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# OIKODOMOS

**a virtual campus to promote the study of dwelling in contemporary Europe**

WORKPACKAGE **PR EP 1**

**Assessment of the Existing Web-Based Platform**
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| | Life-long learning program : Erasmus Virtual Campuses |
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| | OIKODOMOS |
| **workpackage** **PR EP 1** | **Assessment of the Existing Web-Based Platform** |
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This report reviews and evaluates the HOUSING@21.EU platforms and learning model in order to make technical recommendations for the design and implementation of new platforms/environments which will be used within OIKODOMOS. After a summary of results, the report is organized into three sections which bring together a technical usability study (section 2), a study of the platforms accessibility against WC3 guidelines (section 3), and a study of the technical elements of the platforms ability to support learning (section 4). The third study overlaps with the results of the sister report on Assessment of the Learning Methodology (PR EP2).

A different report collects these results and transforms it in specifications for the new OIKODOMOS platform.
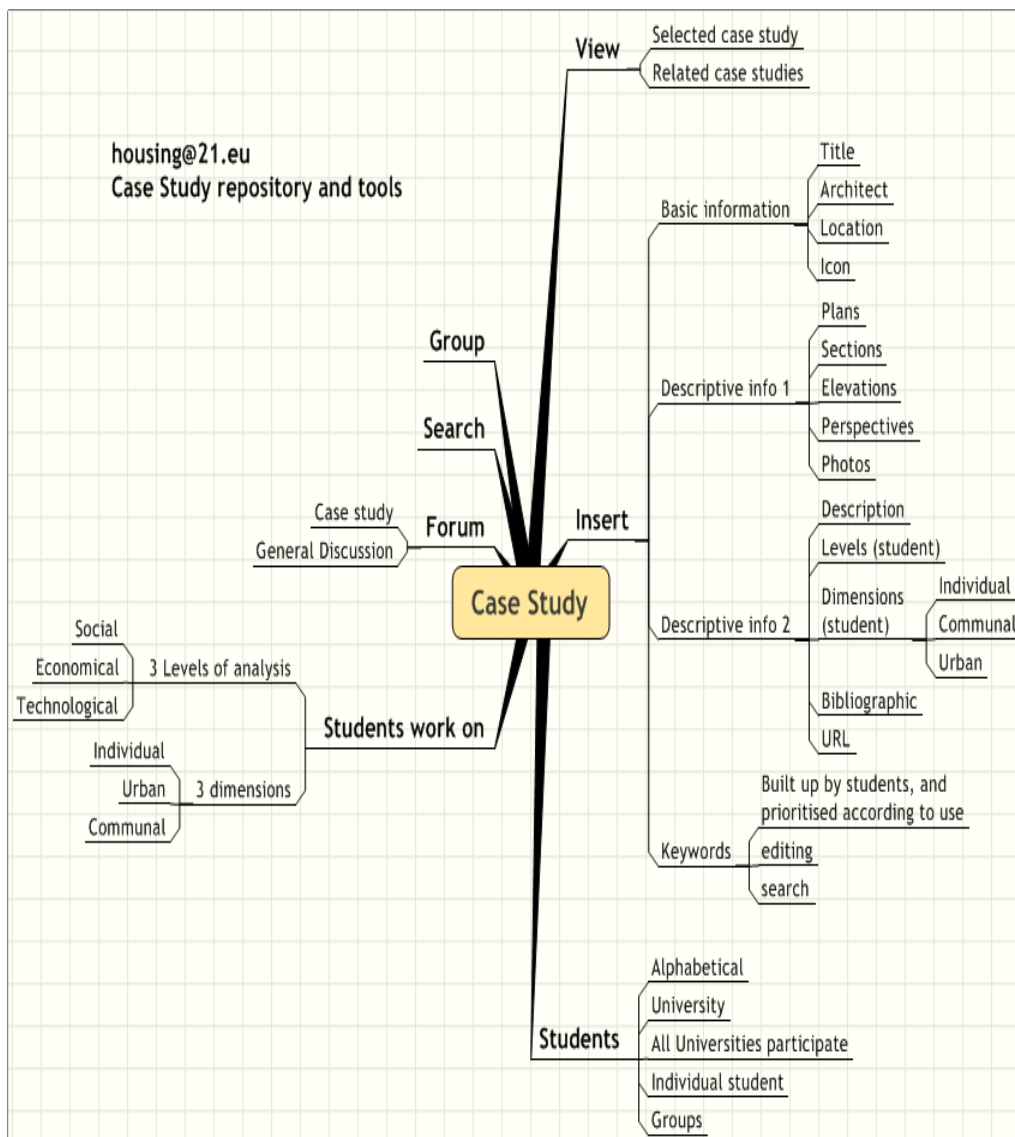
# Introduction

The virtual learning space HOUSING@21.EU was developed and implemented between 2003 to 2006 by partners keen to collaborate in teaching and learning on a pan-European approach to contemporary housing design. HOUSING@21.EU "aimed at integrating web-based platforms in architectural education (on) a European scale" (Madrazo and Massey, 2005). It used an online repository to facilitate the collection, study and discussion of housing case studies in partner institutions (see MindMap below) and a separate web-based environment to support the creation and presentation of innovative housing design proposals during an annual face to face workshop.

