

GLOBETROTTER: Words with their travel-bags

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Abstract

Globetrotter is the first prototype of multimedia software aimed at making the study of the lexicon of a foreign language (in this case English) more efficient and less boring. The tool is destined for the teachers and pupils of the primary and junior high schools and can be exploited by even the least experienced computer technology users.

The tool is child-centered, highly interactive, open and flexible. These features make it particularly interesting from a didactic point of view. It allows the users (teachers and pupils alike) not only to consult but also to enrich the dictionary of the system. The teacher, with the aid of multimedia technology, can prepare efficient and appealing didactic units, while the pupils can explore and increase the material available, by constructing, completing and structuring their lexical knowledge in a foreign language.

Keywords

Lexicon of foreign language, Child-centered tool, Multimedia software

Introduction

Starting from the 80's, there has been the growing awareness that the lexicon of a language is just as important as its grammar. Everyday experience has proved that it is possible to communicate more efficiently in a language even if one is familiar with only a few grammar structures but has a rich and articulated vocabulary.

It is thus necessary to provide the pupils with effective methods and instruments which can help them expand their lexicon.

The recent hypermedia tools offered by information technology seem to meet these needs; however, some of the software systems currently available on the market present a number of weak points which include lack of flexibility and few effective didactic advantages compared to the traditional methods of work with paper and pencil.

1. Prototype Design

In this paper we present Globetrotter, the first prototype of a multimedia software for teaching/learning of the English language, aimed in particular at facilitating activities of acquisition and enrichment of the lexicon. The tool, developed at the Institute of Computational Linguistics (ILC) of the Italian National Research Council (CNR) of Pisa, Italy, and addressed to teachers and pupils of the primary and junior high schools, can be used for both browsing and authoring activities.

The core of the system is an ever-growing bilingual Italian-English dictionary which at the onset consists of a small nucleus of words (mainly nouns, but also verbs and adjectives) of more common use and particularly close to the interests and experiential world of the children. Each entry of the dictionary is accompanied by a personal "travel-bag" containing Illustrations, Pronunciations, Sounds, Environments, Worlds, Models of Behaviour, Families.

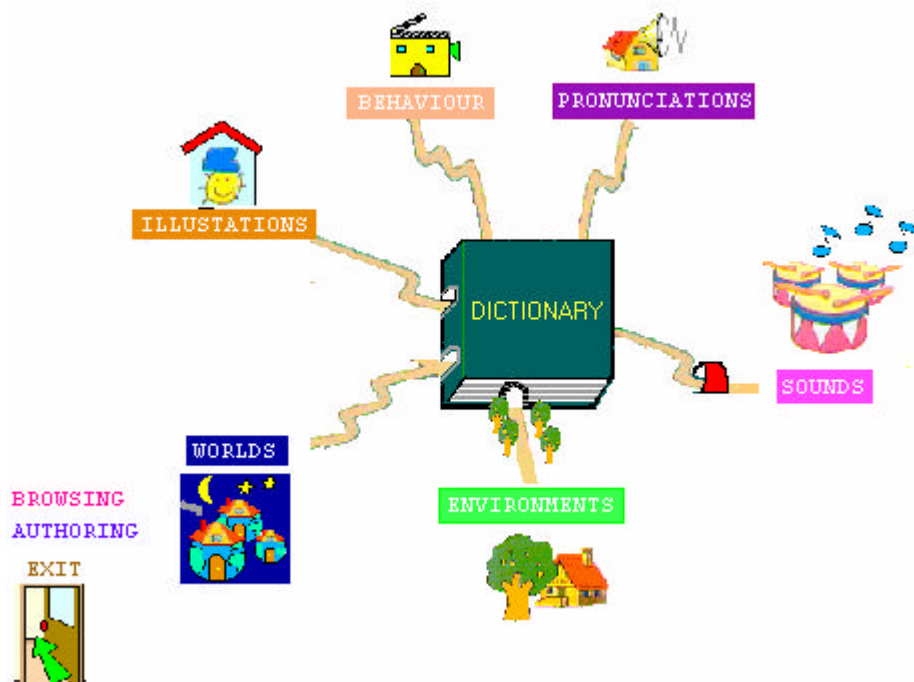


Figure 1. Word travel-bags

Illustrations: each word is represented by one or more drawings. For example, the word *fish* (It.: *pesce*) can be associated with several drawings representing fish of various colours, sizes and shapes. Each drawing can also show different parts of an animal (tail, fins, scales, etc.).

Sounds and Pronunciations: different sounds are available for a particular word (e.g. a dog can bark, growl, whine), as well as different pronunciations (to offer multiple instances that the child can hear and repeat).

