A MULTILINGUAL DICTIONARY FOR SIGN LANGUAGES: "SPREADTHESIGN"

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Abstract

In many countries, deaf education is still not optimal. As they are visually orientated, deaf people need teaching materials which are visually accessible. Ideally, sign language is used as language of instruction. The EU-funded project "SpreadTheSign" (STS) addresses this need by offering a free multilingual dictionary in the form of a website and an app (http://www.spreadthesign.com). At this time, it is the largest online dictionary for sign languages in the world, covering more than half of Europe as well as non-European countries like the USA, Brazil, Japan and India. It started out as a vocational dictionary, but it is no longer limited to vocational topics. Its target groups are deaf (vocational) students travelling to other countries, sign language interpreters and all the people who are interested in sign languages and want to learn and/or compare signs from different national sign languages.

Keywords: Multimedia online dictionary, sign language, deaf, EU- project

1 INTRODUCTION

In many countries, the level of literacy among deaf people is much lower than that of hearing people (for Austria, cf. e.g. [1], [2], [3], [4]). This does not reflect on their cognitive abilities, but on the methods of education used to teach them. Any content needs to be presented in a visual form in order to be accessible to deaf people. Ideally, it will be presented in sign language, as this is the first or preferred language of many deaf people. However, there is not a single sign language used all over the world, but – similar to spoken languages – there exist many different national sign languages and even sign dialects. These national sign languages are not simply words transferred into hand signs, accompanied by facial expressions, but they are languages in their own right, with their own grammar which differs from that of the spoken language of the respective country. For instance, sign languages make use of three-dimensional space during the production of signs and can therefore express three-dimensional information in ways that spoken/written languages cannot.

Sign language research is a relatively new field of science. Although much has been done over the past years, there remains a need for more sign language materials, especially for dictionaries. Using sign language, this is best done in multimedia form, because – although there are some ways of transcribing sign languages like the scientific notation HamNoSys [5] or the more general SignWriting [6], these can hardly capture all the nuances of a sign compared to a live rendition. Besides, dictionaries which use such transcriptions for describing signs (like the American Sign Language Dictionary [7] which used the so-called Stokoe Notation) require their users to be familiar with the respective kind of notation and to be able to reproduce the sign in question themselves. Trained sign language researchers may be able to accomplish this, but such dictionaries cannot be used by all interested parties for everyday purposes. In order to guarantee a more general access, many earlier dictionaries used drawings or photos, often accompanied by arrows to show the direction of a movement (cf. e.g. [8]). These helped, nevertheless all of these solutions are inferior to using videos. Nowadays, multimedia dictionaries are state-of-the-art for sign language, and many countries have started to produce such (first on CD-ROM or DVD, nowadays in online form), e.g. the Online Dictionary of New Zealand Sign Language [9], the Auslan Signbank (for Australian Sign Language; [10]) and LedaSila for Austrian Sign Language [11]. Especially for American Sign Language (ASL) and British Sign Language (BSL), many different online dictionaries can be found on the internet.

In comparison, "SpreadTheSign" (STS) is a multilingual dictionary where signs from many different sign languages may be looked up or compared. The inclusion of more and more sign languages led to its being the largest online dictionary for sign languages in the world.

As STS started out as a vocational dictionary, the original target group were deaf (vocational) students travelling to other countries, who wanted to improve their communication there. However, in the meantime STS has become a tool for anybody who wants to look up or learn signs from other sign languages. A bonus is the possibility to compare videos from different sign languages which is of special interest to sign language researchers.

2 THE PROJECT "SPREADTHESIGN"

2.1 The History of "SpreadTheSign"

The idea for STS was born in 2004. A first application in 2005 failed, but a second application for a Leonardo da Vinci project succeeded in 2006 with six partner countries (the Czech Republic, Lithuania, Portugal, Spain, Sweden and UK). By the end of the project in 2008 they had reached 1200 entries in the dictionary each. A follow-up project (Leonardo da Vinci, Transfer of innovation) with nine partner countries (Turkey, Germany and France as additional partners) started in 2008 and reached 5.500 videos in 2010. Also in this year, the European Sign Language Centre took over the management of STS from the municipal of Örebro. In 2011, within the framework of several smaller projects, Bulgaria, Estonia, India, Latvia, Poland, Romania and the Ukraine joined STS; their goal was to reach 8.000 videos. In 2012, funding was found for partners from Greece and the USA. In addition to the various projects, STS has also been enlarged on a voluntary basis by non-European countries like Japan and Brazil. Thus, STS is not limited to Europe alone. A list of all participating countries may be found on the website of STS (cf. 4.1.).

