

Peer reviewed courses in OpenCourseWare at Universidad Carlos III de Madrid: towards a P2P assessment system for OERs

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Abstract

Peer review is common practice with scholarly papers and articles prior to publication, but this is not quite the case with educational content, particularly with Open Educational Resources (OERs). The Quality Group for the OpenCourseWare (OCW) Project at Universidad Carlos III de Madrid decided to set up a system to validate the quality of the teaching materials published on its OCW site. This paper describes the process involved and the results obtained as well as current and future developments to improve the system. It is hoped that this will be of interest to other institutions running OpenCourseWare projects, whether they be newcomers or experienced practitioners in the field.

Keywords: Quality control, peer review, Open Educational Resources, OpenCourseWare, pedagogical design, self-learning, eduCommons, Moodle, rubric

1. Introduction

Peer review consists in evaluating a colleague's work, projects, papers, and why not, courses and other educational resources. It is common practice in scholarly communication among researchers and scientists that share their publications as a means of quality control of their research findings. Peer review has been considered the "holy cow of science" (De Vries, 2001) that has even been challenging the quality of Open Access for the last decade (*Nature*, 2006). Regularly, when an academic journal receives a paper for publication, the editorial board sends it out to several experts in the field for a blind or anonymous review. These experts send back their comments about the quality of the paper and suggest corrections, amendments, more research to support the findings or even reading some of the uncited literature on the field.

On the other hand, in the realm of teaching and learning, peer review has not been very popular. In higher education quality control has been traditionally devoted to students' assessment of teacher's performance. There are some cases of evaluating peer review of teaching portfolios on applying for tenure, or some initiatives of peer review of faculties performing teaching in particular fields like health education, pharmacy (Davis, 2011) and nursing (Murphy and Bradshaw, 2013).

More and more peer review has been introduced as a way of student evaluation in e/b-learning courses (Lundquidst, 2013). Now, when open education is gaining momentum through MOOCs, Open Educational Resources (OER) formal declarations, etc. it is time to start creating a culture of quality assessment that could legitimize both the particular evaluated resource/course and Open Education as such. In this sense, there are already some initiatives trying to address OER's quality assurance, both at repositories' design level (Atenas & Havemann, 2013) and at course level (UKOER Evaluation, 2013).

In this context, the Vice Rectorship of Infrastructures and Environmental Affairs of Universidad Carlos III de Madrid (UC3M) raised the issue of implementing a quality control system for the incoming courses to be published in its OpenCourseWare course collection. Given the academic context where this project is established, it seemed affordable and adequate to apply the peer review system of academic papers to educational resources. This paper summarizes the process of creating such a quality control system as well as the instruments (rubric) and procedures put in place to guarantee a successful experience.

2. Background

The OpenCourseWare project was launched at UC3M in 2006 and currently has 221 courses on its OCW site¹ in the fields of engineering, humanities and social sciences. In 2010 it was decided to set up a Quality Group² whose objectives are to: veil for the quality of the contents and the impact of the courses published on the UC3M-OCW site; determine the organizational criteria and the content structure to which the OCW courses have to adhere; and foster promotion of OCW courses and their relationship with the degree programs offered at UC3M. This group is composed of representatives of the following areas: graduate studies, postgraduate studies, quality issues, online education, OCW Office, and is coordinated by the Vice-Rector for Infrastructures and Environmental Affairs.

The main tasks undertaken by this working group involve managing the annual call for proposals to be submitted by faculty to take part in the project, selecting the courses to be published on the OCW-UC3M site, overseeing the quality of the courses, and fostering faculty participation in the awards for excellence in OCW launched by the Open Education Consortium and Universia, the Spanish OCW consortium.

3. Quality control

Transition to Open Access has been expected to enhance quality assurance and evaluation of scholarly output by fostering the development of more effective peer-review that allows interactive forms of review and discussion, permits more efficient and more inclusive selection of referees and gives referees more information with which to do their work. (Pöschl, 2006).

A peer review system for quality control should take into account aspects such as the technical platform, referee selection, blind/open review, matching or random association of authors and reviews, etc.

The following sections describe the validation process and the peer review system set up at Universidad Carlos III de Madrid to guarantee the quality of the OERs published in the form of courses on the OCW site.

