

Making Peer Review in Large Undergraduate Courses an Option

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ABSTRACT

In this paper we describe research in progress on web-based peer review of reports and essays. The research is a part of a larger research project on computer supported examination. We have developed an application for administrating peer review of essays and reports in large university courses. The application was evaluated in an undergraduate course with eighty students. This paper discusses our experiences and findings, and we outline further research.

1. INTRODUCTION

In university and other forms of higher education, different types of collaborative activities are slowly becoming the basic block of education. Examples are student-defined projects, net-based discussions, seminars and other forms where interactions among the students are seen as very central for the learning process. These collaborative activities are often building on the model of collaborativism. The basic premise in collaborativism is that learning emerges through shared understandings of more than one learner (Leidner et.al., 1995). The goals of collaborativism are active participation and communication. Collaborativism assumes that the control of the learning should rest with the peer group, that learning is the sharing of knowledge among learners.

Whereas learning activities building on the notion of collaborativism can take many forms in practice, peer review is one possible way to engage learners in collaborativism. The value of peer review in higher education is widely recognized by educators and educational researchers. For instance, it is claimed that "students are found to plan more extensively and write more carefully when they are communicating with an audience of peers than when they are being evaluated solely by the instructor" (Bagley and Hunter, 1992). Similarly, "It's worth emphasizing that it is not always necessary for academic staff to give feedback: students can often learn more from formal or informal assessment by their peers or by themselves" (Ramsden, 1992). Peer review includes many qualities from a learning perspective and in the research community peer review is probably the most widely used approach when evaluating research.

However, focusing on higher education practice, peer review in large classes is by default problematic as it creates an, in many ways, unbearable administrative burden on the educator coordinating the peer review process. Imagine administrating one hundred students writing papers and reviewing each other's within the current course budget.

Networked environments can be a solution to overcome, at least, some of these problems. The value of peer review in an online environment has been suggested by for instance Harasim et.al. (1995). They suggest that students can work together in dyads or in small groups, using email or computer conferencing, for example for the first draft of their course paper. The instructor, they continue, provides a framework to guide peer critiques, and the grading assesses both the quality of the draft and the quality of the critique.

In the research discussed in this paper we take these ideas a little further and suggest a web-based application for conducting peer review in large classes. In the remainder of the paper we describe the application, how it was evaluated, and finally we outline further research.

2. PeeR

PeeR (Peer review of Reports) is an application designed for publishing, reading and commenting short essays on the net. It will later be included as a module in a virtual learning environment currently being developed. Below we briefly describe the functionality of PeeR:

1. Students write shorter reports or essays (2-4 pages) following the specific instructions from the course coordinator and submit those to PeeR.



Figure 1: Report posting

2. The reports are published in PeeR where all students participating in a course have access to read all other essays (figure 2).
3. Each student is assigned one or more reports to review and PeeR also optionally email him or her of the result.
4. The students read, reflect and make constructive comments on their assigned reports and optionally on any of the other.

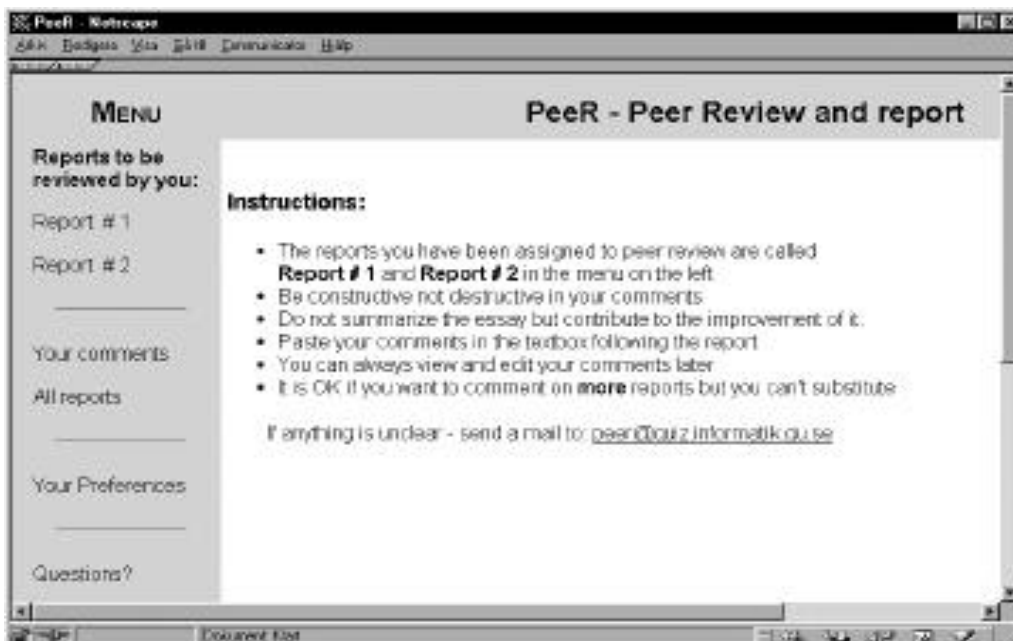


Figure 2: Peer Review

5. Both reports and comments are stored in the PeeR database.
6. The teacher assesses both the report and the comments made by the students. That is, the grade a student receives is dependent equally on the report they write and on the quality of their comments to others.
7. The decision of when to close the posting (of reports and comments) may be preset in the application or changed at any time.
8. As with most web applications, PeeR is available regardless of time and place.

