AddizionarioPLUS: a Creative Approach to Linguistic and Intercultural Education

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*This paper describes A*ddizionarioPLUS*, the updated and extended version of* Addizionario. Addizionario *– a hypermedia linguistic laboratory in which children being from 5 to 12 years old can study Italian as their native or second language at various levels of difficulty and from different points of view – was developed by the Institute for Computational Linguistics of the National Research Council (ILC-CNR.), in collaboration with the Department of Computer Science of the University of Turin, and was successfully tested in Italy and abroad. The main changes that have been introduced into the software concern: a) the graphic interface with the user, b) the programming language, c) the system architecture, d) the possible activities, e) the organization of the working environments, f) a module for the teacher, g) the available ready-to-use material and learning paths, h) the possible helps for both pupils and the teacher.*

Povzetek: Opisan je kreativen način učenja jezika.

1 Introduction

Addizionario [1], a multi-media tool suggesting innovative and appealing ways for improving the linguistic and cognitive development of primary school children [2], was devised in 1998 by ILC-CNR, with the collaboration of the Department of Computer Science of Turin University, and was at first successfully tested in several Italian schools.

In 2003, a multilingual version of *Addizionario* was implemented, which allowed any user to customize the tool in his own language or dialect, starting from the already available languages (Italian, English, French, Spanish and German).

This possibility opened up interesting new prospects [3] for the use of *Addizionario*, which also began to be used in Italy for teaching Italian to foreigners who were to be integrated into our schools and society as well as in other countries.

Abroad, in particular, the software was exploited by the Universidad Autónoma Metropolitana of Mexico City, in collaboration with ILC-CNR, within the scope of an Intercultural Education project aiming at stimulating primary school children of P'urhépecha indigenous communities living in the Mexican meseta of Michoacán to construct the first monolingual dictionary of their native language[1].

2 The reasons for the updating

Being designed in the late nineties, *Addizionario* has now become technologically out-of-date.

Moreover, during the testing phase of the software in Italian and foreign schools, a lot of interesting ideas arose and several improvements were suggested by the users.

As a result, the developers of *Addizionario* have decided to implement a second version of the software, which has been named *AddizionarioPLUS*[2].

3 The main changes introduced

The main changes brought about in the new version of the software are the following ones:

- a new graphic interface with the user;
- a new programming language;
- a new system architecture;
- new possible activities;
- a new organization of the working environments;
- the creation of a module for the teacher;
- the availability of ready-to-use material arranged into learning paths already traced out;
- the availability of "on-line" helps for both pupils and the teacher.

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[1] P'urhépecha is a mainly oral language of the Michoacán area, which is nowadays at the risk of extinction.

[2] This new version of the software was again developed within the framework of a cooperation project between ILC-CNR and the Department of Computer Science of the University of Turin.

3.1   A new graphic interface with the user

The graphic interface with the user has been considerably changed as a result of the loss of attraction suffered by the previous version of the software for children by now used to the high graphic quality of the videogames and cartoons that are available on the market.

3.2   A new programming language

A different programming language has been adopted as well.

The choice of the developers has fallen on C#.NET, a modern and flexible language that generates software able to run on different platforms.

3.3   A new system architecture

One of the most important changes brought about in *AddizionarioPLUS* concerns the modality of the system architecture, which is no longer Stand-alone, but has become Client-Server.
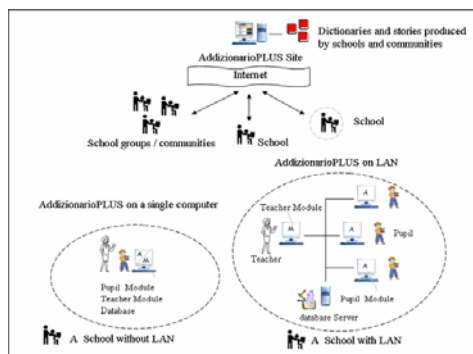

Figure 1: the system architecture.

