Addizionario: a Pupil’s Innovative Tool for Language Learning

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Abstract
This paper describes "Addizionario", a hypermedia linguistic laboratory for children aimed at the study of Italian either as native or as foreign language.

Two strictly interrelated tools are available within the laboratory, (i) a computer Core Dictionary for children - written and illustrated by children – whose name “Addizionario” has been extended to include the whole system, and (ii) an Activity Book, a multimedia creative environment which allows the children to construct their own personalised dictionary.

This product is addressed to pupils of the primary schools, who can study language in a pleasant and appealing manner; teachers, who can prepare didactic units specifically designed to satisfy the needs of their students; and lexicographers, who can exploit the material produced by the children to create better and more attractive young learners’ dictionaries.

Keywords
Hypermedia, Children's dictionaries, Creativity, Lexical Acquisition

Introduction
In this paper we describe “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 6 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.

After the first section describing the leading ideas and purposes on which Addizionario is based, this paper will provide:
1. an overview of the system Addizionario and its two component modules, the Core Dictionary and the Activity Book;
2. an insight of the Core Dictionary environment;
3. an insight of the Activity Book environment;
4. a more detailed description of the opportunities offered by the Activity Book, and of some interesting features of the system;
5. finally, a conclusive section describing the present experimentation in Italy and the tentative use of the system in other linguistic contexts.

This article is an extended and modified version of our paper (Turrini, Cignoni, & Paccosi, 2000).

1. Overall Ideas
Over the past years, the many changes following the development of new technologies and rapid progresses of knowledge have created profound cultural instability in our society: the truths valid today may not be valid tomorrow. These effects have involved different environments and institutions. Particularly touched by this condition of uncertainty has been the school, and in particular the primary school, which should provide the means to face these mutations, but offers instead to the pupils only ready-made solutions which are no longer appropriate (Simone, 1998; Simone, 2000). It has become more and more important to be mentally active, at the centre of the learning process and capable of constructing new personal responses to the problems presented by everyday life. In the field of education, special attention should therefore be given to the development of creative thought by implementation of didactic instruments able to help children achieve flexibility and capacity to adapt to a cultural situation that is constantly changing (Cosentino, 1999).
Among the traditional instruments, which - in spite of their unquestionable utility - tend to be no longer adequate to the new situation there is the Dictionary. Dictionaries do not generally attract the attention of young students - especially those of the primary schools - and the activities for which they are used are considered heavy, difficult and boring. The reasons for this lack of interest are many and include alphabetic ordering as the only key of access to a word, small characters, scarce pictures and poor colour. In some cases, refusal of the product can be ascribed to further aspects typical of many lexicographical products for children, which do not take into due account the capacities, tastes, and interests of the younger users (Turrini 1993). Except for some cases (Rey-Debove 1988, Bertero 1994, Lumbelli 1981, Lehmann 1991), children’s dictionaries seem to be only revised and abridged versions of adults’ dictionaries (Brandi et al., 1990). They often present “circular” definitions, written in a language which is difficult to understand, and their lexicographical and typographical codes presuppose - in order to be understood - abilities not yet developed by the children. Finally, they are too distant from the child’s universe, with hardly any connections with his/her everyday life. Josette Rey Debove (1988), author of the dictionary “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.

The starting point of the project Addizionario was our conviction that it is possible to stimulate the interest and enthusiasm of the children towards the dictionary only if they are directly involved as “authors” in all the phases of collaborative construction of a tool respecting their tastes, abilities and interests. The children understand how the dictionary is structured and how it works observing it from a different perspective, involved as they are both as users and as authors. The possibility offered to the children to enter and to move within the dictionary, traditionally considered as a kind of sacred repository of knowledge, does not only act positively on their relation with the instrument, but it also brings into the dictionary elements of freshness and innovation.

The principles that inspired us when developing our software are those of “social constructivism” (Vygotsky, 1978), which encourages collaborative learning. Knowledge is built performing together with others (the more skilled peers or adults) activities that would never be possible alone. Furthermore, Addizionario shares the ideas of “cognitive informatics” (Papert, 1980; Papert, 1993) which allows an active, constructive and social utilisation of computer tools and technologies in didactics. When working in the linguistic laboratory of Addizionario, the child creates his own personalised Dictionary supplying it with large characters, colourful drawings and sounds linked with stories related to his experiences. This personalised dictionary will therefore contain the “emotional dimension” of the words, so important for the children, and which the dictionaries prepared by the adults can by no means contain. A definition of the type “A baby is a person who makes other people happy as well”, provided by a child from a primary school in Turin, would never appear in a traditional dictionary.

