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Rubric-based tools to support the monitoring and assessment of Bachelor's Final Projects

Herramientas basadas en rúbricas para el control y la evaluación de los Proyectos Final de Grado

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Abstract

The role of Bachelor's Final Projects (BFP) in Engineering Education is critical since it offers the opportunity for students to integrate and employ specific and transversal competences they have developed along the degree. However, given the special characteristics of this curriculum component (personalized according to the student's interests, the number of teachers involved, the changing assessment boards, etc.), the systematization of its formative and summative assessment has been extensively recognized as problematic but highly necessary. To face this problem, there are several recent initiatives reported in the literature that propose a set of rubrics as tools for project advisors and board members to structure the assessment. In this paper, we report the experience in the Engineering School at Universitat Pompeu Fabra (Barcelona) employing a rubric-based approach as part of an assessment guide (with a web-based support tool) for BFP. The guide has been evaluated using quantitative and qualitative data gathering techniques used before, during and after the rubrics use, and the results provide insights about its utility, pertinence, user-friendliness, preciseness and actual adoption. Findings led to the provision an additional feature in the web-based tool for the integrated assessment of transversal and specific competences and a view of a summarized version of the rubrics that can be used using mobile devices.

Keywords:

Formative assessment; summative assessment; Bachelor's Final Projects; engineering education; tool; assessment rubrics.

Resumen

El papel del Trabajo Fin de Grado (TFG) en Ingeniería es crítico dado que ofrece la oportunidad al estudiantado de integrar y aplicar las competencias, tanto específicas como transversales, desarrolladas a lo largo del grado. Sin embargo, dadas sus características académicas (personalizado de acuerdo con los intereses del estudiante, el número de profesorado implicado, la evaluación mediante un tribunal, etc.), la sistematización de la evaluación formativa y sumativa del BFP es un elemento considerado tan necesario como complejo. Para abordar la complejidad de ambos procesos hay múltiples iniciativas recientemente reportadas a la literatura que proponen el uso de rúbricas como herramienta para asesorar y monitorizar tanto el proceso como el producto. En este artículo analizamos la experiencia de la Escuela Superior Politécnica de la Universitat Pompeu Fabra (Barcelona) basada en la aplicación de rúbricas como parte de una guía de evaluación (con apoyo de una herramienta web) para los TFG. Esta guía fue evaluada cuantitativa y cualitativamente tanto antes, como durante y después del uso de las rúbricas y los resultados obtenidos nos permitieron conocer su valoración en términos de utilidad, pertenencia, usabilidad y precisión. Los resultados nos llevaron a realizar cambios para aportar nuevas prestaciones a la herramienta web dirigidos a la integración de la evaluación de competencias transversales y específicas, así como el diseño de una versión de la rúbrica resumida para su uso a través de dispositivos móviles.

Palabras Clave:

Evaluación formativa; evaluación sumativa; Trabajo Fin de Grado; formación en ingeniería; herramienta; evaluación mediante rúbricas.

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1. Introduction

As one of the critical aspects defined in the European Higher Education Area (EHEA) and its particularization to the Spanish system, the Engineering School of Universitat Pompeu Fabra (ESUP-UPF) has worked on the design of the formative and summative assessment used in Bachelor's Final Project (BFP). BFP is a mandatory subject for all Bachelor's degrees (all disciplines) offered by the Spanish universities. As the rest of subjects, the BFP should be competence based (Navío, 2005; Sánchez y Gairín, 2008; SENA, 2003), but it has also specific characteristics that make it significantly different from the rest of subjects, for example: the topic of the project is different for each student and this topic is agreed between the student and a professor acting as the advisor of the student, it is based on a complete project which should be defended in a public defense, it could be related to business, etc. The BFP is planned and developed by the student autonomously but with a progressive formative assessment of the teacher. It is worth noticing that the BFP at the ESUP-UPF involves a significant number of ECTS (European Credits Transfer System), namely 20 credits that represent 500 hours of student work. In their BFP students are expected to apply both specific and transversal (or generic) competences that they have developed along the degree, this includes special attention to innovation and creative skills. The high dedication to the BFP enables the elaboration of projects considerably ambitious and, in most cases, connected to the professional careers the students want to follow after finishing their Bachelor's Degree.