The OIKODOMOS consortium is taking this work forward with the aim of developing a structured virtual campus to support innovative pedagogic approaches that integrate on-line activities with the curricula at each partner institution.

A summary of the results is presented in section 1, while the process and methods of analysis are described in sections 2 and 3 along with relevant results.



**MindMap showing the main elements of the Case Study database and tools of HOUSING@21.EU**

# 1) Summary of the results

## 1.1) Technical usability study results

A number of usability issues were identified within the HOUSING@21.EU application, detailed in section 2. These recommendations are based on maintaining the functional design of the underlying structure and tools, but enhancing usability and integration. This requires a redesign of the case study repository and better integration of data manipulation and communication tools, in order to:

- eliminate the major usability problems, as defined from the Technical usability study.

- allow access and use of a range of *Web 2.0* resources (such as tags and folksonomies, ratings, social classification, etc.), and make use of the extra functionality within its own structure.

- enhance the menu structure to ease of use and conform with accessibility guidelines.

- provide better integration of discussion facilities with working windows.

- blend the Case Study and Design Workshop working environments to allow transparent and integrated access to a working/development and main repositories.

- create facilities for different levels of user / access rights to the environment

## 1.2) General Usability recommendations

- include keyword categories set(s) for classification of resources, but provide process for suggestion and selection of additional keywords

- provide facilities for multi-language user interface

## 1.3) Platform Accessibility results

This study tested the platforms accessibility compliance with W3C standards. In summary, most of the scores under the main categories and associated sub-headings were non-compliant. This reflects the prototype nature of the environment which was designed to test proof of concept application of the underlying methodology to learning and teaching processes.

These results lead to recommendations for the design of the new environment. A summary of the main recommendation is given below, more detailed comments being available in the report in section 5.

- Options to change size of text

- Text/background color combinations

- Screen reader
    - Organization of the screen layout
    - ALT text for images and links

# 2) Technical Usability study

## 2.1) Introduction

The main goal of the usability evaluation was to identify most of the problems, obstacles and breakdowns for the user when interacting with a web application, "the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in particular environments" (ISO 9241-11). For e-learning environments and applications, usability is a necessary (although not sufficient) condition for effective online learning. Easily locating and accessing required content, orienting oneself in the maze of different paths and nested pages of a structured website, avoiding being overloaded by the information clustered in a page, and being able to use effectively the navigation architecture are just some examples of important conditions for a learner to accomplish his/her learning tasks. In other words, usability is the property of a mediated learning environment of supporting the users as transparently as possible in the accomplishment of their learning goals.

Hypermedia content is acknowledged as providing access to vast information resources which is frequently poorly structured (Acosta et al. 2003). If we assume that the organization and the usability of the information is partly responsible for better learning (Najjar, 1996), then a usable e-learning website is not just a resource with a nice "look&feel", but a web application which communicates contents and structures the interaction in such a way that facilitates the learning experience. However, it is clear that usability evaluation is just one aspect of the quality assessment of a e-learning environment. A highly usable online course does not guarantee high quality learning outcomes. Nevertheless, shaping usability represents an important condition for success of e-learning projects.

## 2.2) Method

The usability study was developed following the MiLE methodology (Triacca et al., 2004), in its e-learning adapted version (Inversini, Botturi & Triacca, 2006). This method has been already extensively and successfully used in a variety of web application domains (e.g. educational institutions, cultural-heritage, public education, and e-government) (Matera et al., 2002; Bolchini et. al., 2003; Triacca et.al., 2003), and that has been used and tailored for e-learning web applications. The goal of the contribution is to provide course developers and instructional designers with a structured "kit" of guidelines and practical suggestions for a cost-effective usability evaluation of their online application.

The NewMinE Lab in Lugano, namely Luca Botturi and Marco Faré, developed the usability framework, consisting of user profiles, usability variables and scenarios with tasks. The usability framework developed in December 2007 is presented in Appendix 1 and includes a form for collecting usability results, presented in Appendix 2. These documents were distributed to partners, along with an example of completed form.

## 2.3) Data Collection

The framework presented 5 student scenarios, defined from the actual activities carried out by partners in the previous project. Students were asked to go through the tasks included in each scenario and to evaluate the usability variables.

Responses were collected from:

- Lugano: 6 students
- Bratislava: 6 students
- Barcelona: 5 students
- TOTAL: 17 students

In Lugano, researchers had students working on their own, following a "think aloud" protocol, and were taking notes, asking questions and annotating assessments. In Bratislava and Barcelona, students were first trained and then asked to fill in the form by themselves.

