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Peer Review for Learning in Online and Distance Education

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There has been a fast growth in online and distance education in Sweden; in 2007 every fifth student in higher education was studying on a programme or a course which was partly or fully facilitated by ICT. While more and more teachers are entering into this fairly new arena for teaching there are many challenges to be faced in addition to getting to know the strengths and limits of teaching with ICT. One challenge is related to the current educational discourse promoting education for autonomous, independent and self-directed learners, who takes responsibility for their own personal and professional development, thus changing the educator's role from expert to coach and facilitator. Constructivist and/or sociocultural theories are often consulted when setting the scene for this form of learning, with their emphasis on collaboration and learning as a social activity. Another challenge is to respond to the demands from international trends in Higher Education towards extremely fine-grained approaches to measuring student achievement in combination with "a strong social drive to help learners, some with histories of spectacular 'unsuccess', to obtain qualification" (Sadler, 2007).

The central theme in this article is to share our ideas and experiences of how to transform these somewhat contradictory trends into concrete learning activities. This is challenging enough in the familiar face-to-face environment but can be extra taxing when it comes to implementation in the still fairly unexplored context of ICT facilitated education. In this article we focus on involving students in the assessment process through peer reviews preceded by a discussion of the criteria, thus leaving the responsibility to grade the students' achievements to their teachers while the students' contributions on assessing their peers has advisory purposes as a tool to enhance their learning. We will begin by offering a brief background to our interest in peer assessment and how we arrived at the decision to implement and evaluate peer review in our distance and online courses. We will also describe some of the principles of our design of the peer review element. Finally, we will report some early findings on how the students on a course in which we implemented peer review experienced this element, with a focus on these key issues:

- Strengths and obstacles of peer review
- Participation in ICT and the use of text based communication

Background

Frequent course assignments seem to be a popular strategy for teachers in Online and Distance Education to support and monitor their students' learning progress. Recent Swedish studies on assessment show that students in this study environment are likely to carry out a vast amount of assignments; in some cases a five week course can offer up to seven compulsory assignments which the tutor assesses and comments on (Hult, 2005, 2007, and 2008). Assignments in this perspective seem very central to building both the form and

content of these courses. Similar trends are also visible in this context in other countries. Gibbs and Simpson (2004) reports that an Open University student in United Kingdom may receive up to fifty times as much feedback on assignments over an entire degree programme compared to students at conventional universities. This could indicate that frequent assignments may have been found to be a fruitful strategy to merge the demand for more fine-grained measurements of the students' achievements with the change in the teachers' role towards that of a coach. These assessment patterns are well in line with what many researchers on formative assessment point out as providing good support for the students' learning. Through frequent feedback the students are provided with information about their progress and what they have to achieve to reach their learning goals. However, there could be a risk that they learn something other than what was intended as the frequent assessments may trigger the students to focus their studies on passing the exam. Gibbs and Simpson illustrate this with the following quote:

If you are under a lot of pressure then you will just concentrate on passing the course. I know that from bitter experience. One subject I wasn't very good at I tried to understand the subject and I failed the exam. When I re-took the exam I just concentrated on passing the exam. I got 96% and the guy couldn't understand why I failed the first time. I told him this time I just concentrated on passing the exam rather than understanding the subject. I still don't understand the subject so it defeated the object, in a way (Gibbs, 1992, p. 101).

On the same note, Gibbs & Simpson (2004) want to draw attention to the risk of students' pretending to understand more than they really do:

Students can tackle assignments that are intended as learning activities so as to maximize the marks they obtain rather than maximising the learning achieved from engaging with the assignment. This may involve 'faking good' and pretending to be competent or knowledgeable, deliberately covering up misunderstanding and ignorance, telling teachers what they want to hear rather than what they as students believe, and so on" (p.14).

Torrance (2007) also points out that the students, at worst, may learn how to produce a product which is likely to pass examination but without having developed a deeper understanding of the subject as intended. Thus the underlying risk of this frequent assessment pattern could be to produce reductionist learning and instrumental accountability, rather than meaningful empowerment. The frequent communication between individual students and their teachers could also make students more teacher dependant which would work against the idea of the independent and self directed learner.

