

TEACHING EUROPEAN SIGN LANGUAGES AS A FIRST LANGUAGE: CAN THEY BE TAUGHT WITHOUT THE USE OF ICT?

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Abstract

The objective of this paper is to present the importance of the use of information and communication technologies (ICT) for teaching signed languages (SL) as first language (L1). An integrated curriculum and ICT teaching material for the teaching of national sign languages for deaf and hard of hearing students (D/HH) as first languages is introduced. The development of student assessment in learning SL, as well as a teacher and parent training platform, are discussed. Due to deaf students' visual nature, systematic use of ICT for the development of educational materials is required to ensure bilingual education of deaf students and accessibility and quality in educational materials.

Keywords: deaf, hard of hearing students, sign language, first language, ICT

Introduction

In considering the principles of the United Nations Convention on the Rights of Persons with Disabilities (UN General Assembly, 2007) and the Universal Design for Learning (UDL) (Izzo & Bauer, 2015), the Institute for Educational Policy (IEP) proceeded to design and develop a trans-European program called "Teaching European Sign Languages as a first language" (SIGN FIRST). According to the principles of UDL, the development and implementation of educational tools and practices to support all students is crucial. Educational systems must provide each student with the opportunity to evolve using different methodology, tools and materials (Izzo & Bauer, 2015; Mace, Hardie, & Place, 1996; Sfyroera, 2007; Tomlinson, 2001). In the European Union (EU) countries, the ministers of education are bound by the Paris Declaration (European Commission, 2015), declaring that all children and young people: (a) will have access to inclusive education without barriers

and/or discrimination, (b) will acquire all the skills, competencies and knowledge needed for success in society by removing geographical, social and educational disparities, and (c) will have integrated and adequate schooling, limiting cases of school dropout and improving their social and professional integration. The principles of universal design are supported directly by information and communication technologies (ICT) as technology contributes to the development of appropriate training materials and learning environments and promotes accessibility and differentiation (Smith & Throne, 2007).

Sign Language (SL) and ICT

International studies argue that the academic progress and normal social and emotional growth of deaf children is directly related to language acquisition and development (Hatzopoulou, 2008; Hoffmeister, 2000; Hoffmeister & Caldwell-Harris, 2014; Hrastinski & Wilbur, 2016; Niederberger, 2008; Ormel, Hermans, Knoors, & Verhoeven, 2012; Woll, 1998). Extensive research on the implementation of bilingual programs in the education for the deaf in Sweden, Denmark and the United States showed spectacular results in the academic course of deaf students and stressed the advantages of acquiring the national sign language from preschool age (Baker, 2001; Fish, Hoffmeister, MacVey, & Clinton, 2006). A recent study by Hrastinski and Wilbur (2016) indicates that children who have competence in SL have higher academic achievement, better understanding of the written texts, proper use of spoken language and good perceptive skills about certain mathematical concepts.

In consideration of the above research, the trans-European program «SIGN FIRST» aims to foster D/HH students' literacy skills/competence by developing bilingual programs and creating effective inclusive school environments. The main aims of the European program are (a) the design and development of innovative educational materials for teaching SL as a first language and (b) the creation of quality teaching tools and methods that will contribute to the professional development of teachers and improve the academic performance of D/HH students.

To achieve this objective, the development and exploitation of ICT is considered essential, as it facilitates the deaf students' access to communication and information. In many cases, ICT is the only solution to minimize deprivation of the incoming information for deaf students. Visual information is a key characteristic of ICT that fits with the D/HH students' learning style since the latter use the visual channel to develop their language and thought (Kourmpetis & Hatzopoulou, 2011). By using ICT we can store, analyse and process data of a language as a signed language, which has no written form. The ICT use also improves the students' participation in the educational activity and leads to the acquisition of new knowledge by strengthening their interest.

