PRAZE: innovating teaching through online peer review

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Abstract

The benefits of formative peer assessment of student work are well-recognised, but the onerous nature of administrating peer review remains a disincentive to implementation, especially in large classes. We have developed an online system – PRAZE – that allows the distribution and anonymous exchange of work between students in an educational setting to be automated. In this paper, we describe the functionality of the software and report on an initial trial in which we administered peer review using PRAZE in three subjects taught at the University of Melbourne. Although the subjects involved different disciplines (Zoology and Multimedia & Communications respectively), different year levels (2nd versus 3rd year students), and varying numbers of reviewers, surveys indicated that the opportunity to participate and benefit from peer review was broadly appreciated by students. Students also found the software easy and convenient to use. We identify pedagogical and developmental issues with implementing online peer review, and outline anticipated future changes to the software.

Keywords: anonymous peer review, assessment, student feedback, online learning management systems

Introduction

The importance of feedback for student learning is widely recognised (Ramsden 1992; Pascarella and Terenzini 1998; Hounsell 2003), and is a firmly-established principle guiding teaching and learning at the University of Melbourne (James & Baldwin 2002). Nevertheless, there is often concern that performance in this area (measured via student scores in subject exit surveys) does not match its stated goals. Yet this is an area that universities cannot afford to ignore: in the exit survey given to all graduates from Australian universities, two of the six questions on the *Good Teaching Scale* relate to feedback on students' work. Significantly, the mean scores obtained for these questions are typically among the lowest in the survey, indicating that this is an area of potentially widespread student dissatisfaction.

An important contributing factor to an overall sense of student dissatisfaction with feedback may have to do with the way in which feedback is typically provided in a university context. In our teaching environment, the most common source of feedback for students is often a commentary accompanying a grade attached to a final version of an assignment. This source of feedback has several shortcomings. First, only a single perspective is typically provided – the teacher's. This limits both the qualitative and quantitative diversity of feedback available to the student. More significantly, the approach is ineffective as part of an intended iterative cycle of learning, because there is no further opportunity for students to improve on their assignment. This means there is little motivation for them to reflect on, or learn from this feedback. Thus, while the concept that students learn best when their ideas are exposed to the scrutiny of others is broadly accepted, in practice the type of feedback offered fails to maximise learning benefits.

For writing tasks, formative feedback is well acknowledged as being valuable during the revision phase of writing (Flower, 1986; Topping, 1998). Thus, providing students with frequent and detailed feedback before, rather than after submission of the final version of an assignment improves the formative value of feedback. Nevertheless, in subjects that have large enrolments, this imposes and administrative burden on teaching staff that may be unmanageable.

One solution to the above problems is to create opportunities for fellow students to become involved in the process of evaluating the work of their peers during its formative stages. A growing body of research (Askew 2000; Falchikov 2001; Westberg & Jason 2001) suggests that critiquing peer submissions gives students valuable experience and perspective on their own work, encourages them to revise it, promotes a sense of community and

collaboration, may help to decrease the incidence of plagiarism, and helps students to become equipped for lifelong, independent learning. It is notable that these benefits need not only apply to written work; as we discuss below, peer review of this nature potentially offers benefits in the context of any learning task (in this instance, a design task such as Web design or computer programming).

As academics we spend much of our time producing scholarly publications through a process of self-assessment and peer review. Yet, this process is not brought into our teaching practices often enough . The assessment tasks we give our students often contrast these professional practices, rather than reflecting what we value as academics (Boud, 1990). If we can encourage students to engage in this process, then their work will reflect our own academic practices as well as help them focus on more meaningful learning. This scientific publishing process is well recognised by others as an important part of educating undergraduate and graduate students and is often taught explicitly by taking students through the peer review process as part of a semester activity . As well as engaging students in authentic exercises, participation in peer review provides an opportunity to reinforce assessment criteria by aligning them with peer review criteria.

Peer review also has a potentially important role to play in assessment. Topping (1998) reviewed 31 studies of students at colleges and universities and concluded that they mainly showed positive effects from peer assessment, especially on writing tasks. Although other reviews have found mixed results in assessing validity and accuracy , Topping comments on the adequate reliability and validity of this form of assessment. There is a general consensus that students receive positive effects from peer assessment and that, overall, students' involvement in assessment is valid, reliable and fair.

