OIKODOMOS Virtual Campus

Constructing learning processes in collaboration

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Abstract. The OIKODOMOS Virtual Campus is a learning space where teachers and students of schools of architecture and urban planning collaborate in the design and implementation of learning activities dedicated to the study of housing in contemporary Europe. Its pedagogic model is based on the intertwining of on-line and on-site activities and on the integration of different types of courses following a blended learning approach. A technological platform has been specifically created to support the project’s constructivist pedagogy. In this paper we describe the main components of the pedagogic model, the technological platform, their implementation and application for delivering learning activities.

Keywords. Virtual campus; blended learning; learning sequences; housing studies.

THE OIKODOMOS VIRTUAL CAMPUS

OIKODOMOS (www.oikodomos.org) is a pedagogic research project co-funded by the European Union through the Long Life Learning Programme Virtual Campus of the Executive Agency Education, Audiovisual and Culture. The purpose of OIKODOMOS –a Greek word for ‘the builder of a house’–, is to create a virtual campus to promote the study of housing at a European scale, integrating on-line and on-site learning activities following a blended learning approach. This pedagogic model –based on the intertwining of architectural and urban subjects, learning design and ICT– was successfully implemented in a previous Erasmus Intensive Programme named HOUSING@21.EU (Madrazo and Massey 2005). In this program, we used ICT to create a new learning and teaching space which fostered collaboration of teachers and students in the design and implementation of learning activities carried out both in the participating schools of architecture and in the on-line spaces. The experience gained within that programme motivated us to continue it further into the OIKODOMOS Virtual Campus. Currently, five architecture and urban planning schools participate in the project along with some other associated schools across Europe. Between 2007 and 2009 the project team designed the pedagogic model and the learning environments to support it. Also, learning activities were collaboratively carried out by the partner institutions in the newly developed virtual campus. The objective of the second part of the project running from 2010 to 2011 is to consolidate and expand the virtual campus to other higher education institutions in Europe.
THE MULTIPLE MEANINGS OF VIRTUAL CAMPUS

In the field of education, a variety of meanings have been adopted for the term “Virtual Campus”, none of which can be considered predominant. According to Van Dusen (1997), a virtual campus “is a metaphor for the electronic teaching, learning, and research environment created by the convergence of several relatively new technologies, including but not restricted to, the Internet, World Wide Web, computer-mediated communication, video conferencing, multimedia, groupware, video-on-demand, desktop publishing, intelligent tutoring systems, and virtual reality”. In this definition, the focus is placed on the technology that allows the creation of a “virtual” learning space. For the BENVIC project, which studied virtual campuses implemented at some European universities, a virtual campus “refers to a specific format of distance education and/or online learning in which students, teaching staff and even university administrative and technical staff mainly ‘meet’ or communicate through technological links” [1]. In this definition, the emphasis is placed on creating a space of communication and encounter for different university actors. Following this line of thought, the later REVICA project concludes that “The main goal of a virtual campus is to provide a technologically supported place on the internet where students and teachers can ‘meet’ without being in the same physical place at an institution” (Schreurs, 2010).

This rather vague notion of virtual campus, which focuses on learners’ exchanges and collaboration, can encompass a whole range of activities from sharing a whole academic programme to creating innovative learning spaces supported by ICT which overcome the institutional boundaries. The goal of the OIKODOMOS is to use ICT to create a learning space which fosters the collaboration of learners –students and teachers– beyond the limits established by institutions, disciplines and academic programs. Therefore, OIKODOMOS virtual campus is not meant to be a surrogate of the “actual” university. It is a network of learners and activities, as opposed to an organization of schools with a shared curriculum, a space where learning activities are designed collaboratively and carried in conjunction with other courses taking place at the participating institutions. The uniqueness of the OIKODOMOS’ blended-learning model is that it broadens the interweaving of on-line and off-line learning activities within a single institution to multiple institutions in different countries. This is accomplished by using on-line learning environments specifically designed to support the required pedagogical processes as well as by developing a methodology to implement the underlying pedagogic model.

