

Engaging Students in HCI Design Activities in Virtual Worlds

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Introduction

We present our postgraduate HCI (Human-Computer Interaction) design studio course that makes a combined use of the constructivist pedagogy of PBL (Problem-Based Learning) with a VW (Virtual World) design studio. The goals of the course are to:

- Cultivate high-level skills to students: a) critical thinking and reflection on the use of HCI methods, b) group work, and c) self-directed learning attitude;
- Develop a design project from ideation to user evaluation that is authentic and related to practice requiring field and design work.
- Make constructive use of a number of technologies to improve students' digital design competence (Arvola & Hartman, 2008), with emphasis on VWs.

PBL in an HCI Design Studio Course

We have adopted the PBL pedagogy for this course. In PBL, students are presented with an authentic problem and context and work in groups and autonomously to identify a route to a solution. PBL should not be confused with mere problem-solving; in PBL the problem is authentic and related to practice; the process of inquiry needs to be identified by the learner; the outcome is essentially a unique proposal to tackle the problem (Wood, 2003). Nelson (2003) argues that PBL can be employed to restructure computer science courses, programs of study, or entire institutions provided that professors conceptualize “*curriculum as problems, place students in the role of designers, and reconfigure classrooms as design studios*”.

The HCI course had the following schedule (3 hours/12 weeks):

1. Introduction (1 week).
2. Research & inquiry (3 weeks).
3. Design (conceptual & analytic) (5 weeks).
4. Evaluation (2 weeks).
5. Final presentation (1 week).

The main phases of the project development (2-5) were considered as problems of HCI and design methods use. The course process was iterative and incremental, blending HCI methods, design practice and technology. The main activities (Figure 1) were: (a) presentation; (b) critique; (c) reflection; and (d) design.

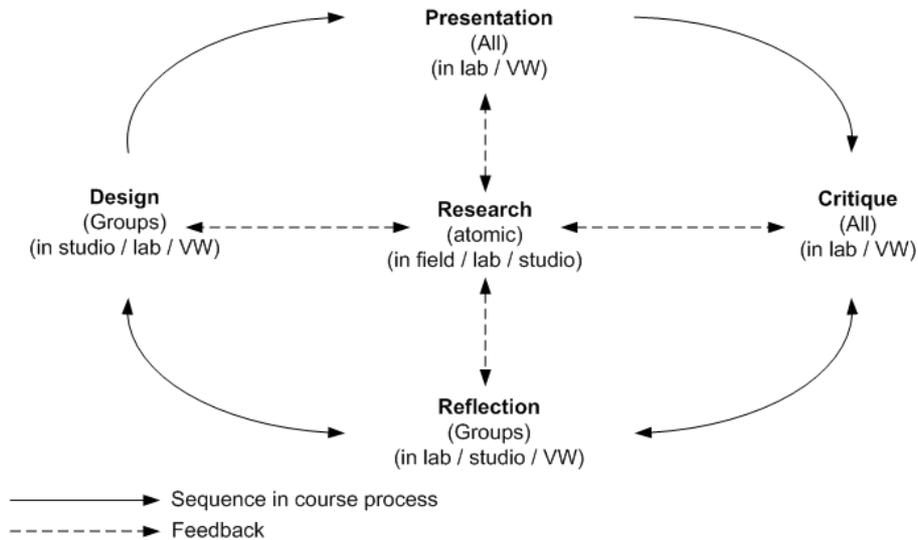


Figure 1: Outline of the iterative process and activities followed during each HCI studio course work.

The Virtual Design Studio: Supporting Remote Collaborative Activities

To support the virtual studio activities we have installed a VW based on open source software¹, instead of the most popular SL (Second Life) environment, to allow us with freedom (and no cost) of configuring the environment, controlling user access and storing user-generated content. However, a Virtual World is not a learning or design environment per se; it has to be designed as such. Therefore, we have designed and developed additional content in the form of workplaces and interactive objects (tools). The workplaces were:

- Classroom; the meeting space used for open presentations and critique.
- Private rooms; for each student to work on his own resources and develop ideas and concepts before public presentations.
- Group collaboration rooms, where the team met to discuss and co-design.
- (Virtual) Prototyping rooms.

We have also developed a number of interactive tools (Figure 2) using the Linden Scripting Language (LSL):

The **Projector** and the **Projector Controller** for group presentations (Figure 3).

The **Annotation** tool stores notes or comments and places them in the environment.

The **Short Annotation** tool displays the message floating above it, so other users do not have to click on the object and open the note to read it.

The **Message Board** is a collaborative text-only whiteboard.