2.2 The Current Project "SpreadTheSign"

The project this paper will focus on lasted from 2012-2015 (the project ended in September; a follow-up project in connection with "SpreadTheSign" has been submitted and already approved by the Swedish National Agency). It was funded by the Leonardo da Vinci program of the EU (Leonardo Network). The coordinator was Örebro University in Sweden, the project manager again the European Sign Language Centre (also located in Sweden).

There were fifteen partner countries: Sweden, Austria, the Czech Republic, Estonia, Germany, Iceland, Italy, Latvia, Lithuania, Poland, Portugal, Spain, Russia, Turkey and the UK (Austria, Italy and Iceland were new partners). Austria is represented by the Centre for Sign Language and Deaf Communication, a faculty centre of the Alpen-Adria-Universitaet Klagenfurt. The latter joined STS in May 2013, when the original Austrian partner dropped out.

A second two-year partnership project (running parallel to the original network project) which comprised most of the above-mentioned Leonardo partners allowed for more meetings which served to improve the communication between the partners and in consequence the quality of the dictionary, as problems could be discussed face-to-face among the partners: Together, solutions could be found.

The aim of the project was for each partner country to reach 15.000 new entries (videos in their national sign language) to the dictionary.

Work on "SpreadTheSign" comprised two different tasks: Each partner had to translate an English list of entries into the national written language and to film the signs for these entries in the national sign language.

3 METHODOLOGY

Each partner country is responsible for its contribution to the online dictionary (i.e. correct translations of the entries into the national written language and sign language videos).

3.1 Translating the Entries into the National Sign Language

The coordinator provided a list of English words and sentences that had to be translated into the national written language and sign language by each partner. The translations were discussed with deaf collaborators who then chose the signs for them. Not all countries have standardised signs, so some countries used regional variants ("sign dialects").

In Austria, there are standardised signs (agreed upon by a special commission of the Austrian Deaf Association), but these standard signs are not all encompassing yet and thus could not cover all of the terms. Where no standard sign was available (yet), regional signs from other Austrian provinces were used instead. These will be exchanged in the future as soon as the respective standard signs exist.

For the Austrian team, a hearing collaborator translated the list into German. For some entries, it was easy for the deaf collaborators to find corresponding signs. For others, a hearing collaborator had to give some explanation because the meaning was not clear from the German word or phrase. Some signs needed extensive discussion (for some examples cf. [12]).

3.1.1 Problems with the Translations and Solutions for them

It turned out that there were some difficulties with the translations. First of all, many of these entries were culture-specific and existed only in certain countries (e.g. terms for food, magical beings, religious terms, etc.). This meant that the other countries not only had to find out what they referred to, but also that usually there existed no sign for them. The first solution was to fingerspell the word (i.e. use the national finger alphabet to spell out the word), but this satisfied neither the partners nor the users. In the end, the partners agreed to mark such entries as country-specific and to give a signed explanation for them. The same held for some proverbs which did not have counterparts in other languages. Also, some entries were regarded as "difficult" to express in sign language and had to be discussed extensively (these differed between the partner countries, cf. [12]). Some remained untranslatable and had to be explained instead.

Another problem, which cropped up towards the end of the project, was that the original English list contained entries with two or more meanings. These were sometimes interpreted differently by the partners, e.g. "bear" (animal, to carry something, to endure something). Some of the translators did not check the word class first (e.g. noun or verb for "bear" or "can"), and even if they did, different signs were possible depending on which meaning was chosen as the basis for the translation (especially, when one meaning was very common, but the translation referred to a technical term – e.g. "stress" in connection with forces acting upon materials). Other mistakes appeared because the explanation contained two possible meanings so translators chose one or the other and disregarded the second one. Some problems were caused by English loanwords in other languages where the meaning differed from the original English meaning.