Although student involvement via peer review may have considerable benefits, there are many pragmatic issues to be overcome before including peer review as part of the feedback process. These typically relate to class sizes and the growing logistic problems that ensue as the numbers rise. Typically it is desirable that the reviews be anonymous, distributed to reviewers based on a set of rules (e.g. Should the reviewer be in a different tutorial group from the reviewee? Should a staff member take part in the review process?, etc.). An efficient system needs to be in place to collate and distribute both the work for reviewing and the reviews themselves; this collation and distribution needs to work to a well-defined schedule that reflects the timing of assignments in a subject. In addition some form of feedback on the reviews themselves might be desirable. If the students are working in groups, then these rules can become more complex. This can make the administration of peer review a daunting workload on coordinators, a logistical problem that has discouraged widespread adoption of peer review.

In this paper we describe an online peer review system we have developed that automates the peer review process. Our aim is to implement the system at our own university and then make it more widely available to others. We begin by describing a pilot program – APRES – that was set up in one department during 2005, and then go on to describe an updated system – PRAZE – that is currently under development and evaluation.

APRES

Background

We initially became interested in the idea of implementing peer review as a result of RM's experiences in teaching a third-year undergraduate subject 'Experimental Animal Behaviour', which has an enrolment of about 60 students. In this subject, students learn about the intellectual, organisational and logistical challenges associated with conducting research in animal behaviour. Students form teams of 4-5 students, supervised by a graduate student or member of academic staff, by selecting a research topic. The team then formulates a question, designs an experiment or sampling regime to test their idea, collects and analyses the necessary data, and finally prepares a scientific paper.

We were interested in a peer review process for several reasons. Apart from wanting to provide students with feedback on their work that was useful in the sense that it promoted a genuinely reflective cycle of learning, 'Quality of Teaching' survey scores had identified feedback as an area for improvement in our subject. These scores were initially perplexing, since the students had ongoing access to supervisors to discuss their project and obtain feedback on its progress. In addition, as an introduction to the scientific process we felt that one thing lacking in our subject was exposure to the process of peer review which lies at the heart of quality control of scientific publication. Although the majority of undergraduate students do not pursue scientific careers, the ability to critique constructively the work of others, and interpret and reflect on critical feedback, are clearly generic skills that are valuable in many work environments. However, when we first considered the implementation of a peer review process within the subject, it rapidly became clear that the task of administering this process would be extremely complex and time-consuming. Technological support of the process seemed to be the obvious solution. We found, however, that while web-based submission and review was increasingly employed by the editors of scientific journals, there was limited

software to manage peer review within an educational environment, and most available programs such as Calibrated Peer Review (CPR; Chapman 2001) and Scaffolded Writing and Re-writing in the Discipline (SWoRD; Cho et al 2007) did not allow customization of the process to suit the needs of a particular subject or form of assessment. For this reason, we set out to develop our own software.

System Features

The first incarnation of our software, known as APRES (Anonymous Peer Review and Evaluation System; Mulder *et al* 2005) allowed students to submit a draft version of their main piece of assessment (a scientific report) and receive reviews on this report from two other students and a supervisor, all within an anonymous double-blind framework. The review form included structured yes/no questions that query important aspects of each section of the scientific report (e.g "Was enough detail presented to allow the methods to be repeated?") as well as open dialog boxes in which reviewers elaborate on their views. Students were encouraged to improve their report by incorporating this feedback into their final draft before submitting it for assessment. This process was formalised by requiring the students to submit a 'letter to the editor' with their final report, in which they explained how they had dealt with the reviewers' suggestions.

