

HOUSING@21.EU

A web-based pedagogic platform for the study of housing in Europe

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Abstract. *HOUSING@21.EU is a pedagogic research group, formed by five Architecture Schools in Belgium, Germany, Poland, Spain and the United Kingdom, working under the auspices of the Erasmus Intensive Programme. The purpose of the research is to study the emergent forms of housing and living in 21st century Europe. The pedagogic goals are twofold: one has to do with architectural content - proposing adequate forms of dwelling for contemporary European societies; the other with pedagogy - integrating teaching methods and information technologies.*

Keywords. *Computer-supported collaborative learning; web-based learning environments; digital repositories; constructivism; housing.*

Housing in twenty-first century Europe

European societies are undergoing transformations which call for a revision of the established housing models. There is a need for flexible, industrially produced dwellings, which respond to social (family restructuring, multi/intercultural societies), economic (part-time jobs, working at home, women at work) and technological (prefabrication, sustainability, ICT) demands. In this context of change, the problem of housing must be, once again, rethought in order to create dwellings that meet the challenges of our time. HOUSING@21.EU provides a learning space for students and faculty to study existing forms of housing, to reflect upon the conditions for contemporary dwelling, and to propose alternative solutions, at a European scale.

In this research, transforming factors have been considered at three different levels: social, economic and technological. Dwelling has been addressed in three dimensions: individual, communal and urban. This three-by-three conceptual structure has enabled students and faculty to approach the complexity of issues involved in the design and construction of housing in contemporary European societies.

The role of computers in education

The significance of the application of computers to education has been the object of much discussion in the last decades. Advocates of technology have placed it at the centre of the debate, at the risk of neglecting other fundamental aspects of education: psychological, pedagogical, cultural and pragmatic (Land and Hannafin, 2000). At the

other extreme of technological determinism are those who simply deny any pedagogic value of computers, using them only to transmit information or simply ignoring them. In between, there are those who bestow computers a capacity to transform education positively, and who are ready to integrate them in their teaching practices, although they are not willing, for that reason, to overlook all of the other factors which are important in education. As Jonassen et al. (2003) have contended: “Technologies will not be the cause of the social change that is required for a renaissance in learning, but they can catalyze that change and support it if it comes”. In our pedagogic work over the last fifteen years integrating computers in architectural education, we have been consistently adopting this in-between position.

We believe that developing a web-based learning environment does not only have to do with applying ICT but, furthermore, with creating pedagogic environments which integrate content, pedagogic methods and technology in an innovative manner (Madrazo, 2003). This was the approach we already adopted in the environment AALTO (<http://caad.arch.ethz.ch/aalto>), a study of some of the Finnish architect’s works carried out in 1997 within the postgraduate programme at the Chair for Architecture and CAAD, at the ETH Zürich (Madrazo and Weder, 2001). AALTO was structured in three modes: a descriptive mode, providing factual information about a project or building; an analytical mode, containing the interpretations students did of a work; and an associative mode, where students assigned concepts to the projects/buildings, bringing about a network of keywords and relationships that embedded a knowledge generated by the interaction of learners and system.

Web-based platform

HOUSING@21.EU represents one more step in this pedagogic line of work aimed at integrating web-based platforms in architectural education,

this time at a European scale. The web environment of HOUSING@21.EU consists of two distinct platforms: one to collect and study housing precedents (Figure 1), and a second one to elaborate and present design proposals for innovative housing (Figure 2) .

1. CASES OF STUDY PLATFORM (www.housing21eu.net)

This is a web-based repository of housing examples selected and explained by students participating in this Erasmus Intensive Programme. It has been conceived to promote collaboration and exchange of ideas among students and professors from the five participating institutions. In this regard, it is more than a digital repository: it is a web-based learning resource suited to the goals of this pedagogic project.

This web environment is structured in nine modes, accessible through the main menu located at the lower right corner (Figure 3):

[+] INSERT. Interfaces to enter data (cases, images, comments).

[S] SYSTEM. Report of the system’s activity, organized by day/week.

[C] CASES OF STUDY. Graphic and text documentation of a selected case.

[K] KEYWORDS. Critical concepts vocabulary associated to the cases of study.

[G] GROUPING. Interfaces to establish associations between cases of study.

[B] BIBLIOGRAPHY. References and sources (books, articles, URLs).

[F] FORUM. Forums for each case of study and for discussing generic issues regarding housing.

[S] STUDENT. Summary of the work submitted by the students and by the Schools.

[Sr] SEARCH. Search tool which returns instances of a simple query found in cases, keywords, groups, and bibliography.