THE OIKODOMOS PEDAGOGIC MODEL

The underpinning model of learning within Architecture and Urban Planning is inherently constructivist. Epitomised by the Design Studio, theoretical concepts are initially explored and understood by placing them in a practical context, steadily building on and expanding the learners reference framework, insight and skills (problem-based learning). “According to constructivism, meaning is not implicit in the structured information. Rather, learners – students and teachers –should assign meaning to it” (Puntambekar and Young, 2003). Design studios allow a dynamic educational process, they are a melting pot for the production and reform of ideas through multiple interactions between students and staff alike. Design studios, therefore, have a twofold significance: as exemplification of a constructivist pedagogic model, and as a place where the learning processes take place.

The early applications of ICT to design studio education gave rise to the notion of a Virtual Design Studio (Wojtowicz, 1994). This enabled geographically distant institutions to interact –exchanging files, communicating– but it begged the question of the transformations that were necessary to achieve a successful integration of the different learning processes, for example, improving collaboration (Bradford, 1994). In more recent years, the notion of a VDS as a surrogate of the design studio has given way to
a blended learning approach in which ICT supported environments are used in conjunction with the activities developed in the on-site design studios, following the philosophy of blended learning (Madrazo and Massey, 2005).

The nature and categorization of blended learning, the blending of technology supported and face-to-face learning activities, has been widely debated. The extensive literature research of Bliuc et al (2007) explored the development and scope of blended learning. Their findings indicate that blended learning encompasses “some complex issues” in which it was difficult to understand all the interactions. Focusing on the online aspect, Pelz (2004) discusses “three principles of effective online pedagogy”, emphasising the need to engage the students with the material, foster the broad scope of interaction between all involved and to develop a community of learners. For Garrison and Vaughan (2004), the real significance of blended learning lies in its potential to transform education, since it represents “a fundamental re-conceptualisation and reorganization of the teaching and learning dynamic” which conveys “rethinking and redesigning the teaching and learning relationship”.

The pedagogy of OIKODOMOS embraces the demands of both on-line and blended requirements. However, it is further complicated by the need to blend the requirements of widely varying institutional academic frameworks, a complication rarely mentioned in the literature. This blending requires significant attention being given to establishing a common understanding of the design of learning and, for this reason, the partners agreed to adopt an approach based on Biggs “constructive alignment” (Biggs and Tang, 2007). This provided a shared vocabulary which enabled discussion of the design and coherence of the different learning and teaching elements, aims, learning outcomes, learning and teaching methods and resources, assessments and evaluation. The development of this common understanding was itself an important constructive pedagogical process, without which it would have been extremely difficult to begin to interweave the tasks and learning activities within and across schools, to achieve common goals.

The integration of on-line and off-line activities across partner institutions in different countries is a distinctive trait of the OIKODOMOS pedagogic model. Typically, after having defined a theme to be developed collaboratively by the participating institutions, the learning activities are first carried out at each institution as a preparation for the work to be done later in a joint workshop (Figure 1). In this preparatory period, the collaboration between students and teachers from the different schools takes place through OIKODOMOS Workspaces, an on-line learning environment specifically designed to support the project’s pedagogic model. After the completion of the workshop, students and teachers bring the knowledge acquired to the courses and seminars at their schools. Then the collaboration continues through the learning environment in different ways: assessing peers’ work; using the outcomes of one course as input for another; making distant presentations and critiques of design studio work. This continuous flow of activities –from the physical to the virtual environments, and vice-versa– can go on in multiple ways until the learning activities come to an end.

The temporal dimension of the learning activities is not determined by the courses or academic programs of each university but by the sequencing of the on-site and on-line activities. Thus, the learning activities are the core of pedagogic model and have an existence of their own: they become more or less active as more tasks are defined and works submitted; they move from the virtual to the physical, depending on the sequence of courses and workshops which are set up; and finally, they come to an end as learners complete their inputs to the process. Learning is mediated as a process through which some inputs –study themes, assignments, references and readings– give rise to associated outputs –student works, comments on others’ works, peer and teacher evaluations. The sequences of tasks
(or assignments) evolve in an open-ended manner as the learning process progresses. They can be carried out in a synchronous or asynchronous manner. Thus the temporal structure of the virtual campus will have meeting points with that of an academic program but does not necessarily have to coincide with it (e.g. semester, quarter).

