Addizionario: an interactive hypermedia Tool for Language Learning

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Abstract

In this paper we present the hypermedia linguistic laboratory "Addizionario", an open and flexible software tool aimed at studying Italian either as native or as foreign language. The product is directed to various categories of users: school children who can perform in a pleasant and appealing manner various tasks generally considered difficult and boring, such as dictionary look-up, word definition and vocabulary expansion; teachers who can use it to prepare didactic units specifically designed to meet the needs of their students; psychologists and therapists who can use it as an aid to detect impaired development and learning in the child; and editors of children's dictionaries who can access large quantities of material for the creation of attractive, easy-to-use tools which take into account the capacities, tastes and interests of their users.

1. Introduction

This paper describes "Addizionario", a software tool implemented at the Institute for Computational Linguistics of the National Research Council (CNR) in Pisa, in collaboration with the Department of Computer Sciences of Turin University. Addizionario is a hypermedia linguistic laboratory in which children from the ages of 4 to 14 can study the Italian language at various levels of difficulty and from different points of view, with particular emphasis on lexical competence and language reflection. The levels of use are not established beforehand, but tailored to the capacities and needs of the users, so that the product can be exploited by impaired as well as fully-skilled children.

The starting point of this project was our conviction that it is possible to stimulate the interest and enthusiasm of the children towards a dictionary only if they are directly involved as "authors" in all the phases of creation of a dictionary respecting their tastes, abilities and interests. Furthermore, children should be provided with appealing tools and allowed to work in an interesting and motivating context.

Dictionaries do not generally attract the attention of young students - especially those of primary schools - and the activities for which they are used are considered heavy, difficult and boring.

The scarce interest for the dictionary on the part of the users is also due to certain aspects which include alphabetic ordering as the only key of access to a word, small characters, scarce pictures and poor colour; in other cases, refusal of the product can be ascribed to features typical of many lexicographical products for children,

which do not take into due account the abilities, tastes, and interests of the younger users.

Except for some cases, children's dictionaries seem to be only revised and abridged versions of adults' dictionaries; they generally present "circular" definitions (written in a language which is difficult to understand), as well as lexicographical and typographical codes which imply abilities not yet developed by the children; finally, they are too distant from the child's universe, with hardly any connections with his everyday life.

Josette Rey Debove, author of the "Le Petit Robert des Enfants", claims that a dictionary should not isolate the child from his surrounding world, but look at the world of childhood as a necessary link between knowledge and the child.

2. Description of the Product

Addizionario reflects a different approach to the use of the dictionary and the study of language. It is an interactive and flexible tool, centred on the child, which involves him both as user and as author.

When working in the linguistic laboratory Addizionario, the child gets to know, to appreciate and to use the dictionary by constructing it himself, supplying it with large characters, sound and colourful drawings linked with stories related to his experiences. This personalized dictionary will therefore contain the "emotional dimension" of the words, so important for the children, and which the traditional dictionaries prepared by the adults can by no means contain. A definition of the type "A baby is a creature that brings happiness and joy at birth", produced for Addizionario by a child from a school in Turin, would never be found in a traditional dictionary.

The learning environment we have designed includes two strictly correlated multimedia tools: "Addizionario" a dictionary for children written and illustrated by the children themselves, whose name has been extended to the have produced for around 1,000 words.

These were extracted from a list of the Italian words most frequently used by young children, and included nouns - both concrete and abstract - adjectives and verbs.



entire system; and the "Activity Book", a creative module in which the child can create his own personalized dictionary working either by himself or in collaboration with his classmates. As a matter of fact, the children should use the product preferably in small groups of three or four, working in front of the computer, supervised and guided by the teacher.

The child who wishes to use the hypermedia laboratory should first digit his name, surname and classroom number. The system opens up a number of files which memorize the textual and multimedia material produced in each computer session. The child is then introduced into the classroom, where both the Dictionary and the Activity Book are located. The graphical interface of the program is clean and pleasant and the screen pages airy and spacious; the icons relative to the different functions are displayed and activated during the various working phases.

2.1. The Dictionary

"Addizionario" contains the definitions, examples, drawings and free associations that 400 children from the fourth and fifth classes of the primary and first and second classes of the secondary schools of various regions of Italy



All this material provides information which can be used at various levels of difficulty and from different points of view.

The first and obviously most important user is the child himself; however this material can be of extreme interest also for psychologists, teachers, or parents wishing to gain an understanding of the children's inner thoughts and feelings, to discover the reality underlying the different words which are used.

Compilers of children's dictionaries can gain useful insights so as to produce more appealing and easy-to-use tools.

With the exception of the most obvious spelling mistakes, the material produced by the child has been kept as much as possible in the original form, with its fresh and lively descriptions and reflections.