Although still acknowledging the valuable support for the students that frequent assessment patterns can enable in online education, these concerns raised our interest in peer assessment. Most of the peer assessment studies we found were carried out in on-campus settings, which made us curious about implementing and evaluating it in an ICT-setting in online and distance education. As a result we initiated a collaborative project funded by The Swedish Agency for Networks and Cooperation in Higher Education, between Umeå University, Mid Sweden University and Luleå University. The aim of the project, which is now in mid-process, is to implement and evaluate peer review elements in our online and distance courses, to learn more about how peer review would work in an ICT-setting and if this element can be a good

strategy to support the idea of learning as a social activity among autonomous, independent and self-directed learners.

Assessment beyond control?

Early research concerning assessment and examination in higher education points out its steering effect on student learning. Becker et al (1968), Snyder (1971), Miller & Parlett (1974) and Marton (1977) showed in different ways how student strategies for learning are influenced by the assessments they have experienced or expect to experience. A fundamental conclusion is that assessments are essential to student learning in the sense that they indicate to the student what and how they should learn.

Later research on assessment argues for formative assessments which not only summatively control expected learning outcomes at the end of a course but also formatively during the course give the students' information on their understanding and performance. In his classic article "Formative assessment and the design of instructional systems" Sadler (1989) argues for feedback as a key element in this formative assessment process. With reference to Ramaprasad (1983) Sadler points to the importance of feedback loops; feedback should serve as information about the gap between the actual performance and the expected learning outcome, as well as how to alter this gap. The goal of the feedback process is to make students not only understand standards and criteria, but also to be able to compare their actual levels of performance with these standards. "A key premise is that for students to be able to improve, they must develop their capacity to monitor the quality of their own work during actual production"(p 119).

In a review of more than 250 studies of formative assessment Black & William (1998) summarise that learning and achievement benefited from feedback in varying content areas, knowledge and skill types and levels of education. When discussing learning assessment, Shepard (2000) argues for a change from understanding assessment as a tool for the teacher to deliver reward or punishment to the student, to seeing assessment as a source for insight and learning, that is, to "create a learning culture". With "dynamic on-going assessments" and teachers who deliver feedback aimed at improving student understanding of the task, two elements of a learning culture would be fulfilled. Other elements are for students to know the criteria by which they are being assessed and furthermore that they also get to assess their own and others work.

Summarising the research on formative assessment and feedback, Nicol & Milligan (2006) report seven principles of good feedback practice. Good feedback practice that can help support learning clarifies good performance, i.e. criteria or expected learning outcomes so that the students know what they are aiming for. If they do not understand and share the assessment criteria with the tutor they subsequently will not understand the feedback. Another principle emphasizes that feedback should facilitate 'the development of reflection and self-assessment in learning' (p 66). Good feedback practice also 'delivers high-quality information to students about their learning' (p 68) thereby helping them to a greater awareness of their strengths and weaknesses. Furthermore, good feedback practice encourages teacher-student dialogue rather than information transmission and it also 'encourages positive motivational

beliefs and self-esteem' (p 71), which in turn affect what and how students learn. Finally, good feedback practice provides a chance to close the gap between existing and desired performance through resubmission and feedback on work in progress and it also provides teachers with information that can help focus their teaching.

Peer assessment

One strategy to preserve the ideas of formative assessment, while at the same time adding a more collaborative approach, is to turn to peer assessment. Topping, (1998, p 249) summarised the idea of peer assessment as something that “builds on an arrangement in which individuals consider the amount, level, value, worth, quality, or success of the product or outcomes of learning of peers of similar status”. One argument for using peer assessment is that it may contribute to the students’ development of critical appraisal skills. Macpherson (1999) found indications of a growth in the students’ reflective and critical thinking skills after participating in a peer/tutor arrangement in which the students were to give oral feedback on each other’s literature reviews. Anderson et al (2001) found evidence that students participating in peer assessment developed their skills of making reasoned justification of arguments. According to Macdonald (2002) the students’ viewings of fellow students’ strategies to approach the assessment task seems to support the awareness of weaknesses in their own approaches.