Evaluating learning outcomes and competences is a fundamental part of the OIKODOMOS pedagogic model. The design of learning activities and tasks includes specification of key competences which students will acquire and are inherent in the learning outcomes selected. Assessments are designed to test if students have achieved the specified learning outcomes and provide a common basis for joint evaluation of their works.

THE OIKODOMOS LEARNING PLATFORM

One of the first decisions of OIKODOMOS was which ICT platform would be used to support the learning activities of the virtual campus. After reviewing some existing learning management systems, we came to the conclusion that they were either too focused on managing—as opposed to designing—the pedagogic activities (e.g. Moodle) or too restrictive in the modelling of the tasks (e.g. LAMS). This led to the decision to create our own learning platform to support the collaborative design and implementation of learning activities which would be integrated with other pedagogic activities carried out at partner institutions.

The OIKODOMOS platform consists of two environments: Workspaces and Case Repository (Figure 1).
The first one supports project-based learning activities, such as the development of an architectural and urban project in a collaborative manner. The second one is a digital repository of housing case studies, which is also constructed collaboratively by learners. Each environment has a distinct technological infrastructure so that they can be used independently or in combination (for example, generating in the Case Repository a report from the analyzed cases and using it as an input to a learning process in Workspaces). In this paper, we will focus on the activities performed in the Workspaces environment.

The design of the learning activities
OIKODOMOS Workspaces fulfils a double purpose: it enables teachers to jointly design the learning activities around a particular theme related with housing studies, and it enables students to carry out the activities working in teams or individually.

To begin using the OIKODOMOS Workspaces, teachers from different schools need to agree on a theme which they want to develop (e.g. “Lifelong dwelling”) during a certain period of time –not necessarily coincident with the academic timetable. Then, a Learning Workspace is created and users from different institutions are assigned to it. The next step is to describe the learning activities, and associate learning outcomes and keywords to them. A learning activity is a well-defined stage in a learning process, for instance, the “analysis of precedents”. Learning outcomes are used to make a rubric which teachers will use in the evaluation of the students’ works (e.g. “The student will be able to conduct research on housing topics and apply the information in new contexts”). Keywords are labels attached to the learning activities to facilitate the search and subsequent reuse of the information generated throughout their implementation (e.g. associated learning resources, tasks and student works) in other Learning Workspaces later on. Learning activities, learning outcomes and keywords are stored in the systems’ database so that they can be used in the design of other Learning Workspaces.

Defining and structuring tasks
The learning activities previously defined and stored in the administrator’s environment of OIKODOMOS Workspaces. They are implemented as sequences of tasks, which can be carried out individually or in teams. The description of tasks is in a unified format (e.g. description, objectives, learning outcomes, and learning resources) which facilitates collaborative learning design.

Tasks linked to a predecessor and successor task give rise to a network which evolves as the learning process advances. In this way, the task output produced by a group or course, by one or several universities, can become the input for a new task which can be later carried out by other learners. For instance, within a Learning Activity named “Site Analysis”, a group of students from one school can provide an analysis of the site to students of another institution who will make a design proposal. Designing the connectivity between tasks is a key aspect of the learning design based on the construction of sequences. Some of the sequences can be thought a priori, for instance, analyzing first a site before making a design proposal. However, other connections can be done on-the-fly, so to speak, as a teacher comes up with a way to use what has been produced in other tasks. This is demanding for the teacher, who instead of applying known procedures needs to venture onto the unexpected road of an on-going learning process.

An interactive map shows the evolution of the sequences of tasks, and their connectivity, aiding the learners understanding and navigation (Figure 3).
Carrying out tasks

In the Task view (Figure 4), the outcomes produced by students are displayed graphically. They are typically uploaded as pdf/ppt format files with an icon and a description. Works can then be commented on by peers and teachers, and evaluated by teachers from different institutions using a rubric containing the learning outcomes previously agreed upon. During their work, students make use of the Web 2.0 tools they find most appropriate (e.g. Skype, Facebook), which enhances their learning focussed social networking activities (Ham & Schnabel, 2011). Thus OIKODOMOS Workspaces becomes the endpoint of some previous working processes carried out elsewhere (in classrooms, with social media) and the starting point for new ones (commenting and evaluating, using the outputs of a previous task as input for another one).