¹ OpenSimulator platform: http://opensimulator.org/wiki/Main_Page

Freeswitch voice server: <http://www.freeswitch.org/>

Hippo (or other SL-compatible) browser. <http://mjm-labs.com/viewer/>

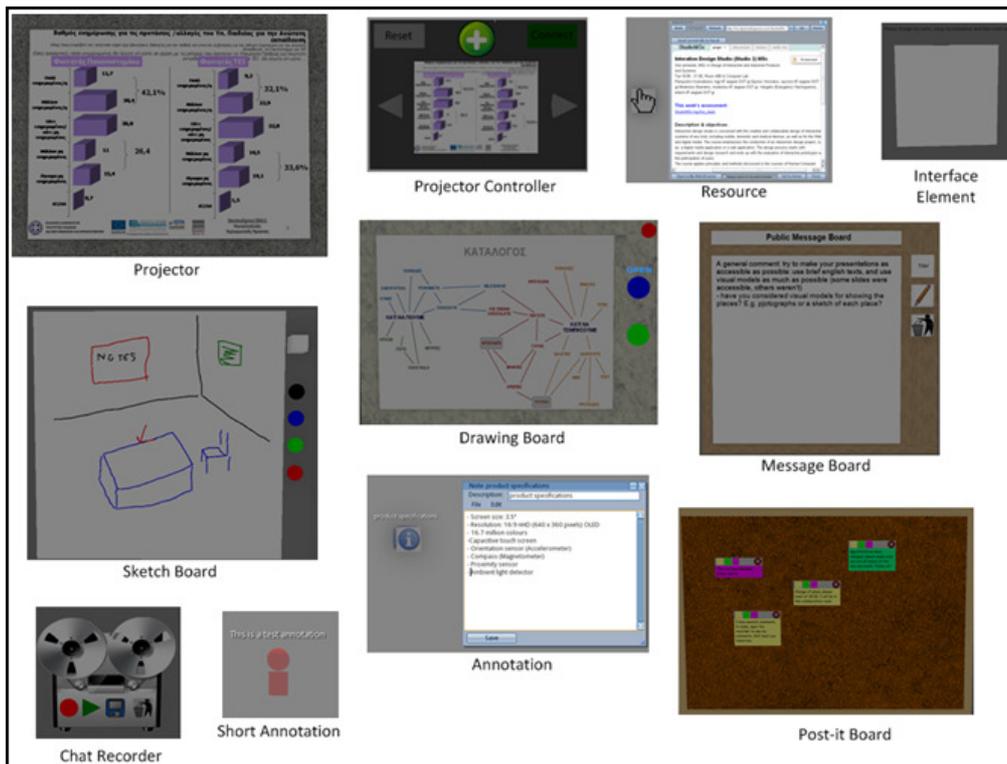


Figure 2. Virtual World tools.



Figure 3. A Group presentation in the classroom.

The **Sketch Board** allows students to directly draw sketches on a white surface.

The **Drawing Board** displays Google Docs drawings in the VW and lets visitors immediately connect and edit the document.

The **Post-it Board** allows students to add new text messages on it in the form of colored Post-it[®] notes.

The **Chat Recorder** allows students to record chat sessions, play them back, or save them as annotations.

The **Resource** tool displays a short description of a Web document and it opens the hyperlink in a new browser window when clicked.

Finally, we have developed the **Interface Element** to be used for the implementation of the functional user interface prototype inside the VW. Using multiple copies of this object, students can progressively construct windows containing elements such as buttons and images and define their behavior using simple commands. The interface element can have one or more of the following functions: (a) a Button, (b) a Window, (c) an Image Container (contains a number of images and it may display the next, previous or any indexed image based on the event it receives).

During the design activities, the VW design studio tools were used in various ways (e.g. Figure 4).

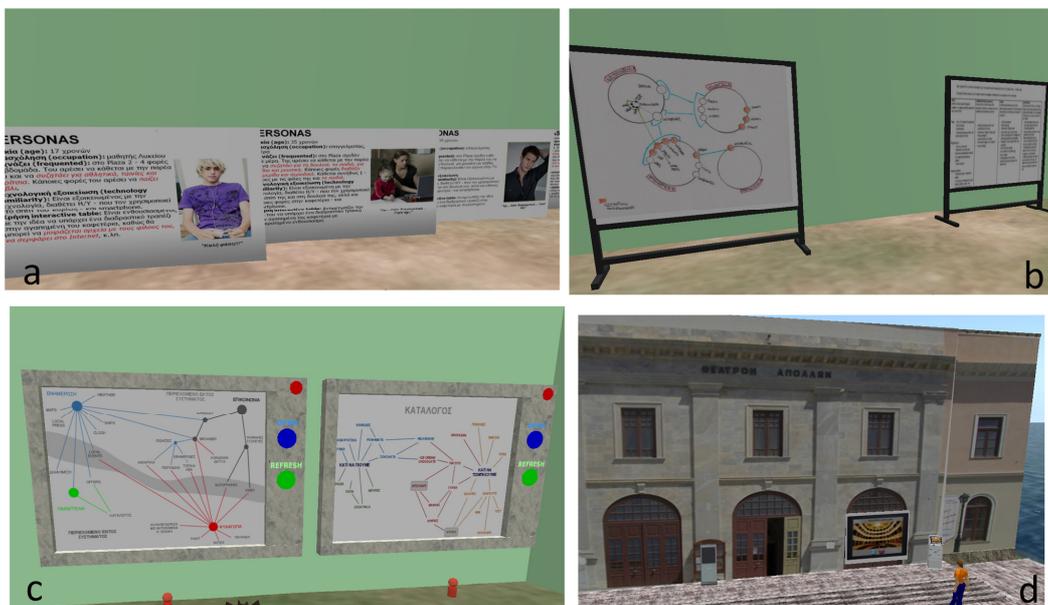


Figure 4. (a-c): Sketches and models of the design projects created in the virtual design studio with the use of the sketch board and drawing board tools; (d) the VW as a prototyping tool: a user approaching a multimedia kiosk at the entrance of a theatre.

Assessment

The assessment of the course indicates that the VW can contribute to students' engagement to the collaborative design project and to the development of digital design competence. The VW has been used in this course as a design studio allowing remote collaboration and as a prototyping tool. We are currently applying and refining our approach in a wider range of projects and paths in the multidisciplinary area of HCI, interaction and service design involving more students and groups on the basis of the experiences gained.

References

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