The e-Portfolio for understanding the city

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Abstract: - Intervention on urban environments and the city in general terms requires, in addition to having a specific ability to read and understand it, the ability to find the proper answer that necessarily implies a subjective interpretation and a personal contribution of the architect in urban design. This paper, a work in progress, aims to show a new adaptation of an effective teaching strategy, the e-Portfolio, in order to ensure that studentsacquire specific and transversal competences needed to be able to address an urban project with a sufficient cognitive and instrumental background to undertake the urban complexity.

Key-Words: e-Portfolio, town planning, architecture, teaching innovation, city, urban design

1 Introduction

Architecture is significantly different from other disciplines: besides acquiring basic technical knowledge to address an urban project, the architect delivers part of his creativity and imagination in order to achieve a suggestiveresult in formal terms, as well as solve functional issues. In this sense, it is not easy for students to reach a high training level regarding both the formal and functional themes. The creative face linked to urban design requires a certainly complex and abstract training level as wellas a previous in-depth knowledge of the problems of the urban fact, allowingher/him to understand the real magnitude of the problem and to deliver suggestive solutions with important doses of imagination on the part of the designer.

The teaching innovation we present here has been implemented during the 2011-2012 schoolyear, in the "Urbanística II" subject at the Escola Tècnica Superior d'Arquitectura de Barcelona, Universitat Politècnica de Catalunya. This is the second course of the Bachelors Degree and its main goal is to provide the student with the basic knowledge about the morphology and the function of the city and its structure, so that the student is really able to intervene in it.

It is therefore essential to choose well the tasks the students will need to carry out in order to ensure a proper learning of the teaching material. This means that the way the subject –and the activities around it– are organized so that we can empower their ability and promote critical reasoning.

As Ken Bain put it "knowledge is constructed, not received" [1]. Storage is not the only way to think about a subject. Our brains are both storage and processing units. Therefore, we must acquire the knowledge while we learn how to use it to make decisions. The formula is intuition + training:it does a lot more for the effectiveness of an information than the storing of data. Therefore, it requires an active, rather than passive, attitude and thereforewe can consider the e-Portfolio as a key tool for learning.

2 A learning strategy

The arguments that are presented in this textarefounded on the basis that, in order to be able to work with certain guarantees on the city and in order to be able to implement the individual creativityin urban design, it is both necessary and indispensable to attain a profound knowledge about the urban reality, its complexities and singularities, its dynamics and processes. This requires an effective mechanism of approximation to its reality. To achieve this goal, the teaching strategy based on e-Portfolio is a very relevant one, as it also incorporates implicitly secondary strategies enabling to reach the required deep learning on the part of the student.

The main objective pursued is that the student, in the course of learning,must be able to reach the critical reasoning about a certain reality and that this critical and profound knowledge must be sufficiently fundamental and versatile as to be applied to

some other city or other urban context that the students can encounter in the future.

3 Application context

The subject of the second year of Bachelor Degree*Urbanística II*("Town Planning II") is structured asa two-hour theory session and a two-hour workshop session each week, during 15 weeks. The teacher team consists of three faculties. The theoretical sessions are taught by one faculty in a big classroom holding all the students (120 students) while for the workshop sessions we split the group into three sub-groups of 40 students each, guidedby one teacher.

In this case study, the course was coordinated by another teacher, so this strategy was implemented only in one workshop group for which the authors of this paper were responsible, while the other two groups followed the traditional scheme. So, this paper deals with the work done exclusivelybyone of the three sub-groups at the workshop.

The starting situation was that, for a number of years, the student had to prepare a brief abstract of his work. In addition to the partial deliveries of the design work, students had to submit –at the end of the course– a dossier where they had to collect all the work done throughout the 15 weeks, duly ordered. This document comes into being, in fact, as a small inventory of the work done.

