E-COURSES USING SIGN LANGUAGE TO PROVIDE DEAF PEOPLE WITH A BASIC KNOWLEDGE OF LINGUISTICS

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Abstract

During the last two decades, Europe has witnessed a considerable application of ICT and e-content in the vocational and educational training sectors. Due to the restrictions on personal contact caused by the COVID-19 pandemic, the use of e-learning tools has increased even more, and there is an urgent need for digital education opportunities. Although lifelong e-learning is more important than ever, suitable opportunities for deaf and hard-of-hearing people are still scarce.

Hearing people often believe that texts or close captions are enough to make online materials accessible to deaf people. However, due to a lack of bilingual education in most countries, most deaf people have not fully mastered their national written language. Deaf people are therefore mostly excluded from using existing e-learning courses, as the contents are not fully comprehensible to them. In contrast, sign language is not only completely accessible but also the first or preferred language for many deaf people. Therefore, it is vital to offer them e-learning in their own visual language.

During earlier projects, we noticed that many deaf adults lacked a basic knowledge about languages and how they work. Being aware of the general properties of languages, their forms and functions helps people to learn any language or improve their respective skills. This is especially important for deaf people for whom even the spoken language of their home country is often a second language and who frequently struggle to learn foreign languages.

We decided to approach this problem with the Erasmus+ project "Deaf Language Awareness", which addresses the need for accessible e-learning material suitable for deaf adults while enhancing language awareness amongst deaf people. It provides deaf people with bilingual e-courses where all content is presented in both the national sign language and the national written language. They cover 18 topics related to language awareness, massively exploiting visual resources such as pictures, animations, and sign language videos.

Our goal is that not only will deaf people profit from the "Deaf Language Awareness" courses, but that this design will also offer a model for similar courses in other languages as well as on other topics.

Keywords: Sign language, e-learning, deaf people, language awareness, linguistics.

1 INTRODUCTION

In the past two decades, we have witnessed a huge increase of e-content in educational and vocational trainings. E-learning is now a widespread tool, employed not only by schools and universities, but, among others, by enterprises, local and national service providers as well. Despite the larger audience, there is still little e-content which is fully accessible to deaf and hard-of-hearing people (d/hh) [1].

Captions and plain texts, where available, are not enough to ensure that the d/hh audience can fully understand the content of an e-course. In fact, most deaf people struggle with the national written and spoken language and prefer to have linguistic content translated into their own sign language [2, 3].

During earlier projects (especially during the Erasmus+ project "Deaf Learning"; https://pzg.lodz.pl/deaflearning/), we noticed that deaf adults often do not have enough knowledge of what a language is and how it works. Some do not even know that sign languages are languages with their own grammar and properties. Language awareness is important for building an enhanced consciousness of the forms and the functions of one's language. Language awareness provides people with a new sensitivity regarding their language. It can even help them to learn a second language [4].

In order to foster language awareness amongst deaf people, four European countries (Austria, Italy, Poland and Portugal) joined their efforts in the Erasmus+ project "Deaf Language Awareness". While enhancing language awareness, the project addresses the need for accessible e-learning materials

suitable for d/hh adults as well. In fact, the main project outcome consists of 18 bilingual e-courses about language awareness in which all content is available in the four national sign languages and the four national written languages.

In this paper, we first provide some brief introductory information about language awareness (section 2). Second, we focus on the Erasmus+ project "Deaf Language Awareness" by presenting the partnership and the aims of the project (section 3). Third, we describe the specific features of Articulate Storyline 3 which helped us designing the e-courses (section 3.1). Fourth, we turn to the design of the e-courses (section 3.2), report on the first user tests (section 3.3), and explain how the COVID-19 pandemic has affected our work (section 3.4). We finally conclude with comments on the project strengths and weaknesses, and we illustrate some possible future developments (section 4).