Partners became aware of problems with the translations. These were especially conspicuous when the German partners started comparing the German against the Austrian ones; the differences were easier to spot because both countries use German as a written language. These translation-based problems were solved by developing "Guidelines for Translation" in a separate meeting by the German and Austrian teams, which were then communicated to the other partners. They contained concrete suggestions like adding example sentences (so that the words could be seen in context) or using only a single explanation in the list of translations (i.e. use separate entries, if there are more meanings) as well as requests concerning the administrative side of translation (linking entries, deleting entries, etc.). These guidelines will help to avoid such problems in the future and will also be of value to possible future partners.

3.2 Filming the Sign Videos

Each partner is responsible for filming their own videos. There were some guidelines for filming provided by the project manager. These included e.g. advice on lighting, positioning the signer, editing and working with a teleprompter (all of them can be accessed and downloaded from the project-internal part of the website, cf. 4.1.1.). In order to provide continuity, it was mandatory for all partners to use the same background (orange-brown) and to dress their signers in long-sleeved black shirts. Partner countries who lack the necessary facilities for filming may travel to Sweden and use those of the European Sign Language Centre.

The partners approached the filming in different ways. Some preferred to do the filming continually, alongside translating, while others waited until they had a longer list of translations to film.

In Austria, all filming was done exclusively by the deaf collaborators of the Centre for Sign Language and Deaf Communication who organised this themselves.

4 THE ONLINE SIGN DICTIONARY "SPREADTHESIGN"

The dictionary can be used for free on the homepage of "SpreadTheSign" (working with all internet browsers), but there is also an app for iPhone, iPad and Android (the basic version is also free), so it can be used on the go.

4.1 The Website of STS

The website comprises a project-internal part and a public part. The former is reserved for the project partners, while the latter is freely accessible.

4.1.1 The Project-internal Part of the Website

As this part of the website is only for the project partners, users have to log in to be able to access it. Here, they can find menu items like *Translate* (which shows the categories and the number of entries waiting to be translated) and *Video/Audio* where files may be uploaded. For a description of these menu items cf. [12] In *New words*, the partners may suggest new entries which need to be approved by the coordinator. *Member* shows the collaborators who are signing the videos.

This part of the website also serves to give an overview of the current status of the project. Currently (October 1, 2015), STS includes 287.994 signs (Austria has already reached the required 15.000 signs).

The menu item *Map* lists all participating countries, while *Statistics* shows the progress status of each country. *Dissemination* gives an overview of dissemination activities that have taken place in each partner country, while *Press* offers links to press articles in connection with STS.

4.1.2 The Public Part of the Website

During the final project meeting in June 2015, the coordinator announced a revision of the website, so the layout shown in Fig. 1 may change in the future. New functions will be added continually (some of them fee-based to fund further developments), e.g. the so-called T3, where 3D-photos of locations (e.g. a doctor's office) are connected to STS and work like a picture dictionary (the users may click on items in the picture and will get the sign for it).

The menu item *Map* provides a connection to Google Maps and contains the sign names of the countries on the map (the sign names of cities, towns, etc. of the partner countries are being continually added). Users may choose between the different sign languages by clicking on the symbol for a location and then on the respective flag.

When looking up a sign or a signed phrase, users do not have to log in to the website. Via the internet address www.spreadthesign.com they can either use the search field to type in what they are looking for (the program will search for all words which contain this combination of letters, i.e. one does not have to type in full words). An alphabetical list will appear, followed by national flags. The users have to click on a flag in order to call up a video in the respective national sign language.

Alternatively, the users may choose a topic. The menu item *Groups* below the search lists all the topics in a drop-down menu, ranging from standard phrases, travel arrangements and technology to arts and religion. Alternatively, a topic may be typed into the search field of *Groups*. All of the entries for a topic will appear in alphabetical order. *View all* lets the users combine topics with grammatical terms like parts of speech (e.g. limit the results to nouns or adjectives, for instance when looking for colours).

A drop-down menu in the upper right-hand corner lets the users change between the various languages. Cf. Fig. 1 for a screenshot of the website (for language reasons, the British English homepage was chosen instead of the Austrian one).