Evaluation

We evaluated the success of APRES in three different ways. First, *student scores in anonymous surveys* carried out before and after the implementation of our software showed a dramatic increase in satisfaction with feedback. Students were invited to indicate the degree to which they agreed with the statement: "I received helpful feedback on how I was going in this subject" by providing a score ranging from 1 (strongly disagree) to 5 (strongly agree). Our mean score for this question before we implemented our peer-review system was 2.8 (n=54). This score rose dramatically after its implementation (mean=4.2, n=56). More detailed information was available from anonymous in-house student surveys. Of 49 respondents, 98% either agreed (n=15) or strongly agreed (n=33) with the statement "The reviews helped me improve my report". Second, *written evaluations* from students indicated that they were enthusiastic about the approach; indeed many nominated the peer review system as a highlight of the subject ("The review system is excellent; no other subject I have done gives this opportunity" … "I learned a lot, reviewing was great!" … "Web-based reviews were extremely helpful" … "reviews were fantastic"). Third, we tested for a net *change in mean student performances*. We reasoned that if effective, our approach should have improved the overall quality of final reports. While we cannot exclude the possibility of cohort differences between years, there was a significant increase in the mean grade obtained for projects from the year before the implementation of our programme to the year of implementation (Mulder et al 2005).

PRAZE

Background

APRES received the Uniserve Science Teaching Award in 2005 and it quickly became apparent that there was significant interest in online management of peer review in a diverse range of other subjects. However, because such developments were never originally envisioned, the architecture of the program proved to be a significant constraint in developing it for more generic applications. For this reason, we decided to develop an entirely new program with enhanced capabilities from the ground up, under the new acronym PRAZE (Peer Review from A to Z for Education).

PRAZE is very similar in concept to a conference review system, but tailored to teaching and learning use. Generally students take on each of two roles: that of 'author' and that of 'reviewer'. During the process , as an author, they submit work for reviewing; as a reviewer they carry out a review on another student's work (often more than one); and finally, again as an author, they read the reviews of their own work and give feedback to the author on its value to them. Throughout the process, documents are distributed anonymously.

Aims

The general aims of the PRAZE software are as follows:

(i) To enable subject coordinators to *set up peer review sessions* for their students. This involves:

- defining who will be involved in the review process;
- defining whether students work in groups or alone and how they are allocated a topic for their assignment;
- defining rules that will determine the distribution of work for reviewing;

- determining the automated schedule of the entire review process;
- creating and editing online review forms and feedback forms.

(ii) To enable subject coordinators to *administer the system* as the semester progresses. In particular:

- to add and remove students from the system
- to add and remove students from groups within the subject;
- to 'simulate' the distribution process (explained below);
- to monitor and take part in the review process;
- to read all reviews and feedback, together with statistical data on students' participation and summaries of any numerical information from the review forms.

(iii) To enable students to:

- login in and work through a process of determining the assignment that they choose or are allocated to;
- if appropriate, view and join groups of students;
- view which aspects of the system are ready for them to participate in (signing up, submitting work for review, reading reviews of others, submitting feedback on a review).

System Features

PRAZE is a very flexible system, allowing the subject coordinator to customise a wide range of aspects of the review process. There is a risk that such complexity that could be daunting to an unfamiliar user. We have tried to offset this by providing a 'wizard' approach to setting up a new subject. Figure 1 shows the main "set-up" screen showing the link to the wizard near the top. The coordinator is taken through a seven-step sequence of tasks that need to be completed (relating to the six bulleted items in (i) above). Later, should particular aspects of the set-up need changing, the user can go directly to that aspect via one of the buttons 'Assignment summary', 'Class attributes', 'Timelines/due dates', or 'Forms'.