All these properties make the BFP a good opportunity to contribute to the achievement of the new missions, roles and expectations of Higher Education as pointed out by the European Commission. European universities have formulated their approaches to the BFP (University of Twente, 2014), designing a complete syllabus for that special subject (University College Denmark, 2014) or a specific regulation shaping the BFP elaboration process (Technishe Universiteit Eindhoven, 2014). Specific studies also analyze the learning effects of education actions designed to support the development of BFPs (Miihkinen & Virtanen, 2014). The Teaching Quality and Innovation Support Unit of ESUP-UPF has worked for the last 3 years in a Teacher's Guide to Monitoring and Assessment of BFP. The efforts have included the design of the Guide based on related international initiatives, its evaluation in experiments, and the iterative revision of the Guide. In parallel a Web application implementation of the Guide has been developed to facilitate its use and foster its adoption by ESUP-UPF professors. This paper summarizes the whole process and focuses on the last iteration,

which emphasizes the adaptations done to the assessment tools (assessment instrument and Web tool implementing the instrument) based on findings derived from context in which the tools are used.

The remainder of the document is organized as follows. Section II describes the research objectives proposed; the third Section is focused on the methodology, Section IV explains the results obtained in the evaluation of the Guide, and finally, Section V summarizes the main conclusions of this work and the future action that we will do to improve the tools we had developed.

2. Research focus and methodological approach

Considering the contextualization of the research so far presented, each of the basic and defining elements of the research are listed below, including the objectives, the methodology, the phases and other relevant questions about the process followed during the study carried out.

2.1 Objetives

The approach on which this research was based was on the need to generate a common framework to all professors from ESUP whom could participate in a BFP as an advisor or/ and as an assessment board member. This framework must be helpful in different terms such as providing teachers some orientations and standards to carry out the monitoring and assessment processes considering BFP's characteristics.

Then, the aim of this research was to design a Teacher's Guide to Monitoring and Assessment for BFP characterized by ease-of-use, its rigor and relevance (in terms of criteria) and by its consistency and appropriateness in terms of the specific ESUP BFP context.

2.2 Methodology

The research methodology could be defined as qualitative with the application of some quantitative elements to identify trends. The methodological approach followed was Design-Based Research (DBR) in a specific case study (Arnal, Del Rincón & Latorre, 1996). This approach highlights the role of context in which the research is framed and the need of iterative exploration. Wang & Hannfin (2005) describe design-based research as a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration

among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories. The five basic characteristics of DBR are: (a) pragmatic; (b) grounded; (c) interactive, iterative, and flexible; (d) integrative; and (e) contextual. Rinaudo & Donolo (2010) highlight that DBR requires a mixed methodology considering the complexity of variables. The Design-Based Research Collective (2003) agrees that DBR helps to understand the relations between the educational theories, the tool designed and the daily practice in a real context.

We designed the research considering the ESUP and the BFP characteristics as the context. The focus of study is a Teacher's Guide to Monitoring and Assessment for BFP developed to support teachers as advisors and evaluators of the final projects. We describe next the design-based research phases followed.

3. Iterative phases inthe design of the BFP'S guide

The previously existing situation around final degree projects (called PFCs, standing for "*Proyecto Final de Carrera*" before EHEA/ ECTS) at the ESUP provided an entry point to the designing of the phases and actions to follow. From that situation on was where the ESUP's Unit of Support to Teaching Quality and Innovation (USQUID-ESUP) started working on several projects leading to a creation and iterations of the Teacher's guide to monitoring and assessment for Bachelors Final Projects. A first phase, entailing the creation of the guide, started in the 2010-2011 academic year (see Table 1).

After the study in depth of the context and analysis of needs observed in Phase I, we confirmed that rubrics could be the best option to manage both monitoring and assessment processes. Facets to be considered in the rubrics were collected and several drafts sketched. During the process of revising and optimizing the rubrics we took the advantage of coordinating a national project entitle "Practices towards the excellence in the implementation of Bachelors Final Projects". The project facilitated multidisciplinary scenario involving several universities and experts to debate, reflect and share

Description	Based on the reflection around the perceived need related to a common framework to handle the BFP monitoring and assessment processes. Contrast potential guidelines for the common framework with current and former academic managers were interviewed (e.g. Head of School, coordinator of final projects).