2   LANGUAGE AWARENESS FOR THE DEAF

According to the European Union of the Deaf, the estimated number of deaf sign language users in Europe is 800.000 [5]. For most of these sign language users, the national spoken and written language will be the second language they learn. For a person who has no access to spoken language because of hearing reduction or loss, learning the spoken language and its written form becomes a real challenge. It is even more difficult if we consider that the national language is rarely taught to the Deaf as a second language, but it is rather used as the vehicular language at school. The communication support in sign language is often limited, even in the remaining schools for the Deaf (most of the schools for the Deaf in Europe have closed due to new regulations on the integration/inclusion of d/hh students in regular schools). In addition, sign language grammar is usually not taught to d/hh students, who often leave school with no or extremely poor metalinguistic competence of their first or preferred language. The experience with the project "Deaf Learning" confirmed that (see [3], p. 170).

Language awareness can be defined as "explicit knowledge about language, and conscious perception and sensitivity in language learning, language teaching and language use" [6]. Raising language awareness (a) can contribute to the development of one's thinking skills within the second language subjects; (b) can help someone gain insight into his/her own process of language learning; and (c) support him/her in connecting the various aspects of language learning [4]. We believe that d/hh people with a deeper understanding of the structures, functions, and mechanisms of their language can approach the study of a second language with more confidence. Also, we are convinced that it is crucial for d/hh people to have a deeper consciousness of their own sign language in order to treasure it and to be able to transmit its value to others (students, children, friends, society).

In addition, many hearing people have poor or little linguistic knowledge as well. They especially lack information about sign languages and their linguistic properties. Raising hearing people's awareness of sign languages is also crucial for a better integration of the deaf communities within the hearing ones. In connection with this, Svalberg [7] (p. 302) points out how "work on cross-cultural LA [language awareness] is particularly concerned with the engagement of minority and dominant groups with each other's languages and cultures".

3   THE ERASMUS+ PROJECT "DEAF LANGUAGE AWARENESS"

The Erasmus+ project "Deaf Language Awareness" (2018-1-PL01-KA204-051109; https://deaflanguage.eu/) started at the beginning of September 2018 and will finish by the end of August 2021. The project leader is the Polish Association of the Deaf, department of Łódź (Polski Związek Głuchych Oddział Łódzki). The remaining partners are: Universität Klagenfurt, based in Austria; Ca' Foscari University of Venice (Università Ca' Foscari Venezia), based in Italy; and the University of Porto (Universidade do Porto), based in Portugal. The main aim of the project is to raise a basic language awareness amongst deaf adults in the four European partner countries. The second aim of the project is to offer a model for accessible bilingual lifelong e-learning opportunities for d/hh adults in these countries, which can be replicated in other countries as well. In fact, the e-courses developed within the "Deaf Language Awareness" project can be translated into many other languages without changing the underlying structure of the courses.

3.1   The Program behind the Project: Articulate Storyline 3

All project partners are familiar with the needs of Deaf learners and have experience in how to prepare accessible content. However, none of the partners have programming skills. Therefore, the coordinator decided to acquire Articulate Storyline (https://articulate.com/perpetual/storyline-3), a very versatile

program that allows one to design customized e-courses without such knowledge. The program is available in two versions – as a downloadable program paid for once or as a renewable online subscription (with additional online resources). We decided on the former, namely Articulate Storyline 3. In the following paragraphs, we will give an overview of the program features that were especially useful for our project.

In Articulate Storyline, any course is built up from slides that are grouped into different "scenes". Both individual slides and scenes may be linked in any way the designer chooses. While the basic functions of Articulate Storyline – like using texts, pictures, and videos – are easily and quickly learned, the real capacities of the program open up only to the more experienced user. Amongst these are the following:

- *variables* and *triggers* that state conditions or lead to certain events (e.g., a video plays or a certain object pops up or moves when the learner executes some pre-defined action),
- *layers* that can be used for sign language videos or different scenarios (success/failure; various choices, etc.),
- *animations* (including freely definable motion paths) of any object in the course,
- an integrated *library of figures* in different poses and with different expressions that can be animated in different ways (e.g., pointing at something, changing facial expressions, etc.).

