcends merely addressing the linguistic and communication needs of the students; it extends to supporting educators, family members, and the broader community in enhancing both sign literacy and print literacy for deaf children. Implementing GSL as an L1, coupled with systematically fostering an accessible language environment for DHH pupils, lays the foundation for equal opportunities in learning, inclusion, and participation in both educational and social settings.

These educational resources are designed to be universally accessible, including to those students whose communication and learning profiles may not be sufficiently supported within their educational or family environments. They can be utilised by students, educators, school counsellors, parents, and all those directly engaged for educational and communicative purposes. Notably, the resources provide significant aid for teachers in their instructional endeavours, especially through the presentation of texts signed by native signers. Additionally, they include an exhaustive overview of the grammatical and syntactic rules of SL, enhancing the understanding of both sign and print literacy.

In summary, the materials serve as a vehicle to foster respect and acceptance of diversity, thereby advancing differentiated pedagogy and inclusive education. This concerted effort consequently elevates the quality of education for deaf and hard-of-hearing students, both within Greece and globally. The multifaceted approach, emphasising the critical interconnection between sign and print literacy, ensures a comprehensive and holistic learning experience.

Undoubtedly, the presented materials are more than tools; they are vital catalysts in promoting the linguistic, academic, and social development of DHH students, in Greece empowering them with the essential skills for successful inclusion and achievement in all aspects of life.

NOTES

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