How the world became smaller

Igor KOSCO

The world of computers became fruitful and independent before the new millennium started. New technologies and methods are giving us new tools and possibilities every day as well as the challenge how to use them. The advantage of architecture and namely of architects teaching at the universities or schools is remarkable: new techniques reflect the education, research and practice - and what is important - by one person. The links between practice and university from the point of view: how the computer technologies and CAAD influences methods of designing, managing and collaboration are very important in both directions. It grows with the number of students who left university with good computer skills on one side and number of architectural and engineering offices using computers on the other. Networks and Internet enables to exchange data but also experiences. Internet itself is not only a tool for surfing and enjoying or the source of information, but preferably like a powerful tool for collaboration, workgroups, virtual studios or long distance education.

This paper describes experiences from research and educational projects between Slovak Technical University, IUG Grenoble, University of Newcastle and others and their influence on architectural education and practice.

Keywords*: long-distance education, research, practice*

CAAD and Studio Design at the Faculty of Architecture, Bratislava

In 1990 the Computer Aided Architectural Design started at the Faculty of Architecture, Slovak Technical University, Bratislava. In comparison with the early beginning when only a few students passed their education in CAAD these days we can say that every student has got at least the basic education in the use of computers and that their interest is far beyond the capacities of the department. Many CAAD based studio works nowadays are at very high quality standard. Best and most experienced students are using computer tools not only for drafting, modelling and rendering but for the highest quality presentation of their ideas and final studio work.

To support such trends as much as possible our department organised competition and exhibition "The Best CAAD Studio Work", where quality, complexity and graphical presentation has been most important.). There were a lot of excellent projects submitted to the competition. The are presented on the following web pages:

http://www.fa.stuba.sk/projects/index.htm or
http://www.fa.stuba.sk/ - folder SUTAZE

Some facts in figures

The highest number of students visiting the department for their compulsory or non-compulsory

lessons was in the school year 1996-97 when in the summer term passed more then 500 students. Nowadays the interest is rather smaller. The main reason is that students has their private computers and software (educational or black versions) at home or at the campus.

The interest is much stronger in higher years - 4th and 5th years where students realise that without good knowledge and experience with CAAD systems they will be not able to find a job very easily. This reflects the fact that 90 percent of Slovak architectural offices are using computers and CAAD systems for their work.

Software used in education

Thanks to the good collaboration with the dealers a wide range of diffferent software packages are available for studetns. They are namely products of AutoDesk (AutoCAD, 3D Studio,etc.) - 58% of students, Bentley systems (Microstation) -23%, Graphisoft (ArchiCAD) - 13%, Nemetschek (Allplan) - 6%. Highest interest for Autodesk products reflects the fact that most of architectural and engineering offices are using their products as well as that students are able to share unlegal copies quite easily. In recent years we have recorded an interest for different ways of presentations, like printed papers and pannels, visualisation, and multimedia or web presentations. Students are quite „hungry" for international competitions or projects as well.

As a positive result from the last years we can take the fact that lecturers and teachers are much more keen to accept. On the other hand it has to be said that the usage of computer techniques negatively influences the quality and concept of the design. This fact is not a new one but is much more readable when nearly all students are trying to use computers as a tool for their diploma work.

Local network, Internet and architectural design

Since the year 1992 the Faculty of Architecture STU is connected to the university network and Internet.

The network supports education and teaching, sharing of data, databases, software and libraries. As usual students are much more familiar with network applications as teachers. However, network connection is used not only for teaching and to common studio work but for the international collaboration and educational and research projects.

The goals:

- Access via the Internet to shared design frameworks, in which changes by one specialist are reflected in the database of another, is a useful model for collaborative working between different disciplines. It could bring efficiency gains, improved information management, and fewer design discrepancies.
- Use of the Internet as a communication tool will increase, as consultants receive more of their data from on-line source, and become familiar with the technology.
- As a reflection to this rapid processus an International collaborative studio work via computer network, Internet and World Wide Web was created . The aim was to get some experiences with network technologies later applicable to the education and practice.