With some practice, it is possible to design professional-looking e-learning courses which may be used on different electronic devices (computers, tablets, smartphones). Everything can be previewed; once the designer is satisfied, the course may be published for online use in different formats (the simplest HTML option may be viewed with any browser, while other formats allow for an integration into a Learning Management System). Articulate Storyline uses its own player that can be customized (editing/restricting the menu, changing colors, adding a logo, etc.). The program automatically adjusts the published output to the device on which it is viewed.

Articulate Storyline comes with a range of basic exercises (drag-and-drop, multiple choice, etc.), but it also offers the designer the possibility of designing individual exercises based on what is on a slide (e.g., using a picture or a text box as a drop target). The program automatically calculates the results given on special results slides that can be reconfigured according to the designer's wishes.

Another advantage is the in-built translation feature of Articulate Storyline, as each course has to be available in all the written and signed languages of the four partner countries: once a course is finished, the whole text can be exported into a Word table. After translating everything into the target language, the file may be uploaded again into the Articulate Storyline project. All the texts will be automatically exchanged; some adjustment may be necessary, though, as the source and the target language may differ in text length. Within the player, the designer can choose between different languages with a simple mouse click, thereby changing the language of all the text messages (such as, for instance: *submit*, *try again*, *resume*, etc.).

The video capabilities of Articulate Storyline were also very helpful – not only can videos be imported into any slide, but they can also be edited within the program (e.g., adding a logo, changing the video size, etc.). Videos can be embedded, set to play, or closed down automatically and much more.

3.2 Designing the Courses

We started by deciding on the topics of the e-courses during the first partner meeting. After a very productive discussion, 18 topics were established. After a first introduction to Articulate Storyline, we did some brainstorming on how to turn these topics into e-learning courses.

The goal of "Deaf Language Awareness" was to produce 18 e-learning courses. This meant that each partner chose 4-5 course topics. The first task was to come up with (English) texts about the contents of the course, using easy language. After they had been discussed and modified according to the comments of the partners, they served as the basis for the e-learning courses. The original texts were later adapted into bite-sized chunks for the e-learning courses, with constant feedback from our deaf colleagues.

The e-courses focus on topics related to language awareness (e.g., "Why do we need a language?", "How do languages express actions and states?", "What is bilingualism?", etc.), and they do so by using not only linguistically accessible content (sign language videos and translation texts), but also many visual cues that will help the deaf person understand the content (pictures, animations, links to websites). Figure 1 shows an example of an interactive slide where the user can see an image of a

flower in three different states of growth, representing the birth, the evolution, and the extinction of a language.
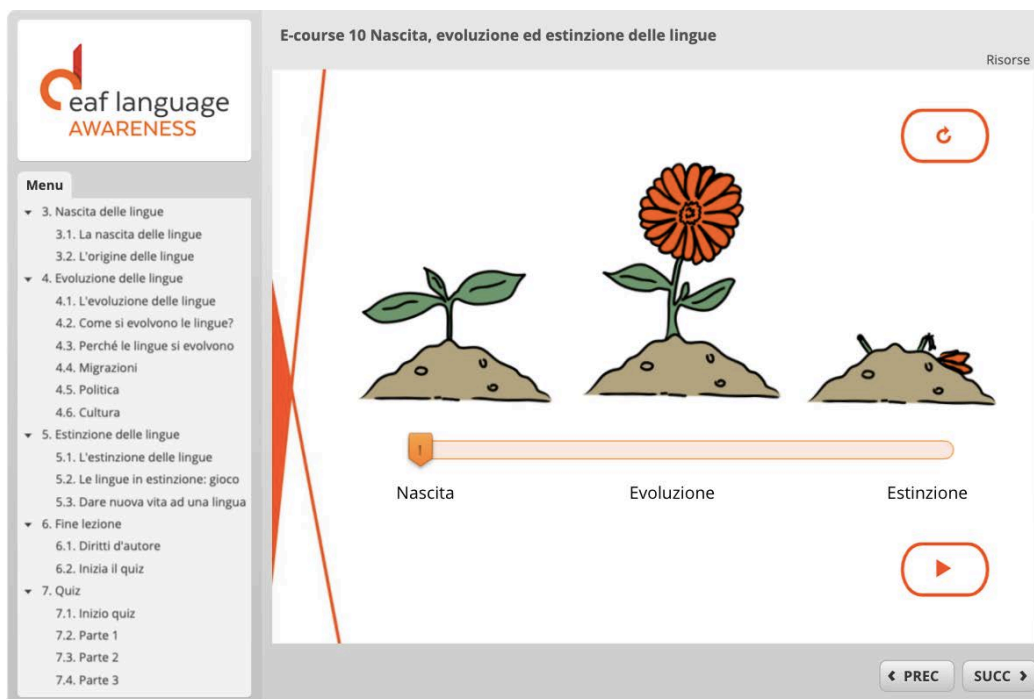