Phase objectives	• Promote and strengthen linkages and communication between teachers involved in BFP. • Improve the general organization of BFP based on the learned lessons in PFC. Weaknesses detected in previous experiences are studied in depth; anticipate issues and formulate improvement mechanisms. • Develop a list of guidelines considering a well balance between useful and clear orientations for teachers and students, and the provision of flexibility with the idiosyncrasy of the BFP's particularities. • Getting a pedagogical tool for teachers. The feasibility and consistency of these guidelines with the other academic elements of the curriculum were an important aim of that first approach. • Making an easy and friendly tool also for students. It was important to let students know in a clear way the expectations of the BFP from different perspectives (e.g. assessment criteria, different levels of domain for each competence that will be assessed, etc.).
Results and other observations	As a result of this reflection the first guidelines and orientations focused on both BFP monitoring and assessment processes were defined.

Table 1. Phase I, 2010-2011 academic year

Description	During this second phase the USQUID-ESUP was working on the first guidelines and orientations optimization done during the first phase. Previous learned lessons about BFP in other contexts and ESUP teachers' opinion were considered in this phase.
Phase objectives	Optimization of the guidelines made in the previous phase considering learned lessons of other universities about BFP and ESUP teachers' opinions. To achieve this objective two basic actions were done: • Collection of evidences and feedback from professors who use the guide, basing their opinion and feedback on the implementation of the rubrics and orientations included in the Teacher's Guide to Monitoring and assessment the BFP. Basically the topics discussed about were related with: continuous assessment, use of rubrics as an assessment tool, need to consider not only specific competences but also transversal/general ones.

Results and other observations	The results were used to refine the guidelines. The outcome was reflected on the Guide making reference to the following points: • The importance of the continuous assessment based on competences-> considered on the monitoring rubric tool included on the guide. • The need to reflect on the pertinence of designing and developing training for teachers focused on using rubrics during assessment processes-> Some orientation of how to use the guide were included. • Promotion of student's autonomy-> the guide proposed three mandatory meetings with the tutor to keep the student's autonomy and continuous work at the same time. • The indisputable need to include transversal/general competences in the general framework of BFP->the rubrics designed included both transversal and specific competences to be assess.

Table 2. Phase II, 2010-2011 academic

experiences and background about BFP in different context. Following, in Table 2 we present the second phase.

After this second phase, a first pilot was carried out during the same academic year (2010-2011). As could be seeing in the following table (Table III), this first pilot affected only in our School.

After this first test and the analysis of the lesson learned, other experimentation was carried out. It this case, over 25 experts in engineering education and pedagogy were working on it. Details of this fourth phase follow (Table 4).

Figure 1 shows an annotated screenshot of the website supporting an interactive use of the guide.

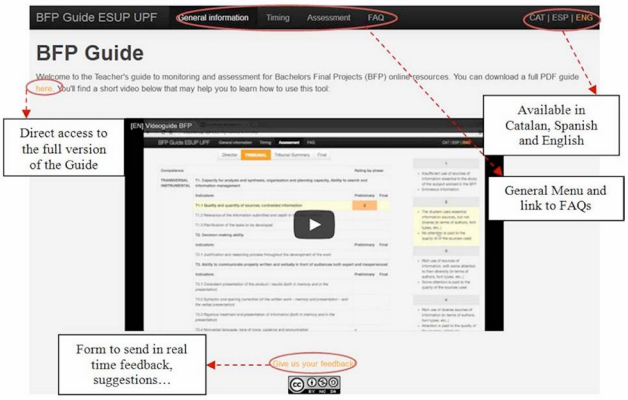

Fig. 1. Screenshot of the Web application implementing the Guide, available at http://www.usquidesup.upf.edu/BFP/index.en.php

As shown in the screenshot, the online version contains both the complete version

Description	First iteration: This phase was based on the guide testing, specifically on the experimentation of the assessment rubrics. The opinion of professors related to the orientations given within the guide was also considered in the test, most of them related to the need of planning at least three meetings with the students, the importance to consider, not only the product of the BFP, but also the process.