Peer assessment can also support the students’ understanding of the often tacit dimensions of academic disciplines. Gibbs (1999) points out that the teacher enters an assessment setting with a much deeper knowledge of the criteria and standards than the students, and with evaluative skills in making judgement about student performance. Students often struggle to understand what they are meant to achieve and they often have problems understanding feedback comments and interpreting them correctly. Many research studies indicate that participating in peer assessment helps the students to understand the deeper sense of the criteria to help direct their learning towards successful achievements (eg. Bloxham & West, 2004). Gibbs (2006) argues that since peer- and self assessment means that students internalise academic standards they also develop an ability to supervise themselves. O'Donovan, et al (2004) argues that the best ways to create meaningful knowledge of assessment and standards are both explicit communication and tacit transfer processes.

Peer assessment in higher education could also be linked to the idea of lifelong learning and the evolving needs of the global employment market, in which autonomous, independent and self-directed learners who take responsibility for their own personal and professional development are a fundamental idea (Lorraine & Stefani, 1998). Boud (2000) points out that assessment is vital for supplementing lifelong learning, and that “This means that it has to move from the exclusive domain of assessors into the hand of learners” (p 151). Boud also argues that the more complex learning is, the greater the need for interaction with others to help us test our understanding, reflect upon our ideas and provide other kinds of support. Further, he proposes that we need “sustainable assessment”, which he defines as “assessment that meets the needs of the present without compromising the ability of students to meet their own future learning needs” (p 151).

The need to prepare students for peer assessment

As pointed out above, the teacher enters a course with far more experience than the students about what criteria mean and how to put them to use in assessing the students' learning. Creating a common understanding of criteria between students and tutors seems a challenging task. Sadler (1989) pointed to the elusiveness and difficulty of defining criteria, partly because what a criterion means and implies for appraisal is hard to define without concrete examples that possess the property in question, "which in any case is usually only one of many properties. "Coming to an understanding of the property is therefore as much an epistemological as a technical matter" (p 135). As Sadler argues, criteria cannot be fully defined and transmitted to students; they are as novices by definition unable to fully appreciate implicit criteria for making refined judgements about quality. "Knowledge of criteria is 'caught' through experience, not defined" (p 135). More recent research also indicates that even if the criteria were presented in both written and verbal form, the understanding of some criteria differs among students and their tutors. (Orsmond et al 1996, 1997, O'Donovan, Price & Rust, C, 2004).

Therefore much of the research literature points out the importance of preparing students for peer assessment by discussing criteria. Students should also be offered direct and authentic evaluative experience guided by tutors, enabling them to develop their evaluative skills.

Price and O'Donovan (2006) point out that tacit knowledge among tutors about criteria obtained from a shared experience of marking and feedback can be used in supervising and engaging students in interpretations and negotiations of criteria as a preparation for peer assessment activities. By mediating this meaning, such discussions contribute to a deeper learning of the peer assessment process. Their findings were replicated over a three-year period and showed that students attending assessment workshops, containing both group and tutor-lead discussions of criteria and group as well as individual review of assessments, achieved significant improvements in performance. This improvement was also sustained at a significant level one year later.

In a meta-analysis of 48 quantitative peer assessment studies that compared peer and teacher marks results indicate that the criteria derived from students, or that students have agreed on, give a better teacher-peer agreement in marking than if the criteria were supplied by the teacher (Falchikov & Godfinch 2000). Results from the same study also indicate that the use of well understood and explicit criteria gives more accurate judgements than when students are left with little or no guidance on how to interpret the criteria.

The study

The findings reported in this article derive from a distance course within a programme in teacher education. The teachers who had been teaching this course for many years were open to the idea of implementing a peer review element, especially since this course was given at advanced level for the first time.