Unfortunately, no teachers took part in the evaluation. However , this is of relative importance, as the difference in terms of scenarios and tasks was minimal (1 scenario with 4 tasks).

It is important to notice that users were not trained to use the system, so the study measures the "first impact" of an interface which should be designed for "self learning".

The full results of the usability study are presented in the following table. Please notice that time is expressed in minutes, success is binary (completed/failed), while all parameters are assessed on a scale 0-4. Cells marked in color contain critical values.

| | TIME | COMPLETES TASK? | SATISFACTION | CONTENT | ORIENTATION | NAVIGATION | PREDICTABILITY | LAYOUT | GRAPHICS |
|---|---|---|---|---|---|---|---|---|---|
| **SCENARIO STUDENT 01 – You have been assigned a design task. Search a Case Study from Germany for inspiration** | | | | | | | | | |
| Task 01: Log in | 0.6 | 1.0 | 3.3 | 3.4 | 3.8 | 3.8 | 3.6 | 2.9 | 3.4 |
| Task 02: Find an interesting case study for houses that use wood | 3.9 | 0.8 | 2.4 | 2.8 | 2.7 | 2.3 | 2.3 | 2.6 | 2.9 |
| Task 03: Find a case study from Germany | 1.7 | 1.0 | 2.8 | 3.3 | 2.8 | 2.5 | 2.5 | 2.6 | 3.0 |
| Task 04: Find a case study by Mies van Der Rohe | 3.2 | 0.6 | 1.6 | 2.6 | 2.5 | 2.2 | 2.2 | 2.2 | 2.3 |
| Operation with a case study | | | | | | | | | |
| Task 05: View pictures and plans and identify good ones | 1.2 | 1.0 | 2.9 | 3.1 | 3.3 | 3.4 | 3.4 | 2.9 | 3.1 |
| Task 06: Read testual contents | 1.8 | 0.9 | 2.5 | 3.0 | 2.9 | 2.9 | 2.7 | 2.6 | 3.1 |
| Task 07: Add a new picture | 3.4 | 0.8 | 2.5 | 3.1 | 2.8 | 2.8 | 2.5 | 2.4 | 3.1 |
| Task 08: Add a new reference | 1.6 | 0.9 | 3.1 | 3.2 | 3.0 | 3.1 | 3.1 | 2.6 | 3.1 |
| Task 09: Add a comment about that Case Study for the author | 2.3 | 0.6 | 1.6 | 2.1 | 1.9 | 2.3 | 2.0 | 2.2 | 2.6 |
| Task 10: Edit the description and add some details | 0.7 | 0.4 | 2.3 | 3.2 | 2.2 | 2.2 | 2.6 | 2.2 | 3.2 |
| Connections | | | | | | | | | |
| Task 10: Identifiy the group and (if exists) find other Case Studies of the same group | 2.1 | 0.7 | 2.2 | 2.6 | 2.5 | 2.4 | 2.2 | 2.5 | 2.9 |
| Task 11: Identify the student who created that Case Study and find other Case Studies by the same student | 2.5 | 0.7 | 2.1 | 2.2 | 2.6 | 2.4 | 2.4 | 2.1 | 2.8 |
| Task 12: Do the same with university, year, architect, and a reference | 2.5 | 0.8 | 2.6 | 2.8 | 2.1 | 2.9 | 2.5 | 2.8 | 2.9 |
| **SCENARIO STUDENT 02 - You worked in the atelier and want to add a new case study to the repository** | | | | | | | | | |
| Task 01: Create a new Case Study | 2.8 | 0.9 | 3.1 | 3.0 | 3.0 | 2.9 | 3.0 | 2.9 | 2.8 |
| Task 02: Add 2 pictures | 2.3 | 1.0 | 3.1 | 3.4 | 3.0 | 3.2 | 3.4 | 2.9 | 3.4 |
| Task 03. Add 2 plans | 2.2 | 0.8 | 2.9 | 2.9 | 3.0 | 2.9 | 2.8 | 2.6 | 3.1 |
| Task 04: Classify it with existing keywords | 2.3 | 0.7 | 2.4 | 2.5 | 2.1 | 2.2 | 2.2 | 2.4 | 3.0 |
| Task 05: enter a new keyword and use it for classifying the new Case Study | 1.7 | 0.8 | 2.2 | 2.5 | 2.6 | 2.7 | 2.3 | 2.6 | 2.7 |
| **SCENARIO STUDENT 03 – You are back on your design assignments, and would like to explore groups** | | | | | | | | | |
| Task 01: Search for groups which have to do with steel construction, if any | 2.4 | 0.8 | 2.9 | 2.9 | 2.6 | 2.8 | 2.8 | 2.4 | 2.8 |
| Task 02: Search for case studies which have to do with steel, if any | 2.0 | 0.9 | 3.0 | 2.9 | 3.1 | 2.9 | 2.7 | 2.6 | 2.9 |
| Task 03: Create a group on "wood" | 3.3 | 0.7 | 2.5 | 2.7 | 2.6 | 2.5 | 2.0 | 2.4 | 2.7 |
| Task 04: Add 3 relevant case studies to the group | 1.4 | 0.7 | 2.2 | 2.4 | 2.7 | 2.6 | 2.5 | 2.2 | 2.6 |
| Task 05: Add a comment to the new group | 1.5 | 0.6 | 2.0 | 1.8 | 2.0 | 2.1 | 2.0 | 1.9 | 2.3 |
| **SCENARIO STUDENT 04 - To complete your assignment, you need some references. Search all references about "steel"** | | | | | | | | | |
| Task 01: Locate references about "Steel" | 4.3 | 0.4 | 2.6 | 2.1 | 1.9 | 2.3 | 2.4 | 1.8 | 2.4 |
| **SCENARIO TEACHER 01 - Monitor class** | | | | | | | | | |
| Task 01: Identify the last case study uploaded | | | | | | | | | |
| Task 02: Identify the most productive and least productive students | | | | | | | | | |
| Task 03: Identify the last group created | | | | | | | | | |
| Task 04: Find a case study of Mies Van der Rohe and link it from a coure in the school's LMS (if available) | | | | | | | | | |
| **AVG** | | **0.8** | **2.5** | **2.8** | **2.7** | **2.7** | **2.6** | **2.5** | **2.9** |