Data is submitted primarily through the INSERT MODE, and secondarily in the CASE STUDY

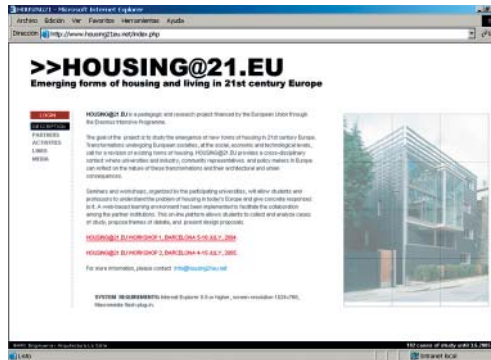


Figure 1. Web site to collect and study housing examples (www.housing21eu.net).

Figure 2. Web site of the Design Workshop (www.housing21eu.net/workshop1).



MODE. Cases are described by means of images and texts. Visual descriptions are organized in plans, sections, elevations, perspectives and photographs. Texts are structured as: description (concise and factual description of a case), levels (the student's reflection of the three transforming factors -social, economical, technological- as they apply to a case), dimensions (the student's reflections of the three dwelling dimensions -individual, communal, urban- as they apply to a case), and keywords (concepts proposed by the student which designate the main characteristics of a case).

In the CASE STUDY MODE, cases can be selected in the left side menu, where they are listed by the name of the project/building, the name of the architect and the year of the work. Alternatively, the listing can be done by the student name and by participating Universities. The central window shows images of the case corresponding to the selected category (plans, sections...), whereas the window underneath displays texts (descriptions, levels, dimensions, bibliography)

On the right side menu the names of students who have contributed to the case study, keywords related to the case, groups where the case has been included, and a forum where participants discuss the case, are shown. By selecting keywords or groups, the icons of the related cases appear on the right side menu. This way, it is possible to

navigate through the case study library in an associative manner, jumping from case to case, following the chain of associated keywords or exploring the cases within a group, without leaving the CASE STUDY MODE.

The CASE STUDY MODE is not only meant to display information, but it also allows users to add new items to a case study (a new image, a new keyword, a new bibliographic entry). This is done using the + sign preceding the corresponding item.

In the KEYWORD MODE (Figure 4), cases can be organized according to the concepts students assign to them. Keywords can refer to typology (block, tower...); morphology (repetition, modularity,...); location (urban, suburban,...); style (historical, modernist,...); construction (concrete, prefabricated,...) or any other criteria. In the description of a keyword, students explain the meaning of a concept in relation to the case study with their own words.

In the GROUPING MODE it is possible to create a group of cases with common attributes, and label it. Compared to KEYWORDS, GROUPING is the opposite way of relating cases and concepts. Whereas with KEYWORDS a set of words designate a case, with GROUPING a set of cases designate a word.

The creation of a group is done in an intuitive manner, by simply dragging the icons representing

cases to the lower hot area (Figure 5). Before doing that, however, the user must select the case's visualization mode on the upper menu according to the established image categories (as plans, as sections, as elevations, as perspectives, and as photographs) This way, if one is interested in finding similarities among floor plans, it would be appropriate to switch to plan-icons rather than having photograph-icons of the cases (the default depiction mode of the case).

FORUM discussions can take place at two different levels: 1. in the CASE STUDY MODE, there is a forum to discuss each case 2. in the FORUM MODE, generic questions regarding housing can be posted and discussed.

In the STUDENT MODE, participants have a log of their contributions as well as the items (images, keywords, forum entries, groups) which other students have added to their cases. Besides, when a student adds an item (an image, a keyword) to the case introduced by another student, this one will be automatically informed of the additions by an email. Similarly, when a student creates a group with cases from other students, each one of the owners of the selected cases is informed. The STUDENT MODE is particularly important to keep track of the interweaving of individual and collaborative learning activities.

A SEARCH tool allows users to make simple queries which return instances found in the cases, keywords, groups and bibliography. The output is displayed as a list which can be used to directly access the retrieved information in the corresponding mode, facilitating the navigation through the system.

Pedagogic Methodology

The structuring of the web-based platform already conveys a certain pedagogic methodology. As Duffy and Jonassen (1992) have contended: "Our designs are not just objective descriptions of the instructional sequence, but rather they are also an implicit expression of our theory of learning".



Figure 3. Case Study mode.