In *Addizionario*, the software was designed to be installed on single computers (Stand-alone modality), and could therefore only be used by one pupil at a time or by a small group of pupils (usually two or three), who had to use the mouse and the keyboard in turns.

The data produced during each working session were stored only in the computer used by the pupil and, as a consequence, the material produced by different pupils was physically stored in different computers.

In *AddizionarioPLUS*, on the contrary, the software is designed to be installed and used on a network, both on a Local Area Network (LAN) and on the Internet (Client-Server modality).

Data and users modules (*Pupil Module* and *Teacher Module*) are memorized in a database stored on one particular computer (referred to as "server" or "computer server" or "database server"), which can be easily accessible from the different workstations of the network (referred to as "client servers") by pupils and the teacher at the same time (each of them with his own goals and data views).

For a greater effectiveness of the system, it is advisable to memorize data and users modules on the computer server instead of the client servers.

For want of a LAN, of course, the software can still be installed and used on single computers.

In this case, however, as in the case of *Addizionario*, each computer will contain in its memory both the users modules and the data produced by pupils and/or the teacher during the working sessions.

The architecture of *AddizionarioPLUS*, where all the data are centralized and accessible by means of a database server, offers considerable advantages to both pupils and the teacher.

Pupils have the opportunity of sharing their materials, examining and using the material produced by other pupils and carrying out appealing collaborative activities (such as constructing a "Class Dictionary" or writing the text of a fairy-tale or a story together).

On the other hand, the teacher can easily supervise and monitor the material produced by his/her pupils, manage the security copies of the data collected and organize group activities and possible collaborative activities by using the information resources placed at his/her disposal through the network (concerning, for instance, the possible ways of forming and managing working groups, of organizing work-shifts, of assigning tasks and responsibilities etc.).

Moreover, if an access to the Internet is available, it is possible to publish the material produced on a Web site specially created by the authors of *AddizionarioPLUS*, whether the software is installed on a single computer or on a LAN.

This possibility is extremely important, since it gives pupils the satisfaction of displaying their works on line and, at the same time, offers the teacher the opportunity of examining, discussing and re-elaborating the material produced by other users (pupils as well as teachers).

The use of *Addizionario* on a LAN and on the Internet was an improvement suggested by the Mexican test participants.

Network resources were required because of the peculiarity of the Indigenous Education, which tends to emphasize the collaborative character of the learning process[3].

Moreover, the P'urhépecha communities consider network resources to be essential for the collective construction of a dictionary being able to represent their language, which is a task that requires collaboration and frequent discussion.

The fact that these communities live far away from each other was another reason for their request for connection resources.

3.4   New possible activities

AddizionarioPLUS differs from *Addizionario* also in the number and types of activities to be performed.

While in the first version of the software the activities were granted to the creativity and initiative of the teacher, in the second one they are more supported (for both pupils and the teacher).

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[3] Indigenous education often makes use of the figure of the child-tutor, that is to say, an older, more experienced child, who frequently stands in for the teacher during everyday teaching activities in multi-level classes, taking care of younger children that need support and guidance.

In *AddizionarioPLUS* there are many possible activities which may be more free and creative (as in *Addizionario*) or more supported and organized in detail (differently from *Addizionario*).

Activities are arranged into four working environments (which will be described in the next paragraph) and are developed at differing levels of difficulty in each of these environments.

3.5 A new organization of the working environments

The working environments of *AddizionarioPLUS* are the following ones:

1) *My Dictionary*;
2) *My Stories* (or *My Storybook*)*;*
3) *My Drawings* (or *My Drawingbook*);
4) *The Children's Dictionary compiled by children* (which is equivalent to the "Core Dictionary" of *Addizionario*).

Another novelty of the second version of the software is that its working environments are presented in separate modules, even though they are interconnected.

That offers the pupil the possibility of using the software even only for writing stories or drawing, without necessarily passing through his dictionary (which he/she had to do in *Addizionario*).

