



Strategies for Italian Deaf Learners

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Abstract

This paper describes language teaching and learning methodologies adopted in the Italian founded FIRB-VISEL project, aimed at creating a Deaf-centered E-Learning Environment (DELE). DELE is an interactive e-learning environment where adult deaf people (both using sign language or not as their primary means of communication) can improve their literacy skills. Existing research has revealed that many deaf people typically have problems in the acquisition of written language and in the development of linguistic skills. The risk of addressing the literacy problems of deaf people in a text-based e-learning environment is to lose the learner's motivation during navigation, for which the knowledge of the written language is often a prerequisite. Therefore the DELE we are working on aims to present language learning as an interactive and dynamic process in which new knowledge is most fruitfully acquired when learners can explore materials and resources flexibly. For the implementation of DELE, we have incorporated some concepts including CLIL, web accessibility, text easification, embodiment and storytelling. In the original form, CLIL refers to teaching in content areas such as science, history or math, to learners through a foreign language. In our environment we aim to improve the linguistic skills of deaf people in their local language (Italian) focusing on the written language. The deaf users are immersed in a virtual environment in the form of a university campus. In this environment, our CLIL subject is "The History of the Written Language," presented as an academic course: the texts are the subject of the course and there's a virtual final exam allowing the student to pursue the educational path. We will thus present the way in which CLIL principles can be used to create innovative e-learning environments with increased visual facilities, whose possibilities could go beyond deaf accessibility and learning.

1. Literacy for Deaf People

Research shows that deaf people, especially those whose deafness began prelingually (before 18-30 months), typically face difficulties in the acquisition of written language and in the development of linguistic skills in the spoken language (e.g., Caselli et al., 2006; Fabbretti & Tomasuolo, 2006). Given that deafness is not a determiner of cognitive abilities (e.g., Schick et al, 2000; Schick, 2004) and the fact that literacy difficulties occur in all spoken language communities (Grushkin, 1998), we are faced with the possibility that current systems of language instruction need to be reevaluated.

Schooling in Italy still offers no effective systematic response to the difficulties surrounding the education of the deaf. Traditionally the approach to deaf education has focused on comparing deaf learners with hearing learners, without viewing deaf people as visual learners with different learning behaviors. The social cost of this situation is enormous: deaf people are often excluded from written communication and, in many cases, they cannot perform professional tasks involving minimum competences in written language and cannot access higher levels of education.



Considering the difficulties deaf learners meet during the acquisition of verbal, and, in particular, written language, deaf people often experience frustration with language acquisition. This indicates the need for tools and educational methods aimed at welcoming and resolving their difficulties; however this is often a challenge since each person comes from different communication, education and rehabilitation paths, which in turn lead to different literacy skills. The common denominator for deaf people, though, is their reliance on the visual channel for accessing the world of communication; thus, successful methodologies for deaf learners should utilize this channel.

In this paper, we will introduce the work done within the research project “E-learning, deafness, written language: a bridge of letters and signs towards knowledge society” (FIRB-VISEL, RBNE074T5L, <http://www.visel.cnr.it>). This project aims to design and test a prototype of an e-learning environment for promoting written language abilities in deaf learners (both signers and non-signers), taking in due account their learning and communication needs. The new e-learning tools we design are intended to effectively promote appropriate receptive and expressive written language skills in deaf Italians in post-secondary educational settings.

2. Content and Language Integrated Learning: Motivating Deaf Learners

The educational path is built providing a full immersion and constant input of knowledge provided through visual cues which capture the attention and motivate the learners, adapting different educational methodologies to meet their needs.

A comprehensive literature review by Stephenson and Easterbrooks (2006) shows that the following four literacy practices are among the top twenty literacy practices for encouraging the linguistic development of deaf students:

1. use of metacognitive reading strategies,
2. use of a semantic approach to vocabulary,
3. reading in the content areas,
4. use of technology.

Banner and Wang's study (2011) on reading strategies used by adult and student deaf learners revealed that, regardless of the reading skill of the participant, metacognitive reading strategies were always prevalent. However, the higher the reading skills, the higher the variety of reading strategies were used. Encouraging the use of metacognitive strategies to provide students with improved inference skills (Brown and Brewer, 1996) can also provide opportunities for incidental teaching of basic linguistic skills. These skills include lexical comprehension (semantics) and analysis of syntax, leading to an overall improvement of reading and writing abilities (Kelly, 2003).

Lexical comprehension is a known weakness in a population with less access to the stream of information constantly available to the hearing population. Hearing people have more incidental opportunities, via more channels, for passive learning of information, whereas deaf people must actively use the visual channel for accessing information and to navigate the world around them, thus creating a division of attention that most hearing people do not face. Deaf signers in a fully immersive sign environment have more access to incidental information than a majority of deaf people who are born and raised in a mainly auditory environment, making them more prepared for literacy situations (Freel, et al, 2011). To address the reduced access to input among a majority of deaf learners, utilizing opportunities to increase exposure to print via technology (including specially designed immersive virtual environments) would allow them to see words used in different contexts and increase their knowledge of multiple meanings, idiomatic expressions, and the denotative and connotative meanings of



words. The mutual relationship between semantics and syntax (Kelly, 1996) indicates that the improvement of one will lead to the improvement of the other.