The 60 students were all teachers who had returned to studies to further their education. They were gathered on campus three times during the course; at the introduction, in mid course and

during the final examinations which consisted of a portfolio with literature and lecture comments and a written report of a study the students had to plan and perform during the ten weeks of the course. The students were informed at the first on-campus gathering about the peer assessment project and that they were to participate in the peer review procedure using FirstClass, which was the standard platform used for online interaction in this programme. Participation in the peer review procedure was obligatory. The students were not given a specific number of how many postings they had to make on this matter, instead they were told to include examples of their own and others contributions to the learning process of the peer review process in a self evaluation which they were to include in their portfolio.

Based on the understanding we gained from previous research on formative and peer assessment, we designed a concept for implementing this in a course. We decided to introduce peer assessment in the form of peer review as our purpose for introducing this element was to explore its potential to enhance the students learning. No matter how much the students interpret and are made familiar with the implicit dimensions of criteria, the teacher still will be the most experienced and knowledgeable of evaluating student achievements. Also the responsibility for assessing the students are formally a teachers responsibility which we also wanted to acknowledge by highlighting that the students' responsibility in the assessment process was to use the assessment tool for advisory purposes. We designed a workshop model in which the students were tutored with questions while interpreting and negotiating specific course criteria in the light of general steering documents. This was meant to help them to become more aware of the implicit dimensions of assessment criteria. They were to identify or formulate a few criteria they found to be constructive to use when giving feedback on each others' products during the learning process. At the end of these discussions the students were given a document with specific questions regarding how to identify more overarching academic qualities in reviews of texts and seminar discussions. Thereafter, the students were to apply their chosen criteria on the assessment of two example texts. Both example texts were deliberately of mediocre quality to trigger discussion, although one of the texts was more likely to pass a teacher's examination than the other one. The idea was to activate and tutor a discussion among the students about how to identify the qualities asked for by the criteria. After this, the students were to modify the criteria they had agreed upon based on (hopefully) new understandings, before moving on to the task of reviewing each others' work in process.

Each workshop seminar was accessible throughout the whole course but the time for discussion in each of them was set to between 3 to 5 days, depending on what task the students were to work on, to enable flexible participation.

Data collection

Data used in this article was collected through an online questionnaire with open and closed questions. The students answered these questions during the last meeting on campus. The questionnaire package included demographic questions, questions about the students' experience of the criteria discussion, the peer review element and their views on different aspects of text-based communication. Data analysis was conducted through the use of descriptive statistics for the closed questions and a content analysis of the answers from the

open questions. The questionnaire was answered by 51 students (n=92% of the student group). Those who did not answer were students who did not participate in the on-campus meeting.

Findings

Although the students initially expressed to their teachers that they were confused about the role of peer review and criteria discussion in this course, they reported at the end of the course that they valued this element highly. This issue is for example mirrored in one of the students' answers to an open question:

At the beginning of the course it felt like a side track, but as the course progressed the meaning of the workshop became clearer to me. I developed a new understanding of earlier activities in the workshop. But as I said, it took a while before the knowledge and understanding became visible and obvious to me (our translation).

The students' engagement in the peer review process could also be confirmed by the vast number of postings in their workshop forums, where most of their peer review tasks and discussions were carried out.

As shown in table 1, 84 percent of the students answered that reading and commenting peer students' texts had enhanced their own learning.

Table 1. My own learning was enhanced by reviewing and commenting texts made by peers

	Frequency	Percent	Cumulative Percent
Valid Agrees to a little degree	8	15,7	15,7
Agrees to a high degree	24	47,1	62,7
I totally agree	19	37,3	100,0
Total	51	100,0	

One student pointed out that:

It was time consuming but gave me an enormous amount. To see how one could think in different ways made me see different aspects of the texts and how you can formulate and structure the presentation of reflections on a subject (our translation).

Another student wrote that:

The review and commenting on other peers' a text has been valuable and I have learned from gaining insight into someone else's views. Additionally, it contributed to my own learning process (our translation).

What strengths did the students identify?

On the direct question if they found the peer review element unnecessary in this course, only four out of the 51 students answered that they agreed with this. As many as 84% of the students marked that they felt that participating in the peer review process had a positive effect on their development of independent and critical thinking skill.