SIGN FIRST: Organisation, Key Programme Objectives and Partners

The target group of the SIGN FIRST program is the pupils of the kindergarten and the first two grades of the primary school, aged 4-7 years. However, older pupils of higher grades can also be included in the project's target group as this is a program for teaching SL as a first language, and most D/HH students have never been taught Greek Sign Language (GSL) systematically, at schools. The program is transnational because the challenges for the education of the D/HH students are common throughout the world. In addition, transnationality facilitates the exchange of experience and expertise and the promotion of innovation among the partner countries. Seven different organizations from four countries (Greece, Switzerland, Cyprus and the Netherlands) are the members of this transnational cooperation. The specialization on the education of D/HH students, the knowledge to develop bilingual educational material and the experience in previous European programs were the criteria for the selection of the participants.

The project coordinator is the IEP, which is a leading scientific organisation in Greece with extensive research on the education of D/HH students. IEP has developed specialized accessible multimedia materials for teaching the GSL as a first language (<http://www.prosvasimo.gr/el/polimesiko-uliko/ekpaideutiko-logismiko#koita-me-sou-lew>) expertise, which is exported through transnational cooperation (see samples in Figure 1).

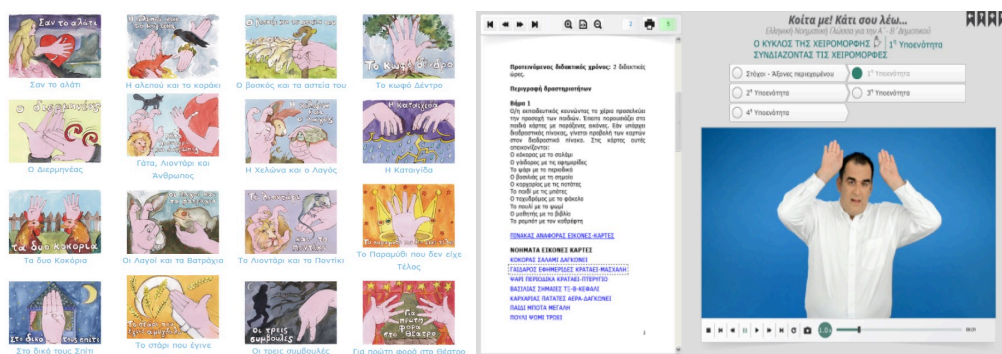


Figure 1. Accessible multimedia materials for teaching GSL as a first language.

The other participant organizations include (a) two universities specializing in teaching and assessing SL (the University of Applied Science in Special Education of Zurich, in Switzerland, and the European University of Cyprus, in Nicosia), (b) two schools for the D/HH students that implement sign-bilingual programs in Greece and teach GSL as a first language, the Special Nursery School for the Deaf and Hard of Hearing Argyroupolis and the Special Kindergarten and Elementary School for the Deaf and Hard of Hearing Likovrisis – Pefkis, (c) the research organization Dutch Sign Centre in the Netherlands, specialized in the research of Dutch Sign Language (DSL) and the development of digital dictionaries, and (d) the Habilis Agency (EPE) organization, with extensive experience in creating accessible digital material for students with disabilities in inclusive education.

SIGN FIRST Outcomes

The outcomes of the SIGN FIRST project are the following:

1. During the first year of the project, existing materials were mapped and best practices used in the EU member countries for teaching and learning SL as a first language, were identified. In the second year, the survey will be extended to countries outside the European region. The aim of the survey is to record:

- The existing curricula for teaching European SL as a first language
- The existing teaching materials, the existing teachers' guides and other resources used for learning SL as a first language
- The good practices that have been used for teaching SL as a first language in the EU countries
- The existing assessment tools and language tests for the knowledge and use of the SL by the D/HH students
- The existing programs for teachers' training for teaching SL as a first language

The research will use a Google Form questionnaire, which is a simple but functional application that allows the development of both open- and closed-type questions. With the use of this application, the given answers can be automatically collected in real time in the questionnaire form offering information and graphs of the responses. Moreover, the data can be exported to excel sheets for parametric analysis.

2. The expansion/development of materials that will enhance the teachers' efforts in implementing bilingual programs-curricula and teachers' guides for teaching SL as a first language will be the main output of the project. Taking into account the existing curricula for the GSL (Pedagogical Institute, 2004) and the existing educational materials for learning the GSL as a first language (Karipi, 2015), the aim of the program is to create a common framework curriculum for teaching European national SL as a first language.