¹ <http://ocw.uc3m.es>

² <http://ocw.uc3m.es/comision-de-calidad-1/comision-de-calidad>

The first step was to draw up a questionnaire covering technical and pedagogical quality aspects that an OCW course should fulfill. It was decided that the OCW Office staff would be responsible for carrying out the formal technical review concerning aspects such as correct use of Creative Commons licenses, intellectual property rights, metadata, etc. A similar review had been done in the past but in a less formal manner without the use of a specific questionnaire. The Quality Group would undertake the review of the pedagogical aspects, for example the balance between the theoretical and practical content, the degree to which the course fosters self-learning, the clarity and coherence of the didactic proposal, etc. Exactly how this would be carried out was a topic of some debate for quite some time that was affected by changes in the university management team and consequent changes in members of the Quality Group.

Parallel to this debate and in the framework of the MAREA (Multimedia and OERs) initiative at UC3M, the OCW Office did a survey of other OCW Offices at a number of Spanish universities to determine whether quality control of the teaching materials published on their OCW sites was common practice. Ten universities responded and the results of the survey showed that in all cases the OCW Office staff carried out a technical review of the contents. However, only four universities (UM, UNED, UPM and UPV) took this a step further to review pedagogical aspects of the course contents in one way or another.

Finally, in 2013 a sub-committee was formed within the Quality Group that is composed of the Vice Deans for Quality at the Faculties of Social Sciences and Law, and Humanities, Communication and Library Sciences, and the Assistant Director for Quality at the School of Engineering. This Review Committee³, coordinated by the Deputy Vice-Rector, is responsible for implementing the validation process of new OCW courses to determine whether they meet sufficient quality criteria to be published on the OCW site.

4. The validation process

The first task undertaken by the Review Committee was to draw up a rubric for evaluating OCW courses. It was composed of ten items which were evaluated on a scale of 0 to 2, and in some cases 0 to 3. Each member of the group tested the rubric by evaluating two OCW courses. As a result of this trial run, it became clear that this validation process would have greater value if a peer review system were set up. This would require involving more reviewers and it was decided to approach faculty who had published an OCW course in the past and had received an award or mention either from the OEC consortium or Universia.

It also became evident from using the evaluation rubric that some courses lacked sufficient teaching materials, as just publishing the PPT presentations used in class was not enough. In some way the teacher's lack of presence had to be compensated for by supplementing these slides with a guide or video including the lesson summary. The same could be said for the exercises and practice materials, that in many cases were not self-sufficient and the student needed additional help in order to be able to tackle them appropriately. In

³ <http://ocw.uc3m.es/comision-de-calidad-1/comision-revisora>

particular, there was a lack of tests and self-evaluation exercises with solutions that could help the student gauge his learning process.

In order to help faculty with the process of preparing materials and creating courses that would meet a suitable degree of quality, the Review Committee drew up a series of guidelines in the form of a '*Guide for the OCW Pedagogical Model*'⁴. The aim of this guide is for OCW courses to adhere to a coherent pedagogical design that will encourage self-learning, whether they are intended for students, self-learners or teachers.

The idea was to move away from the traditional model of a repository of stand-alone course materials towards a model of self-contained courses that adhere to a pedagogical design that will foster self-learning by providing sufficient materials and feedback mechanisms for the student. This model is contemplated as being half-way between a traditional OCW course and a MOOC (Massive Open Online Course).

5. The peer review system

The peer review system had to be tackled in two ways: faculty had to be enlisted as reviewers and a technical support system had to be set up so that the review process would function correctly.

Twenty-three teachers who had received an OCW award or mention were contacted by the Vice-Rector. Fifteen agreed to taking part in the process, the rest declined for various reasons.

Initially the OCW Office considered setting up the review system on the *eduCommons* platform on which the UC3M-OCW site is built, since the workflow includes the state of '*Quality Assurance*' in which materials can be screened before being released for publication. Reviewers would be assigned the QA role. However, since the review would be based on a rubric it was decided to use the university's LMS (Learning Management System), *Moodle*, which includes the functionality of grading by rubric.

