

Architecture of the virtual in housing

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Abstract: Information and communication technologies (ICT) have brought about a revolution in architecture and urban planning; they are transforming learning and practice and presenting new challenges in our understanding of space, place and society. An entirely new world of architectural expression and experiment is opening up to us.

At Faculty of Architecture in Zagreb a new optional course, Virtuality in Housing Architecture, has been proposed and is being taught for the first time. Subjects cover a wide area of use of ICT in housing architecture: research into the role of the computer in architecture as a creative discipline; encouragement of new challenges to the concept of the role of digital media in housing architecture through research of digital concepts such as computerization, information, electronic media, virtuality and cyberspace; themes related to development of intelligent environment and spaces, interactive buildings, virtual reality and cyberspace as directions of development. In our work we try to implement the method of e-learning, teamwork, communication and design through the Internet.

Through experimental projects and research of new housing concepts, students create a basis for discussions on theoretical and practical solutions for the housing of the future, create new ways of presentation and open new fields of research. We shall here present the experience from our work.

Keywords. ICT, housing, virtuality, teamwork, e-learning

Preliminary remarks

Design in architecture is essentially an act of innovation, a constant effort to integrate practical, metaphorical and symbolic characteristics in designing, while using modern technical achievements. Information and communication technologies (ICT) have brought about a revolution in architecture and urban planning; they are transforming learning and practice and presenting new challenges in our understanding of space, place and society. An entirely new world of architectural expression and experiment is opening up to us. Information and Communication Technologies cover a growing number of activities of the archi-

tect and engineer and make possible the implementation of ever larger and more complex tasks (research, design, building, maintenance).

Possibilities of using ICT in an art such as architecture represent a big challenge, especially in architectural education. We can ascertain that the knowledge and education we have achieved so far are insufficient to provide answers to a plethora of questions for the future, which are multiplying by the day. To prepare students for professional work, it is essential to have knowledge of possibilities of ICT. That knowledge has to be integrated into subjects of architectural design and develop methods of designing in the environment of the new media. Knowing the tools

and programs is essential, but they have to be adapted to creative work.

The role of the Internet and WWW as media of information and presentation in architectural education is growing, therefore it is necessary to accept the method of e-learning. Besides, it is necessary to show students the concept and possibilities of work in a digital surrounding, using the potential of contemporary CAD programs, the Internet as a computer network and CSCW (Computer Supported Collaborative Work) techniques through work in a virtual bureau. Because of all this, it is clearly necessary to continue developing education about the application of ICT in architecture.

Virtuality in housing architecture – new optional course

“The computer’s potential and the use of new media are an ideal combination for creativity and communication” (Schmitt).

A new optional course, Virtuality in Housing Architecture, has been proposed and is being taught for the first time. It has been introduced on the basis of our experience of work with students on courses Architectural Design III (introduction to housing architecture), Architectural Design IV (family house) and Architectural Design V (block of flats), work in Motovun International summer school of architecture, as well as practical work and work on the dissertation.

Subjects cover a wide area of use of ICT in housing architecture. The main subject of the course is research into the role of the computer in architecture as a creative discipline and the ways in which digital and immersive technologies affect the methods used by architects to conceptualize and present real and virtual spaces, with an emphasis on the role of the computer as a tool and medium of visualization accompanying the creative process. It also covers review and encouragement of new challenges to the concept of the role of digital media in housing architecture

through research of digital concepts such as computerization, information, electronic media, virtuality and cyberspace.

Buildings are changing – through active systems of control, the use of smart materials and omnipresent computerization. Students must be prepared for the future and enabled for designing “physical, virtual and hybrid spaces” (Schmitt). Special emphasis is placed on themes related to the development of intelligent environment and spaces, interactive buildings, virtual reality and cyberspace as directions of development. Virtual community increases networking and leads to a concept of participational design. New technology of virtual reality is an area of new possibilities, which will enrich interaction between man and computer in the future.

Furthermore, new possibilities of work in a networked environment affect the designing Process. Teamwork, communication and design through the Internet, the ability to design physical and virtual aspects of our environment are necessary for the future of architectural profession. In this way we encourage discussions and help define architecture of the digital era.