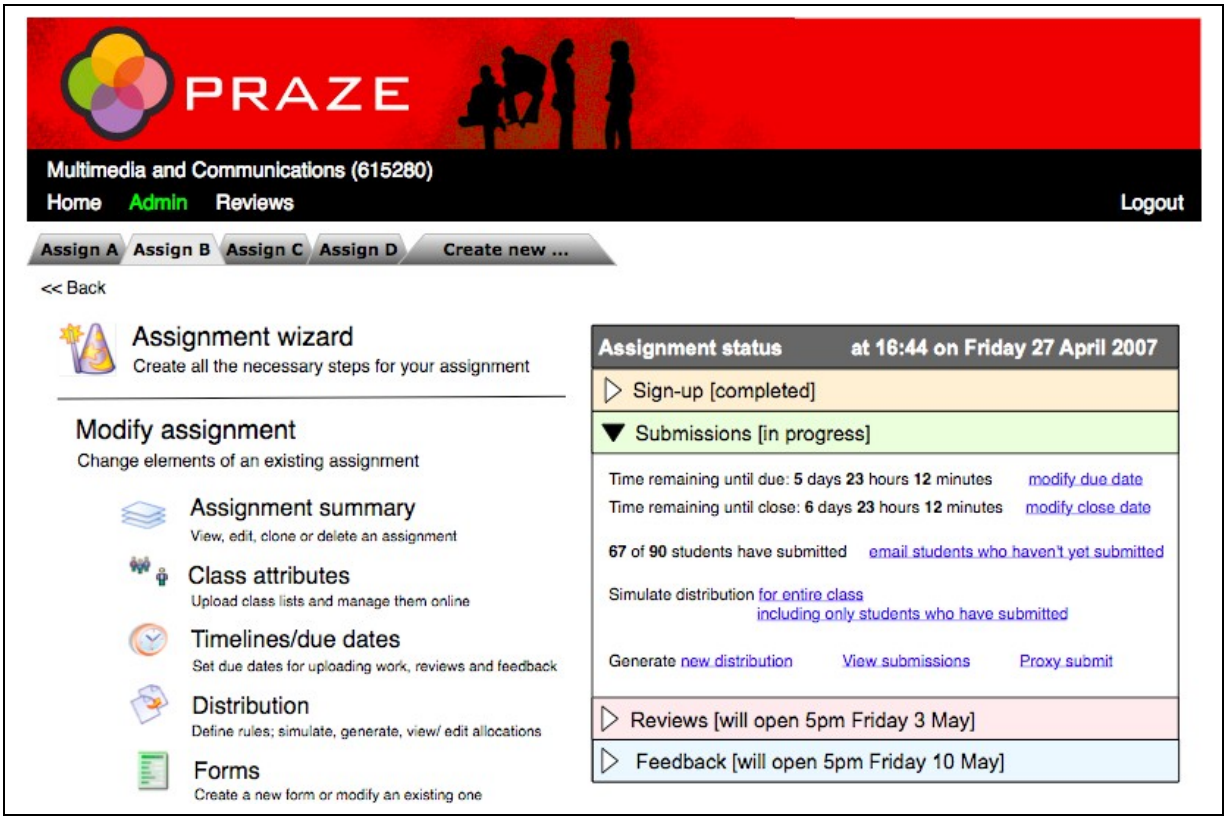

Figure 1: the main screen for subject coordinators

A key feature of the software is the 'Distribution' link. Once the rules have been defined for a subject (e.g. student allocations to groups; who will participate in reviewing; what restrictions are placed on who reviews whom; etc.), it is important to know whether it is theoretically possible to satisfy all the rules for that particular cohort of students. For instance, if the rules are too constraining, it is possible that there might be no solution to that particular arrangement. The 'Distribution' button allows the coordinator to carry out a simulation of how authors and reviewers

would be allocated should all students submit work as expected. The results of the simulation show, in tabular form, which work will be sent to which students for review, alerting the coordinator to any impending problems with the rules she has defined. If this cannot produce a solution free of errors, then some rules might need to be relaxed (e.g. *retain* a rule that says reviewers may not belong to the same *group* as authors, but *remove* the rule that reviewers may not belong to the same *class*).

The simulation can be performed either on the entire class, or a subset of only those students that have submitted work. If the desired distribution is not possible, some manual adjustments of the system can be carried out at this stage. This is important because it is quite likely that some students will submit late, or fail to submit any work at all. A hypothetical example will help to illustrate this problem. Consider the case of a subject with an enrolment of 500 students. These students are divided into 25 different tutorial groups; they are participating in group-work, with 5 students in each group; each group has been allocated randomly to one of ten possible topics and is writing a research paper on their topic. The subject coordinator wants each group's work to be reviewed by five individual students. She wants to ensure, of course, that no student is allocated their own work to review; but she also wants to ensure that no group's work is reviewed by a student who is doing the same topic or who is in the same tutorial class. She wants each class's tutor to also take part in the review process. Not only is this a complex set of rules to follow, but there is no guarantee that there is a solution to the distribution task. The simulation allows the administrator to both gauge the potential for an acceptable distribution on the basis of the theoretical submitting cohort (the entire class) and the actual submitting cohort. The larger the cohort of students, the less likely the distribution is to be affected by late or missing submissions.