Phase objectives	The aim of that first testing was the recollection of evidences and feedback to improve the Guide, basically about these points: • Self-awareness of the need to have an instrument to make both monitoring and assessment processes of BFP (by teachers) easier and more systematic. • Consideration about the importance and usefulness for professors to have a common framework to carry out the BFP assessments, including indicators and criteria to make the process more objective (by teachers). • Predisposition for using rubrics as a tool for both monitoring and assessment of BFP (by teachers). • Perception about usefulness and importance to consider in that kind of tool, both continuing assessment and transversal competences. • How relevance and univocal are the indicators and assessment criteria provided in the Guide. Pointing out specially the different levels of domain defined to achieve professors' consensus.
Results and Other information	The opinion of the stakeholders about the Guide was collected using a questionnaire. A total of 15 professors (representing a 48.4 % of the professors supervising BFP) and 19 students (67.8 % of the students completing a BFP) participated in the study.

Table 3. Phase III, 2010-2011 academic year

of the Guide and the rubrics to monitoring and assessing the BFP. After designing this website we have tested it and collected data from professors and students.

It is important to keep in mind that the formulation and pertinence of the indicators and the rubrics were evaluated based on the quantitative and qualitative opinion of the professors using the Guide.

As shown in the screenshot, the online version contains both the complete version

of the Guide and the rubrics to monitoring and assessing the BFP. After designing this website we have tested it and collected data from professors and students.

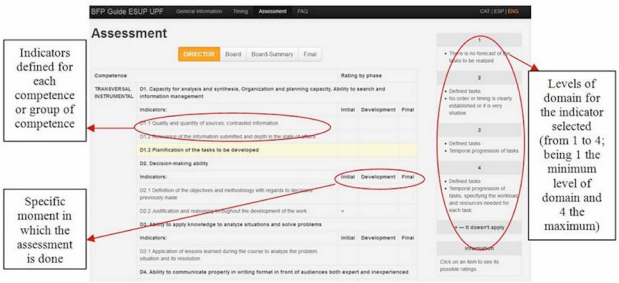

Fig. 2. Screenshot of the Web application implementing the Guide, available at http://www.usquidesup.upf.edu/BFP/valoracio.en.php

Description	In an advanced and more practical stage of the national project previously mentioned (Practices towards the excellence in the implementation of Bachelors Final Projects) the USQUID-ESUP carried out another experimentation

Phase objectives	The aim of this project was to define excellent practices related to the monitoring and assessment of BFP. Project points directly related to the Guide designed by USQUID-ESUP were: The experimentation in 8 boards and the monitoring of 11 PFC. Note that the assessment process was carried out following the traditional system considering that the Guide was not completely tested and, in some cases, the PFC were in an advanced stage when the experimentation started. Analysis of the possibilities to transfer the orientations/actions collected on the Guide to other contexts as excellent practices. Creation of an online version of the Guide to promote and make its access and use easier. Dissemination of the Guide through several channels (such a USQUID-ESUP website, School website) and analysis of the access statistics and material use. Planning actions related to the impact assessment focused on both teachers (tutor and board member roles) and students.
Results and Other information	The aim actions done were the web application to promote the use of the rubrics and to make the work more visible (see Figure 1 and Figure 2). The results will be presented in detail on the *results section.*

Table 4. Phase IV, 2011-2012 academic year

It is important to keep in mind that the formulation and pertinence of the indicators and the rubrics were evaluated based on the quantitative and qualitative opinion of the professors using the Guide.

After the phases described a new improvement process took place, described in Table 5.

The Guide was revised according to the improvement considerations described and established as the official guidelines to be used at the School (from experiment to implementation –2012-2013 academic year –). Training sessions were run for the professors involved in advising BFP. The

Description	Improvement on Teacher's guide to monitoring and assessment of BFP based on the reflection, collected data, professors' proposals and other actions focused on testing the Guide improvements (Moreno, Hernández-Leo, Camps & Melero, 2012; Hernández-Leo, Moreno, Camps, Clarisó, Martínez-Monés, Marco-Galindo & Melero, 2013).
Phase objectives	The aim of this phase was focused on the revision of the Web application (Hernández-Leo & Moreno, 2013).

Results and other information	Following a summary of actions/ improvements made: • A more dynamic and interactive use of the Guide during the BFP defense and the discussions of the board. • The grades are automatically calculated considering the weighting coefficient of each rubric for the indicators associated to the diverse competences. • Professors can generate and download a PDF version of the rubrics when the assessment is done. In this way, every BFP advisor can register the students' progress; share it with the students, etc. • Students could look up the assessment criteria and simulate their potential grade considering a self-assessment of their progress.