Approaching SL as a target language, the systematic recording and presentation of grammatical and syntactical rules is intended, acknowledging that all SLs follow the same linguistic principles and share common linguistic characteristics on grammar and syntax level. The above-mentioned materials will be fully accessible for deaf students and will be presented using a multimedia computer application that will follow specific requirements relating to: (a) the interface and (b) the rendering of the content in SL. The application will be interactive with display screens of the written text and the translation in the national SL, a practice that promotes the full bilingual process of information (Kourbetis, 2013).

3. The development of new multimedia applications and new accessible material for the growth, the improvement and the cultivation of communicative skills of D/HH children and their parents in SL. The project aims to address the restricted knowledge of SL and the lack of resources for parents of D/HH by creating open access on-line material for teaching and learning SL, such as the translation of books and dictionary type of apps.

4. Different assessment tools will be created and adapted for the purposes of the SIGN FIRST project. The tools will evaluate the SL vocabulary knowledge and the narrative comprehension and production skills of the D/HH children, aged between 4-12 years. The students' receptive and expressive SL capacities will be assessed based on the assumption that there exist different degrees of strengths and knowledge.

5. A platform (www.sign1st.eu) has been created to promote the program and disseminate the deliverables and project outcomes. All the material that will be created for the project will be uploaded on the platform, and it will be accessible and free for everyone. The platform will be connected to the Digital Interactive Library based on the pan.do/ra platform (<http://pan.do/ra>) and the JavaScript OXJS library (<https://oxjs.org/#doc>) and will be implemented using the PostgreSQL database. It is envisaged to have two main functions: sign language video upload and playback with the potential to create and import interactive video subtitles and the creation and enrichment of an online sign language file-repository. The platform is installed in Ubuntu OS 14.04 LTS 64 bit and is running on nginx web server. The platform's content has been translated into Modern Greek by K. Boukouras, the 4th author, and can be interchangeable with the English language and can be translated to Dutch, German or any other language with ease. The platform can accept various video formats (.mp4, .webm, .mpeg) all of which are converted into .webm format during the upload operation. Video downloading is available through the platform's web graphical interface. The interactive video subtitles are generated automatically using the graphical interface or by uploading subtitle files (.srt files) using the platform's video upload interface (Figure 2).