Satisfaction threshold     0.6
Dimensions threshold     2.3

**Usability study results**

## 2.4) User's responses

Users were also allowed to express open feedback with respect to tasks. This happened only for students in Lugano, and the comments are reported in the following table. It is important to keep in mind that participants in the usability studies tend to annotate problems and negative features more than positive features.

| SCENARIO STUDENT 01 – You have been assigned a design task. Search a Case Study from Germany for inspiration | | |
|---|---|---|
| TASK | POSITIVE FEATURES | NEGATIVE  FEATURES |
| Task 01: Log in | | - One must click twice to do the login<br>- it opens a second **small window** (the work window) without closing the homepage |
| Task 02: Find an interesting case study for houses that use wood | | - navigation not predictable: disagreement about positions of the toolbars, about symbols referring to the buttons;<br>- **heterogeneous layout**;<br>- there are different ways to solve the task: "Sr" key doesn't give correct results; "K" key  gives correct results but one has to scroll all the keywords to find the desired one. |
| Task 03: Find a case study from Germany | | **- the "Sr" key doesn't open a new window but visualizes the results of the new search on the same window of the previous search,  which remains BEHIND the case study window;**<br>- the "Sr" key doesn't' find case studies coming from Germany, but ones which have got something to do with Germany. |
| Task 04: Find a case study by Mies van Der Rohe | | - there are 2 case studies of Mies van Der Rohe but the search by author gives only one as result;<br>- authors are ordered by name, and not always in the same way (Ex. By "M" → Mies; or by "L" → Ludwig Mies…<br>- one has to scroll the author list (on the left side) to find the desired one |
| Task 05: View pictures and plans and identify good ones | | - no possibility to print plans and pictures;<br>- pictures and plans too small;<br>- zooming on all the plans and pictures wished |
| Task 06: Read textual contents | - short content paragraphs | - impossible to print |
| Task 07: Add a new picture | - after a while becomes evident that that the "+" key is to do additions to the case studies | - navigation unpredictable: one has to discover the right way to solve the task by trying;<br>**- no feedback message after posting;**<br>**- the added picture isn't visualized after the refresh, one has to re-open the case study to see the changes;** |
| TASK | POSITIVE FEATURES | NEGATIVE  FEATURES |
| Task 08: Add a new reference | - the "insert" method is always the same → once one has understood how to add information ("+" key), it's easy to solve other "insert" tasks! | - feedback message after posting but it doesn't refresh the page!<br>- the added picture isn't visualized after the refresh, one has to re-open the case study to see the changes; |
| Task 09: Add a comment about that Case Study for the author | | **- the user loses the case study he's working on at every new action! → there isn't a "back" button**<br>- utility of the forum is unclear; |
| Task 10: Edit the description and add some details | | - the task is unsolvable! |
| Task 10: Identify the | | - the function of the "groups" isn't clear; |

| | | - the user is confused about the way to work with the group section; |
|---|---|---|
| group and (if exists) find other Case Studies of the same group | | |
| Task 11: Identify the student who created that Case Study and find other Case Studies by the same student | | - unclear summary of the student's profile and of the information he/she posted about the case study; |