Environments: these are complex structures of the dictionary which contain sets of graphical objects (table, watch, word, wall, etc.) representing the relevant words. These objects are appropriately disposed in order to reproduce real places or situations (for example, a fish can be contained in the SEA environment, and in this case it will be with other fish, seaweed, starfish, crabs; it can be seen at the MARKET, behind a stall ready to be bought; otherwise in a HARBOUR where it has just been caught, or in a FRIDGE together with meat, fruit, vegetables, etc.).

Worlds: they are structures of the dictionary grouping words of the same semantic category and reflecting the different experiential “worlds” of the child. For example, the word *heart* can be found in the World of Affection with terms like *love, mother, friends*, but also in the World of Health, and in this case with words like *hospital, doctor, medicine*, etc.

Models of behaviour: these are the mechanisms which make it possible to reproduce through animation and sound the actions performed by people, animals or things in response to requests formulated by use of particular verbs (e.g. clicking the verb *to close* associated to the image of a door, it makes the door close).

Families: a Family is a network in which a word (the family-head) is linked to other words of the dictionary by different types of relations. The Family of *pesce*, for example, could be formed by words like *water, fisherman, frying pan*, etc., because each of these words is linked to the word in question by one or more specific relations: *a fish lives in the water, a fish is caught by a fisherman, a fish is fried in a frying-pan*, etc.).

This structure helps the child understand the meaning of a word without him being given the Italian translation.

Let us consider for example the following relation: bee _ PRODUCES honey

If the child knows the word on the left of the arrow and the relation “PRODUCES”, he is also able to understand the word on the right.

Therefore, the above relation could be represented as follows:

ape _ PRODUCE honey

or as

image of bee _ PRODUCE honey

In other words, the child uses all the knowledge he already possesses (reading of Italian, reading of images, and encyclopedic knowledge of bees) as tools to learn and memorize the lexicon of another language.

2. Functional modes of the system

The system GLOBETROTTER allows the users (teachers and children) to access the dictionary not only for activities of consultation, but also of authoring.

The teacher, having at his/her disposal a rich and helpful tool which avoids the anxious search for didactic materials, can concentrate instead on the design of personalized routes, monitoring the progress made by the pupils.

2.1 Consultation

In the dictionary of the system the words are not isolated but related through different types of links which can be used by the child for hypertext navigation. These links connect the words of the same environment, those of the same world, and also of a family to its family-head, an object to its different parts, one environment to another, and finally words to the verbs which make them react.

This net-shaped dictionary, strongly interconnected, is fundamental for consultation activities. Pupils in particular benefit from this dynamic, non-linear and tri-dimensional structure, where the information can be explored forwards, backwards, and in-depth, satisfying their natural curiosity.

The possibility of consulting a dictionary in ways other than simple alphabetical ordering is very interesting for primary school children who have not yet achieved the basic skills and for whom the alphabet is too abstract. The system Globetrotter offers to the users different types of access to the dictionary:

- Alphabetical access: (via alphabetical ordering of the words).
- Contextual access (via *Environments*): these make it possible to reach all the words through the images belonging to the same graphical context. For example, in the Forest Environment one can reach words such as *tree*, *squirrel*, *mushroom*, etc., by clicking on the relevant images.
- Conceptual access (via *Worlds*): one can browse words belonging to the same conceptual class (for example from the word *red*, which belongs to the Colour World, one can reach other words like *blue*, *yellow*, *pink*, etc.).
- Relational access (*Families*): starting from the family-head word, it is possible to get to each of the words it is linked to through specific relations. For example, in the Chick Family, from the family-head word *chick*, one can reach *egg* (where the baby bird develops), *hen* (its mother), *yellow* (its colour), etc. The families are functional to navigation, introducing a sort of natural access to the words.

2.2 Authoring

The more interesting of the two functions of Globetrotter is the authoring activity, which involves both teachers and pupils.

For the teacher, the possibility of enriching the dictionary means that s/he can tailor it to the needs of the pupils preparing appropriately designed didactic units, while for the child it means achieving the lexicon of a foreign language by a learning method which gets him more strongly involved and motivated.

In order to increase and personalize the dictionary, the users (teachers and pupils) get access to a considerable amount of material and of an integrated set of tools.

For the addition of pronunciations and sounds, the system supplies archives containing ready-made contents; otherwise, the users can pronounce and sonorise the words themselves by means of a recording environment.

For illustration of the words, a simple and functional drawing tool is provided; however, the users need not necessarily start from scratch since they can appropriately change and re-adapt the pictures available in the libraries of the system. An illustration can be supplied with details, assigning names to its different parts. Furthermore, it will be possible to use the same drawing to construct environments, families and behavioural descriptions.

An Environment can contain illustrated words, Models of Behaviour, and Links to other environments. It reproduces in graphic, audio and animated form a particular place containing objects which also give access to the relevant words in the dictionary. The graphical objects can be searched in the system archives, or created by the user, and assembled so as to reproduce structures with multiple interconnected levels.