2. Description of the Product

Addizionario reflects a new, non-traditional approach to the use of the dictionary and the study of language. It is an interactive and flexible tool, centred on the child, who gradually constructs his lexical knowledge. The teaching environment we have designed includes two strictly correlated multimedia tools:
1. The Core Dictionary (“Addizionario” for brevity in the icons), a dictionary for children written and illustrated by the children themselves.
2. The Activity Book, a creative module in which the child can build his own personalised dictionary working either by himself or in collaboration with his classmates. 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 the class attended. The system opens up a number of files that memorise the textual and multimedia material produced in each computer session. The child is then introduced into the “classroom” (Fig. 1), where the Core Dictionary (a book-shaped icon with the label “Addizionario”) and the Activity Book can be seen clearly, placed on a shelf and a desk respectively. 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 shown and activated as the work proceeds.
2.1. The Core Dictionary

The Core Dictionary (Fig. 2) contains the definitions, examples, drawings and free associations that 400 children of the fourth and fifth classes of the primary and first and second classes of the secondary school from various regions of Italy, 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. All this material has provided information that can be used at various levels of difficulty and from different points of view.

The first and obviously most important user of the Core Dictionary is the child himself. However, the relevant material can be of extreme interest also for psychologists, teachers, or parents wishing to gain an understanding of children’s inner thoughts and feelings and to discover the reality underlying the different words that are used. Compilers of children’s dictionaries can gain useful insights so as to produce more appealing and easy-to-use tools able to respect the abilities, tastes and interests of the users. With the exception of the most obvious spelling mistakes, the material produced by the children has been kept as much as possible in its original form, with its fresh, lively and immediate descriptions and reflections.
2.1.1 Empty Slots

The children we had contacted at the beginning of the project were free to perform the number of tasks they wished; therefore, not all the definitions, examples, drawings or associations of a given word were supplied. At an early stage we had thought of collecting other material to fill in the empty slots but during experimentation of the product we soon realised that what had initially appeared to be a fault turned out to be an extremely positive feature. The child discovers that it is particularly stimulating and amusing to add the missing parts himself, using the “Activity Book”. A lively and flexible instrument - to be completed where necessary and increased at pleasure, even with the aid of the teacher - is much more interesting than a tool which is flat, boring and restricted to itself.

2.2. The Activity Book

The Activity Book (Fig.3), the most interesting device of the system, is the creative module of the hypermedia linguistic laboratory. It allows the Core Dictionary to be extended and constantly enriched. It differs from the Core Dictionary (which is a non-modifiable block) in that the words, definitions, sounds, drawings, etc. can be introduced, modified, grouped, etc., by the users, according to their personal criteria. At the onset, it is an empty set of words, definitions, ...etc., which can grow progressively, embodying more and more new words (if desired, the entire content of the Core Dictionary, or any of its parts, can be copied into the Activity Book, to provide a first set of contents to be customised and increased).

![Figure 3. Activity Book - writing a Definition](image)

Words, definitions, etc., can be introduced by hand, or copied or moved throughout the Activity Book by means of the “copy” and “paste” commands, using either the information already present in “Addizionario”, or other material external to “Addizionario” which can be accessed by the computer. A menu of icons suggesting the activities that can be performed is provided. The icons are generally self-explanatory, thus leading children to identify after a few trials their correct meaning and to understand how to use the tool (an on-line help is, however, available). No specific order is requested when performing the various activities, nor is it necessary for all the tasks to be carried out. Thus, work with the Activity Book is an appealing and friendly task that children can perform as if it were a game. It is however advisable that the teacher is present for supervision.