International Collaboration and Design Studios

As the initiative of the teachers from four different universities - Faculty of Design and Technology, University of Luton, United Kingdom, Technische Universität, Graz, Austria, Technische Universität, Wien, Austria and Faculty of Architecture, STU Bratislava, Slovakia several international design studios were created from 1995 till 1998. These projects has been presented several times at ECAADE Conferences, other conferences papers or on the WWW pages of participating universities

Projects were successful in achieving completed design proposals at each participating institution. The

fact that the students did not all have easy, open access to the relevant electronic communication media, and that much of the information exchange was carried out through the teaching staff, prevented the project from functioning precisely in the way that was originally foreseen. The forum for continuous debate between the students, which it was intended to create, did not really developed.

Evaluation

In educational terms the project was beneficial in developing the awareness of the students on issues connected with collaborative working, differing architectural cultures and the potential of electronic communication in design. All the participants, particularly the teaching staff, learnt a great deal about the possibilities and difficulties of using the Internet as a collaborative working tool.

Unfortunately, the mechanics of achieving the data transfer tended to take up time which could have been better spent exploring more fully the architectural, educational and cultural aspects of the project. This is a weakness that will have to be amended in future collaborative projects. The greatest gain to the students was in raising their knowledge of the ways in which CAAD and electronic communication technologies could be integrated to form a powerful tool, which could have great benefits in terms of education and international architectural practice.

Interactive multimedia archive and presentation systems

This systems or virtual publication presents the basic information and characteristics of works, building, movement and the dates of construction. To each building are related text and visual information such as photographs, drawings, sketches, schemes or historical documents form archives together with all important links and bibliography. The system contents the authors register which introduce most important architects and authors of this period with a short characteristics of their work and biography.

At 1994 ECAADE Conference "The Virtual Studio" presented a proposal for a collaborative venture in compilation of an Interactive Multi-Media Archive of Great European Architecture (P.Mirabelli, A.Fortuzzi, J.Petric, T.Maver) - IMAGE A:, later IMAGE ABC: (Architecture, Buildings and Cities). This idea was adopted by a number of participants of the conference - representatives of the universities and institutes all over the Europe. Such complex Internet presentation of historical and contemporary architecture does not exist and probably will not exist without the power of universities and without the enthusiasm of the staff and students.

However this project has never started.

A Slovak project called "Slovak Modern Architecture - 20th Century", interactive multimedia archive and presentation system (Authors: Matus DULLA, Igor KOSCO) was presented at 1998 conferences and is reachable at the address *http://www.fa.stuba.sk/projects/index.html*. This project was prepared in collaboration of several institutions: private architectural and design office AUP MEDIA, Bratislava and two educational and research institutes: Faculty of Architecture, Slovak Technical University and Department of Architecture, Institute of Construction and Architecture, Slovak Academy of Science, Bratislava, and was contributed by a PRO SLOVAKIA State Cultural Fund.

The new initiative started this year. It is an institutional research and educational project SLOVAK ARCHITECTURE AND HISTORICAL MONUMENTS (Slovenska architektura a pamiatky). The target is to collaborate with students under supervising of lecturers of Slovak historical treasures and to prepare more or less complex system based of the official state list of monuments. The pilot phase started this year and we have got a several students works as a WWW pages, similar as those presented above.

Evaluation

It is a lot of work to prepare such presentation archives more complex, for example there is 12 500 records on the list of Slovak architectural monuments. The

positive results from these initiatives are:

- Virtual publication which could be permanently used by students, professionals or anybody interested in any location in the world
- Use of the Internet as a tool for students , to receive more of their data from on-line source, and to become familiar with the technology as well as to prepare data for such sources
- A new teaching method with a new presentation of student's work is being developing. Such methods are off course not new but they are first time used in regular teaching here.