Some other important features of PRAZE are illustrated in Figure 1. The 'Assign' tabs at the top of the screen show how PRAZE accommodates multiple peer review sessions within a single subject. Each individual assignment has its own set of rules and schedules. The right-hand side of the screen shows the 'status' information that is available for the subject coordinator at all times. This highlights the stage of the process that is currently active, as well as useful information on timing, student participation, etc.

Most of the complexity of PRAZE lies in accommodating various modes of use. But while PRAZE is relatively complex from an inexperienced coordinator's perspective, from the students' perspective it is very simple. Students login and, if necessary, form groups and choose (or are allocated to) topics or assignments. The screen reminds them of dates and times at which various events will happen: submit work as an author, download work as a reviewer, submit reviews, read feedback on reviews that they have written, and possibly enter a peer assessment of group members if participating in group work. In the future there will be an option for students to read the reviews that other students wrote on the same work that they reviewed. Several students have commented that the software aspects of PRAZE was easy to use and straightforward.

Evaluation

Pilot trial – three case studies

Basic features of PRAZE were implemented for the first half of 2007, with the intention of adding more features, and refining the user interface, for the second part of the year. Four subjects were used to test the system in different configurations. Three of them, with different approaches to peer review, are described below.

1. Group work; individual submissions; unique topics. *Experimental Animal Behaviour* had 60 students working in groups of four, choosing from 15 topic areas in which they conducted their own research and supervised by a tutor. In week one of semester each student logged into PRAZE and signed up for a topic online. They met with their group members, and designed and executed their research projects. After groups completed their research, individual students uploaded a draft report (which was not graded) for distribution to three reviewers; the group's tutor plus two student reviewers from different groups. Thus each student wrote two reviews for other students and received three reports on their own work. Report authors used the reviews to improve their final submission, and wrote a 'letter to the editor' in which they detailed how they had dealt with the reviewers' comments.

2. Individual work; individual submissions; some common topics. In *Animal Behaviour*, 110 students wrote a popularised account of a scientific paper as part of their assessment. Students were able to choose from among six possible papers as the subject for their article, and signed up online for one of these six topics. To reduce the risk of plagiarism, we quota-restricted each subject to a maximum of 49% of students to ensure that each draft could be allocated to a reviewer writing on a different topic. One week before the final article was due, each student uploaded a draft version of their paper, and received one review on the article, written by another student allocated to a different topic.

3. Group work; group submissions; individual topics. A subject very different in nature was *Multimedia and Communications* in which students learnt a process of user-centred Web site development with the aim of improving science communication through the use of multimedia. This subject was organised into 14 student groups of four or five students. Near the end of the Web design process, when prototype sites were ready for some preliminary user feedback, each group submitted the URL of their site to PRAZE. These were distributed to other students in the class so that each individual received one Web site to review. The review process was driven by an extensive online questionnaire and a standard Web site usability checklist. PRAZE ensured that students did not receive their own group's site to review, nor indeed a site from their own tutorial class (since they already had some familiarity with these sites). Two staff members also reviewed all sites resulting in each group receiving 5 or 6 anonymous user reviews. The comments in these helped them to identify bugs and design issues, and fix them before the final submission. They also had a chance to feed back their thoughts of the reviews to the reviewers. The average score from one Likert scaled question in the review form was used as a component of their final group assessment.

This third example shows how peer review can be used as part of a design process rather than a writing process. It is extraordinarily valuable in this context. Not only do students see examples of the work of others – features of which may highlight to them issues in their own design – but also they receive multiple feedback from peers as to specific issues with their work, which they can address before their final submission.

Preliminary feedback evaluation

Experimental Animal Behaviour. Students in Experimental Animal Behaviour (n=47; 78% of student population) were asked to rate their response to the statement *"The peer reviews helped me improve my report"* on a scale ranging from 5 (strongly agree) to 1 (strongly disagree). Seventy-nine percent of students (n=37) either 'strongly agreed' (46%, n=22) or 'agreed' (32%, n=15) with this statement. The remaining 21% gave a 'neutral' score of 3; no scores of 1 or 2 were awarded. Thus, most students had an extremely positive experience of peer review. This is supported by written comments such as "*Reviews were a great help!", "Reviews were a very good aspect of this subject", "The peer review process was very helpful"* and *"I think the peer review exercise should be introduced into every Zoology subject"*. It is interesting to note that where students awarded a score of 3, this was commonly accompanied by written statements that complained about the variable quality of the reviews.