2.2.1 Operating with the Activity Book

When opening the Activity Book, the screen displays an open exercise book with facing pages. The left-hand page contains an editable slot for the word to be treated, as well as icons corresponding to the different
“activities” that can be selected. The right-hand page (empty at the start) is the environment in which the selected activity can be carried out. The various activities can be both linguistic and non-linguistic.

i. The linguistic activities consist in the production of definitions, examples, free associations, idiomatic expressions, synonyms and antonyms - if any -, verbs and adjectives somehow associated with a particular noun, e.g. verbs like “taking off” or “landing”, and adjectives like “military” or “civil”, in the case of the noun “aeroplane”.

ii. The non-linguistic activities consist in handling the multimedia aspects of the system (graphics and sounds) and the grouping-and-ordering criteria. The children can produce their own drawings and sounds, or can use the material already available in the archives of the system.

We shall now discuss in further detail some of the most interesting aspects of the Activity Book.

**Figure 4. Activity Book - The Drawing Environment**

**Drawings** – The drawings can be either created by the child himself, or imported from the Core Dictionary or from the Addizionario archives, and customised according to the needs of the user; simple tools are available, such as pencils, an eraser, paint, scissors, etc. (Fig. 4).

The Drawings archive of Addizionario is an open environment and can be enriched by new drawings, created on paper and then copied by means of a scanner, or taken from any of the Clipart archives.

The drawings are one of the most stimulating aspects for the children and a suitable site for making connections. Particular links exist between the words and the drawings. The child can construct in an easy manner “hot areas” highlighting different parts or details of the image, and these details can encourage him to create new words linked to the original word through the image. These words, in turn, can be added to the Activity Book if they are not already present.

Invented stories and personal experiences interconnected with the drawing of a word are other important tasks that can help the child become actively involved in the work. The child can associate a story to a drawing, then modify the drawing to better adapt it to the story, and can move from one to the other, so that the story and the drawing evolve in parallel.

**Sounds** - As regards the sound device, for each word the child can record the pronunciation and link a sound to the drawing (or to the parts of the drawing) that illustrates that word. This sound, unless specified otherwise, is “inherited” by all the occurrences of that word whenever it is used again in the Activity Book. Once a sound has been assigned to an image illustrating for instance the word “aeroplane”, that sound will be automatically associated, by default, to all the other images linked to the word “aeroplane”, throughout the whole Activity Book. “Local” changes are however permitted; thus, inside an image showing two or more aeroplanes (used to illustrate, e.g., the word “sky” or “airport”), the default sound can be turned into the different sounds associated to different types of aeroplane. Differentiation of sound can also be useful to make the child aware of the different verbs indicating sounds, showing, e.g., that a dog does not only bark, but can also growl, yelp, gnarl, etc. according to different contexts.
Sounds are introduced with a microphone or captured from the Archive of sounds of “Addizionario” (Fig. 5), or from other Archives.

“*W*orlds” of *W*ords - An interesting feature - common to the Core Dictionary and the Activity Book - is that the words can be ordered both alphabetically or in “worlds” of words (Figs. 6-7). The latter are assigned, within the Core Dictionary, according to the categories typical of the adults, which do not always coincide with those of the children. Conversely, in the Activity Book it is the child himself who can organise his lexical knowledge, creating different “worlds” that correspond to his ways of looking at reality. A word can pertain to different worlds at the same time. The personal organisation of the material will allow children to retrieve more easily the information stored in the Activity Book.

The possibility of creating special groupings of words in the Activity Book can also be exploited by the teachers, who can use it in the daily activities to draw the attention of the children on particular semantic areas (sets of words). For example, in order to help the child overcome spelling difficulties of the type of the Italian word “acqua” (water) and its derivates (e.g. acquaio, acquario, acquazzone, acquetta, acquedotto, etc.), 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 is unlikely that the child will get the spelling wrong in the future.
3. Conclusions and Future Prospects

The software of Addizionario was patented by CNR and implemented by the Institute for Computational Linguistics of Pisa in collaboration with the Department of Computer Sciences of Turin University. It is currently distributed free of charge and experimented in about a hundred primary schools of Italy. A parallel research is also 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.

As the software can be tailored to the needs of the users, specialists working with physically, intellectually or emotionally impaired children can customise the product to their particular requirements. The tool is used 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 strong immigration from other countries have requested the program. Result evaluations are not yet available. 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 is used, on the difficulties encountered and possible improvements suggested. All this material, stored in a database, will be made available for future research studies and, in particular, for updating of the Addizionario system.

References