From his/her book of stories or a drawing album, however, the pupil can always access his dictionary in order to insert new words and/or images as well as for a consultation.

Figure 2: the working environments.

My Dictionary, *My Stories* and *My Drawings* are contained in the *Backpack* (which is highlighted in the figure 2, since it is open).

The foreseen activities can be carried out both in an individual way and in a collaborative one.

In response to the invitation of the teacher or the system assistant (an amusing but never domineering *on/off Parrot*), the pupil can choose the kind of activity – either individual or collaborative – to carry out and, subsequently, the environment in which he prefers to work.

Collaborative activities can be proposed by the teacher through the *Blackboard*, which can be considered as the fifth working environment of *AddizionarioPLUS* in every respect.

Figure 3: the *Blackboard*.

3.5.1 My Dictionary

My Dictionary is the creative module corresponding to the "Activity Book" of *Addizionario*.

In fact, it re-proposes in a richer form many of the functions already present in the latter.

Thanks to these functions renewed and enriched, the pupil becomes the author of his/her own dictionary, defining the words, drawing them, assigning them a sound and putting them together in conceptual groups called "worlds".

Unlike *Addizionario*, however, *AddizionarioPLUS* offers the pupil the possibility of constructing his/her dictionary following different approaches as well as the possibility of carrying out activities aiming at extending and organizing his vocabulary.

Moreover, *My Dictionary* is the ideal environment in which many of the activities that can be carried out are such that they can be performed in a cooperative manner.

Three of the approaches for constructing one's dictionary can be chosen directly in the "Construct" menu.

Figure 4: *My Dictionary* "Construct" menu.

Here one's dictionary can be constructed:

a) word after word starting from a blank page (as in *Addizionario*);
b) starting from the so-called "containers of words"[4] (namely, homogeneous sets of words that can be empty or to be completed, such as the glossary of Geography, the words of affection etc.);

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[4] The expression "container of words" is less poetic but more immediate and functional than the expression "world of words" at first selected by the authors of *AddizionarioPLUS*.

c) starting from the so-called "pictures of words" (namely, illustrations of environments of different type, where images of persons, animals or things are visible, to which their names, pronunciation and possible typical sounds can be associated).

Following the first approach, the pupil can start off from single words not necessarily connected together (for instance, words attracting his attention or creating difficulties of understanding while he is reading a text or listening to a lesson).

Following the second approach, the pupil can start off from words belonging to a specific semantic field (for instance, the one of feelings).

Following the third approach, the pupil can start off from words denoting people, animals or things, whose representations are "set" in the same graphic context, that is to say, in the same picture (for instance, the illustration of a farm, a street, a school etc.).

Moreover, the pupil can construct "pictures of words" *ex novo* or explore and complete "pictures of words" already constructed or half-constructed and can insert new words in his dictionary as well.

A particularly interesting possibility offered to the pupil within this module is the one of interconnecting different graphic environments by creating some accessing points for "entering" the objects represented in a picture (in the context of a "farm", for instance, the pupil can construct an accessing point to the "roost" and examine its inside).

Other approaches for constructing one's dictionary (not included in the "Construct" menu) foresee:

d) to start from texts, where the user can locate the words he considers worth inserting in his dictionary or working on;

e) to expand and complete the material produced by the pupils who created the "Core Dictionary" of *Addizionario* with one's material (definitions, examples, drawings and sounds), which may be useful to give pupils the opportunity of not starting from a (often discouraging) blank page.

When the software is used on a network (both a LAN and the Internet), another approach (not included in the "Construct" menu) foresees:

f) to construct the *Class Dictionary* with the contents of the *Fellow school children's Dictionaries* considered the best ones by the pupils themselves according to a collaborative logic and under the supervision of the teacher.

3.5.2   My Stories and My Drawings

During the testing of *Addizionario*, the request was often made to have the possibility to access the software only in order to either write stories or draw.

