

# Peer-Review Support in a Virtual Learning Environment

Martin Homola, Zuzana Kubincová, Jakub Čulík, and Tomáš Trungel

Comenius University in Bratislava, Mlynská dolina, 842 48 Bratislava, Slovakia  
{homola, kubincova}@fmph.uniba.sk, {jakub.culik, t.trungel}@gmail.com

**Abstract.** In this demo paper, we provide an overview of a peer-review facilities of our learning management system.

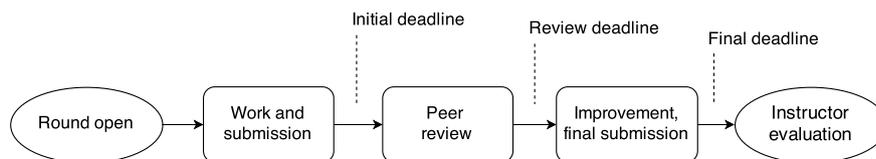
**Keywords:** Virtual learning environment, peer-review, tool.

## 1 Introduction

In the educational context, peer reviews were shown to improve the engagement with the others work, they provide a different type of feedback from a different point of view than the instructor's one [7]. Peer reviews foster discussion and experience exchange between the students, facilitating the social learning effect, a valued phenomenon according to the constructivist [6, 3] and constructionist [5] learning theories.

In this paper we describe the peer-review functionality of the learning management system developed at our faculty, that will be demoed during the PRASAE 2015 workshop. We first describe the generic workflow, then the functionality offered to the students, and finally that offered to the instructors.

## 2 Peer-Review Workflow



**Fig. 1.** Peer-review process workflow diagram

Peer reviews are provided by the Assignments module. It allows the instructor to configure and publish assignments as well as to comment on submissions and reviews, and the students to submit their work and participate in peer reviews. Each assignment may be structured into multiple submission rounds. This allows for iterative submissions of the same work.

The workflow of a single round is depicted in Fig. 1. Once the round is open for submissions by the course instructor the students work on the initial submission before the first deadline. Then in the peer-review phase the students are assigned three submissions to review, which they do before the review deadline. In the next phase they may improve their submissions before the final deadline. Once this deadline expires, the instructor evaluates the submission and the reviews as well.

The review phase and the improvement phase are optional and may be disabled by the instructor.

### 3 Student's View

Assignments > Project

Current round: Phase 2

Phase 2: Mobile layout and user interaction

Deadline: 27 November 2014

Your submission: <http://myproject.example.org/>

Submit new version:

My submissions

Round	Submission date	Deadline	My submission	Details
Phase 1	2014-10-26 20:28:47	2014-10-27	<a href="http://myproject.example.org/">http://myproject.example.org/</a>	<a href="#">details</a>
Phase 2	2014-11-26 14:00:47	2014-11-27	<a href="http://myproject.example.org/mobile">http://myproject.example.org/mobile</a>	<a href="#">details</a>

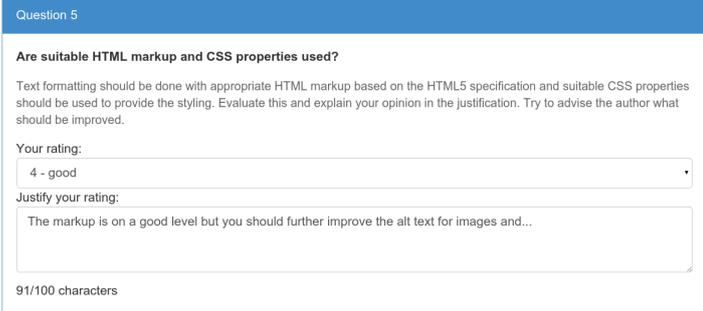
**Fig. 2.** Student's view of the Assignments dashboard

The main student's view of the assignments is shown in Fig. 2 with an assignment ("Project") open. On top the student sees information and the submission related to the current round. Below there is the listing of her own past submissions (in previous rounds). She may see the submission, and by clicking on "details" she gets to the submission page with reviews and feedback.

The submission page features all details of the given submission, together with the reviews of the submission (if there are any) and instructor's feedback once it arrives. The reviews are shown anonymously. The submission's author is able to rate the quality of the reviews.

Below the list of past submissions the student sees also the list of reviews assigned to her in a similar form (not pictured). She is able to access each submission and its respective review form.

For each review the students fill in a pre-structured review form consisting of a series of questions. The interface of a selected question is shown in Fig. 3. Each question



Question 5

**Are suitable HTML markup and CSS properties used?**

Text formatting should be done with appropriate HTML markup based on the HTML5 specification and suitable CSS properties should be used to provide the styling. Evaluate this and explain your opinion in the justification. Try to advise the author what should be improved.

Your rating:

4 - good

Justify your rating:

The markup is on a good level but you should further improve the alt text for images and...

91/100 characters

**Fig. 3.** Review form detail showing one of the questions

features a hint/detailed instructions. The answer type is configurable, in this case it is a numeric rating (1–5) combined with verbal justification.

Once the review is submitted the submission page of the reviewed submission is accessible to the reviewer. Other reviews are visible anonymously. This is useful for the reviewer to compare her assessment of the project with the remaining reviewers. The submission author's name is visible depending on the settings (blind vs. double-blind reviews).

## 4 Instructor's View

In the instructor's view, the assignment's main page contains the listing of submissions for all assignment rounds. For each submission it lists the author's name, submission date, and the link to access the submission page. The submission page is as in the student's view but all students' names (authors and reviewers) are always showed and there are forms for posting feedback on the submission and as well on the reviews.

The list of reviews assigned to each student in each round is also available in the instructor's view. For each review there is a link to the respective submission page so that the instructor is able to compare it with the other reviews of the same submission.

In the configuration area the instructor is able to add and remove assignments, configure the number of rounds, deadlines for each round, submission format (either URL or file upload). Furthermore, for every round reviewing can be disabled and enabled, and the review type (blind or double-blind) can be set.

The review forms are fully configurable. They are structured into review questions, which can be freely added or removed. Every question has the question line and the hint, the latter is intended for more detailed instructions. There are three possible answer types: rating with the scale 1–5; verbal answer (free text); and the combined one – the rating scale 1–5 with verbal justification.

The review management also enables to assign submissions for reviewing: after submission deadline is over, the instructor simply clicks the "Assign reviews" button and the system assigns each submission to three randomly selected students from the group of students who submitted in the given round.

Once the given round is finalized by the students, the instructor may evaluate both the submissions and the reviews. As mentioned above, she may post verbal feedback for both submissions and reviews, and in addition she may grade these activities using a separate grading module of the system.

## 5 Conclusions

As we saw in Sect. 2, the whole multiple-round submission–peer-review–resubmission–instructor-evaluation process is rather complex, as it involves setting and observing the deadlines, collecting the submissions, peer-review assignment, and configuration of structured review forms. With much smaller cohorts this can perhaps be managed without a dedicated tool, however with slightly larger number of students this would be infeasible. The tool is also very instrumental in assuring certain quality of the process, such as for instance randomization of the review assignment, assuring that only the students who submitted their project are allowed to review, and enforcing minimum (or maximum) length limits on the review answer text.

Another important point is the methodology to be paired with such a tool. We covered this in our recent paper [2], as well in our older studies [4, 1], where the reader will also find a report of our results.

The described Assignments module is part of a larger learning management system that has been developed in collaboration with our students and it was used in our courses for last four semesters. In the future we may further extend the Assignments module with further functionality, e.g., adding more discussion options on the submission page, and support for team assignments.

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