Table 5. Phase V, 2012-2013 academic year

use of the Guide was not strictly mandatory for the professors (especially for those with experience supervising and assessing PFC), but training sessions were run for those interested in its use. At the end of the defense period of the 2012-2013 academic year another study based on a questionnaire was made (see Table 6).

Before BFPs presentations the BFPs coordinator sent a reminder to all ESUP teachers talking about the Guide and its new shorter rubric to be used as an assessment tool. Is not possible to present quantitative results related with its use but we have some data about the guide website accesses during this period. Next section contains this data and a summary of results found in the two different interactions and the improvements done in the Guide as well.

Description	Study based on a questionnaire.
Phase objectives	The aim was focused on understanding the degree of use and opinions about guide's utility, pertinence, in which BFP phase is perceived more useful by tutors and how difficult is perceived by the board the management of using the rubrics during the BFP presentation.
Results and other information	Results will be presented in details in *results section*. They are related with how teachers use the guide and their reasons to use it or not, for which kind of process they consider this guide more useful (monitoring and/or assessment) and which kind of improvements could be done.

Table 6. Phase VI, 2012-2013 academic year

4. Results

In this section we summarize the results obtained in first iteration (teachers using the rubrics). As presented before, the first iteration was on the Academic year 2010-2011 (Table 3. Phase III). This evaluation was based, specifically, on the experimentation of the assessment rubrics. The aim of that first testing was the recollection of evidences and feedback to improve the Guide. The opinion of the stakeholders about the Guide was collected using a questionnaire. A total of 15 teachers (representing a 48.4 % of the professors supervising BFP) and 19 students (67.8 % of the students completing a BFP) participated in the study. The main results from the analysis of the data are:

- 92.3 % of professors completing the questionnaire consider that the Guide could be a useful tool to improve the assessment process of BFP taking into account that it considers the evaluator functions (e.g. assessment criteria and competences to be evaluated).
- 100 % of students completing the questionnaire consider the formative assessment as an important way to take into account the work done during the whole process.
- 68.4 % of students perceived the positive impact of knowing in advance the assessment criteria on their work (especially during the process) to, for example, balance the efforts and improve their work.
- 53.9 % of professors agree/totally agree about how the Guide developed could be helpful to standardize the BFP quality and assessment criteria in both monitoring and assessment processes and 100 % of them acknowledge the worth of the Guide to decrease the evaluator's subjectivity.
- 94.7 % of students consider advisor's feedback as a quality key element during the BFP development.
- 100 % of teachers consider the importance of both monitoring and assessment processes to increase the quality of BFP and 84.7 % also consider the importance of establishing a continuous contact with students to assure a good work routine.

Results of this first iteration show trends in the way they are considerations and reflections about how useful they perceived a rubric system to carry out both monitoring and assessment processes.

5. Final Iteration

The second iteration, carried out on 2011-2012 academic year (Table 4. Phase IV) was,

as we presented in the section above, focused on specific improvement aspects after using the rubrics by the web tool designed. A summary of the results follows:

- We collected the opinion from the 48.3 % of teachers who acted as advisors and 77.8 % of board members.
- All advisors asserted that they had consulted the Guide, but not all of them used it as an assessment tool, concretely 35.7 % of them affirmed that they used it during the whole process, 35.7 % affirm that they used in different parts (but not in all) and finally, 28.6 % affirm that they did not use it at all (they just looked it up while the assessment process).
- The same question but answered by board members indicated that 58.3 % confirmed its usage.

In the analysis of the explanations about why some of them used or not used the Guide, we found the following arguments: on the one hand, professors emphasized the timing proposed because it includes a specific monitoring process; the assessment criteria and the possibility to show their students how (why) and when they will be evaluated. On the other hand, teachers considered that the rubric is too long to be used during the BFP defense.

We also asked professors and board members about the clarity, rigorousness, and usefulness of the Guide. 38 % of them considered the Guide especially useful for the formative assessment process, a 24 % consider it especially useful for both the formative and summative assessment and, finally, a 24 % consider the Guide especially useful for the final assessment.

As a final comment, the participants highlighted that the establishment of assessment criteria was easier with the Guide (67 %). Nevertheless, participants, as in the first test, perceived the need to have the chance to include explicitly the specific assessment competences and also, they suggested to "simplify" (shorten) the rubric for the defense evaluation.

