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Student Portfolio as a learning tool in UPC-BARCELONATECH technical and health degrees. Good Practices in GTPoE-RIMA

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Abstract

The *Universitat Politècnica de Catalunya*, UPC-BARCELONATECH (http://www.upc.edu), is a technical university that teaches engineering, architecture and optometry degrees. RIMA project (http://www.upc.edu/rima) has been created as a meeting point for Communities of Practice (C&P) at UPC-BARCELONATECH in research devoted to teaching and learning methodologies. RIMA project includes Student Portfolio Community of Practice, GTPoE, focused on portfolio design models and templates. The main goal of GTPoE is to help teachers and students in developing portfolios as an authentic and holistic assessment tool in the frame of European Higher Education Area (EHEA) degrees and masters. GTPoE allow teachers and students to show and share works and examples according to Autonomous Learning (AL) level, as well as exchange experiences and results by creating a Decalogue of Good Teaching Practices, to improve students' portfolio performance.This work provides an approximation to research, based on fundamental aspects that a lecturer might consider to include in a student learning portfolio optimised for common activities in engineering and optometry degrees, essentially describing a relation of good practices. Portfolio experience can be easier applied to other subjects once the GTPoE site contains storage of some examples of using the portfolio in subjects in engineering and optometry degrees. This collection will be also very resourceful for other lecturers and students who have to introduce the tool. Generally, portfolio activity assessment is carried out by means of a survey, in which students can identify the strengths and weaknesses to guarantee the continuous improvement of their performance through portfolio development, in a progressive way to integrate academic knowledge and professional skills.

Keywords: Student portfolio, e-portfolio, UPC-BARCELONATECH, Professional skill, Decalogue, Good practices, GTPoE, Autonomous learning.

1. Introduction

As far as UPC-BARCELONATECH Degrees and Masters take part of the European Higher Education Area (EHEA), it is stated that the development of professional skills has to be one of the major priorities. Traditional academic syllabus have been transformed to incorporate methodologies and strategies to make possible students reach a level of maturity and proficiency, not only in the traditional reading-writing-studying-taking exams process, but also in developing protocols, skills and professional skills, including the widespread use of ICT (information and communication technologies) in every kind of every day task ranging from planning projects to final documentation and presentation. The adaptation to a more competent profile of studies has been necessary in order to reduce the

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distance between professional requirements and profile of recent graduated students, who were fully academically prepared but not much skilled in the procedures and protocols required by their future profession, to a point that for them were not easy to respond in a flexible way to the demands of career paths and future opportunities.

To make the change possible, UPC-BARCELONATECH focused in seven generic skills to be added to the profile of all degrees, accordingly to the official documental framework for the design and implementation of curricula degree [1]. Generic skills are transferable to a variety of functions and tasks, and enable students to integrate successfully not only into the profession but also into social life. They are not thought to be exclusive of any professional specialty, but can be applied to a broad range of knowledge areas. The seven generic skills are: entrepreneurship and innovation, sustainability and social commitment, third language, effective oral and written communication, team work, proper use of information resources, and autonomous learning. Planning of new degrees includes three important items: first: student-centered learning, second: goals accomplishment by means of skills and planning, and third: continuous evaluation and monitoring of all teaching activities using European Credit Transfer System ECTS criteria (http://www.ects.es).

From this approach, the mission of the teacher is designing activities, guiding students in learning, planning and performing assessment tools and evaluation. Students' job is to perform activities planned, construct their self-learning and get engaged in it. The use of portfolio in higher education is a major way to transform the interaction between student and teacher, for it motivates deep engagement of students in the learning process, infusing reflective practice and designing different ways to asses work and evaluate knowledge and skills in the professional area. This is a challenge, requires radical changes in practice. This is the aim of this paper, leading to writing a Decalogue of good practices in developing portfolios to be used as a guideline for implementation of skills in technical and health university bachelor degrees and masters.