The e-Portfolio is much more than that. It represents, as described below, an assessment of the achievements of individual knowledge, a "digest" of the information received, a reflection of the ability to make a critical reflection on the learning process; and it requires a greater dedication. Given that the activity of the e-Portfolio needs more hours of work on the part of the student, it was brought up as an optional activity and the extra effort from the student was taking into account.

From the 40 students attending the workshop, only 19 decided to do the activity. This situation may be considered a problem though it allowed comparing the students who opted for the e-Portfolio and those who followed the conventional course [2]. As will be shown, the differencesin achievements of the course skills, both specific and transversal,for both groups are really very significant.

As has already been mentioned, this is a key activity in the learning of the students. Building a good e-Portfolio represents an important effort for the studentbut, in return,the student acquires an experiences that outweighs the effort. As has been said, not all the students opted to bring forward the e-Portfolioand, for this reason,a compensation was offered to encourage them to make this choice. The strategy was to assess the final note with the option to get a 2 extra points on 10 in the event that the student perform this task (in other previous courses have been raised it as an obligatory task, but it must be said that the results have not been as satisfactory).

4 The e-Portfolio

The e-Portfolio consists of an argued narrative of the learning process, made with different materials and languages. The documents must be necessarily diverse, of individual and collective sources: bibliography, scholarly articles, web sites, newspaper articles, photos, charts, analysis, field work, videos, interviews, experiments, evaluations, teacher's corrections and feedback from partners, and also references to work of their companionsconsidered by the student assuggestive.

It is not, therefore, a simple accumulation of documents and reports, as would be the case of the standard dossier. The student musts prove that he has learned. Students need to select the content required but above all other optional inputs: the student has to take a center stage in his own learning process.

The e-Portfolio is also an instrument of continuous assessment, requiring constant maintenance (it is recommended to devote at least half an hour per week to this task). Students should pursue to document what has been learned, the learning process, as well as to perform a self-assessment.

The motivation of the students comes from the fact that students areable tobuild a document that they can reuse for future activities, in order to present their credentials and abilityto apply for a scholarship, to enter into aninter-university project, or even to look for jobs in the future.

In order to facilitate the task as much as possible, it has been built a pattern or template in Google Sites, so that students can use it in order to build their own e-Portfolio. This template is perfectly modifiable fromits content toits structure, considering that the work of the e-Portfolio is absolutely individual and, therefore, very personal. The great advantage of this digital system is that it allows to include documents of diverse origin, from videos, links, Powerpoint presentations, and other digital systems.The template is organized into different sections which are all aimed to seek the student's critical reasoning regarding the activities that they will have to develop throughout the course (the template can be accessed at the following internet address: *https://sites.google.com/site/u2franquesa/*).

This document, which is delivered to the student at the beginning of the course, incorporates in the same template the instructions, so that the student knows how to fill the content of each of its sections. In addition to the various teaching strategies which are explained later, the document also incorporates all the necessary data in order to make it understandable to its content, in case of an external visit by someone unaware of the course. Therefore, the e-Portfolio must include some previous specific information, like the course program and the principles of the work provided by the teacher. Also,it has to includethe material taught at the theoretical sessions, whether the notes taken by the student or the text material provided by the professor, through links on the document facilities, as well as the bibliography used by the student throughout the course.
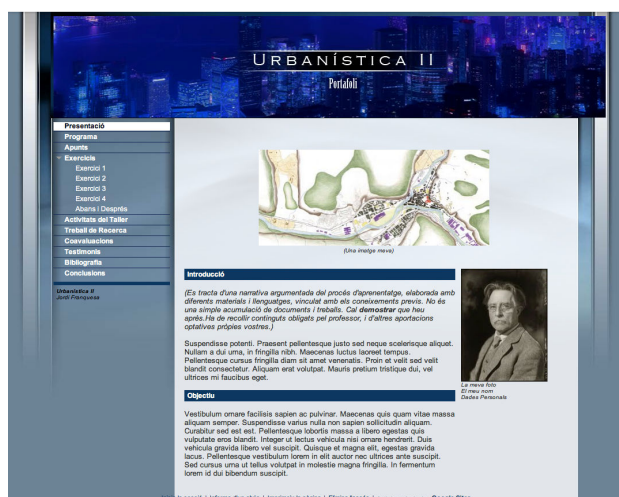

Fig. 1: Main page of the web site.