PeeR was designed and developed on a standard PC with Internet Information Server (IIS) and Microsoft Access.

3. EVALUATION

About 80 undergraduate students attended an introductory course in informatics. They were asked to write a short essay as examination at the end of the course, naturally using PeeR. We wanted the essay topic to reflect the discourse of the course. Therefore, the topic of the essay was decided only a few days before it was presented to the students. Thorough information about what was expected of them was provided both in class and on the web - both instructions for the report but mainly for how to peer review.

STUDENTS

As part of a larger research project on computer supported examination (ExCon), we have previously surveyed a large number of students (approximately 400) about why they preferred a certain form of examination. This research showed very diverse examination preferences among the students. However, when asked why they preferred a certain form of examination three categories of answers emerged after analyzing and coding their responses:

- Learning (during examination)
- Fairness
- Convenience

These categories were then used in the preliminary evaluation following the course outlined in fig 3.

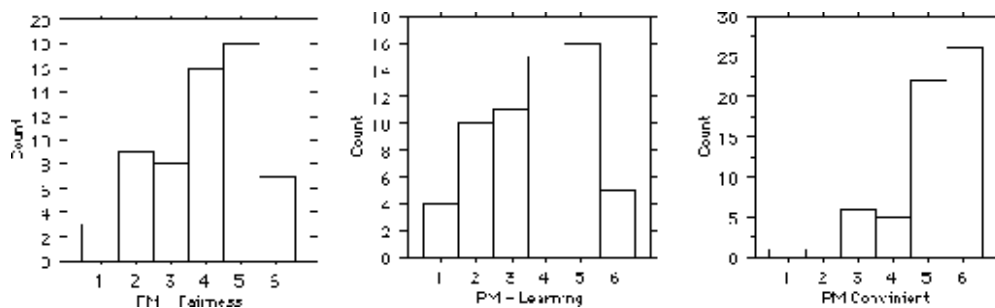


Figure 3. Survey results

The aim was to have the students to view the report and the peer review as nonseparable entities of an examination.

Summarizing we find that in accordance with previously described categories, the evaluation indicates a high degree of student satisfaction.

COURSE COORDINATOR

Report - The open assignment invited the students to relatively freely structure their report. Hence, from a qualitative perspective most of the reports did not follow academic standards. More connection to the material covered in the course was however expected.

Peer review - Apparently many students experienced difficulties in being constructive when commenting on their peers' writings. And as we all know "Making criticisms is ten times easier than coming up with a constructive alternative" (Nonaka, 1995). Limited instructions in the form of guidelines were provided but the difficulties were expected. However, very few destructive comments were made.

Summarizing the report and the peer review we find that the student achievement overall must be considered as meeting the quality expected of second year business students.

ADMINISTRATOR/DEVELOPER

Report - Due to rather extensive online help and JavaScript validation, the call for active participation from the administrator was practically nonexistent during this phase. It was more a question of giving more information about the assumed content of the essay.

Peer review - Here, however, the administrator played a more active part. The major reason to this was the applications use of cookies and the fact that a great deal of the students had disabled them in their browsers. In addition to this the campus computers, administered by the computer department at the university, didn't allow the students to accept any cookies. This was just a matter of misconfiguration and once identified it was easily solved.

These problems are neither new nor especially surprising - it is what you get when working in a distributed, platform independent, heterogeneous environment - but it's nonetheless a problem. These problems are however considered as being manageable.

5. FINDINGS AND FURTHER RESEARCH

Our main findings from conducting the evaluation can be summarized as follows:

- The survey of the students showed, as we interpret it, that our use of PeeR was successful. The participating students found PeeR to support learning in addition to being a fair and convenient form of examination. All in line with the findings in our previous research with ExCon.

- From the perspective of the course coordinator, as stated above, peer review was a new form of examination to most of the students. However, by a more thorough discussion with the students about the purpose of peer review as examination, as well as more structured instructions and guidelines, PeeR is believed to be a viable complement to other forms of examination in large undergraduate courses.

- We have also shown that peer review is possible to administrate even when the number of students is substantial, albeit there is still much work to be done with the application.

Informed by these findings we outline the following further research. The next steps of PeeR are:

1. To design and develop the full application with an administrative interface.
2. To increase the number of settings controlled by the administrator.
3. To give the option of converting essays to portable document format (pdf), in order to enable the application to email large documents to the peers.
4. To have the comments instantly mailed to the author of the essay to give them the possibility to follow the progress.

6. REFERENCES

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