Teaching

Practice is the basis of our work; it directly affects our new knowledge. Through courses of Architectural design we impart on our students accepted and assessed knowledge, we provide them with theoretical framework of architectural design in the environment of new media and develop new methods of architectural design supported by ICT. Optional courses at the Zagreb Faculty of Architecture are organized through a one-hour lecture per week. Through this course, along with theoretical lectures, we have introduced for the first time practical work organized as experimental teamwork in a virtual environment. The theme of the practical work is research

of modern housing. concepts. We are researching new concepts of housing in which flexibility, ecology (sustainable development) and virtuality are of crucial importance. The concepts of “intelligent” environment , “a smart dwelling of the future”, which contain all achievements of contemporary IT, new intelligent materials, there emerge “intelligent” dynamic membranes, LED and LCD screens instead of walls, VR systems become an integral part of both professional and private life... Living in parallel worlds—virtual and real worlds must reflect on the concept of contemporary housing. The theoretical segment is expanded with the making of Web pages of the course, which contain course material and useful links, while students are enabled to present their work in phases, in accordance with the set deadlines. The work is public and accessible to everyone. The Web page is organized to support collaborative work inside the course, expanding electronic information and increasing communication. The technology enables the designing process to be more information-intensive. In their work, students use available ICT, develop possibilities of using digital media in visual expressions and analyses of ideas, in research and presentation of projects and concepts; they research and apply the possibilities of electronic communication and electronic information gathering. Through experimental projects and research of new housing concepts, they create a basis for discussions on theoretical and practical solutions for the housing of the future, create new ways of presentation and open new fields of research.

Systematization of experience

Work organized through a virtual medium increases communication and interaction on the student-teacher level and reflects on the final product of the work. Through introduction of a new level of communication, which is written

word, the wealth of information increases, which leads to the deepening of knowledge. We are creating new value of communication, which stems from the comparison of written and spoken word. Personal contact is enhanced through communication on the Internet in combination with SMS mobile phone messages. Unconventional method of communication through e-mail successfully bridges the traditional “communication gap” between teachers and students. The use of mobile phones has further shortened reaction time.

Students broaden their knowledge of architectural design and house building, raise the level of knowledge about possibilities and potential of the use of ICT and enrich the communication level. They develop their own model of presentation and their own expression.

Teamwork, an entirely new experience for students, reflects on creativity and contributes towards more efficient work, more complex and better quality solutions. One of the main advantages of e-learning is its ability to focus on both just-in-time learning, i.e. independently of time and place, at the moment there is a need for it, and on-demand instruction, that is, customized to the individual (Van der Biest, 2001, Van Petegem, 2001). Both fit well into design education.

It was those very possibilities, just-in-time and on-demand work, that showed appropriate in the designing process to make possible individual student's access to essential information and knowledge at an appropriate moment. Learning is concentrated, information is available, physical location is no longer a restriction in acquiring knowledge.

Continuous monitoring of students' work in a digital environment results in the storing of knowledge and creating a digital database of knowledge for future generations, which presents the final design but also stores the genesis of a pro-

ject's evolution. That database becomes a basis for developing new methods of architectural design in the environment of new media and education. Supervisors and students alike have created a base of useful links. All students can use the new base of links and monitor their colleagues' work on the Internet.

Conclusion – improvement possibilities

Virtual architecture offers a new way of using computers in architecture. "Virtuality" fights with demands of the radically new in terms of medium in which architecture is created, with new architectural forms, new types of objects and innovative models of collaborative work and practice. It is important to encourage students to use their boundless imagination and sophisticated computer programs to work in innovative conceptual designs, some of which could be very hard to realize in the physical world at the moment. Still, these forward-looking projects are undoubtedly an important influence on the architectural climate.

Considering the importance and depth of the possible influence of ICT on architectural land-

scape of the future, there is a need for permanent discussion and education at the faculty on the subject of virtual architecture. The intention is to increase the practical segment of the work through parallel work in the real and virtual environment. These experiences should serve as an impetus for discussion on the subject of the development of architectural education of "the new digital era".

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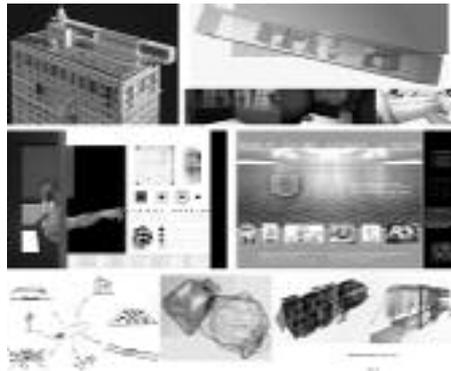


Figure 1. Student works - examples