**SCENARIO STUDENT 02 - You worked in the atelier and want to add a new case study to the repository**

| TASK | POSITIVE FEATURES | NEGATIVE FEATURES |
|---|---|---|
| Task 01: Create a new Case Study | | - after the new case study is created, the uploaded photo is visualized only from the student's profile but not from the case studies collection (for example: if you search for the new c.s. using the "C" button and scrolling the list, you can find the c.s. but without the photo) → **BUG** |
| Task 02: Add 2 pictures | | - it is possible to add pictures both from the personal profile (from the red + button), and from the case study (e.g., search by title, then add picture). BUT in the first case pictures appear both in the personal profile and in the case study, in the second pictures are only in the case study, and not in the profile.→**BUG**<br>- no confirmation message for the upload → you have to make a refresh to see the new photos |
| Task 03. Add 2 plans | **- absurd! Now everything works with even a confirmation message… I also did once again the previous task and now it works. Pictures are uploaded very quickly and the website is updated in real time.** | |
| Task 04: Classify it with existing keywords | - the task is **solvable** but only if at first one chooses an existing fit keyword from the list and then inserts it as a new keyword → the c.s. is correctly classified with the chosen existing keyword | |
| Task 05: Enter a new keyword and use it for classifying the new Case Study | - when you add a new keyword the general keywords list is automatically updated | |

**SCENARIO STUDENT 03 – You are back on your design assignments, and would like to explore groups**

| TASK | POSITIVE FEATURES | NEGATIVE FEATURES |
|---|---|---|
| Task 01: Search for groups which have to do with steel construction, if any | | - the task is solvable but **unpredictable at all**! To be sure that the group you have found is the right one you have to read the brief paragraph given by the "Sr" button as a result under the voice "group" → the voice "groups" is the last one among the search results, so the user has to scroll the page … but he probably cannot imagine that after the list of c.s. there are "dedicated sections" for "keywords" and "groups" |

| TASK | POSITIVE FEATURES | NEGATIVE FEATURES |
|---|---|---|
| Task 03: Create a group on "wood" | | - where are the visualized photos picked up? Are they photos of the case studies? How can one chose the "right" photo?<br>- **the uploading process doesn't work well**; it has different problems: sometimes it uploads more then once the same photo, sometimes it doesn't upload the desired photo, sometimes it doesn't' update the case study… → **BUG**<br>- the drag and drop mode is not predictable → it would be useful an indication |
| Task 04: Add 3 relevant case studies to the group | - it works! | |
| Task 05: Add a comment to the new group | | - one can make a comment only adding it to a case study of the interested group and **not directly into the group**, or writing it in the "description" box when creating the group |
| | | |
| **SCENARIO STUDENT 04 - To complete your assignment, you need some references. Search all references about "steel"** | | |
| TASK | POSITIVE FEATURES | NEGATIVE  FEATURES |
| Task 01: Locate references about "Steel" | | **- one can insert a generic reference but not a specific one (such as a reference about steel), because there isn't a classification of the references** |

## 2.5) Findings

The  HOUSING@21.EU  application  exhibits  a  number  of  usability  problems.  Particular  examples include tasks 4, 9, 10, 11, 12, 13 for scenario 1, task 4 for scenario 2, tasks 4 and 5 for scenario 3 and task 1 for scenario 4. The dimensions most affected are *predictability* and *layout*.

The application was rapidly developed 5 years ago in a short time, and implemented new devices which are now part of the "standard" vocabulary of Web 2.0 applications – such as comments to cases (labeled "forum"), or tagging ("keywords").

Based on these considerations, the project team decided to redesign and reprogram the case study repository from scratch, with the following goals:

- -   Fixing major usability problems
- -   Implementing new functions
- -   Adapting it to the new "language" of web applications
- -   Using up-to-date technologies

A number of usability issues were identified within HOUSING@21.EU application, detailed above, and resulting in the list of recommendations for inclusion in the design of the new case study repository.

Data structure:

- -   Revise data structure with new information for each case study
- -   Create  sound  data  structure  for  references,  keywords,  authors  (make  automatic validation/correction of names).
- -   Is it possible to integrate it with the MACE project (Metadata for Architectural Content)?

Layout:

- Avoid using multiple windows (e.g., login, search)
- Add "back" and internal navigation.
- Design predictable menus + place them on top
- Better display of user profiles
- More space for reading content

Bugs:

- Reprogram upload function
- Use consistent CSS styles
- Make platform cross-browser
- Provide consistent feedback for operations

Also, some functions were found to require fine-tuning, namely:

- Revise group creation/management
- Revise list browsing (avoid paging)
- Revise keyword classification interface (as tags?)
- Make comment/ratings system consistent

Other functions were identified as useful functions to implement, namely:

- Make things printable (as far as possible, PDF?)
- Make pictures zoomable
- Quality control: rating systems (distinguish students and teachers

# 3) Accessibility study

## 3.1) W3C Content Accessibility Guidelines Checklist

In the framework of the evaluation of the platform, we also conducted an accessibility study based on the W3C guidelines. The table below provides a summary of scores of the HOUSING@21.EU environment.

Under each guideline are a number of sub-headings, and the full list of checklist scores, with comments where appropriate, are available on the W3C website. In summary most of the scores under the main categories and associated sub-headings were non-compliant. This reflects the prototype nature of the environment which was designed to test proof of concept application of the underlying methodology to learning and teaching processes.