Internet and architectural design

The world becomes smaller even via using internet for submitting and presenting of the student's studio design work or architectural designs of offices. There are some advantages that will serve us like the lessons from the past for our future development:

- Collaboration via Internet is very comfortable, unexpensive and powerfull.
- As a reflection to this rapid processus a lot of student's or professional's competitions is using internet to share information as well as to submitt final designs. We have got very good experiences with a group of our students participated at the ACADIA 1998 Competition (*http://www.fa.stuba.sk/~acadia/)*
- Some students are able to consult their work and present it permanently on the web during their studio desig work. This means that they will get much more consultants from the university or from practice (even from abroad...). This is a new teaching approach in a slovak architectural education and these methods are currently used with students who are passing some time at the foreign istitutions or vice versa.
- Finally they are able to present the result of

their work on Internet and World Wide Web. This means they will get experiences with network technologies later applicable to the practice.

International research projects and Internet

Other research activities include international projects based on EU schemes like TEMPUS. These projects were orientated to planning and had gained together different experts and teachers from different countries. There was a great interest to use electronic media for the communication and data exchange. Electronic mail, FTP and Internet became a standard tools for the project although the exchange of staff (teachers) and students were more preferred by participants. The network technology was used namely for email purposes - even some participants tried to persuade others to use Internet like most suitable communication media, the result in use had been very weak. This has been caused namely by the limited experiences of teachers and students participating in project.

Project TEMPUS SPECTRA: Introduction

In 1998, the Slovak Technical University, based in Bratislava, Slovakia, signed a (2) year contract the European Commission to establish the "Central European Training Centre in Spatial Planning" (SPECTRA) in Bratislava. Under an internal statute, the responsibility for fulfilling this contract was delegated by the University to its Faculty of Architecture (FA STU). This document outlines the measures now being taken by FA STU to give effect to this agreement.

The prime purpose of SPECTRA is to satisfy the needs of academics and practising professionals for continuing education in the fields of urbanism and landscape planning. To this end an initial post graduate studies programme will concentrate on "Current

Trends in Landscape Planning within the Context of European Integration". This will provide information on current legislation, theory and practise within the field of land-use planning as a part of the creation of complex environmental protection programmes established, or being established, in the Slovak Republic and EU countries.

Participants will obtain practical experience in grasping modern means and methods of managing landscape development at different levels of public administration and self-administration, as well as in planning practice. The program is planned for 8 different modules. These will include skills necessary for international and remote communication via computers (see Module 2).

Partner organisations:

Among the partner organisations are leading European institutions for urbanism and landscape planning. These represent different, presently converging, planning systems and play an important role in the process of integrating European landscape planning. They have a long tradition within practical planning activities, science and education within the field of spatial planning. These partner institutions are:

- University of Newcastle, Newcastle upon Tyne, England – a partner for the SPECTRA project
- Université Pierre Mendés France, Grenoble, France – a partner for the SPECTRA project
- Akademie fuer Raumforschung und Landesplanung, Hannover, Germany - a partner for the SPECTRA project
- TU Wien, Fakultät fuer Raumplanung und Architektur, Vienna, Austria – an associated partner

Modern technology & computer aided systems for land-use/spatial planning: Module 2

This section describes a typical module, the coordinators for which are J. Furdík, M.Arch. PhD.,

FA STU Bratislava and Prof.J.Tucny , IUG Grenoble. The main objectives are to acquaint participants with new aiding systems for land-uses/spatial planning. Stress will be focused on :

- The usage of GIS - Geographical Information Systems for land-uses/spatial planning
- Computer graphics and available CAD systems
- Multi media
- Remote communication and collaboration including videoconferencing

Content: 40 hours of direct teaching (combined during the session with module 1)

1. Computer graphics and basic program outfit
1.1 Improvement in computer literacy, Windows 98, NT and MS Office
1.2 Information on available systems CAD