GTPoE (*Grup de Treball en el Portafoli de l'Estudiantat*, http://www.upc.edu/rima/grups/gtpoe) is a community of practice (C of P) included in a major RIMA project (*Recerca i Innovació en Metodologies d'Aprenentatge*, http://www.upc.edu/rima), a proposal from Education Science Institute (ICE, http://www.ice.upc.edu), a meeting point for all the research groups of the UPC-BARCELONATECH in teaching and learning innovation giving them visibility to their activities. By means of RIMA, GTPoE is the forum where teachers who are concerned in adapting their subjects to new trends in higher education implementing the use of portfolio, can share their experiences and work together creating and carrying out common projects, like the one presented in this paper [2].

2. Student Portfolio as a teaching-learning tool

Student portfolio is a collection of evidences of what has been learned over a period of time, during an academic period, in a specific subject, along with reflections and evaluations about the progress in learning done by students or cooperative groups of students, under the supervision of their instructor [3]. The collection of selected works (real-world artifacts) included in the portfolio is dynamic and changes as the course develops and student matures in the process. Depending on the objectives stated in common at the beginning by teacher and student, portfolio may show the learning process (learning portfolio) [4] or the selection of the best work the student has performed during the year or through all the studies (showcase portfolio) [5]. Portfolios, thus, have the potential to make learning concrete and visible, thereby providing faculty, future employers and students with the opportunity to focus on new ways of learning [6].

Creating a portfolio is a meaningful way to learn. It is an unbiased material evidence that student has reached (or not) the goal proposed: to demonstrate his skills in a concrete subject, not only from an academic point of view, but also developing strategies in decision making, and starting to build a professional identity. The process of developing a portfolio is the best way to shift student from playing a passive role in the learning process to an active role, including assessment and evaluation (by means of agreed rubrics) because he must engage in more complex thinking and self-evaluation, to choose the best evidences (real-world artifacts) that demonstrate his skills. Developing a portfolio is a way to boost interaction among teachers and learners. It has been proved that clear goals, high standards and expectations raise the level of student performance. Knowing that student's work has to be public is a motivation that raises the level of duty and obligation of both students and teachers.

When teacher and student agree in using portfolio as a learning and assessment tool, they assume some challenges: to work in a highly organized subject, requiring a level of involvement which is substantially higher than when studying a conventional course based on assessment with multiple choice question or essays; the need of new organizational structures; a high commitment on the use of technology skills and tools; more study time in class and out of class; consensus upon rubrics to score assignments done; commitment in professional development; and some legal attributes like portfolio authorship. On the other hand, there are many benefits associated with the use of portfolio: student is the center of learning process, so it is necessary to use active learning techniques, as cooperative learning, experimental case reports, problem-based learning, discovery learning, and it makes easier the self-evaluation, peers-evaluation (also called co-evaluation), all of them activities associated with the higher cognitive level [7].

2.1. Preparing a Portfolio

Deciding to implement portfolio as a teaching-learning tool in a course, implies a change of paradigm: from now on, student becomes the centre of learning process. This situation has several implications that teacher has to consider:

- The purpose of portfolio will determine its organization, content and presentation style. It is very different to conceive a portfolio to show the learning development in first course of a degree (formative), or a clinical portfolio to demonstrate participation in clinical practices (summative), or a showcase portfolio to be presented to a hiring agent (marketing portfolios).
- The level of teacher commitment and dedication, according to Biggs [8].
- The level of student autonomy according to the level of the course in the curriculum. UPC-BARCELONATECH takes as a reference the Bloom's taxonomy of learning cognitive level hierarchy [9] and defines three main levels. Table 1 shows the relationship between student level of autonomy and the suitable portfolio format according to contents it has to include.
- The nature of studies: in classroom, blended or e-learning (at the UPC-BARCELONATECH by means of its Moodle-based ATENEA platform).
- The level of technological complexity with which work has to be performed [10,11].