So that the system would be completely anonymous a 'course' was created in *Moodle* for each reviewer where a series of resources were published: instructions for the review process, a link to the course on the OCW site, and a link to the course rubric in *Moodle*. (See Figure 1) Once the reviewer selects the corresponding scales on the rubric, *Moodle* calculates a grade in the form of a percentage. The reviewer can also include comments for each item of the rubric and general comments at the end.

The review process of the courses resulting from the 2013 call for proposals (CFP) was carried out in two stages. In November 2013, twenty-one courses that were ready for publication were reviewed and in February 2014 another nine. Each reviewer had to evaluate four courses.

⁴ http://ocw.uc3m.es/comision-de-calidad-1/recursos/Guia-modelo_pedagogico



Figure 1: Peer review ‘course’ in Moodle

The Review Committee met after each review process had been completed to study the results in detail and decide which courses were eligible for publication. Only courses with an average minimum grade of 70% would be considered suitable to be published. In most cases there was a considerable degree of similarity between the peer reviews and grades for each course. In those cases, three in all, where there was a considerable difference between the peer reviews, the Review Committee carried out a third review before making a final decision.

As a result of this peer review process eighteen courses were published. The following table shows the total results.

Nº Courses	Resulting Grades
2	40% - 49%
6	50% - 59%
4	60% - 69%
11	70% - 79%
4	80% - 89%
3	90% - 100%
Total courses reviewed	30
Nº courses published	18

Table 1: Results of peer review process (2013 CFP)

In the case of those courses that were not considered eligible for publication the Review Committee drew up a series of recommendations which were approved by the Quality Group and then sent to each teacher/author by the Vice-Rector. The recommendations were generally along the lines of: adapting the course to the self-learning model; including more self-explanatory study materials; adding guides or worked examples for the practice materials; and inserting tests with solutions for each lesson to enhance the user's self-learning experience. Once the teachers improved their course materials and considered that they were ready for publication the courses were evaluated by the Review Committee, instead of being submitted again to the peer review process. As a result, three more courses have been published bringing the total up to twenty-one.

The peer review system was repeated again in February 2015 to evaluate the nineteen courses ready for publication from the 2014 call for proposals. As a first step, and based on the previous year's experience, the Review Committee set to work on a more refined version of the rubric, since we felt that certain aspects had to be defined more specifically.

We began by defining the ten criteria of the rubric as can be seen in Table 2.

	Criteria	Definition
1.	Balance in the general distribution of course materials	There has to be a balance in the distribution of the study and practice materials and they have to complement each other.
2.	Number and variety of study materials	Each module of the course must have study materials. It is important that they are presented in different formats (audiovisual presentation, guides, lessons, summaries, PPT presentations, ...)
3.	Number and variety of practice materials	Each module of the course must have practice materials. It is important that they are presented in different formats (exercises, practical cases, tests, ...). There should be a feedback mechanism so that the learner can check his/her progress.
4.	Self-assessment tests	Each module of the course must have self-assessment tests. It is important to provide the solutions so that the learner can check his/her answers. It is recommended to present the tests in an interactive online format so that the learner can get instant feedback.
5.	Self-learning format	It is important for the course to foster self-learning. The study materials should cover the full syllabus. The practice materials must

		provide feedback mechanisms so that the user can evaluate his/her learning process.
6.	Number and suitability of bibliographic sources and information resources	The course has to provide bibliographic sources and online information resources. It is important that they are relevant and up to date and supplement the main course materials.
7.	Accessibility of supplementary materials	The supplementary materials have to be provided in open access format so that they are available for everyone. If software programs are used for practice exercises, etc. it is important that they are open source and available for all users.
8.	Adequacy of the didactic proposal	The course contents must coincide with the didactic proposal.
9.	Coherence of the didactic proposal	The course contents have to be interrelated and should be coherent, from a didactical point of view, with the course structure.
10.	Clarity of the didactic proposal	The didactic proposal should be clear. It is important for the course to propose innovative and interesting methodological and didactic practices.

Table 2: Definition of the rubric criteria

Once the criteria had been clearly established, we worked backwards defining each of the levels on the scale for each item of the rubric. During this process we decided to change the scale from 1 to 3 and in certain key items to include an additional level with a value of 5 points to try and distinguish those courses with excellent quality levels from the rest. The current version of the rubric can be seen in Annex 1.