These results lead to recommendations for the design of the new environment, which are included as comments against each of the items:

**Key:** C – Compliant, NC – Non Compliance, N/A not applicable, ? - unknown
Degree of NC compliance:  1 – fully,  5 – high / absent

| | | |
|---|---|---|
| Guideline 1.1 | Provide text alternatives for all non-text content | NC 5 |
| | *All menu graphics need labels. Imported graphics of buildings etc need to have a label associated with them automatically, which could come from meta-data tags.* | |
| Guideline 1.2 | Provide synchronized alternatives for multimedia | N/A |
| Guideline 1.3 | Ensure that information and structure can be separated from presentation | NC 5 |
| | *Menu items, eg in the Case Studies section appear as graphics without labels. There is inconsistent location of menu items between screens, and variable numbers of menu items. No back-button is available from many screens, and the browser backbutton is disabled. (The navigation can loose those with normal vision, so those using screen readers etc are going to be confused.)* | |
| Guideline 1.4 | Make it easy to distinguish foreground information from its background | NC 3-4 |
| | *In particular, colours used for menu items and background need to be chosen to allow sufficient contrast* | |
| Guideline 2.1 | Make all functionality operable via a keyboard interface | NC 5 |
| | *Almost all of the interface is mouse driven, without keyboard options being available. Any short timeouts on user activities need to be eliminated, or a means to turn off the timing provided.* | |
| Guideline 2.2 | Allow users to control time limits on their reading or interaction | C & ? |
| | *Any short timeouts on user activities need to be eliminated, or a means to turn of the timing provided.* | |
| Guideline 2.3 | Allow users to avoid content that could cause seizures due to photosensitivity True Success Criterion Comments | N/A |
| Guideline 2.4 | Provide mechanisms to help users find content, orient themselves within it, and navigate through it | NC 3-5 |
| | *The problems highlighted in 1.3 also apply here.  The navigation needs to be improved to allow easy movement through the environment from all pages, and to provide a clear indication of the current page location, eg bread-crumb trail* | |
| Guideline 2.5 | Help users avoid mistakes and make it easy to correct mistakes that do occur | NC 4-5 |
| | *Restrictions on access to materials need to be in place (eg different types of* | |

| | | |
|---|---|---|
| | *user), and confirmation of deletions etc requested. There is no undo function on user entry/edit pages* | |
| Guideline 3.1 | Make text content readable and understandable | NC 5   & ? |
| | *No option to change text size.* <br> *Approved and holding sections for information submitted, possibly incorporating a proof reading/editing stage. As well as time implications, this has implications for the pedagogical process, but the separation probably needs to be built into the environment.* | |
| Guideline 3.2 | Make the placement and functionality of content predictable. | NC 4 |
| | *The relationship between navigation / menu items and content is important and needs to be well defined. See menu comments under 1.3* | |
| Guideline 4.1 | Support compatibility with current and future user agents (including assistive technologies) | NC 4 |
| | *Forward compatibility not built in.* | |
| Guideline 4.2 : | Ensure that content is accessible or provide an accessible alternative | NC 5 |
| | *No parallel alternative resource available* | |

# 4) Evaluation of platform support of Learning¡Error! Marcador no definido.

## 3.1) Methodology

Questionnaires were used to review the overall learning and teaching approach including broad reflections on the platform (All Questionnaires are give in the appendices of report on the Assessment of Learning Methodology, PR EP2). The results of an assessment of the case study environment against W3C guidelines is given in section 4.

## 3.2) Questionnaires and Results for Evaluation of Learning and Teaching approach and platform

As the HOUSING@21.EU learning resources were used in academic years 2003/04, 2004/05 and 2005/06, and the current external evaluators were not involved at that time, the retrospective evaluation of the environment has, of necessity, been largely based on the three end of year reports. These have been supplemented by questionnaires completed recently by some of the staff and students who were involved in HOUSING@21.EU and discussions with some of the academic staff who continue to be involved in the OIKODOMOS project.

The student focused questionnaire was based on the MECA-ODL approach to evaluating quality in open and distance learning adapted to assess elearning (Riddy and Fill, 2004; Fill, 2005). An iterative process allowed current participants in OIKODOMOS to suggest amendments and additions to the questions and scoring methods. Once all contributors were agreed, the questionnaire was mounted online, previous students were alerted by email and asked to complete it. The questionnaire was mounted online at *http://interviste.lu.unisi.ch/mrIWeb/mrIWeb.dll?I.Project=OIKODOMOS* and distributed to 71 students. A total of 11 students responded. The questionnaire is given in Appendix 1, of the report for Work Package EP2.

The staff focused questionnaire (see Appendix 3, EP2 report) was based on an approach developed and used by one of the evaluators in a previous Anglo-American e-learning project (Rees *et al*, forthcoming). The questionnaire was distributed by email to 14 members of staff. So far there has been one agreement to holding a telephone interview.