Fig. 1: The Homepage of "SpreadTheSign" (public part)

Some entries are combined with a pictorial or gestural representation of the meaning in order to facilitate comprehension. This also helps with differentiating between homonymic/polysemous entries like the above-mentioned "bear" (cf. Fig. 2):

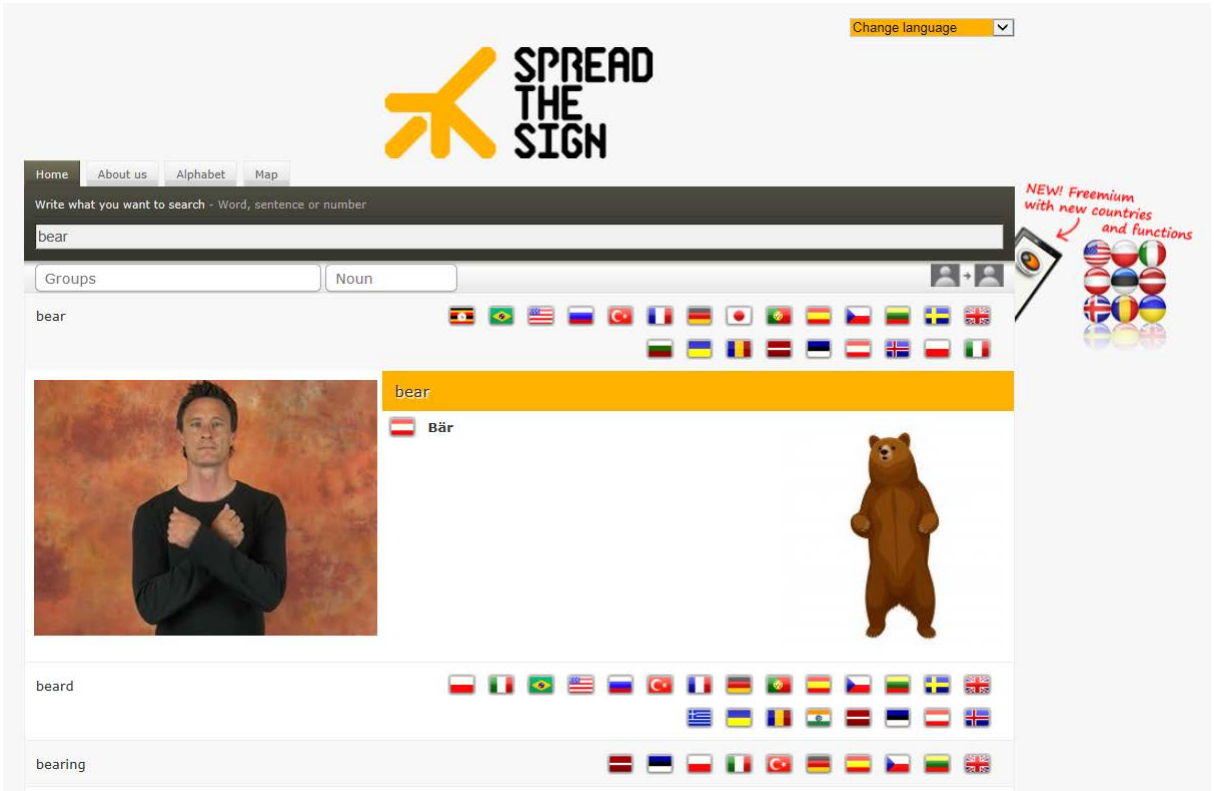

Fig. 2: Pictorial representation of the meaning of the sign ("bear", Austrian Sign Language)

A future aim is make such signs available to younger children who cannot read yet so that they will be able to look up signs on their own by simply clicking on the pictures.

A special tandem function allows a comparison between any two sign languages. In order to activate this option, the users have to click on the button that shows two people next to each other (cf. Fig. 3, marked with a red ring). As long as the function is active, the button will be shown in colour (when non-active, it turns to black and white). When the user clicks on a flag, the respective video will appear as the second video (the first one will be the one of the language originally chosen for working with STS). Both languages may be changed via a drop-down menu.