As we said before, each BFP is different, so, including all specific competences in the Guide seems to be a difficult task and not so appropriate because it is not feasible to cover all the possible specific competences. To address this problem, we were working on the online Guide version to enable professors the formulation, by themselves, of the specific competence. As with the transversal ones, the application is now able to calculate the final BFP qualification considering the weight assigned to these competences.

The USQUID-ESUP has also worked to meet the need of having a shorter version of board's rubric. To make this shorter version we considered the number of indicators and criteria taken into account in the first version to prevent an unfair treatment between boards who will use the longer rubric version and the ones who prefer the shorter version. It also considers a weighting coefficient for the indicators to minimize an unfair effect depending on the rubrics used. The following aspects have been considered to match given

the long and short rubrics (Figure 3):

- The longer version has 10 indicators to assess the transversal competences; the shorter, 3. This matching is made considering that all indicators and criteria are presented in both short and long versions.
- The shorter version includes the preliminary assessment carried out by the board two or three weeks before the presentation. We let professors know the importance of taking into account this previous assessment to prevent an unfair treatment between both longer and shorter version (preliminary and final).
- The levels of each indicator domain are defined in general; emphasizing in how sufficient is each one to indicate the possible levels (from 1 to 4). Like in the other cases, there is the option to indicate that the indicator does not apply.
- It is also considered the option to write the specific competences for each BFP (up to a maximum of 4), and use the general description to indicate the domain level as well.
- A general formula to calculate the grade of each BFP was also included, the final grade appears in a qualitative mode as an orientation (this grade could be fit by the board/tutor) according to other variables observed during the BFP development or/and presentation.

To make the match between both rubrics to assess the BFP by the board explicit, the criteria from the long version included in each indicator of the shorter version are indicated at the end (in brackets). The levels of domain are, as can be seeing in the screenshot (Figure 3), general, that is to facilitate their use for all cases but the third indicator is different (TR.2.1 The Presentation: resources/support material, verbal and non-verbal communication), in