For example, creation of the Farm Environment involves the design and assemblage of different objects (a farmhouse, a stable, animals, a tractor, etc.) which are, in turn, other environments to be created and linked to the previous ones.

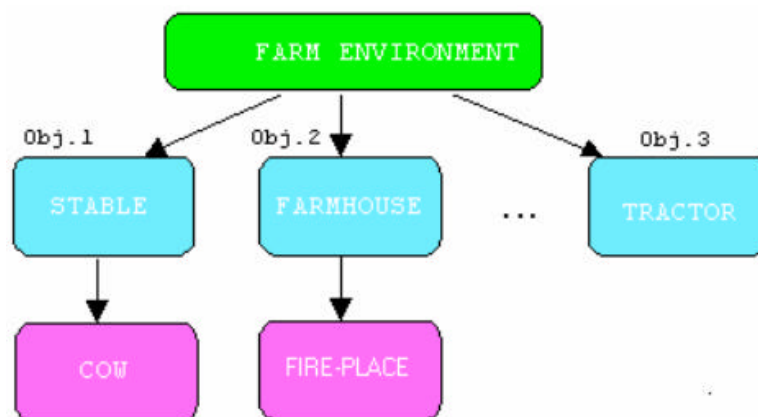


Figure. 2. A multilevel environment

For the teacher, the creation of a world consists in providing the child with modes of access to the dictionary which are more stimulating than the alphabetical one; on the other hand, for the child it means possibility of organizing his own lexical knowledge and constructing personalized accesses to the dictionary data. For example, a child who is very fond of his dog is more likely to place the word *dog* in the World of feelings rather than in the World of animals (or in both). The child can construct worlds also as exercises at the request of the teachers.

The creation of a Family offers the opportunity to create a network (or groups of networks) in which the words of the dictionary are mutually linked through different types of relations. Every word has its own Family, a set of words linked to the family-head, each by means of a specific relation. Each relation has a name, and it can link words both in textual and illustrated form.

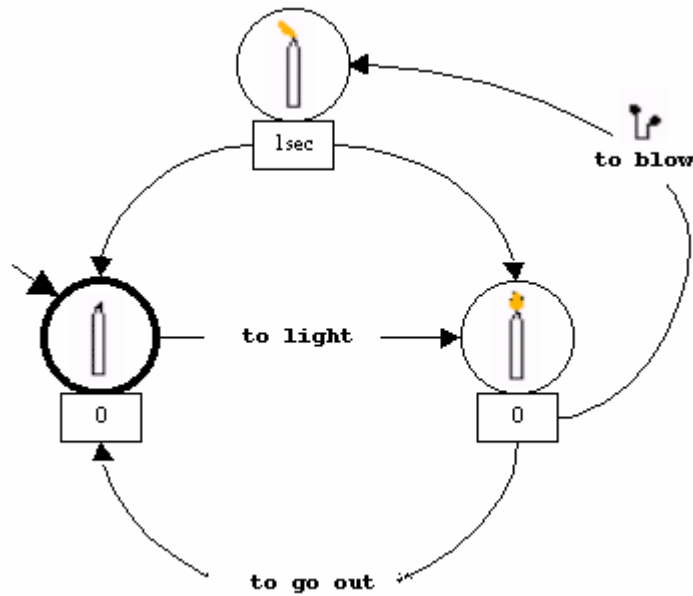


Figure 3. Model of behaviour

For the construction of the behavioural models, Globetrotter supplies a small animation laboratory in which it is possible to explain, through the transformation of objects, the meaning of those verbs corresponding to concrete actions.

From a practical point of view, the creation of a behavioural model consists in the construction of a sequence of photogrammes and of the writing of simple rules establishing the order and times of transition from one photogram to another.

The models introduce constructive activities which are particularly stimulating: the child understands what lies behind an animation, getting involved in logical (constructions) and linguistic (use of verbs) activities.

Conclusions

In these pages we have presented the first prototype of the system Globetrotter, a didactic tool for the teaching/learning of the lexicon of the English language. The system presents the following principal characteristics:

- It is easy-to-use also for non-experts in computer science.
- It is strongly interactive (teachers and pupils are required to use but at the same time to enrich the materials at their disposal).
- It responds to effective didactic needs, designed as it was in strict collaboration with the final users.
- It is open, flexible and its levels of use are non pre-established.

Owing to the possibilities of modifying and customizing the system, one can adopt teaching/learning methods which respect and enhance the originality and personality of each pupil.

Globetrotter presents many of the motivating factors which make an activity more interesting and appealing: active participation of the users, immediate feedback, easy correction of errors, possibility of making choices and turning a task into an opportunity of cooperative learning.

In view of a transformation of the system from prototype to product, the travel-bag of each word could be enriched with portions of text taken from child literature, in which a word is used; metaphorical uses; idiomatic expressions or particular uses of a word; rhymes. Furthermore, different “accesses” to the dictionary could be studied, for example those grouping the words according to perception categories.