Table 1. Relationship between level of autonomous learning and portfolio format

Autonomy Level	Student is able to	Suitable in courses	Portfolio format
Level 1: DIRECTED	Make brief reports and production about what is learned. Follow timetable schedules rigorously. Follow strictly guidelines on how to do tasks. Work with information sources that teacher recommends or makes available as study materials.	FIRST COURSE IN DEGREE SYLLABUS	Paper Moodle platform
Level 2: GUIDED	Write individual and group reports about what is learned and future actions proposals. Take decisions on the study time devoted to tasks based upon teacher orientations. Suggest improvements in guidelines on how to do tasks. Add bibliographical references and	INTERMEDIATE COURSES	Paper Moodle platform Electronic support

	other information sources based on teacher suggestions.		
Level 3: AUTONOMOUS	Analyze the accuracy and importance of topics in learning process and final knowledge. Decide time spent in learning content, and doing the work. Decide how to do tasks to perform as professional as possible. Decide to add other sources of information appropriate to meet the learning objectives.	LAST COURSE IN DEGREES. END-STUDIES PROJECT. PERSONAL PRESENTATION TO HIRING AGENTS	Moodle platform Electronic support: Videos, DVD, artefacts... web 2.0 for sharing

2.2. Portfolio contents. Good Practices

As stated in the previous section, Portfolio's contents are directly related to its purpose and context. We present herein the example of a summative portfolio, which is the most convenient to develop in first-intermediate-final years, and using a reasonably high technological level, including the option to elaborate an e-portfolio that can be shared in Moodle ATENEA Virtual Campus with the purpose of allowing co-evaluation.

0. Front page: Showing a corporative image, subject title, date of presentation, student and teacher names, etc.
1. Personal presentation: First page can be written as if it has to be a blog profile, containing information about student. It is important to focus a paragraph on concerns and projects about studies, specialization area, and professional profile chosen concerning what student aspires to carry on after graduation).
2. Initial reflection: To place student in perspective, the second page of portfolio will contain this rationale (about studies and about professional profile).
3. It is appropriate that the third page of the portfolio contains the index, to easily find sections, exercises, artifacts placed in it. The index should be an exhaustive guide of the work presented.
4. On the fourth portfolio page, the teaching guide (Virtual Campus) has to be placed, including assessment and evaluation criteria, and time planning. It is necessary to keep our goals in mind at any time.
5. "Weekly time control templates" (Virtual Campus) are designed to help student to have an exact idea about time devoted to the subject, in and out of classroom. Time spent, suggested articles to read, activities carried out by self-initiative or planned by teacher. Students can also present a real case in which they have participated in his company and which is related to the topic developed in classroom that week. This activity can be recorded as time devoted to the subject, and may be assessed positively when evaluating the competence autonomous learning. These "weekly time control templates" are accompanied by "task report templates" that have to be included in the portfolio to summarize all kind of complementary activities the student carries out that week.
6. Initial assessment: This is an estimation of the starting level of student's subject knowledge. Teacher may ask students to do some kind of activity, a task to be solved and delivered through virtual campus once assessed and handed in before the due date.
7. Evidences and artefacts: It is necessary to hand in evidences of every unwritten task performed, particularly in online courses. Material can be multimedia, pictures of the activity done, the diptych of a conference that was attended, etc. If it is an artefact that has been manufactured, pictures or videos are suitable.
8. Documentation provided by own initiative: Sometimes, students search information far beyond what is expected by the teacher. In this case, they are asked to add a report reflecting: Why they were interested in further information? What was the issue that captured their attention? How it relates to the topic presented in classroom, etc.
9. Assessment: A midterm of final evaluation is considered, also a proposal for improvement.
10. Last page of the portfolio includes a final reflection and a survey of the subject, allowing teachers to undertake improvements in future courses.

3. Portfolio assessment and evaluation

The rubric we present herein (see Table 2) can be used to score portfolio in a holistic way, to assess the completeness of the contents taking into account all previous and partial scorings of particular tasks and artefacts presented during the course. It were designed by a group of lecturers at the UPC-BARCELONATECH [12].