The FIRB-VISEL project's e-learning platform provides an immersive visual and text-rich environment, creating rich opportunities for building on the connections between prior knowledge and personal experiences with new information, particularly words and concepts. Reading in the content areas in this environment increases opportunities for learning to learn, capitalizing on intrinsic motivation for obtaining information from texts, which requires the application of metacognitive strategies.

It is also important to consider the role of motivation in the learning process. Parault and Williams (2010) show that deaf students have higher levels of reading motivation than their hearing peers, despite their lower reading skills, revealing to us the importance of stimulating and maintaining this motivation to foster further development of print literacy. If instruction continues to focus on their deficiencies, deaf students can easily lose motivation for activities crucial to their development of literacy skills, which is in turn crucial for their success in navigating a mainly hearing world in which they have reduced access.

3. Deaf-Centered E-Learning Environments (DELE)

Considering the factors affecting deaf language learners laid out in the previous section, the first thing we took into account when we designed an e-learning platform for literacy development was to develop a *motivational* e-learning environment.

Since text-based environments risk detracting deaf people from fully interacting with the context, a visual environment with an iconic navigational structure has been designed for the development of a deaf centered e-learning environment (DELE). In order to create such an environment, we drew from the theory of embodied cognition (EC) and the principles tied to conceptual metaphors (Johnson, 2007; Lakoff & Johnson, 1980). Following these approaches, knowledge is acquired through the physical interaction with the environment and subsequently projected onto the abstract domains of the mind using a pre-verbal and unconscious structure of knowledge (*image schema*). These image schemas are ingrained within memory: they are recognizable as a sort of "feeling" which gives the qualitative aspect found in the meaning of words and concepts.

Concerning the application of these approaches to the DELE, our hypothesis is that the use of metaphorical representation of learning concepts might be suited for deaf learners. Since our target population is composed of deaf students attending university courses, a university campus became the metaphorical setting for mobility within the e-learning platform. From this starting point, the DELE structure is composed of a blend of visual aids and instruction on texts taken from original contexts.

Using this tool, three different levels of CLIL have been depicted:

1. The metaphors of DELE: DELE is composed of two major "metaphors" that support navigation within the virtual environment and the natural path by which students move through the learning activities.

Learners, represented in the virtual campus by a customized avatar, are able to interact with the virtual campus environment, which in turn provides natural contexts for communication (e.g., forums via a community board and chat rooms in a coffee shop) and learning (e.g., activities within the individual homes and university buildings).

Storytelling (McKillop, 2005; McDrury & Alterio, 2002; Bruner, 1991) provides the theoretical basis for guiding learning activities, with different environments within the system combining to build knowledge of a common topic (in this case, Italian literacy). The user's learning path can be seen as a story with a beginning, a development phase, and a conclusion. The more environments a learner experiences, the more complex the stories are. The stories are "stored" as a learner portfolio within the user's individual home on the platform.

The Bassiano Museum of Writing: Based on existing materials in a museum located in Bassiano, Italy, we are working on the implementation of a sample course in which the user is a virtual visitor of a museum focusing on the history of written language, from its birth to its influence on ways of describing the world and our ability to work with information. The museum visit consists of four exhibits, each containing videos, animations, games and tutorials; it is accessible by a university building containing the learning units.

3- Comprehension activities: Linguistic structures are presented and explained using interactive text easification strategies. Easification devices guide the reader through text, making them more accessible through the use of graphic organizers, images, videos, and comics (Bhatia, 1983). Transmitting language affordances are made easier through the use of metaphors. For example, in the case of connective words such as *nonché* (as well as) and *nonostante* (although), we use a bridge metaphor, connecting two separate elements to allow access. Animations (e.g., symbols, arrows, image schemas, and diagrams) explain the correct position of the connective word in the sentence. Deaf signers (LIS-L1 users) have access to Italian Sign Language (LIS) video clips in which the concept is not translated but made explicit through visual expression, gesture, and examples. All these activities will be done in a realistic and dynamic context, aimed at encouraging deaf learners to interact with and manipulate text using a variety of tools. Through this interaction, they not only gain skills that allow them to achieve educational goals, but to successfully navigate daily language situations.

Conclusion

Literacy issues in deaf adults can be faced by a change from the "deficit perspective" to an approach based on their skills and competences. Principles coming from CLIL, embodied cognition and storytelling approaches guide the design of a DELE which aims to provide a new perspective to language learning for deaf people.

The preliminary results of the ongoing VISEL project are:

- An approach based on skills and competences in deaf education, and the aim to bring learner competences up to what the European Commission has defined as 'key competences' in 'lifelong learning'
- A new paradigm of e-learning systems for deaf people based on visual systems of navigation and online instruction
- A framework for providing innovative techniques based on embodied cognition, used to explain verbal language structures in an accessible way for deaf learners.

Based on a survey of research in Italy, these results show a pioneering approach to teaching deaf students. It is our view that tapping into non-verbal understanding of concepts will provide deaf learners with increased access to the meaning of language structures. While this remains an area that needs continued research, we believe these to be good starting points for the improvement of deaf learners' literacy skills and, most of all, for their increased integration into the professional and social domains.

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