Figure 1. Screenshot from the e-course "What is birth, evolution and extinction of languages?".

Each country designed the respective e-learning courses for the topics they chose. The texts in their national language were then translated into English so that the partners would understand the contents. Sometimes more than a simple translation was required, as some examples had to be adapted to the language and the culture of another country. As the partners grew more familiar with Articulate Storyline, the complexity of the courses grew; also, each of us started out with other features, which were then taken up by the other partners in their next courses, thus adding to the variety of the final product.

3.2.1   Deaf Teammates

Each national team involved deaf collaborators who were co-responsible for the content intelligibility and its translation into sign language. Besides their engagement as co-workers, it was interesting to see their interest in some of the topics covered by the e-courses. This was a first (internal) positive feedback on the project outcomes, which was then confirmed by external feedback as well.

3.2.2   Bilingual content

From the beginning, we decided to use both sign language and written language in the courses in order not to exclude anybody – due to the heterogeneous nature of the d/hh community, we could not assume that all possible users would be fluent in their national sign languages. Some might have acquired it later in life or chosen not to use it at all. After debating all the pros and cons, we took a final decision: for all the longer texts, the signed version would come first. The user can call up a written version by clicking on a "Book" button next to the video (an example is given in Figure 2).
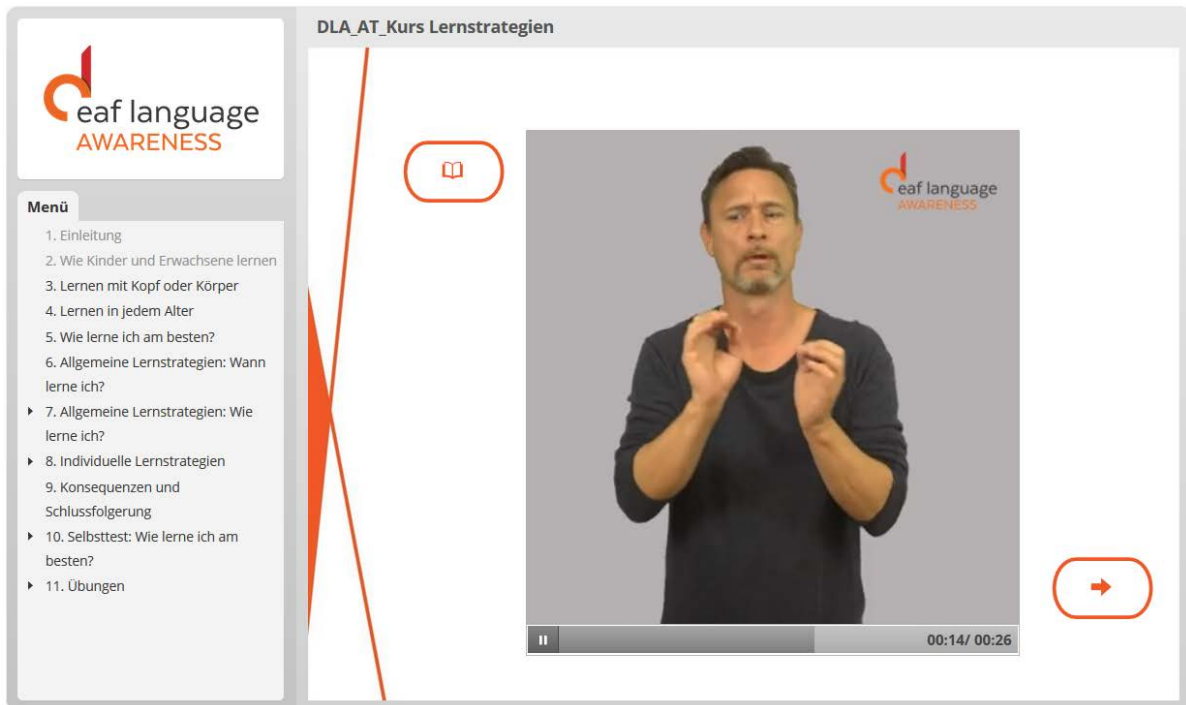
Figure 2. Screenshot (sign language video and text button).