4. Conclusions and future lines

In this paper, we have presented the requirements to develop a student portfolio taking into account its purpose and all the contextual conditions, which also can be used as a reference for teachers who want to implement this tool in their courses and share the experience in GTPoE Community of Practice. The aim is to create rubrics and templates, considering the particular needs of each degree at the UPC and to spread the use of the portfolio in our university. In a final phase, we aim to present the result of this cooperative research

Table 2. Relationship between level of autonomous learning and portfolio format

QUALITY CRITERIA FOR STUDENT'S PORTFOLIO			
CRITERION	**VERY GOOD**	**TO IMPROVE**	**INSUFFICIENT**
Schedule implementation	Student has given different versions of the portfolio according to schedule, also co-evaluation activities handed in.	Student handed in some portfolio version or some peer co-evaluation later than scheduled .	Student has not handed in any of the versions of the portfolio or peer co-evaluation.
Writing style	Phrase length at about 2-3 lines. Well-used punctuation marks help to understand the phrase without any difficulty. Ideas are connected with each other. Text does not present misspelling. It presents consistency in tense and the verb form is active.	Some sentences exceed the recommended length (2-3 lines), although the punctuation marks help to understand the sentence without any difficulty. Some ideas appear disconnected from others. Present tense consistency, although sentences are passive. Text has no misspelling.	Predominant long sentences and poorly constructed. Do not use punctuation correctly (points replacement comma or semicolon). Change the tense without any justification (from past to future, for example). Phrases appear with the verb in passive participle. The text presents misspellings
Description of learning	Text clearly describes learning and improvements in each of the skills.	In some cases text does not clearly describe what has been learned or improved related to a certain competence.	Text simply describes what have been made, but does not describe what student learned or improved related to evaluated skills.
Improvement goals	Improvement targets for each of the skills are clear and concrete and reasonable goals are exposed.	Explains the weaknesses in their learning, but does not specify what needs to improve. Terms do not appear in improvement plan.	It does not indicate what improvement targets are,
Evidences	Evidences provided for each skills are a good example of what has been learned or improved.	In some cases, there is no clear relationship between provided evidence and described improvements.	Provided evidences not related with described improvements.

References

[1] Consell de Govern de la UPC. *Marc per al disseny i la implantació dels plans d'estudis de grau a la UPC*. Acord número 38/2008, de 9 d'abril, del Consell de Govern. Barcelona.

[2] *Aproximació al disseny de titulacions basat en competències*. Institut de Ciències de l'Educació UPC, 2008. Barcelona (http://www-ice.upc.edu/documents/eees/disseny_titulacions_competencies.pdf).

[3] *Monogràfics*: *El portafoli de l'estudiantat.* Institut de Ciències de l'Educació UPC, 2010, Barcelona

[4] Barrett, H *Balancing the two faces of the eportfolio*. http://electronicportfolios.com (last consultation: November 2011)

[5] Valero, M., Rubio, J., Sánchez, F. J., *Introducing the student competency portfolio in the Castelldefels School of Technology (EPSC)*, E-Portfolio Conference, Maastricht, Holland, 2007
[6] Johnson, R.S.; Mims-Cox J.S.; Oyle- Nichols, A. *Developing portfolios in Education*. *A guide to reflection, inquiry and assessment*.. 2nd ed. Sage. California 2010
[7] Krathwohl, D.R.; Anderson, L.W *Taxonomy for learning,teaching and assessing: A revision of Bloom's taxonomy of educational objectives*. Ed. Pearson, London 2001
[8] Biggs, J. *Teaching for Quality Learning at University.SHRE*, Open University Press,1999., http://www.engsc.ac.uk/er/theory/ (last consultation: November 2011)
[9] https://www.upc.edu/eees/disseny_assignatures/guia-docent/copy2_of_els-objectius (last consultation: november 2011)
[10] Wyatt III, R.L.; Looper, S. *So You Have to Have a Portfolio: A teacher's Guide to Preparation and Presentation*. 2ª ed. Corwin Press, California 2004
[11] Barret,H *Electronic Portfolios*. [on-line] http://electronicportfolios.com (last consultation: November 2011)
[12] Armengol,J. Hernández J., Mora J, Rubio J,Sànchez F.,Valero M. *Experiencias sobre el uso del portafolio del estudiante en la UPC*. Revista de docència Universitària, III, Monogràfic III (June 2009), http://www.um.es/ead/Red_U/m3/ (last consultation: september 2011).