Figure 3
Interactive map of the sequences of tasks.

OIKODOMOS Workspaces is a place where ideas are formalized and communicated to others. Therefore, students are encouraged to use a Learning Workspace as a communication space rather than as simply a storage space to upload assignments. The challenge for students is to summarize their reflections of a particular subject – e.g. flexibility in contemporary housing – in a way that they can be grasped by others. This requires: 1. Understanding the topic at stake, identifying the main concepts and supporting the reflections in the appropriate references 2. Communicating the ideas in an effective manner, choosing the most appropriate medium (written texts, diagrams, images and videos).

In much the same way as teachers need to be able to set up a join learning structure – by sharing objectives, vocabulary and protocols in order to define tasks – students need to be aware that the main
The goal is not to deliver an assignment in Workspaces, but to provide an input to a collaborative process of knowledge construction, as represented by the sequences of tasks within the structure of learning activities. This demands intelligibility of the ideas and in the forms of expression, both in visual and written form. They need to consider that their work will have to be understood by other learners: by other students who will make a critical judgement to incorporate it in their own learning process, or by other teachers who will evaluate it.

The structure of learning activities and tasks is at the core of the pedagogic methodology of OIKODOMOS (Figure 5). The design of this structure is both a top-down and a bottom-up process. Even though the learning activities can be agreed from the start by the teachers involved, some of the tasks are likely to emerge during the process. Controlling the evolution of the learning process as this evolves requires good communication between all participants, teachers and students. Again, communication lies at the core of the learning experience.

**IMPLEMENTATION OF THE VIRTUAL CAMPUS**

During the first stage of the project implementation, between 2007 and 2009, three Workspaces were dedicated to the themes “Lifelong dwelling”, “Dwelling for all” and “Effective housing”. As part of the learning activities dedicated to these themes, three joint workshops were organized in Ghent, Grenoble and Bratislava. A fourth Workspace dedicated to the topic “Proximity” has been carried out during 2011, and the corresponding joint workshop has recently taken place at Istanbul Technical University.

Along with the collaborative learning activities developed in Workspaces, the topic of “Proximity” in contemporary housing design was addressed from multiple perspectives in the courses and seminars.
at each institution. In the School of Architecture La Salle, for instance, a group of students and teachers collaborated with citizens to analyze the living conditions in the neighbourhood Plus Ultra in the city of Barcelona. The task for students was to communicate effectively with citizens in order to elicit their knowledge of their built environment. Then, through participative actions taking place in the neighbourhood, citizens described their perception of the environment, their memories of the place, the use they give to public spaces, and the relationships between domestic space and public space.

To facilitate the dissemination of these activities through the internet, a system of OIKODOMOS blogs –one for each participant institution and one for the project– has been set up, which enables the participation of external learners in the learning activities [2]. Also, social media –like Facebook– is being used to promote the creation of learning communities around the analysis of the neighbourhood. In this context, the integration of the academic activities developed in Workspaces with those carried out in the social media is a key issue. To achieve such integration students are encouraged to communicate the academic results produced in Workspaces via the project blogs, using a language suited to citizens’ knowledge. Again, the issue of communicating their ideas effectively –this time in another space, the blog, and for another audience, non-professionals– becomes an important pedagogic goal.

**CONCLUSIONS**

In OIKODOMOS, we have created a unique learning structure which integrates a constructivist pedagogy with a learning platform specially created to support it. Through the implementation of the pedagogic model, we have been able to identify its potential and weaknesses. The next challenge for the project
is to come up with protocols which would help other institutions to apply the virtual campus pedagogic model. This involves guidelines for learning design, recommendations for applications, and tutorials about the learning environment. It will also be necessary to facilitate access to the learning resources which been accumulated through the implementation of the learning activities. This includes the formulation of themes, learning activities and tasks, and also the bibliographic references and other related learning resources. In this way, the learning platform would become the support for knowledge permanently under construction, which is built on the previous knowledge generated by learners interacting in the Learning Workspaces.

REFERENCES

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