Animal Behaviour. Students in Experimental Animal Behaviour (n=88; 80% of student population) were similarly asked to rate their response to the statement *"The peer review helped me improve my report"* on a scale ranging from 5 (strongly agree) to 1 (strongly disagree). Fifty percent of students (n=48) either 'strongly agreed' (23%, n=20) or 'agreed' (27%, n=24) with this statement. Twenty-two percent (n=19) neither agreed nor disagreed (score=3), while 17% disagreed (n=15) and 11% strongly disagreed (n=10). In this subject therefore, although students had a largely positive experience of peer review, they appeared to be less enthusiastic than those in the Experimental subject.

Multimedia and Communications. The feedback by students in this subject was also positive. Fifty-seven percent of students (n = 34) completed a survey that presented Likert-scaled response questions as well as some free text comments. In response to the statement: *"This year the idea of peer review was introduced to help improve the quality of team Web site projects. I think the idea of peer review used in this way is:"* one half of the students (n=17) said that they thought it was 'quite good' (n=12) or 'great!' (n=5). Nine students responded that it was 'just OK' and only eight had a negative response, rating it as 'not very good' (n=4) or 'not to my liking at all' (n=4). When asked to reflect on the *value* of the comments that they received from their peers, most students (76%) rated these as 'quite helpful' (n=14), 'helped quite a lot' (n=10) or 'extremely helpful' (n=1). Eight students found the comments 'just a little helpful' and no students rated the comments as 'not helpful'. Thus, while not all students in this subject liked using peer review, the majority did, and most found it a valuable experience for their Web design work.

When asked to write a general comment on the use of PRAZE, 24 positive and five negative comments were received. Positive comments indicated a high degree of satisfaction both with the system and the peer review concept as applied to a subject of this nature. Students appreciated the ease of use of the system, the value of the reviews, especially coming from a *"real world user"* (i.e. a student, rather than a lecturer!), and the value of a structured review form that helped to identify specific aspects of their work that they could improve. Three of the negative comments related to using aspects of the peer review as a part of each group's assessment (about 15% of the project's assessment was based on one overview question on the review form asking the reviewer to rate their general impression of the Web site at this stage of the development process). One of these commented that the process was a *"waste of time and should not be marked"*. The others indicated concern that other students might not review fairly due to either lack of understanding of how to grade the work, or due to deliberately trying to manipulate the system either to be kind to others or to gain themselves a higher mark. Issues relating to reviewer competence are discussed below. Deliberate manipulation of the system for personal gain is unlikely to be a cause for significant concern, because of the anonymity of the system, and the fact that each group's mark was an average of five or six independent reviews.

Issues

Pedagogical

A particularly interesting set of issues relate to the pedagogy of using peer review. While research has been carried out into effective designs of peer feedback activities (see, for example, the study by) we do not yet have much experience of students using PRAZE in different situations. For us, this raises numerous questions: How do we train students to be effective reviewers? Is the effectiveness of peer review likely to vary across years (e.g are first year students too focussed on a 'delivery' mode of education to accept feedback from their peers?) Are there cultural issues that might impact on the acceptance of peer review by students from overseas? Is feedback on writing exercises any more or less effective than feedback on design exercises? In the subjects described earlier we have linked peer review to assessment in two ways: a tutor assessing the quality of the reviews, and students assessing the quality of the work they were reviewing. We need to explore other modes of incorporating assessment and how effective they might be.

Our preliminary survey results suggest that although the peer review process is widely appreciated, there is considerable variation across subjects in terms of the degree to which students were satisfied with the process. Because there are many confounds across the subjects, including class size, structure, group versus individual submissions, and the number of reviewers, we cannot convincingly identify any particular factor as responsible for the variation we observed. Perhaps the most variable ratings and lowest levels of satisfaction were received in the *Animal Behaviour* subject, where students received only a single student peer review. Since the review task was one with which the students had limited experience, this increased the likelihood that a given student might have received a poor review. Cho *et al.* (2006) have shown that the reliability of individual student reviewers tends to be modest and is lower than that of instructors, whereas a collection of four to six peers produced very high levels of reliability. In *Experimental Animal Behaviour*, where students received three reviews, one of which was by an instructor, students showed considerably higher levels of satisfaction with the peer review process.