My Stories and *My Drawings* are the two working environments of *AddizionarioPLUS* responding to these requirements (being they presented as separate modules).

3.5.2.1   My Stories

With the introduction of *My Stories* as a separate module, *AddizionarioPLUS* offers the pupil not only the chance

of writing a story (as *Addizionario* did), but also the one of constructing a real book of stories (including its cover) following different approaches.

Three approaches for constructing one's book of stories can be chosen directly in the "Construct" menu.

Figure 5: *My Stories* "Construct" menu.

Here it is possible to write three different kinds of stories:

a) classic stories composed only of a text and emphasizing characters and places;

b) stories facilitated by the use of images and words;

c) stories illustrated with captions.

Each kind of story can stimulate and develop different abilities in the pupil.

Moreover, *My Stories* could be one of the most appropriate environments for the organization of group activities, such as writing a story together or compiling simplified texts (for instance, texts where pupils are invited to explain the meaning of difficult words or to substitute them with synonyms that are easier to understand).

The construction and the possible consultation of a story facilitated by the use of images and words can be illustrated with the example reported below ("The Magic Pipe").

Figure 6: "The Magic Pipe" (Constructive Modality).

The teacher can prepare his/her lessons by simplifying an excerpt (extracted from a book or downloaded from the Internet) with definitions, synonyms and pronunciations or sounds, either by himself (as in the case of a remedial teacher) or involving his pupils.

After that the title, the text and the graphic context of the story proposed have been notified to the user (who can be a pupil as well as the teacher), some possibilities are offered to him:

- he can simplify the story by replacing a word with the corresponding image (which can be drawn by himself or selected by him within the "Drawing Gallery");
- he can write the definition of a word;
- he can substitute a word with a synonym;
- he can record the pronunciation or the sound of a word;
- he can insert a word in his dictionary.

Figure 7: "The Magic Pipe" (Consultative Modality).

By selecting the button "Make the word jumping" (which is symbolized by a *Frog* and represents the link between *My Stories* and *My Dictionary*), the user can verify if the word selected is or is not present in his dictionary and, in the negative case, he can insert the word selected in his dictionary.

The work performed by pupils may be also useful for either foreign children or children with cognitive disabilities.

In this connection, it should be underlined that children are always favourably disposed to take part in these kinds of activities, which involve friendship and offer them the possibility of helping their fellow school children.

3.5.2.2   My Drawings

With the introduction of *My Drawings* as a separate module, *AddizionarioPLUS* offers the pupil not only the chance of drawing (as *Addizionario* did), but also the one of constructing a real drawing album by making use of numerous tools.

This environment already existed in *Addizionario*, but has been improved in *AddizionarioPLUS*, where new functions and specials effects have been added.

In particular, some possibilities are offered to the user:

- he can work on an expandable drawing table (against the fixed and too small drawing table available in *Addizionario*);
- he can use an increased quantity of ready-to-use material (against the scarce quantity of ready-to-use material available in *Addizionario*);
- he can use an interesting space for the creation of simple examples of animation (where, for instance, by using only two still pictures, it is

possible to represent graphically the meaning of certain kinds of antonyms, such as "close/open", "switch on/switch off" etc.).

Figure 8: a graphic representation of an antonym.

3.5.3   The Children's Dictionary compiled by children

The fourth working environment of *AddizionarioPLUS* is the *Children's Dictionary compiled by children*.

This dictionary re-proposes to the users of the new version of the software the material previously produced by the pupils who created the "Core Dictionary" of *Addizionario* [4].

What is expected here is that pupils expand and complete it with material of their own production (definitions, examples, drawings, pronunciations and sounds).

This didactic approach can stimulate pupils to read and use what other pupils have created and, at the same time, can help them to overcome the anxiety that can arise in them when they start from a blank page (for instance, by providing them with a list of words to start from in the construction of their dictionary and possible examples that may give them an inspiration).