The results of the peer review with the new version of the rubric can be seen in Table 3. We found that the grades of the majority of the courses (15) ranged between 60% and 79%, lower than the previous year, although the overall impression was that the general quality level of courses had improved.

In view of this situation, the Review Committee tested the new version of the rubric with two courses, evaluated the previous year, and by comparing the results of both versions of the rubric found that, indeed, the new version distinguished excellent courses but, at the same time, considerably lowered the grade of good quality courses.

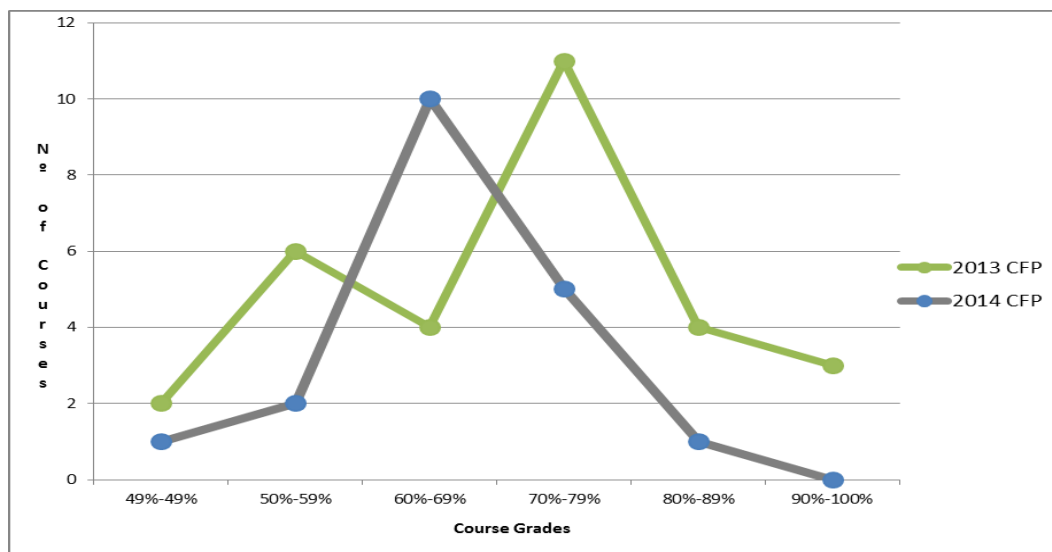
Thus, it was decided to drop the average minimum grade for a course to be published to 60%. As a result, fourteen of the sixteen qualifying courses were published, the other two are in standby since in one case there is a problem with copyright issues that has to be resolved and in the other it was lacking the lesson guides to accompany the PPT

presentations. Whether these courses plus the three that had grades below the qualifying mark will be eventually published remains to be seen. It will depend on the willingness of the professors to do further work on their courses, according to the recommendations made by the Review Committee, and we will not know the final outcome till the deadline of December 31st 2015.

N° Courses	Resulting Grades
1	40% - 49%
2	50% - 59%
10	60% - 69%
5	70% - 79%
1	80% - 89%
0	90% - 100%
Total courses reviewed	19
N° courses published	14

Table 3: Results of peer review process (2014 CFP)

The comparison of the results of the peer review of the courses from the 2013 CFP and the 2014 CFP can be seen in the following graph.



Graph 1: Comparison of course grades for courses from 2013 and 2014 CFPs

6. Conclusions

In general, we can say that the results of our first experiences with a peer review system for OpenCourseWare materials have been positive, although there is, of course, room for improvement.

The technical support system set up on *Moodle* has, on the one hand, guaranteed anonymity for each reviewer and, on the other, has simplified the actual review process by using the grading by rubric functionality.

Regarding the rubric itself, we feel that this is an important tool for peer evaluation. It is essential to clearly define the criteria and gauge the scales accordingly which may require several iterations before reaching an optimum model.

The response from the potential reviewers, 65% of the faculty that were initially contacted, can be considered satisfactory. The optimum number of faculty involved will depend on the number of courses to be reviewed. In view of the already heavy workload of our professors, we think that it is important to keep the maximum number of courses for each reviewer to two and certainly no more than three.