Both questionnaires used Likert scales with open response boxes and included questions on the learning platforms, their use, and the learning and teaching process. All the returned questionnaires and comments were analysed manually. The results from the questionnaires relevant to this report are listed below.

## 3.3) Results

*Student evaluation questionnaire responses (11 responses)*

Very few comments were given. Only one was relevant to the design of the Case Study respository., which is included after Q6 below.

| Q No | Question | A | **B** | C | D | E |
|---|---|---|---|---|---|---|
| 2 | The Case Study Repository was easy to use. | | **8** | | 2 | 1 |
| 3 | Required tools were included (e.g. to add items / keywords/ cases ; to group cases). | | **9** | 2 | | |
| 6 | All the materials in the learning space were easy to access. | **1** | **8** | 2 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Despite time of loading and to small (for me ) window resolution, some of tools were against intuitive use | | | | | |
| 13 | I enjoyed using the Case Study Repository. | **2** | **5** | 3 | 1 | |

The Likert responses suggest the students were satisfied with the functionality and scope of the platform tools, but the comment points to the system not being user-friendly for this individual.

*Staff interview responses (No responses, 1 interview)*
The structure interview questions are given in Appendix 3 of the report for PR EP2

*Summary (one staff member, by telephone)*
The environment was good for bringing together a diverse set of information about buildings, but there were a number of problems usability issues which made educational use difficult:

- The response time of the environment was found to be unpredictable, but frequently slow. This may have been due to access problems over the network.
- The interface was not intuitive / user friendly. The language used to describe the tools used many technical terms and was too cryptic.
- There was no facility to print resources other than using print screen, a requirement exaggerated by the poor response times
- Adding resources as a process was on the surface straightforward, but there was no visual confirmation of an addition being successful, and sometimes resources didn't appear. This led to a lack of confidence in the system and having to time spend checking content had been added.
- There was no consistent tagging of the resources which made searching ineffective. There needs to be a drop down list for tags, perhaps with free-text available for users personalised input.
- There was only one level / type of user for the system giving full access to editing the resources. Staff were therefore unable to control / moderate edits which students made to any of the material. Several levels of access and information partitioning are required, allowing staff to have control of some content areas.
- Forums need to be better linked with content pages, so that discussion points can be made through direct reference to the content?
- The different 'spaces' should be connected in a way that is transparent to the user. In particular the Case Study database, the forums, and the Design Workshop Space(s).

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# Appendixes

*APPENDIX 1: Usability Framework*

**Usability Variables**

The MiLE Usability Kit for OIKODOMOS was built around the variables and values, taken from reports from the HOUSING@21.EU project.

**The idea of usability evaluation is to have users performing some real tasks and see if they can complete them in an easy way.**

<div style="border:1px solid black; background:#ffff99;">

**What should I do?**
Read this carefully. You should simply be aware of what the key terms in the method mean. They are the building blocks used for the usability evaluation.
In the practice, you just have to fill in the usability form attached, one for each test.
If something is not clear, please ask Luca Botturi (luca.botturi@lu.unisi.ch).

</div>

*Student and Teacher Profiles*

*First complete the user profile area (bottom right), by asking for information from the users.*
User profiles are generated around four main features:

1. Role (student | teacher)

2. Age (indicate number)

3. Education Level (Masters | Bachelor)

4. Previous experience with eLearning (high | average | low)

5. Technical skills (high | average | low)

6. Motivation (highly motivated | average motivation | scarcely motivated)

Please notice that disabilities (seeing, reading) are not included as a special evaluation following the W3C guidelines should be conducted in order to check this issue.

*Scenarios*

*The actual testing is done by having users complete the tasks described in the scenarios. The experimenter observes the user and annotates values for each usability dimension, as explained below.*

The scenarios around which the evaluation process is built were drawn from the descriptions provided by participants in the HOUSING@21.EU project. They are the narrative scenarios that will frame user testing. You might read these descriptions to students/teachers to introduce tasks, if you find it appropriate.

*Student scenarios can be run both for students and teachers.*

The teacher scenario is useful only for teachers.

SCENARIO STUDENT 01 – The student imagines s/he has been assigned a design task about a housing unit in Germany. For this reason, the professor advises to search a Case Study from Germany for inspiration in HOUSING@21.EU. S/he also remembers Mies van der Rohe although s/he is not sure he has ever built housing units in Germany. Once s/he finds a good case study, s/he adds a plan and a picture, and leave a comment to the original author. S/he then starts browsing around to see if there are other interesting things.

SCENARIO STUDENT 02 – The student has worked in the atelier and want to add a new case study to the repository, and also to classify it with keywords.

SCENARIO STUDENT 03 – The student is now back to her/his your design assignment, and would like to explore groups. The interest now is for building technologies, namely steel and wood. S/he has done a research on wood.

SCENARIO STUDENT 04 - To complete the assignment, the student needs now some references. S7he needs references about "steel"

SCENARIO TEACHER 01 – A teacher has been using HOUSING@21.EU for the course, and would like to monitor the class. Moreover, s/he wants to link a specific case study to a course within a regular LMS.