Table 2. Peer review contributed to the development of my independent and critical thinking skills

	Frequency	Percent	Cumulative Percent
Valid Agrees to a little degree	8	15,7	15,7
Agrees to a high degree	26	51,0	66,7
I totally agree	17	33,3	100,0
Total	51	100,0	

One student expressed it like this in a comment: It has enhanced the depth and expanded my perspectives, it was incredibly good (our translation)!

A majority, 42 students, also agreed that the peer review process had enhanced their understanding of knowledge building in the academic context. It is also interesting to note that 40 of the 51 students agreed that this element in the course was valuable for gaining an understanding of how to direct their learning in the course. In this context, the students' answers to the question if they thought that participating in the peer review process would enhance the chance that their examination products would pass the examination successfully are a bit puzzling as only 27 students answered that they thought it would. To the question if participating in peer assessment had a positive effect on their motivation to fulfil the course, 24 of the students replied that this was indeed the case.

Overall, it seems as though the collaborative structure of the peer review element was appreciated by the students. 43 of them found that it contributed substantially to their learning and only one student thought that concentrating on their own learning process instead of working collaboratively would have enhanced learning more. One of the students expressed that: If you haven't understood, you can be helped by your peers. You grow wiser together (Our translation).

What obstacles did the students identify?

Although these are promising results from our project, it is important to note that some students found participating in peer review somewhat taxing. This was a group of students in mid life, with many life commitments competing with their studies. Even students who found this element valuable on many other levels expressed in their comments that participation meant hard work and commitment. Accordingly, nine students answered that they felt that the peer assessment element was too time consuming, although only three students agreed with the statement that participating in peer assessment was a waste of time. It is notable that students who expressed that they had engaged fully in the peer review procedures also found

the peer review element more valuable than those who answered that they had participated with lesser commitment.

One explanation for why some students did not value participating in peer review to a higher degree could possibly be that they thought they had missed out on more qualified feedback made by their teachers. As visualised in table 3, 18 of the 51 respondents answered that comments from the teacher would have been a better support than feedback from peers.

Table 3. The support had been better if the continuous feedback on my work was given by my teachers

	Frequency	Percent	Cumulative Percent
Valid I don't agree at all	7	13,7	13,7
Agrees to a little degree	26	51,0	64,7
Agrees to a high degree	11	21,6	86,3
I totally agree	7	13,7	100,0
Total	51	100,0	

The students' views on asynchronous text communication

As a vast part of the peer review experience was carried out as text-based communication we found it valuable to capture the students' experiences of how participating in the peer review worked in relation to this aspect. It is notable that a majority of the students didn't find the text-based communication inhibiting.

The fact that this form of communication gives more time for reflection before utterance was pointed out as beneficial. Another benefit was that writing and formulating their thoughts in text enhanced a better understanding of their own standpoints in the matter discussed. One student pointed out that it triggered her to a higher level of abstraction. The fact that asynchronous text-based communication enables flexible participation in a discussion was also pointed out, as summarised in this student comment:

It suited me perfectly. I can reflect whenever I want to with anyone in the group. I can take my time and consider my own opinions. I also can go back and see how I thought before. I know that everyone in the group can read my reflections at any time (Our translation).

It also seems that some students found that communication through text had a great value in itself. One student wrote that:

It opened up the opportunity to freely communicate on a better level. It's easier to express oneself in text form (our translation).

However not all students were happy with the written communication. Nine of the students remarked that it was hard to write posts that transmitted their meaning in a way that could not be misunderstood, and some commented that it is hard to express feelings through text. Additionally, six students answered that they felt it was hard to fully understand what their peers meant with their postings. Others pointed out that communication through text is more time-consuming than face-to-face communication. One student expressed that written communication is flat by nature and that it lacks nuances. One student captured these concerns in this comment:

It's hard to formulate in text since the words are weighted and are more visible when written. Face to face communication allows me to read body language and helps me judge if I have to express myself more clearly (Our translation).