2. Communication and information systems
2.1 Basic information on available GIS systems and basics of practical use of one of these
2.2 Practical experience and display of equipment of information systems for local places

3. Communication and multi media methods and systems (1x1 day x 4 hours)
3.1. Multi media presentation systems
3.2. Remote communication, collaboration and data sharing via network and Internet
3.4. VideoConferencing (CU-SeeMe, QuicTime, WebCam)

Thanks to the participants from Grenoble and Newcastle a video conferencing were used for long distance communication in previous projects. Unfortunately it has not been possible to connect Bratislava really on-line as there are no ISDN lines available yet. The transfer of data via Internet works and is used but it is too slow. However this technology has been presented and proposed to use in the near

future (fall of 1999).

It is important now to create a virtual region in Europe to work on common problems in planning via electronic visual media like video conferencing, electronic white boards, etc. and to find proper methods and tools for such work.

Students exchanges: TEMPRA

Based on the Tempus - REGAMTER and on the collaboration between Bratislava and Grenoble is running current project TEMPRA. The main target of the project is not computer aided design or the use of the network or Internet as it was in some of the previous project. As a surprise this group of students under the supervising of lecturers from Bratislava and Grenoble started to use all electronic media as a tool for their work, from CAAD software, text processors to local network, WWW libraries and archives , email and Internet .

As the result the working Web pages has been created as a source of the presentation of the partial work in Bratislava for their teachers an colleagues in Grenoble. Web pages are used for the consulting and contribution of their lecturers. WebCam and videoconferencing is the next powerful tool for communication as well. So - we are all finally around the table on the net and the world is smaller...

Conclusion

- Our own experiences, with CAD based design projects linking students or professionals at different centres via Internet, have shown us that this form of collaborative work can be effective and rewarding. The available electronic communication currently limit the type of interaction which can take place, particularly in the area of synchronous working.
- The economic and management advantages offered by electronic networks, which enable the most efficient and able specialist to work together on common design database without

any geographical limitations, will be irrestible to the commercial sector. Network will also be extended to the construction site.
- Building, architectural, urban or landscape design are always an multi-disciplinary processes, and the more frequent and flexible interaction between specialists offered by new technologies should result in improved design quality. Great advances in collaborative design working will come through the integration of human knowledge and creativity, modern tools and technologies, electronic networking and long distance communication.

Access via electronic networks to shared design frameworks in which changes by one specialist are reflected in the design database of another, enables more effective collaboration between construction professionals. Use of the Internet as a communication tool will increase as professionals receive more of their technical data and information from on-line sources, and become more familiar with this type of technology. Electronic communication technologies offer the possibility of more frequent and direct interaction between design team members, and savings in time and travel. Practices with an international portfolio of works can use new technologies to maintain closer contact with their local advisors, and design and procurement teams can be selected on the basis of their suitability for projects, with the economics of geography being relatively unimportant. New technologies are being currently tested at the universities, academic and research institutions but they are immediately implemented into the practice.

> *"The key change is that those who understand this, build on the particular opportunity to contact and relate with any community of interest and to develop dialogue in a deeper, closer manner. So, we can see a strange phenomenon that the **remoteness** can actually bring a **closeness** of a new kind, as*

communities explore common interests. The impact of remote technology is already bringing not only a freedom of place to architectural designers, (who may now work at home, on the train, in the office, or in remote facilitation centres), but also a freedom of actors in the designing stage. A new dynamism is seen in ability and preparedness to embrace other actors' ideas [including those of the community of end users], more freely into the design debate." (Kokosalakis,1998)

Advances in collaborative working are coming through the integration of virtual reality techniques and electronic networking. This is one of the lessons from past which helps us in our current developments. The technology is available, now it is our turn to find a proper use and new method and approaches how to use them efficiently for innovating in education, research and architectural practice.

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Igor KOSCO
Faculty of Architecture
Slovak Technical University
Bratislava
Slovak Republic
kosco@fastu.fa.stuba.sk