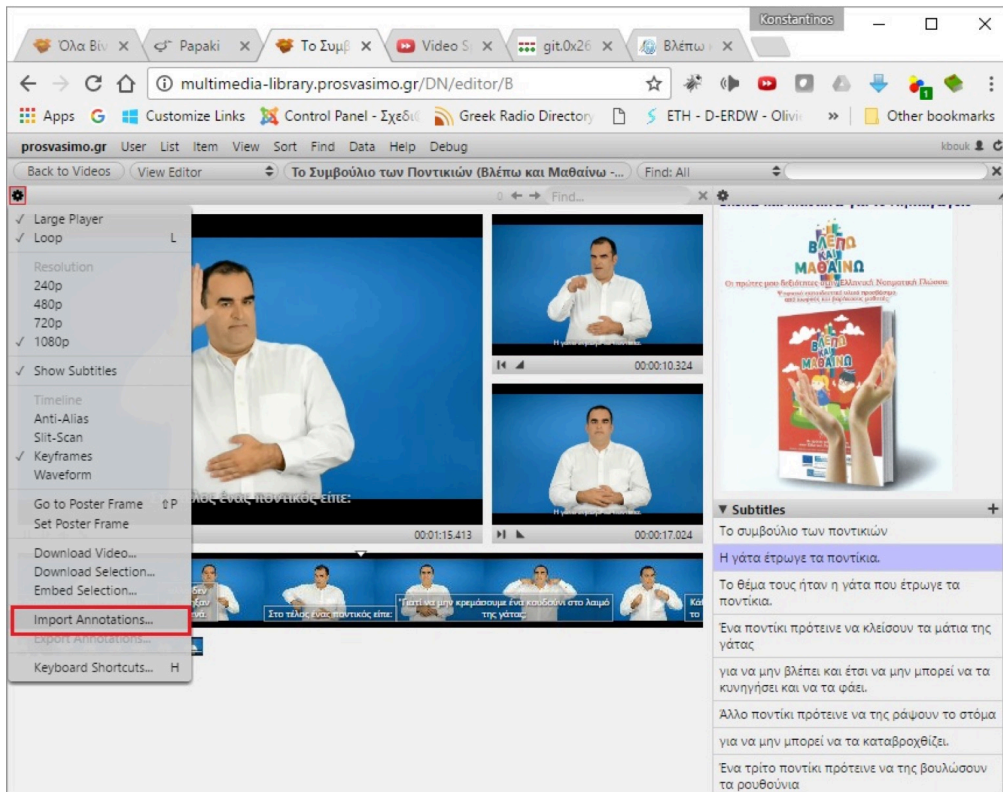


Figure 2. Importing annotations.

During video playback, the subtitles are displayed on the right side (Figure 3A) and they can be interacted with (Figure 3B). When they are selected, the playback of the video begins from the time corresponding to selected subtitle.



Figure 3. (A) Subtitles panel, (B) Subtitle selection, video resumes playback from selected part.

All the videos uploaded on the platform are available through an advanced search and display form. The default view sorts the video alphabetically (view as a list) and displays the title and the program from which they originated. The next display type is the grid mode that displays the videos with a cover showing a screenshot from the first scene of the video (Figure 3A, 3B).

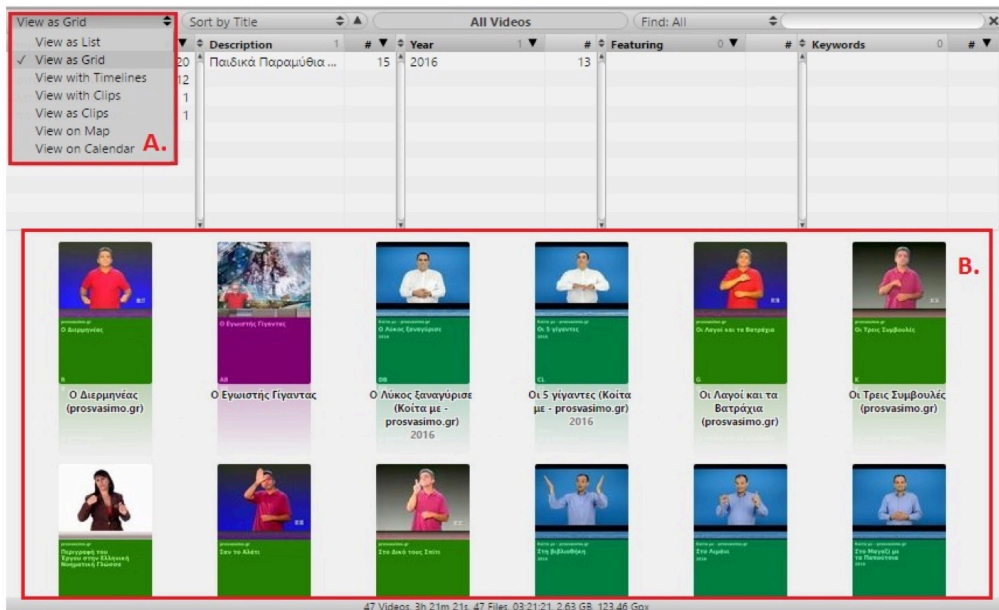


Figure 4. (A) View modes, (B) View area with available videos.

The "view/display as a time series" mode is also available while the "view with clips" displays the video along with the corresponding clips included (Figure 5). The term *clip* describes the video segment that includes a separate subtitle track. Finally, the "view as clips" mode displays all the platform video clips together.

