Exploring the processing of formatted texts by a kynesthetic approach
Carlo Bellettini, Violetta Lonati, Dario Malchiodi, Mattia Monga, Anna Morpurgo, Mauro Torelli
Dipartimento di Informatica, Università degli Studi di Milano, Milan, Italy
{bellettini, lonati, malchiodi, monga, morpurgo, torelli}@di.unimi.it

The context
A teaching activity about word-processors: 25 pupils in 9th and 10th grades. The learning objective was the understanding of the challenges posed by the automatic processing of formatted text. Pupils were requested to work in small groups to foster confrontation and almost every task was proposed together with an accompanying meta-cognitive reflection.

Methodology

1. A first approach to text formatting with a word processor.
2. A dramatization of the process through the use of tangible objects.
3. A game designed to force pupils to restructure their mental models and discover the power of symbolic meta-languages.
4. A final use of special software tools for formatting texts, also capable of showing the data structure used to record the meta-information.

The algomotricity “loop”

Algomotricity aims at replacing an abstract symbolic manipulation by physical activities, which should help the pupils in developing their mental representation.

- Computers and software tools should be of secondary importance, but the conceptual link with them should be clear.
- The approach should be mostly allosteric: the direct transmission of knowledge should be kept to a minimum, and pupils should be forced to reconsider their mental models about text formatting by discovering themselves useful techniques.

Activity 1: in the lab
Discover that formatting is not just an aesthetic issue, but it also has an important role in transferring information. Pupils (working in couples) were requested to produce a formatted text. Which type of formatting did you use? Why did you choose it? Did you use more than one formatting for the same piece of text?

Activity 2: in the gym
The proposed task was the reproduction of a formatted text on a big copy of the text put on the floor. Formatting had to be codified by using the objects available in the gym. Every group of pupils (6 persons) was requested to write down the rules they used in the codification and another team had to interpret these rules to get back to the original formatted text.

Activity 3: in the classroom
Teams were again requested to reproduce a formatted text with objects and write down codification rules precise enough to be followed by another team. However, the task was made more challenging by the introduction of a “cost” for the objects. The cost incentive was enough to let the pupils discover what is commonplace in mark-up languages: the use of tags at the beginning and at the end of (possibly overlapping) regions.

Activity 4: Software
An ad-hoc software tool was used to show the formatted text according to several views: mark-ups, WYSIWYG, object tree.

Acknowledgments
We would like to thank Giorgio Fattorelli and the Marie Curie IIS for giving the opportunity to experiment our ideas in their school.

http://aladdin.unimi.it