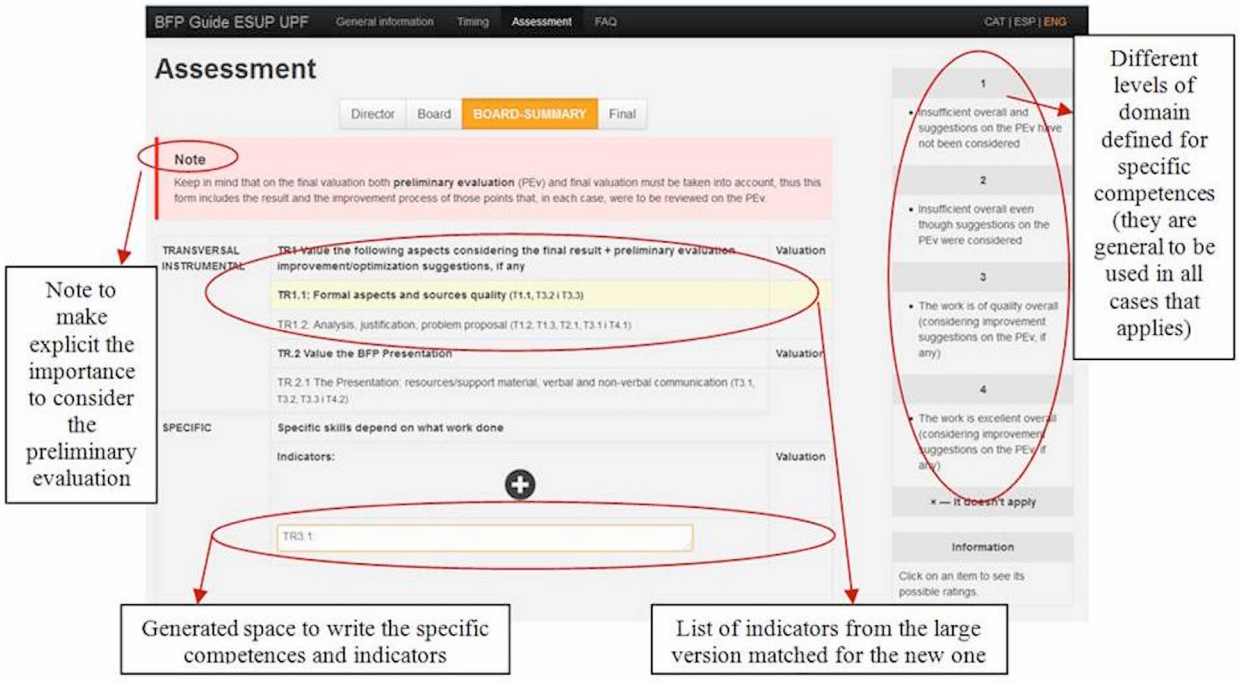

Fig. 3. Screenshot of the board summary of the rubric included on the Web application implementing the Guide, available at http://www.usquidesup.upf.edu/BFP/valoracio.en.php

that case the evaluation is done using the scale 1 to 4 being 1 insufficient quality, 2 sufficient quality, 3 excellent quality and 4 beyond expected.

About the specific competences edition and assessment, should be consider a different scale of domain levels, based, broadly speaking, to be applied in all cases. At the end of this page, the grade calculation could be done distinguishing between transversal competences and specific ones. Once the assessment process is over (either in the case of the director's sheet and the two people of the board), two actions can be done: calculating the grades of the assessed competences, and download the resulting table in pdf with the grades corresponding to the achievement levels for each competence. The grade appears following another scale, which includes: pass (SUF), pass+ (SUF+), notable (NOT), notable+ (NOT+), and excellent (EXC) (Figure 4).

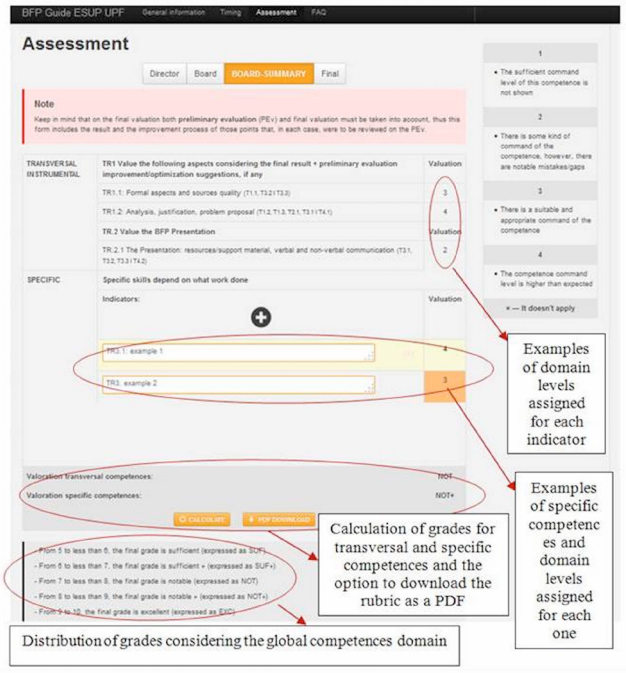

Fig. 4. Screenshot of the board summary of the rubric showing an example of BFP assessment (including grades for each competence both transversal and specific) with the final grade and orientations, available at http://www.usquidesup.upf.edu/BFP/valoracio.en.php

When the whole process is over (both formative and final assessment made by Director and board after the presentation), it is time to fill the *Final* table, in which grades should be added and calculated previously and obtain a FINAL qualification for the BFP (Figure 5).

To make the web tool use easier, we also have worked on a video guide, which includes some