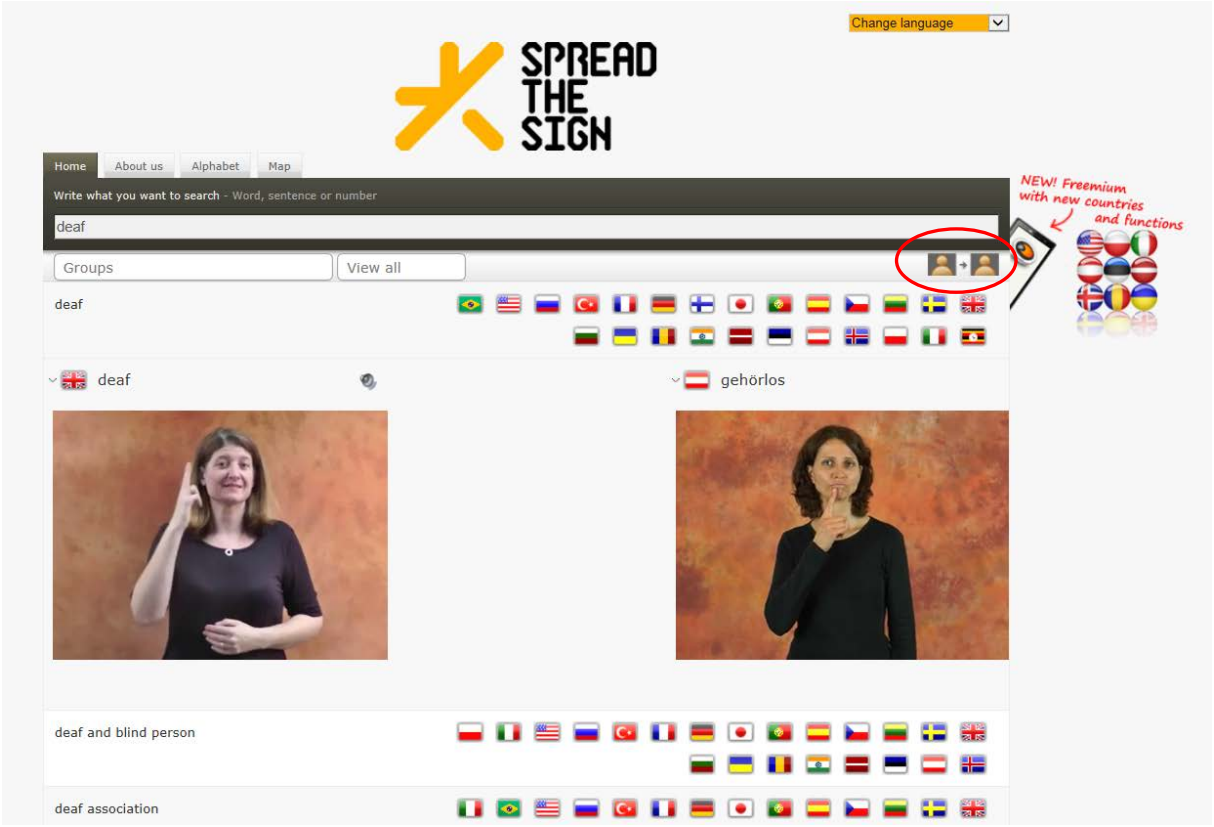

Fig. 3: Comparison of two sign language videos (entry "deaf", British vs. Austrian Sign Language)

This function is of interest to sign language researchers who want to compare signs with regard to similarities. These may be based either on iconicity (e.g. the sign for EAT will look similar in many sign languages) or on historical relationships between sign languages (e.g. when settling new countries or dating back to an influence from foreign sign language teachers who imported their own national signs when teaching in another country, as happened with French deaf teachers). In other dictionaries, the users have to open several windows and to arrange them on their screen in order to compare signs. Besides, for many entries in STS one can compare more than 15 sign languages, not just two or three (cf. the examples in Fig. 3).

Further options include looking up the different hand alphabets used for fingerspelling words (similar to sign languages, these differ between the countries) via the tab *Alphabet* or reading more about the project (tab *About us*). This tab lists all the participating countries. It includes links to press articles and videos (*Articles*, *Press*). The lower-tier tab *About us* gives some background information on the project; the partner organisations and their collaborators can be found in *Members* (by clicking on a pin in the map). *Statistics* shows the current number of signs for each partner country. *Leonardo* lets users download evaluations and an EU report.

All of these functions may be accessed free of charge in the web version.