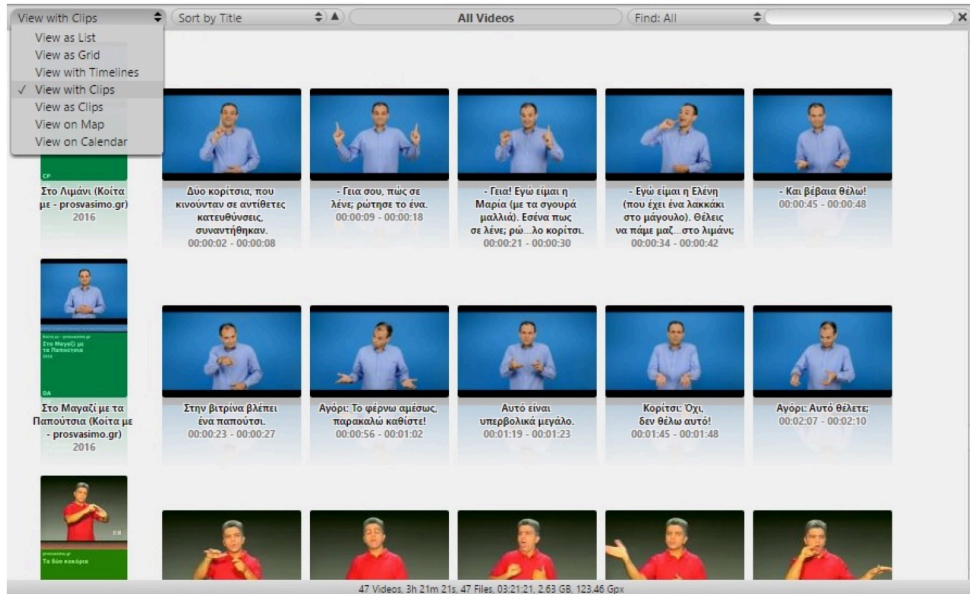


Figure 5. “View with clips” mode. All available clips of each video are shown separately.

All these display modes can show the videos and their clips sorted in many ways such as by title, program name, subtitle number, duration, resolution, video size, etc.

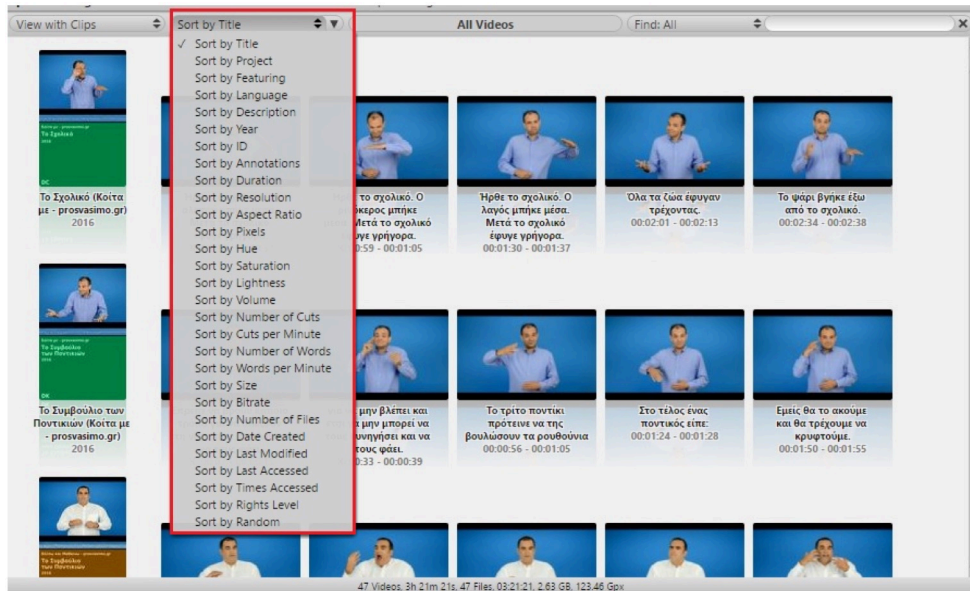


Figure 6. Platform’s sorting options.

Through the digital platform search engine, the user can search the database by various criteria, such as title, keywords or video captions. The search by video subtitles finds words or phrases in the captions of all the platform videos

and displays only the clips containing the searched phrase or text. Only the video displayed and the corresponding clips that contain the searched word, appear. The searched word appears highlighted in a yellow background (Figure 7).