The work's sequence, carried out over a period of five months, begins with the study of selected examples, which students do at their respective Universities under the guidance of a site coordinator, ending with the joint Design Workshop where all participants come together at one of the Schools to elaborate housing design proposals. In the analysis stage, students are requested to select three to five examples of their choice, to study them and to explain them in the web environment. Once the cases have been submitted, the collaborative tasks start: adding items to other's cases, making groups, and discussing cases and topics in the forums. By the end of the case study analysis, if this process is successfully carried out, a learning space is created, as a result of the collaborative work done on the web-based environment.

For this learning space to emerge, first it is necessary for students to have studied the cases they have selected in depth, under the guidance of their tutors. The work performed in a classroom context, which precedes the task of inserting data in the web, is fundamental to ensure a subsequent meaningful learning using a web-based environment. Students' reflections are presented in the system with texts, in their different formats (description, levels, dimensions, keywords, grouping, forums), and through appropriate visual depictions (selecting images that better represent the case). Furthermore, as Van House (2003) has stated: "In-



Figure 4. Keywords mode.

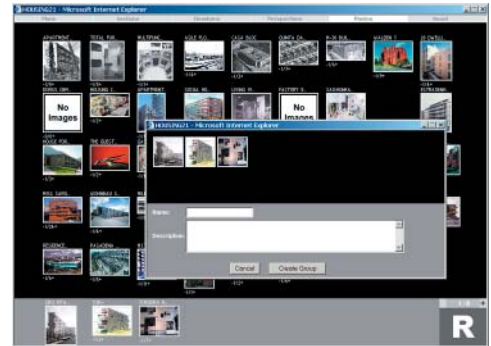


Figure 5. Grouping mode.

formation artifacts, including texts and images, are not simply reflections or carriers of knowledge. They shape and reflect practice and are instrumental in creating and re-creating knowledge as well as coordinating work across space and time". Case descriptions, therefore, embedding the personal knowledge the student has acquired by studying a case, are the knowledge blocks with which learners can subsequently build knowledge, collaboratively interacting in the web system.

Eliciting knowledge from a digital repository is a typical example of constructivist pedagogy. According to constructivism, meaning is not implicit in the structured information. Rather, learners - students and teachers- would assign meaning to it. Retrieving knowledge from the case library is a fundamental activity, since this is what ultimately gives sense to the effort of collecting and organizing information. Furthermore, for learners to carry out this knowledge of construction collaboratively in a web-based environment they must have some "shared understanding" of the tool, the context of the learning and the role of the educator (Puntambekar and Young, 2003).

Adding items to other student's cases, assigning keywords to cases, and grouping cases are the three activities which allow users not only to derive knowledge from the digital repository but to add new knowledge to it. In this context, the educators' role is to act as moderators in the web discus-

sions and also as mediators, helping to bring the knowledge back and forth between the web and the classroom. In order to design efficient digital repositories, it is important to understand how these processes of knowledge construction work, so that they can be effectively supported by the technology (Van House, 2003).

2. DESIGN PLATFORM (www.housing21eu.net/workshop1)

The joint Design Workshop is the concluding work, following the study of cases in the web. In its first edition, in the summer of 2004, the two-week Workshop was dedicated to the design of innovative housing in the city of Barcelona. The City Planning Office put forward three sites for students to make concrete proposals for housing. The design brief called for dwellings for young residents, combining living with other functions (working, elderly care, kindergarten...).

Descriptions of the design tasks (sites, briefs) were published in a website, created especially for the Workshop (www.housing21eu.net/workshop1). This website was also used during the Workshop, to record the ideas that were being discussed in the meetings and to present the design proposals.

To promote dialogue and debate among participants, group discussions were set up in the second week of the Workshop, each one led by

two professors from different institutions. During one hour, each group discussed one of the topics of the three-by-three conceptual structure (social, economic, technological factors; individual, communal, urban dimensions). The results from the discussions were to be summarized both by students and teachers and published in the web log of the Workshop.

To encourage transnational cooperation, designs were done in groups of three students, each one from a different institution. At the end of the Workshop, each group was expected to make a presentation of a design proposal, on the web.

The relationship between analysis and design

Some projects in architectural education using digital repositories have been motivated by the idea of extracting knowledge from precedents to apply it to the creation of new designs. For instance, Archie-2 (Zimring et al., 1995) is a repository of public buildings (libraries, courthouses), created as a case-based design aid for professional architects. According to Kolodner and Gudzial (2000), these repositories would fulfill a double purpose: as supports for reflection, and as cases libraries, where previous experiences would serve as external memory for a reasoner.