4.2 The App

For smartphone users, an app version of "SpreadTheSign" may be downloaded from the homepage by clicking on the button next to the search field (cf. Fig.1). It is available both for iPhone and Android.

Naturally, the smaller display leads to some differences and not all functions of the website are (yet) available. Once they have downloaded the app, the users may type in a word (it is not possible to search for topics at the moment) and they will get the respective video. They may change between

different sign languages by scrolling and clicking on the language buttons below the video window (cf. Fig. 4).

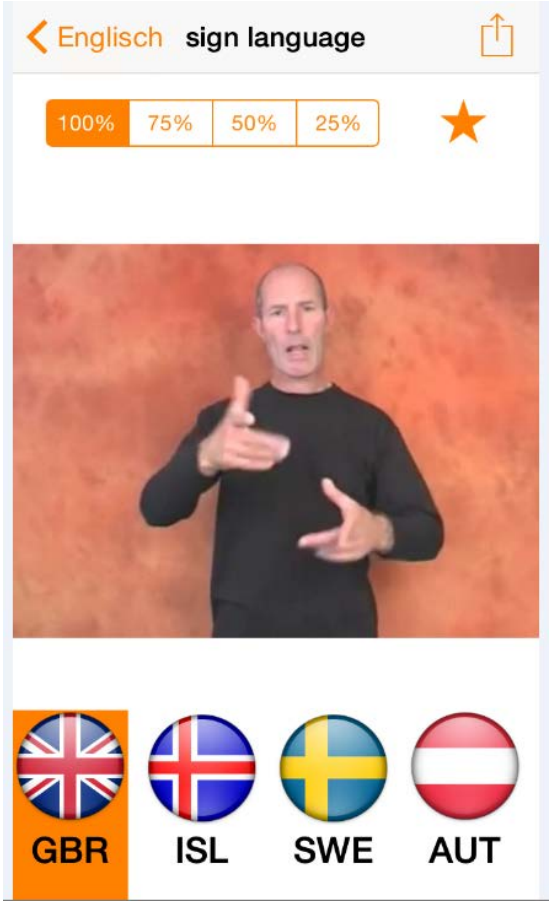

Fig. 4: Screenshot of the "SpreadTheSign" App for iPhone (entry "sign language", BSL)

For advanced functions, the users have to pay a small fee to fund the development costs, e.g. for saving favorite signs, watching the videos in slow-motion or sharing them. Some non-gratuitous functions may be used for free on the website; these include looking up national finger alphabets or baby signs (the latter are signs used to communicate with toddlers).

In spite of its current limitations, the app is very useful as it makes STS available anytime and anywhere. Therefore it is very popular among deaf and hearing sign language users, even in countries that do not participate in STS yet (e.g. Hungary).

5 RESULTS OF THE PROJECT

The various "SpreadTheSign" projects have led to a working website (free of charge) and an app (basic version free of charge). The current STS project is on a good way towards reaching the limit of 15.000 signs for each partner country (most partners have already done so), and a new project has already been approved by the Swedish National Agency.

The partnership has led to new friendships and furthered cultural understanding between the nations. Best-practice examples have been exchanged, for example concerning deaf education. Dissemination has not only served to make STS well-known within the deaf community and among sign language researchers, but has also raised awareness among the hearing population of the partner countries with regard to deafness and sign languages. During the national launches of STS (held in the course of partner meetings), people who have not been in contact with deaf people before have become interested in sign language and in looking up or comparing signs (many of them were surprised to learn that there are different national sign languages).

6 CONCLUSION

"SpreadTheSign" developed from an idea of a vocational online dictionary for sign language users to the largest multilingual online dictionary for sign languages in the world and it is still growing. Contents and new features are being continually added, new partners are joining the effort. All the partners and especially the Swedish project manager keep coming up with new ideas on how to make STS even better. Few EU-projects involve so many countries (STS already covers a big part of Europe and is reaching out to non-European partners).

An important focus is now on improving what has been done up till now, especially with regard to the linguistic quality. For instance, an additional search function according to the handshapes used in the signs is to be realised as soon as the necessary funding for the programming work can be found.

Anybody who is interested in sign languages or wants to learn more signs may use the website and/or the app. By making this resource available, "SpreadTheSign" also contributes to an improved communication between deaf and hearing people.

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