
WHEN REALITY FILLS FANTASY

AUTHORS

Rob van Helvoort
Hogeschool West-Vlaanderen
Departement Simon Stevin
Rijselstraat 1
8200 Sint-Michiels – Brugge
Belgium

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Reality

The moment one takes a look at the opportunities for work in the professional world of architecture one cannot help but notice one important point: It is no longer the skilled architect who is wanted most; it is the professional draughtsman industry is looking for.

I happen to be privileged to teach at an institute of higher education where young individuals are trained to become this essential part of the design office. At our school, next to almost every other skill you can use in the office, extensive instruction in and by Computer Aided Design (CAD) is a major part of the training. The software package for CAD we use is AutoCAD, a design tool used by a major part of industry worldwide. We teach both 2D- and 3D-drawing, wireframe and solid modeling, as well as some basic programming skills.

After having had students in practical training for some years now, both in Belgium and in other European countries, we have discovered it does not really matter which CAD package is used in the design office they work in. Having an AutoCAD background means that most of the time it is only a matter of hours for one to be able to work with almost every other CAD program. Even better; within weeks quite a number of our students actually became responsible for the CAD-department in the office.

Education

Where does this knowledge take us as an institution of education? For the moment we think we can turn out persons skilled up to the level the professional world asks for. We can confirm this pretentious statement by the fact that up to 80% of our students have jobs even before they graduate. However, in order to be an interesting place for a student to come to, for us, next to a constant update on our CAD courses, it is essential always to be one step ahead of what the professional world is looking for.

At present the topic really wanted by the professional design office is a three dimensional (3D) presentation of a project. But that only is the beginning.

Today, a 3D presentation no longer only is a drawing with hidden lines, but it is a design with 'real life' materials applied to the 3D structure. There is ambient or spotlight in the right place and a professional render to finish. The next step is a 'walk-through' this 3D presentation. At the moment the price of hardware needed for such a walk-through is affordable, even for a smaller organization, thus enabling almost every design office to make animations. The only thing which lacks is skilled personnel. As the number of staff needed well exceeds the amount of students leaving school, the professional world is faced with a huge problem.

ICT

In order to solve part of the problem we have now started to introduce ICT (Information and Communication Technology) as a new technology within the traditional world of education. In this way we hope to increase the level of education by computer in the field of architecture, both for CAD as well as other, most of the time graphical, computer-programs. Next to a rise in quality, ICT also enables us to make our courses available to almost anybody who wants to use them, using the Intranet (local network) of the participating institutes of education as well as the Internet.

Starting point

Before setting up a research project for the use of a new technology in the world of education, we searched, worldwide, for Information and/or Communication software already available; we didn't want to reinvent the wheel. During this virtual trip around the world, we found the USA to be some steps ahead of us, using the computer in a wide range of open- and long distance learning. However, most applications we found were nearly always 'text-oriented' only.

A little closer to home, in Belgium and the Netherlands, ICT is a very popular topic to talk about but, next to some international e-mail projects and Open Universiteit Heerlen, Information and Communication Technology most of the time is limited to a premature status in the minds of some fanatics.

This knowledge, together with specific graphical demands of CAD and the possibility of an extensive use of computer technology available, made us develop a new concept we named MECANO (**M**odules voor **E**ducatie in **C**omputertechnieken voor **A**rchitectuur met behulp van **N**ieuwe **O**nderwijstechnologie -- **M**odules for **E**ducation in **C**omputertechniques for **A**rchitecture using **N**ew educati**O**nal technology).

Inspiration

But where did the inspiration come from? There is an abundance of motivation.

The current system of education at this level stands for large numbers of students one has to deal with at a time. There also is a tendency to a reduction of hours the students actually have to be present at site. As a result, students only have limited access to computer infrastructure.

As there are no specific exams students have to take before they can enter, each student has a different level of education starting at one of our schools. Besides, every student has his or her own speed of learning. It is obvious these conditions make it almost impossible for us to help them with individual problems, check progression...etc.

At the same time, Internet and Intranet are available at our schools, theoretically enabling students to take a course where and whenever they want to. The Net also should enable staff to keep their courses up-to-date in an easy way; only think of the annual upgrade of almost any software package and start to realize how much you are in need of a lenient method to change your course.

The earlier AVOCAAD (Added Value of Computer Aided Architectural Design) research project resulted in educational material which generates a creative use of the computer in architectural education. Thus creating the need to

develop a user-friendly interface to encourage the use of these new components.

Result

As result the MECANO project will create a database, grounded on the most recent web-technology which enables to create web-pages using a dynamic method.

In this way, the student interface no longer uses statically web-pages, identical for everyone consulting, but generates a new page for every user, dependent on their statistics in the database. Using this procedure, there is a personal approach which deals with the different level of education students have as well as the different speed of learning.

Staff will get an interface which enables to build, maintain or update their courses on the Net in the easiest possible way without any specific knowledge of programming languages required. Next to this, staff will also be able to react to any electrical question or remark any student posed. Exercises can be graded automatically; the progress students make is stored in the database and can be consulted at any time.

To test student- and staff interface, a limited number of modules will be developed; two CAD tutorials (AutoCAD and STAR Archi) and a spreadsheet (Excel) for architectural use. Each of these modules will consist of a set of dynamic web-pages which:

- offer the possibility to acquire basic knowledge and skills to the level of a trainee in the design office;
- offer the answer to Frequently Asked Questions (FAQ);
- offer regular exercises according to the knowledge and skills acquired;
- offer integrated exercises which round up specific subjects and check the student's level;
- refer to relevant web-pages and topics for further reading;
- highlight the current subjects in the related MECANO newsgroup.
- Using the latest state of the art technology, VRML (Virtual Reality Modeling Language) animations and 3D models are integrated in the web-pages, making MECANO a project which can be put forward as an example in the world of architectural education.

Technically, the database will be consulted by means of PERL scripts via PostgreSQL (ODBC compatible). In this way the project will be completely independent of any operating system, enabling users to choose the hardware and software they wish.

Fantasy

Use of this new technology in education gives the student a clear responsibility; it no longer is the institution which decides where, when and how the student takes a course. This asks for a strong backbone, are students up to this?

There are circumstances that might help. MECANO integrates new web-based technology, through the Internet already very popular with students, into education. In this way, the world of education will relate more to the world of the student than it has ever done before, thus increasing motivation. Creativity, flexibility and problem-solving will be encouraged, 'life-long learning' automatically becoming a way of life.

As inquiry proved, the final goal for students in the nineties is to graduate. If and when the professional world of architecture asks for specific skills, courses on these subjects are very popular. By means of this new technology, a theoretically unlimited number of students can be admitted to any course, even if not available at their own campus.

But it is no longer 'students only'. The moment the design office is in need of skilled staff and has no suitable applicants, current staff can instantly be given further training by using the new technology. In this way the professional world also fits into the social evolution of 'life-long learning'; the moment that reality fills fantasy.