As for the authors/teachers whose courses have been reviewed, overall they have been receptive to this new evaluation system. Regarding the new pedagogical model that the *Quality Group* has implemented, a small number of professors have expressed certain reticence regarding its implications. The need for OCW courses to adhere to a coherent pedagogical design that will encourage self-learning requires a greater workload on behalf of the professors, as in many cases it implies developing new materials specifically for the OCW course. The advantage is that these materials can then be used in class or uploaded to the university's LMS for the benefit of their own students.

Regarding resources to help teachers understand the implication of this new self-learning design, the '*Guide for the OCW Pedagogical Model*' written by the Review Committee has been considered a useful tool and is included in the documentation⁵ for teachers in the yearly call for proposals.

As for the peer review model itself, it is a valid system not only for evaluating scholarly articles but also for evaluating Open Educational Resources. However, it should not be overlooked that peer review is a time-consuming task that allows for grant applications, but although it is costly it legitimizes quality.

When considering suitable profiles of peers for the review process, these may be other educators, other OER producers and also other experts in the domain of educational resources.

To sum up, we can say that this quality approach (peer review) is even more applicable in the context of OCW, where the submission of a course can be compared with a paper proposal in a particular field for an academic journal or for a conference. Furthermore, to base the evaluation on a rubric, intrinsically strengthens the quality of the open educational repository, as in our case of the OCW's course collection. It allows the professors preparing a course to be compliant with the rubric, even before submission for publication.

⁵ <http://ocw.uc3m.es/participar-en-el-proyecto>

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ANNEX I: RUBRIC FOR PEER REVIEW (Version 2)

Course:				
Reviewed by:			Date:	
1. Balance in the distribution of course contents	The distribution of the contents is unbalanced and/or some of them are superfluous.	There is a certain balance in the distribution of the course contents and they are complementary to a certain extent. Most of the materials are necessary.	The distribution of the study and practice materials is well balanced throughout the different parts of the course. The various contents are complementary.	
	1 point	2 points	3 points	
2. Number and variety of study materials	There is a minimum amount of study materials but it is clearly insufficient.	There is a sufficient amount of study materials, but they lack variety.	Although there is an abundance of study materials there is a need for greater variety.	The course has a large range of study materials of different varieties.
	1 point	2 points	3 points	5 points
3. Number and variety of practice materials	There is a minimum amount of practice materials but it is clearly insufficient.	There is a minimum amount of practice materials, but they lack variety.	The course has a sufficient amount of practice materials of different varieties but there is no feedback system.	The course has a large range of study materials of different varieties. There is a feedback system.
	1 point	2 points	3 points	5 points
4. Self-assessment tests	There are some self-assessment tests but they are either insufficient or provide no solutions.	There are some self-assessment tests with solutions but they are not interactive.	Self-assessment is a distinguishing feature of the course. The tests are interactive providing instant feedback.	
	1 point	2 points	3 points	
5. Self-learning format	The course format does not foster self-learning.	The course format partially fosters self-learning.	The course format fosters self-learning.	
	1 point	2 points	3 points	

6. Number and suitability of bibliographic sources and information resources	There are too few bibliographic references.	There is a certain amount of bibliographic references but not of all of them are up to date or relevant.	There is an abundance of bibliographic references that are relevant and up to date.	The bibliographic references are supplemented with relevant and useful online information resources.
	1 point	2 points	3 points	5 points
8. Accessibility of supplementary materials	The supplementary materials are not available in open access format.	Only some of the materials are available in open access format.	All the materials are available in open access format.	
	1 point	2 points	3 points	
8. Adequacy of the didactic proposal	The course content does not match the didactic proposal.	The course content matches the didactic proposal to a certain extent.	The course content totally coincides with the didactic proposal.	
	1 point	2 points	3 points	
9. Coherence of the didactic proposal	The structure and organization of the contents lacks didactic coherence.	The coherence of the contents needs to be improved in certain aspects.	The structure and organization of the contents is coherent and they are interrelated.	
	1 point	2 points	3 points	
10. Clarity of the didactic proposal	The course lacks a clear didactic vision.	Certain methodological and didactic aspects need to be improved.	The proposal is adequate from a didactic point of view but it is not particularly innovative.	The course proposes innovative and interesting methodological and didactic practices.
	1 point	2 points	3 points	5 points
OVERALL GRADE (10-38)				