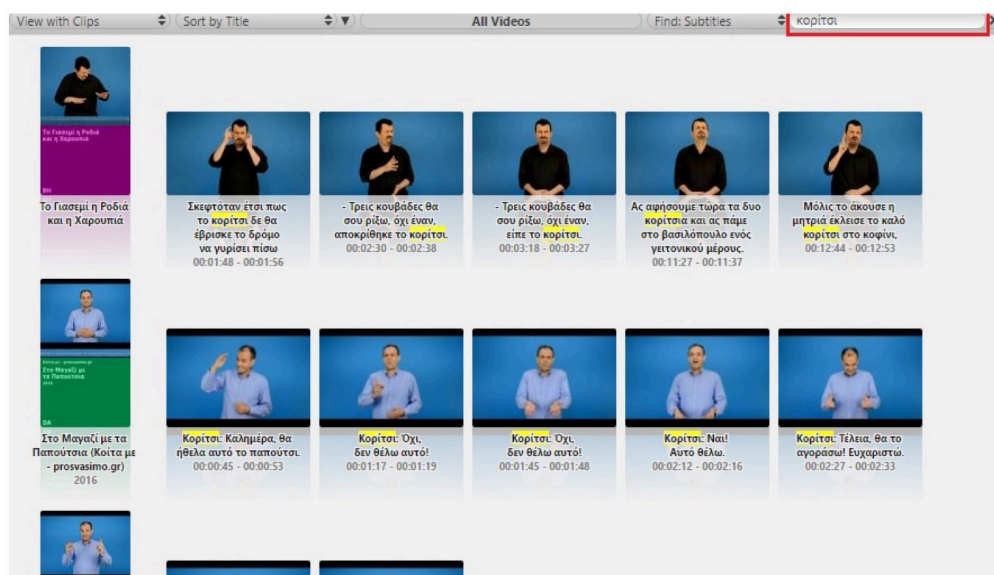


Figure 7. Search through the digital platform for the word “girl.” The word “girl” is entered in the search form at the left top corner highlighted in red.

This award-winning search engine allows someone to search for a sign in the digital sign language database and compare the results, something that until recently was impossible to be implemented in the language training of D/HH students (Boukouras, Gelastopoulou & Kourbetis, 2014; Kourbetis, Boukouras & Gelastopoulou, 2016).

6. Two training activities in Greece and Cyprus will be carried out for teachers to develop and improve their didactic skills on teaching SL as a first language. For the continuation and proliferation of these activities the popular OpenEdX asynchronous learning platform will be deployed that allows the organization of Massive Open Online Courses (MOOCs) designed for distance learning and training of teachers and parents. The OpenEdx developed by edX, a non-profit organization founded by MIT and Harvard universities, is the platform behind the popular <https://www.edx.org> service.

7. Finally, all the outputs, the deliverables and the actions of the program will be presented at a conference that will be held in Greece in 2018.

Conclusion

The answer to the title question “Teaching European Sign Languages as a first language: Can they be taught without the use of ICT?” is clear. Teaching SL as a first language without the use of ICT is like an attempt to teach written language without books. The use of ICT in collecting, storing and using interactive sign texts makes teaching sign language effective and easier than ever. It gives teachers, students and their parents a communicative environment with adequate linguistic input, search capabilities in native sign

texts, viewing and reviewing sign and translated texts, storing and sending small or large sign passages for homework. This innovative action for teaching European SL as a first language covers not only the language and communicative needs of D/HH students, but also supports the teachers' efforts at national and European levels as well. Deliverable materials will support a student population that has insufficient service provision from the school and the family, ensuring its equal learning opportunities, participation and access to education and society. Various stakeholder groups (e.g., students, teachers, school counselors, parents) may exploit all outcomes in various ways for educational or training purposes. Through the program, advanced opportunities in the use of ICT by the students are going to be created, contributing to the development of their technological skills and their familiarization with ICT. In conclusion, the project pursues the academic and language development of D/HH students, as well as the respect and acceptance of their diversity, and promotes the differentiated pedagogy and inclusive education. Overall, it improves the quality of education provided in Greece and Europe for D/HH students. The educational material and software will be available in electronic form at www.sign1st.eu and <http://www.prosvasimo.gr/el/>.

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