For shorter texts, i.e., titles, there would be a written version on the slide with a sign language button. The national teams could choose to hide this sign language button in their version if they thought that no signed translation was needed (during the first user tests with d/hh people, some of them stated that for single sentences or phrases, a translation into sign language was superfluous). During the first user tests, some test persons kept almost exclusively to the signed version but sometimes looked at the written versions to confirm some points.

3.3   The first Feedback from Test Users

Each partner country had to do user tests on the first finished e-courses. Eleven deaf adults were involved in the tests in Austria and seven in Italy (a picture from the Italian user tests is shown in Figure 3).

These first user tests brought very positive results. The test persons liked the courses and seemed to regard them more as a game rather than a teaching tool. They had little trouble in finding out how to use the controls and do the exercises. There was some surprise that the menu was locked in some courses; however, this was a conscious decision as some information built on other information, so it was vital to look at the slides in a prescribed sequence.

In Italy, the topics were new to most of the test persons. This observation supports the novelty of the content with respect to the already available e-learning opportunities in the national context. All test users stated that the courses made them reflect upon language. They also expressed their satisfaction in learning some new signs and new words. Some suggested that a similar model of e-courses would be useful in vocational trainings, e.g., courses on safety (actually, there is already another Erasmus+ project called "Signed Safety at Work", dealing with that issue: https://www.signedsafety.eu/), refresher courses for workers. They think such bilingual e-courses could be a great support where the sign language interpretation service is not provided by the employers.

Figure 3. Test person trying out the e-course "What are Language Functions?".

3.4 How COVID-19 affected our Work

COVID-19 has had an impact on the development of the project. The most obvious effect of the pandemic on our work was that a project meeting had to be cancelled, and we had to resort to several virtual meetings instead. Also, the duration of the project was extended. It should have ended on July 31, 2021, but in light of the effects of COVID-19 on the work progression, the Polish National Agency was asked for an extra month. One of the reasons for this request was that face-to-face dissemination events were not possible. While hoping that this will change in the foreseeable future, we needed more time to plan alternative online events.

Another reason was that many of the collaborators have been at least partially in their home offices. While this may have had positive effects on allowing the course designers to concentrate fully on their work without any distractions, it led to difficulties with filming the sign language videos. For weeks, even months, no more than a single person was allowed to be in a room, so that filming was impossible (even with all safety precautions). Normally, one person is signing, while at least one more is operating the camera, checking on the signs, adjusting the speed of the autocue, etc. In spite of the COVID-19 pandemic slowing down our work in terms of filming the sign language videos, we could still proceed with the course design.

4 CONCLUSIONS

The Erasmus+ project "Deaf Language Awareness" offers accessible bilingual e-courses for deaf adults in four European countries. The e-courses present 18 topics related to the use of language and language functions. The project aim is to enhance language awareness amongst d/hh people and, by doing so, facilitating the learning of a second language. In order to adjust the course better to the needs and the culture of d/hh people, we worked closely with deaf teammates for a proper translation of the content into sign language. The deaf teammates also supported the design of the e-courses with their constant feedback about the structure, the content, the graphics, etc. The first test users gave us positive feedback on our work.

Thanks to a special feature of Articulate Storyline, the software we used to design the e-courses, the final products can be easily translated into any other language and reach other d/hh communities worldwide. The bilingual model used for the e-courses of "Deaf Language Awareness" could be useful for designing any other e-content in educational or vocational trainings targeting d/hh groups.

ACKNOWLEDGEMENTS

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