

Giving learning a personal touch

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A learning system that adapts to the abilities and needs of students opens the way to a more personalised approach in delivering education electronically.

The use of the web as a teaching medium has not had the success that many had hoped it would. Universities around the world have placed much of their teaching online, accessible from their websites. Many open and distance learning institutions are relying heavily on the web as a means of distributing teaching material to students working at home.

Yet somehow reading a computer screen and interacting with software is not the same as studying in a classroom or a laboratory and e-learning has had a mixed reception.

“The problem is that such an approach is technology driven,” says Pierluigi Ritrovato of the Research Centre in Pure and Applied Mathematics (CRMPA) near Salerno, Italy. “The web is a wonderful tool for delivering content so people imagine that this technology is suitable for e-learning. So all the efforts have been going into producing some content and then finding technological solutions for delivering it.”

A second, subtler problem is that the teaching content itself contains assumptions about the kind of person the student is and what kind of teaching approach is appropriate. The student or distance teacher is not able to adapt easily the contents to the needs of the student.

What e-learning software has overlooked until now is that no two students are the same. They have different backgrounds, different learning styles and different approaches to learning. A technological medium that ‘delivers’ the same material in the same way to every student is bound to fail.

Models of learning

European researchers in the EU-funded project

ELeGI (European Learning Grid Infrastructure) decided to take a new approach to e-learning. They designed key network software designed around models of how people learn.

Ritrovato, who is one of the project’s scientific coordinators, cites the example of people who want to learn a programming language.

“I might like to work with experiments while others are more interested in reading and understanding, or doing exercises or perhaps by a ‘learning by doing’ approach,” he says. “The learning model is general enough to take all these aspects into account in a comprehensive way.”

The consortium of universities and research centres involved in the project pursued two research lines. On one hand, researchers focused on formal learning such as in educational institutions. On the other, they researched methods of informal learning through collaboration and conversational approaches.

The learning platform developed by the ELeGI team can automatically be tailored to the different needs of students, and can also adapt rapidly in the way it can access teaching resources through a ‘grid’ of networked computers.

If a teacher decides that the students would benefit by collaborative working, the ELeGI platform can find suitable software, perhaps a wiki, locate a machine to run it on, set it up for the group of students and set them to work in an automatic and transparent way.

The ELeGI software can group students who share similar learning styles. It can also recognise when a student is having difficulty and can offer a ‘mini-course’ of remedial work, generated according to the student’s profile and preferences.

Intelligent web teacher

A number of pilot studies and demonstrators have

shown how the ELeGI platform could work in practice. The studies include a series of 'virtual scientific experiments', mainly in physics. In the studies, students learn from a simulated experiment.

2007.

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The researchers also designed several demonstrations related to collaborative working and designed a system to automate assessments of students' work. As part of the programme, the researchers also launched EnCORe, a net-based encyclopaedia of organic chemistry.

"In terms of outcome we have the model for creating adaptive and personalised learning experience, the ELeGI software infrastructure, that is based on grid technology," says Ritrovato. "It can be considered the first example of a service-oriented infrastructure for learning."

Insights gained through ELeGI, particularly in formal learning, have been incorporated into Intelligent Web Teacher (IWT), a software platform for distance learning that has been developed over many years with support from several other EU-funded projects.

IWT is marketed by MoMA, a spin-off from the Pole of Excellence in Learning and Knowledge, a virtual research organisation based at Salerno University and which includes several ELeGI partners.

The project demonstrated that it is possible to create a highly personalised learning experience in a dynamic way taking into account the user's reaction, preferences and the pedagogical aspects," Ritrovato says

"It is now clear in the community that the existing learning management systems are out of date," he adds. "They have to change their approach to learning and to be much more user-driven instead of content-driven. This is one of the key features that IWT and ELeGI have been developing. The teacher should be a guide, a support for the student in their learning process."

The project, which lasted for 41 months and received funding from the EU's Sixth Framework Programme for research, came to an end in June

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