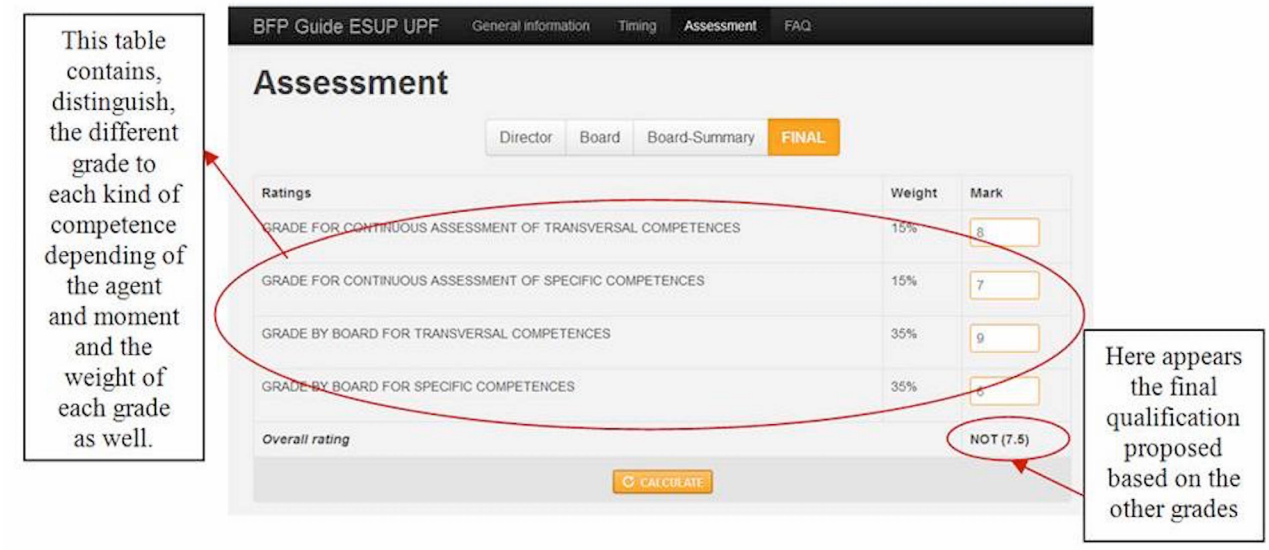

Fig. 5. Screenshot of the final table in which grades should be added and calculated previously and obtain a FINAL qualification for the BFP the board summary rubric http://www.usquidesup.upf.edu/BFP/valoracio.en.php

tips to manage the sources within the web (planning orientations, FAQs, rubrics, etc).
This video guide is available in English, Spanish and Catalan. Focusing on the evaluation of the improvements carried out after the second iteration, it is necessary to keep in mind that the official period of presentations is in July, then, this process will take place after July. However, we are checking the website access to know if users are consulting the web tool made for both BFP monitoring and assessment processes and which support sources are read the most. The formal period, considering the study plans, to start working on BFP begins after Christmas (second quarter), so we have been analyzing the access data to the web tool. Following a summary of the most significant information found considering the period from January 12th to July 8th (2015):
-There have been 1347 sessions. Almost 596 from Spain.
-These 1357 sessions include over 2268 pages visited, concretely:

- Home page/General Information (which includes the video guide, the general view and a banner with all the resources you can find): 1457 visits (64,24 %).
- Assessment resources (including rubrics for monitoring and assessment processes, the final table to calculate the grade, etc.): 374 visits (16,49 %).
- Timing information (which includes a description of the different suggested phases that may provide the BFP an essential structure and other basic features of the subject, such as ECTS number, ECTS distribution throughout the course, etc.): 306 visits (13,42 %).
- FAQs: 104 visits (4,56 %).

It needs to be considered that more than 1775 sessions (more than 40 % in Spain) run into the typical period of most intensive work of BFP. During this period, teachers are monitoring student's progress in their BFP.
Considering the results of both iterations and reflections done during the whole process we present some conclusions and future derived actions.

6. Conclusions and Future work

In this section conclusions and future work are presented. This work was focused on the design of a guide to support teachers in the BFP monitoring and assessment processes. Iterations along several academic years allowed us to make improvement actions towards defining a framework adapted to their needs from both academic/pedagogical and logistic perspectives. Our experience shows that the specific design of assessment instruments to be used in a real context by the teaching community is not a trivial task as this kind of resources should consider several variables.

Besides, considering the competences to be assessed and the state of the art, it is important to understand the perception of the users about these instruments in its context of use. This paper explains the process followed and details two iterations in the design of rubrics for the formative and final assessment of Bachelor's Final Projects at Engineering School (UPF). The first iteration was focused on using rubrics as an instrument for monitoring and assessing the process and product of BFP made by students, and the second, final, iteration focused on the experience using them, collecting data about their perception in means of pertinence, and satisfaction as well.

The main change in the second iteration was on the design of a complementary shorter rubric that can be easily used by board members. During this period we also made a video-based manual to facilitate the use of the guide. We consider necessary to make the evaluation of this new shorter rubric in the short term. This evaluation will provide insights about how teachers perceive this new rubric, including the mechanisms proposed to evaluate the specific competences.

7. Acknwoledgement

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