

Guest Editorial

This Special Issue contains six papers focusing on different aspects of research on the computer in education. This research, which dates back to the 50s, considers both the potential of technology to improve learning and the conditions of use which allow exploitation of this potential. Although the results already obtained have been promising, much has still to be done: the crucial problems have not yet been worked out. Automating a complex process such as learning requires a complete knowledge of the process itself. This implies in-depth study not only of how specific knowledge on a given subject is acquired, but also of how the different strategies allowing use of that knowledge are developed and acquired, in accordance with the educational environment and the students' psychological conditions. This selection of papers (listed below in alphabetical order) is intended to offer a broad cross-section of problems faced and technology used in this field.

Alfio Andronico, Giuseppe Di Palma and Pasquale Lo Schiavo present Gulliver, an educational system aimed at teaching basic concepts of computer science, through a constructive approach. In particular, Gulliver allows users to: design, step by step, the physical structure of a microprocessor; define symbolic program languages based on the architecture implemented; and simulate the functionality of the architecture. The results of two experiments carried out with secondary schools students are discussed.

Paul Brna faces the problem of helping novices to become more proficient programmers. Among the various learning methodologies described in the literature, attention is concentrated on learning to look through a library of cases and retrieve an appropriate example. This approach is examined by using SunTed, a Prolog techniques editor that features an intermediate description language. The results of a study aimed at analysing the problems faced by students in using an intermediate description language are also discussed.

The paper by Peter Brusilosky and Leonid Pesin is framed in the context of adaptive navigation support, an area of research aimed at increasing the functionality of hypermedia systems. The educational advantages of this technology are evaluated by analysing the adaptive navigation support implemented in ISIS-Tutor, and by discussing the results of an experimental study carried out with students of computer science at Moscow State University. ISIS-Tutor is an intelligent learning environment that supports the learning of a print formatting language.

Darina Dicheva and Vanya Dimitrova discuss an approach for supporting the teaching of the English language together with computer science terminology. This idea is embedded in ITELS, an intelligent tutoring system aimed at helping the Bulgarian university. The most interesting feature of the proposed approach is that of separating the language knowledge from subject area knowledge, thus making the system reusable.

The paper by Paola Forcheri, Alfonso Quarati and myself discusses a method to transfer research results on computer-based training to small and medium enterprises. The training is based on the use of multimedia and networked educational tools for continuous training in office automation. The intended users of these tools are employees of small and medium enterprises who face redundancy, especially women. This work is carried out within the Qualification 2000 project, supported by the EU's Adapt initiative.

Herman Maurer discusses the main features of Hyperwave, a WWW system that has been successfully used for educational purposes. These features are promising in that they overcome some technical and pedagogical deficiencies of educational environments based on web technology, and

are the basis for the development of GENTLE, a General Networked Teaching and Learning Environment. Ten guidelines that must be kept in mind when designing or evaluating an integrated teaching and learning environment are discussed in depth.

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Maria Teresa Molfino
Istituto per la Matematica Applicata
Consiglio Nazionale delle Ricerche
Genova
Italy