*If during the test a user cannot complete a task, wait until s/he gives up, annotate it, then help her/him and move on to the next task.*

## Usability dimensions

While users (students/teachers) execute the tasks in the scenarios, you as experimenter can observe them and annotate their results in the usability form. For each task, you should indicate:

1. How long does it take, until accomplishment or renounce? (indicate minutes, so that 0,5 is 30 secs)
2. Did the user complete the task? (yes | no)
3. Was s/he satisfied overall? (0=not at all, 4=completely)

Usability involves a number of different issues. For this reason MiLE proposes to articulate usability judgments around dimensions. For OIKODOMOS's purposes the following set is satisfactory:

1. Orientation: does the user understand where s/he is, at what step in a process or in what position in the application?
2. Navigation: can the user easily reach the tool/page/content s/he is looking for? Can s/he identify the right path to it?
3. Predictability: is the user able to know what is going to happen when s/he clicks on a link/button? Does s/he get surprises?
4. Layout: is the layout consistent? Is the user able to identify functional areas that support easy interaction?
5. Legibility/Graphics: can the user read the content? Are the graphics useful for working with the application or are they confusing?

*You will find these dimensions in the Usability Form document, and – as inspector – you will be asked to assess each of them for each task, with a number from 0 (lowest) to 4 (highest).Please use only integers.*

It is also good if you can annotate specific difficulties or good things in the text fields related to each task. While this is not mandatory, it is extremely useful.

## APPENDIX 2: Form to collect usability results

| | TIME | COMPLETES TASK? | SATISFACTION | CONTENT | ORIENTATION | NAVIGATION | PREDICTABILITY | LAYOUT | GRAPHICS | POSITIVE FEATURES | NEGATIVE FEATURES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SCENARIO STUDENT 01 – You have been assigned a design task. Search a Case Study from Germany for inspiration** | | | | | | | | | | | |
| Task 01: Log in | | | | | | | | | | | |
| Task 02: Find an interesting case study for houses that use wood | | | | | | | | | | | |
| Task 03: Find a case study from Germany | | | | | | | | | | | |
| Task 04: Find a case study by Mies van Der Rohe | | | | | | | | | | | |
| Operation with a case study | | | | | | | | | | | |
| Task 05: View pictures and plans and identify good ones | | | | | | | | | | | |
| Task 06: Read testual contents | | | | | | | | | | | |
| Task 07: Add a new picture | | | | | | | | | | | |
| Task 08: Add a new reference | | | | | | | | | | | |
| Task 09: Add a comment about that Case Study for the author | | | | | | | | | | | |
| Task 10: Edit the description and add some details | | | | | | | | | | | |
| Connections | | | | | | | | | | | |
| Task 11: Identifiy the group and (if exists) find other Case Studies of the same group | | | | | | | | | | | |
| Task 12: Identify the student who created that Case Study and find other Case Studies by the same student | | | | | | | | | | | |
| Task 13: Do the same with university, year, architect, and a reference | | | | | | | | | | | |
| **SCENARIO STUDENT 02 - You worked in the atelier and want to add a new case study to the repository** | | | | | | | | | | | |
| Task 01: Create a new Case Study | | | | | | | | | | | |
| Task 02: Add 2 pictures | | | | | | | | | | | |
| Task 03: Add 2 plans | | | | | | | | | | | |
| Task 04: Classify it with existing keywords | | | | | | | | | | | |
| Task 05: enter a new keyword and use it for classifying the new Case Study | | | | | | | | | | | |
| **SCENARIO STUDENT 03 – You are back on your design assignments, and would like to explore groups** | | | | | | | | | | | |
| Task 01: Search for groups which have to do with steel construction, if any | | | | | | | | | | | |
| Task 02: Search for case studies which have to do with steel, if any | | | | | | | | | | | |
| Task 03: Create a group on "wood" | | | | | | | | | | | |
| Task 04: Add 3 relevant case studies to the group | | | | | | | | | | | |
| Task 05: Add a comment to the new group | | | | | | | | | | | |
| **SCENARIO STUDENT 04 - To complete your assignment, you need some references. Search all references about "steel"** | | | | | | | | | | | |
| Task 01: Locate references about "Steel" | | | | | | | | | | | |
| **SCENARIO TEACHER 01 - Monitor class** | | | | | | | | | | | |
| Task 01: Identify the last case study uploaded | | | | | | | | | | | |
| Task 02: Identify the most productive and least productive students | | | | | | | | | | | |
| Task 03: Identify the last group created | | | | | | | | | | | |
| Task 04: Find a case study of Mies Van der Rohe and link it from a coure in the school's LMS (if available) | | | | | | | | | | | |

DATE _____
EXPERT _____

**USER DATA**
ROLE (student/teacher) _____
AGE _____
LEVEL _____
ELEARNING EXPERIENCE _____
TECHNICAL SKILLS _____
MOTIVATION _____