2.2. "Worlds" of Words

An interesting feature - common to Dictionary and Activity Book - is that the words can be ordered both alphabetically or in different "worlds". In Addizionario, the worlds have been created according to the categories of the adults, which do not always coincide with those of



the children. On the other hand, in the Activity Book, it is the child himself who can organize his lexical knowledge, creating different worlds which correspond to his ways of looking at reality. This personal organization of the material will allow him to retrieve more easily the information stored in the Activity Book.

The definitions, examples, drawings or associations of a given word were provided only in part, since the children who had been contacted at the early stage of the project were free to perform the number of activities they wanted. We thought it would be necessary to collect other material from the children in order to fill in the empty slots. However, during experimentation of the product, what at first had appeared to be a shortcoming turned out to be an extremely positive feature. The child as user of the laboratory can add the missing parts himself in a stimulating and amusing manner.

A lively and flexible instrument, to be completed where necessary and increased at pleasure - with the aid of the teacher - is much more interesting than a tool which is flat, boring and restricted to itself.

2.3. The Activity Book

The Activity Book is the creative module of the hypermedia linguistic laboratory, where the child can work on the construction of his personal dictionary.

Using the "copy" and "paste" commands, he can transport into his Activity Book some or even all of the information present in "Addizionario", changing and tailoring it to his needs or including new words.

For every new word included in the dictionary, the child is free to perform the number of tasks he wishes, either linguistic or non-linguistic, which appear in the menu.

The linguistic activities include the production of definitions, examples, free associations, idiomatic expressions, synonyms and antonyms if they exist, as well

as verbs and adjectives which can be associated with the word in question (for example, in the case of the noun "aeroplane", verbs like "taking off" and "landing", or adjectives of the type "military", or "civil").

Finally, the writing of invented stories and personal experiences, strictly connected with a word and stimulated by the relative drawing, is another important task which can help the child become actively involved in the work.

The non-linguistic activities consist in handling the multimedia aspects of the system. The children can produce their own drawings, record sounds, or can use the material already available in the archives of the system.

With particular regard to the drawings, it is possible for the children to use the material which has been produced on paper previously and then transferred onto the Activity Book by means of a scanner. If a child wishes to create drawings on the computer directly, or prefers to personalize those which have been taken from the archives, simple tools such as pencils, an eraser, paint, scissors, etc. can be employed.

On the drawing the child can construct in a simple and easy manner "hot areas" highlighting different parts or details of the image and these details can also be added to the Activity Book as new words.

The possibility of creating special groupings of words in the Activity Book can also be exploited by the teachers who can use them in their daily teaching activities to draw the attention of the children on particular semantic areas. For example, in order to help the child overcome spelling difficulties of words like "acqua" (water) and its derivates, the teacher can include them in the "water world" and ask the child to produce the relevant definitions, examples, drawings, etc. After having performed a great many activities on these words, it will be difficult for the child to get their spelling wrong in the future.

As regards the sound device, for each word the child can record the pronunciation, or can associate a sound to the





entire drawing, or to its specific parts.

The sound associated to the entire drawing, unless specified otherwise, is "inherited" by all the occurrences of that particular word which are present in the Activity Book. The sound assigned to the image illustrating the word "aeroplane" will be automatically associated to all the other images of "aeroplane" found in the Book.

In the case of homographs, the sound can be used to disambiguate the words.

For example, the word "porto" (port) with the meaning of "wine" can be associated to the clattering sound of glasses, while the same Italian word, with the meaning of "harbour", a space of protected sea where ships can stop or take refuge, can be associated to the sound of a siren.

Differentiation of sound can also be useful when different sounds produced in contexts of various types are associated to the same word. For example, a dog does not only bark, but it can also growl, yelp, gnarl, etc., according to different contexts.

3. Conclusions

The software of Addizionario patented by CNR is currently experimented in various schools in Italy, and has aroused the interest of teachers, psychologists, therapists, etc. and of all those working with children who are physically- or mentally-impaired.

The tool can be useful not only for the acquisition or improvement of one's native language, but also for the learning of a foreign language. Teachers working in areas with a strong immigration from other countries have also requested the program, which is used successfully in various situations.

With older children attending junior high schools, the system can be exploited for the study of different subjects including natural sciences, history, geography, arts, etc.

The data produced by the children are returned to our research group together with a detailed form compiled by the teachers, containing information on the ways in which the program has been used, on the difficulties encountered and possible improvements suggested.

All this material, stored in a database, will be used for future research and, in particular, for updating of the core dictionary.

A parallel research is now being carried out on the use of Addizionario in other linguistic contexts. In particular, a pilot project has been started with the University of Cardiff, to study the cultural differences between Italy, Wales and England.

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