3.6   The creation of a module for the teacher

Another novelty introduced in *AddizionarioPLUS* is the *Teacher Module*.

Whereas in *Addizionario* the teacher was considered as an external and detached controller of pupils' activities, in the new version of the software he/she is considered as a user in every respect.

The same possibilities offered to the pupil within the *Pupil Module* are provided to the teacher within the *Teacher Module*.

Here the teacher can:

- monitor his pupils' work, control the work performed and stimulate his pupils to reflect on it;
- manage the "Class Dictionary" by publishing the best material;
- start collaborative activities through the *Blackboard*;
- prepare customized learning paths for his pupils by using the facilities supplied by the system;
- manage the security copies of the data collected.

Moreover, the teacher has his own dictionary, which is not visible to pupils except when the teacher resorts to the *Blackboard*.

3.7   The availability of ready-to-use material arranged into learning paths already traced out

In an attempt to accommodate users' requirements arisen during the testing of the previous version of the software, a larger quantity of prepared material (texts, drawings, sounds, "containers of words" and "pictures of words") have been included in *AddizionarioPLUS* (which, among other things, may be useful to spare pupils the so-called "discouragement for a blank page").

As already mentioned, in each working environment it is possible to either carry out free creative activities or follow learning paths suggested by the system (which facilitate and "enrich" the possible activities).

Many of the possible choices – left to the initiative and inventiveness of the teacher in *Addizionario* – are already traced out in the new version of the software, thus facilitating the teacher's task.

The main learning paths proposed include the creation of:

*   glossaries of various disciplines;
*   a sensorial vocabulary;
*   the so-called "Tra-di(c)tionary", a multilingual storage space for the documentation, preservation and oral and written transmission of values, cultural models, usages and customs.

3.8   The availability of "on-line" helps for both pupils and the teacher

Compared with *Addizionario* (where help devices were scarce and very simple), *AddizionarioPLUS* also offers the possibility of guiding pupils' creativeness.

For this purpose, a wide selection of ready-to-use help devices (some dedicated to pupils and others dedicated to the teacher) is contemplated.

Pupils can rely upon the constant help of the already mentioned *on/off Parrot*, which is always ready to give them:

*   encouragement (by helping them not to lose hearth and not to lose themselves in the software environments);
*   technical support (by explaining the functions of the various icons to them and giving them information about the possibilities offered by the software).

On the other hand, the teacher can benefit from:

*   technical explanations about the use of the software;
*   suggestions for including the software in daily teaching (individual as well as collaborative) activities – including informative material supporting the management of collaborative activities (concerning, for instance, the setting up and administration of working groups, the management of work-shifts, the subdivision of

tasks and responsibilities etc.) – and indications about the aims that may be achieved by means of these activities;

*   a specific environment – a Web site specially created by the authors of *AddizionarioPLUS* – for interacting with other teachers (discussing with them about the difficulties encountered while testing the software and reading and/or publishing the material produced by pupils, other teachers or himself).

4   Conclusion

The prototype of *AddizionarioPLUS* – the updated and extended version of *Addizionario* – has now reached an advanced stage of development.

The new version of the software has been completely re-designed, bearing in mind the suggestions and ideas arisen during the testing of the previous version of the software in schools both in Italy and abroad.

A particular attention was paid to the requests made by a group of indigenous schools using the P'urhépecha language in the Mexican meseta of Michoacán and intending to construct the first monolingual dictionary of their native language by means of *Addizionario*.

As in the case of *Addizionario*, the work is being carried out in close contact with pupils and teachers.

In particular, the Mexican school children are involved in preparing graphic material and texts, which are destined to enrich the intercultural learning paths provided by the software.

As we look at the future, we hope that, in spite of the present difficulties in raising funds, *AddizionarioPLUS* can succeed in reaching its aims and, in particular, that it can arouse and develop in pupils a greater curiosity and a bigger love for their languages and cultures than those produced by *Addizionario*.

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