4.1 The e-Portfolio structure
The e-Portfolio must include primarily two types of documents:

1. Documents used by the student and the material developed individually.
   - The content of the teaching matter.
   - The documents prepared by the students.
   - The sources of information used to make the activities, that must be necessarily diverse, as we said, with individual and collective sources.
2. A reflection and a critical analysis on the learning process: the evolution of one's own learning, of the ideas of the student as the work develops, and of the goals.

With this premise, the structure of the e-Portfolio should be able to achieve these contents and

purposes. To this end, the organisation of the e-Portfolio is as follows:

1. Presentation. Students brings their credentials and an introductory page that explains the purpose of the document.
2. Program. In this section students hang the course program provided by the teacher.
3. Notes. Students incorporate the notes taken from the different lectures that have been given. It is important that the they reflect clearly the main ideas of the session, the doubts that it has generated in his mind, and what has really been learnt.
4. Exercises. Students in this section have to include the various tasks undertaken during the course, where they must include the Network Criteria (see 4.2.4), the Learning Record Card (see 4.2.2), the "Before and After" task (see 4.2.1), and describe the process of sedimentation of the different project ideas on the development of urban design.
5. Workshop Activities. It includes the different tasks carried out at the beginning of the workshop sessions (see 4.2.3).
6. The Research Paper. Throughout the course,the students have to do a small research on a particular theme, that must be incorporated in this section. This searching work is part of the program course.
7. Coevaluations. The evaluation of other fellow's work by the student is a task thataffects very directly the learning process (see 4.2.6).
8. Testimonies. The student brings personal experiences in this area related to the content of the course (see 4.2.7).
9. Bibliography. The student must provide here all the sources of information that have been used throughout the course for the completion of the work.
10. Conclusions. Finally, the student must include a global reflection about this new way to read the city and a review of the academic year and its positive and negative aspects.

4.2 The strategies
One of the most significant advantages of the application of this adaption of thee-Portfolio consists of the incorporation of different activities and strategies aimed at improving student learning and allowing the student to achieve a good critical reasoning on the matter. These strategies, of which we will show only the most significant ones, are then tools aiming at enrich the additional

documentation and the contents of the e-Portfolio focused on deep learning.

Although not all students undertake the elaboration of the e-Portfolio, all the classroom participates of all the different strategies. The only difference is that the results of these activities are simply mirrored in the dossier by some students while, in the e-Portfolio, they are also consciously analyzed.

Next is shown a short summary of some of the most important strategies employed in the workshop during the course.

4.2.1 "Before and After" task

One of the tasks that has a more meaningful involvement for the feedback information on this learning initiative and which allowsthe assessmentof its effectiveness and its operating capacity is the "Before and After" task. The first day at the workshop this activityis presented, consisting primarily in the projection of a single image in the classroom (alternatively, it may also consist of a case study or reading a short text). Without any comment on the part of the teacher, the students have to write a short text about the image; they have15 minutes to make the task. The student will have to save this text comment until the end of the course. The last day of the workshop, the same image is projected, and the student has to redo the text comment, considering now what has been learnt during the course.

This strategy has two main objectives: it allows to perform a very important statistical analysis of the feedback teaching initiative, inasmuch as we can compare the writings of students who have completed the e-Portfolio vs. those who have not (see results section of this document) and, on the other hand, it allows students to be more aware of their own learning, comparing the first text they wrote with the last text they have written.

4.2.2 The Learning Record Card

It is absolutely necessary that the student is aware about why he has been assigned a specific task, so he understands clearly what is the purpose and therefore to understand the orientation of his learning. At the same time, it is also very important that, once the task is completed, he is able to make a reflection on his own learning and he can prepary a summary about his job [3].