Conclusions

Judging from this early data it seems as though the students found many advantages in participating in the peer review element in this particular course. Judging from the high

activity in the discussion forums in which the workshops were carried out, this element seems to stimulate the students to engage in collaboration with their peers. But did it really mean that they understood the deeper sense of the criteria that Bloxham & West (2004) identify as an important tool for directing their learning towards successful achievements? From the data in this article it is impossible to draw any conclusions about what impact the criterion discussions and peer reviews had on their understanding of the deeper sense of criteria. It has to be kept in mind that all these students were teachers furthering their education, which means that most of them probably had some experience of criteria analysis previously. Perhaps they already were, as Sadler (1998) points out as important in formative assessment aimed to enhance learning, equipped with at least some of the evaluative skills that their teachers had. However, the fact that they found the peer review element taxing and time consuming and despite this showed high commitment could indicate that participation in peer review truly stimulated them to seek for deeper understanding. The fact that so many of them found that participating in peer review had helped them understand how to direct their learning in the course can also support such conclusions. Another sign of this could be that so many, despite an initial confusion about the purpose and value of the peer review process, came to rate this element as highly valuable in the evaluation at the end of the course. Some of the students' answers to the open questions also indicate that they sensed that they gained a deeper understanding of what they were supposed to relate to when considering "the amount, level, value, worth, quality, or success of the product or outcomes of learning of peers of similar status" (Topping, 1998, p 249). Hopefully, a more in-depth analysis of their criteria discussions and peer reviews will confirm that they indeed developed an understanding about what they were expected to achieve in this course and that they also managed to put this understanding to use as support for their peers.

The students' responses to questions about what impact participation in the peer review activity had on their learning process are also promising. Although one must separate what people think they have learned from what they have actually learned and are able to put to use, it is positive that so many found that peer assessment contributed to their independent and critical thinking skills. If this result can be further confirmed by other data from the project, for instance their text discussions and comments on each others' assessment products, it will be possible to draw the conclusion that peer review could be an important strategy to use when setting the scene for the independent and self directed learner.

It is also interesting to note that the students gave their own examples of how they found that the reviews of others' examination products gave them insight into the variety of strategies to use when accomplishing a task. If this means that they could evaluate their peers' products on other levels than making explicit criterions such as formalities and structure, this could mean that peer review could prevent the instrumental learning that Torrance (2007) argues that formative assessment could trigger.

It was somewhat contradictory that so few students believed that participating in peer review would enhance the possibility of passing the final examination despite the fact that a majority seem to have found great value in the peer review element. As there is no explanatory data in this matter, we can only speculate about the reasons for this. One possible explanation could be that they were already confident about their abilities and thought they would have passed

their examination successfully even without this participation. Another way to interpret this could be that although they gained new understanding of the meaning of the criteria, they chose to use earlier strategies. Maybe it is easier to identify what needs to be done than to actually go ahead and do it when new to something. In that case, the eventual impact of the peer review element may not show until the students have advanced further into the programme. Yet another way to understand this could be that the students found it hard to trust that they had interpreted the criteria in the way meant, which they wouldn't be assured of until they received the results of the final examination products. After all, as many as 18 of the 51 students answered that they thought that feedback from the teachers would have been more valuable than feedback from peers. These are interesting questions which we will interpret further later on in this project.

Another interesting result was that so many students found the text-based communication sufficient in the peer review process. It is important to note that some students actually found the text-based communication better than face-to-face communication, with arguments such as; it provides room for reflection and enables everyone to express their views. But at the same time some students found it hard to communicate in this manner and wished for other means of communication in which they could use attributes such as body language and tone of voice to clarify meaning. One way to support both types of students could be to begin with text-based discussions but introduce audio-visual communication for conclusive discussions. Such an arrangement could also help make communication less time consuming, which was an issue pointed out by the students. Such ideas support our intentions to test what audio-visual techniques could contribute in this context in our further project development.

All in all, participating in the peer review process seems to have engaged the students and enhanced their collaboration, which correlates to sociocultural and constructivist theories of learning. The promising results on the benefits of peer review **preceded by a discussion of the criteria** in the online context makes it interesting to proceed with the project to learn more about its effect on the students' learning and interaction and to find out more about how to design the peer review element to enhance the students' learning.

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