In the design of our web platform, as well as in the pedagogic methodology we have embraced, we kept these two activities separate: studying precedents, and making design proposals for innovative housing. In this regard, the work we have done should be distinguished from those using digital repositories as a source of knowledge to be applied to design. We have thought of the repository exclusively as a 'support for reflection' with the goal of helping to find out critical issues collaboratively to, in a separate realm, carry out the design tasks. The link between the two activities, if any, would be undertaken by students and teachers during the design workshop.

For future releases, we are considering including students' design proposals in the repository,

so they could be indexed along with the celebrated examples. This would strengthen the links between the study of cases and the design of new proposals, maintaining the idea that these are two distinct activities.

Technical implementation

The web-based environment we have developed so far is meant to be a prototype, with the purpose of providing a simple, reliable and useful web platform for the five institutions to work together in this project. It has been programmed using basic web technologies: DHTML, MySQL database and CGI scripting. During the second year of the programme, the problems identified in the first year have been amended, and new functionalities have been added (searching tool, discussion forum). Once the usability of the prototype has been tested, our goal is to rebuild the environment from scratch, introducing other techniques like XML which would facilitate the structuring of the knowledge users bring into the system, as a result of interacting with it.

Reflections on the pedagogic experience

This pedagogic programme was carried out for the first time in the period February-July 2004, with the participation of 24 students and 8 professors from 5 institutions from Belgium, Germany, Poland, Spain and the United Kingdom. From a quantitative point of view, the results were sufficient, considering it was a first-time experience: 71 cases of study submitted (at the moment of writing, as the second year of the programme is taking place, the number approaches 200), containing 796 images, 107 keywords, 100 bibliographic entries and over 50 Internet links. As a result of the collaborative tasks, 13 groups of cases were created, 32 contributions were added to the forums and 183 emails were sent by the system. From the programme's

first year experience, we could draw the following conclusions:

- Before engaging in a transnational project, it is necessary for participants (students and teachers) to share a common view of the project, regarding the subject of study, the pedagogic methodology and the role of ICT technologies. Also, it is necessary for each institution to create the necessary conditions, which allow students (granting credits for the participation in the programme) and professors (exempting them from other tasks so that they can allocate time to guide students' work, on the web and outside the web) to take part in the project. Coordination of timetables among institutions is fundamental for the project's success.

- Differing levels of proficiency in English, particular cultural backgrounds and the sometimes startlingly different views on architecture lead to some difficulties in communication and collaboration, in the study of cases on the web as in the joint Design Workshop. These difficulties are even more noticeable using a web-based learning environment to support collaboration, since written word becomes the main vehicle of communication.

- In order to explain a case using the rather restrictive presentation format provided by the web system, students must carefully choose the visual and textual information that better explains a case. An icon, for example, should be the most representative image of the case, helping to recognize it quickly on the screen. Plans, sections and elevations should be chosen to allow other students' understanding of the spatial qualities of the project or building. Texts must be clear and concise, using the students' own words, and explicitly acknowledging other sources when they have not written the text. In general, before entering data into the system, users should first think that other participants should understand what they are submitting. Exposing a case study in the system is not about self-expression, but mainly about communication.

- Cases of study adequately described and explained, both visually and textually, and an

awareness of the critical issues regarding housing in contemporary Europe, are the prerequisites for students to engage in a meaningful exchange with other participants during the collaborative work; particularly in the forums. Professors' active participation in forums is particularly important to prompt the necessary group dynamics.

- Unlike some on-line communities which emerge more or less spontaneously in Internet (wikies, blogs, photologs), in this kind of 'academic' web-based environments students need to be motivated to participate; particularly in the earlier stages of the web environments' development. To engage students, it is necessary to create an enticing learning situation, to make the pedagogic goals clear to them, and to guide them through the whole learning process. While doing so, educators should avoid placing methodological issues in the centre of the learning experience, at the expense of content.

- The ultimate goal of a web-based learning environment is to give rise to a social space, by helping to bring together people with a shared interest in a topic, by creating personal ties among them, and by enabling them to construct knowledge in collaboration. After this first time experience, we cannot provide evidence yet that we succeeded in producing such social space. This will remain a challenge for the second and third year of the programme.

- We have used the potential of ICT to blur boundaries between disciplines (design, history, computation), between learners (both students and professors collaborating in processes of knowledge construction), between institutions (superseding academic structures) and between cultures (engaging learners from different countries in a common project). However, simply using technology will not bring about the disappearance of boundaries the existence of which is based on methodological, academic, social, and cultural grounds. A genuine breakthrough in education can only occur after a restructuring of all of these

realms has occurred as a result of their intermingling with technology.

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