To this end,the Learning Record Card has been created: it is a reasoned analysis of each of the partial deliveries made during the course. The student has to deliver, besides the work, a small text

on a sheet where he must answer the following questions:

A. Before the job:
1. What do you think your work is going to be useful for?
2. Which do you think are its three main objectives?
3. How are you going to structure your job to prove you have achieved these goals?

B. After the job:
1. What is the most important argument that youcan extract from the work?
2. What aspect do you think you would get better?
3. What new questions and concerns has this workgenerated in your mind?

It is therefore very important that students do not limit their work to what the professor has asked, but are rather able to reflect on what they are doing in order to avoid the superficial knowledge and achieve to a truly deeper learning (as we can confirm in the survey made at the end of the course, the student demands, and thanks for, activities that led him to *think*) [4].

4.2.3 Workshop Activities

The purpose of the Workshop Activities is to encourage discussion and to promote exchange of ideas among students. During the workshop sessions, before proceeding to make corrections of the different works of the students, a small activity (lasting from 20-30 minutes) is always planned that seeks to make a reflection on the theme that has been developed during that week of the course, or on generic aspects of the city. It consists of a short video projection, of a readingof a suggestive short article, or of constructing a definition term as a group. These activities generate an open debate, often very interesting and profitable.

The academic course of Town Planning II includes, as we said, different documental elaboration that the student has to generate. Besides these works of urban design, students have to prepare a small written text at the end of the course, that consists of two open questions that seek to assess the student's critical reasoning about certain aspects of the matter. One of the most welcoming Workshop Activity has been the fact that one of these two questions is raised by the same students in the workshop. This exercise, meaning to create an exam question altogether, has brought up very intense and interesting discussions in the classroom, and has

also enabled the student to prepare properly for the exam. It should be noted that it is an open question and that, therefore, the student's personal reflection is what counts and what is more valued.

4.2.4 The Network Criteria

The Network Criteria are intended to inform the students, before starting their job, about the aspects that will be valued in their work, so that they can properly orient their implementation. The Network Criteria focuses on various issues with different intensity. The aspects that are considered less crucial, such as the formal presentation of the work, have less value but it is important that students become aware that the presentation will also be taken into account. Other issues, such as the organisation of work, or the clarity during presentations, are aspects that are of great importance and, therefore, they have a higher score.

One of the most important aspects of the Network Criteria is the weight attributed to interpretation, namely the ability of students to draw their own conclusions from the work made to encourage critical thinking [5]. This section, which has a very important specific weight, has very significant implications, to the extent that the requirement that is made to the student not only summarizes in delivering the work, but it prompts an assessment of his work and a reinterpretation on the document that has been elaborated.

At the same time, the Network Criteria allow a pattern to be able to make the coevaluations that are described later, because each question that is part of the Network (presentation, organization, reflection, documentation provided, and so on) has three possible scores in order to facilitate the student to score the jobs of his/her colleagues .

With this document provided to the student, it can be shown that works delivered have a superior level above conventional ones, since students have a preset pattern to which to adhere, and it helps them to properly organize their material and not be exposed to surprises at the time of the assessment of his work by the teacher.

4.2.5 Checking

The academic coursehas a duration, as we said, of 15 weeks. In the course of the eighth week, we devote 10 minutes to an anonymous evaluation of the content and teaching strategies applied so far;all the students have to writea paper and deliverit to the teacher. This allows to receive feedback from the student and to redirect some of the activities if

deemed appropriate, an aspect which should be necessarily shared with students in the following week: it is also fundamental that the studentsconfirm that their opinion on the development of the course counts in fact for its organisation and the definition of its structure.

4.2.6 Coevaluations

As we have suggested before, the student has not learned enough if he is not able to evaluate his own work. He will be keenly aware of his own learning when it assumes the task of autoevaluation, to assess their own work, or that of his colleagues. As said, during the course students submit three partial deliveries of their work. Students who choose the e-Portfolio, are tasked with assessing the work of two colleagues a week before a partial deliveryand assume the commitment to make a constructive assessment of these works, pointing out how they could be improved and using the Network Criteria explained before. This student, for his part, will receive two reviews of his own work from two independent students. In the final delivery of the document in the following week, the student will have to justify the acceptance or rejection of hiscolleagues' observations.

This activity increases substantially the critical reasoning capacities of the students, and stimulates the exchange of ideas among them, thus improving the overall quality of the workshop.

4.2.7 Testimonies

In this section, students can enter the personal experiences that have encouraged them to reflect on the teaching of the subject matter or about the idea of the city in general terms. This means that they can enter here any article they have read on their own, or an experience they have linked with the subject matter, or a movie seen, and that has lead them to think about the city. The main objective of this task is to link teaching with other subjects and to recognize at the same time the important matter of his interdisciplinary aspect, absolutely necessary to understand the dynamics of the city in its globality.

5 Results

It is imperative that, after implementing a particular teaching initiative like this one, there must be also a true feedback process in order to ascertain whether the strategies used are really coherent and efficient with the result than is expected. In this sense this

work has dealt with two relevant information sources:

1. The documents and material delivered by the students.
2. The results of the surveys provided to all students at the end of the course, where they value their own experience.

Regarding the first part, the documents submitted by the 19 studentsthat chose the e-Portfolio demonstrate a higher level of development than the 21 students that did not, where the personal contributions and self-assessment mainly show a higher level of attainment of specific and transversal skills, both regarding size and content.

In this sense, the "Before and After" task is very significant: while students who have not completed the e-Portfolio demonstrate in general terms a significant evolution over the new interpretation of the image that they worked on the first day, the ability of reasoning of the students who chose the e-Portfolio goes far beyond, because they incorporate new suggestive ideas and hypotheses in their writings about the subject, and they give true evidences of reaching a more profound knowledge of the discipline: these texts are in this sense a lot more creative and thought-provoking ones.

As for the second section, while students who have completed the e-Portfolio recognized having achieved higher levels of knowledge and, at the same time, having produced a very useful document for their own future, they have also warned of greater dedication in hours and the effort that this activity has required, claiming a more rational balance of the course, which requires a reflection with a view to future editions.

6 Conclusions

As we stated at the beginning of the paper, knowledge is not received, but constructed. In this respect, the e-Portfolio is a fundamental tool that students can use to build their own knowledge. The conclusions of this educational activity are as follows:

1. Students who have opted to develop the e-Portfolio are able to **create**: on the documental results of his learning task we can demonstrate how reaches better planning and critical capabilities, which is much more able to devise and formulate hypothesis on its own, while students who have not developed the e-Portfolio are generally able as much to apply and implement concepts, develop ideas and compare them, but without this creative ability that distinguishes the other students.

2. The elaboration of the e-Portfolio, as described above, involves an active attitude on the part of the student. The fact of having to control their own learning requires more hours of dedication. If the aim is to implement the e-Portfolio, it is necessary to **re-structure the course,** to arrange it around this activity, and to assess the achievements of the course's objectives on the basis of this document.

3. **Student's motivation** is very important for skill achievement. It is fundamental that students realize about the advantages of elaborating this document to control their own learning, and particularly to learn to draft a document that will be very useful in the future (to access other universities or simply to look for work).

4. The surveys revealed that the elaboration of the e-Portfolio prompted students to think about the course and its content, an aspect that they evaluated very positively. It becomes therefore obvious that there exists a true demand for students to **think on their own**.

5. Students have not learned enough if they are not able to **assess their own work**. The e-Porfolio allows students to assess their work on a continued basis, allowing to achieve a deeper knowledge of the subject, providing them with a critical reasoning attitude about the discipline.

6. This learning strategy is **applicable to other disciplines**, provided that it is adapted to the characteristics of the course subject.

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