Student satisfaction with the peer review process is likely to depend not only on the quality and quantity of the reviews they receive, but also on student perceptions of reviewer competence. The quality of reviews will obviously be improved by providing reviewers with training and guidelines on how to distinguish between work of high or low quality, and the knowledge that reviewers are being trained should also increase the faith of reviewees in the competence of their reviewers. For many students, this was their first experience with peer review, so in the *Animal Behaviour* and *Experimental Animal Behaviour* subjects we offered a 2-hour tutorial session in which we both described the peer-review process generally (in the context of the primary literature) and then gave more detailed descriptions of issues to consider when writing a review. This included advice on the process of reviewing (reading and annotating a manuscript, preparing and proof-reading the review, completing the review form); guidelines for areas on which to focus, the importance of providing both praise for the positive aspects of a study as well as highlighting the weaknesses, examples of helpful and unhelpful reviews, and tips for time management of reviews. In all three of our subjects, the review forms were also structured, including checklists of issues and questions as another way of guiding students through the review process. Nevertheless, some form of calibration (e.g. Chapman 2001) will be a desirable feature to implement in future versions of PRAZE. Such a calibration would allow students to test and develop their reviewing skills on set pieces of work of varying quality and be allowed to progress with genuine review only after demonstrated competence. Finally, we think it is desirable to maximise (within constraints of workload) the number of reviewers for any piece of work. Not only does this reduce the likelihood that any student will receive poor feedback, but student confidence in reviewer feedback is presumably enhanced when the same issue is highlighted by more than one reviewer.

We have used the peer review process mainly in the context of providing formative feedback. However, there is also significant potential for students to participate in summative feedback (i.e. provision of grades). While there are understandable concerns about the potential effects of student inexperience and potential for bias, Cho *et al.* (2006) point out that instructor reviews may similarly be subject to issues of reliability and bias, and demonstrate convincingly that under appropriate conditions, peer-generated grades can are sufficiently reliable and valid to be used widely in university settings. Indeed, it appears that negative student *perceptions* of the validity and reliability of peer-generated grades are a more significant impediment to their implementation than the validity and reliability of the scores themselves.

Finally, our use of peer review has been in the context of students reviewing written work or design (Web) work prior to its completion. But the review process could be a valuable asset to *motivate* students' work. It could be used *before* lecture material is presented as a means of exploring students' initial ideas in a topic, raising issues, and letting them see the initial opinions of others. This approach is being considered for the Web design subject in 2008.

As we trial PRAZE through more diverse areas of the university, we hope to be able to address some of these issues.

Developmental

There are many issues that arise during the planning and development of a project like PRAZE. It is a complex system, partly because of our aims to make it widely available to university communities. We ran a workshop early in the design process to find out how others would use peer review in their own contexts. The challenge then was how to incorporate as much flexibility as possible without 'feature bloat' making the package unworkable. We approached this through the use of the wizard to assist in setting up a new peer review session. We also are planning some interactive representations to help communicate the conceptual ideas behind the process. This is important since it is difficult to explore a system like PRAZE due to its reliance on sending and receiving information from 'real' students. To fully explore the system one really needs to set up several fictitious users, send them work to review, return the reviews and then return feedback. It involves playing the roles of coordinator, author and reviewer – not an attractive proposition for a person who simply has a casual curiosity in the system!

Current and future plans

PRAZE is currently being developed by the Educational Technology Services at The University of Melbourne. Its current status is that it has undergone trials in semester 1, 2007 and is undergoing further testing and evaluation during semester 2. The system is operational but some features are yet to be fully implemented. One of the original aims of developing PRAZE was to make it easily available to others within the university as well as the broader educational community. The university employs Blackboard as its learning management system (www.blackboard.com) and one approach is to develop a PRAZE 'building block' for this system. However, this university is also exploring the potential of the Sakai online Collaboration and Learning Environment (sakaiproject.org), which is open source and offers more flexibility over the propriety Blackboard system. Our aim is to trial a version of PRAZE running within Sakai early in 2008 with an aim to integrating it fully within this environment by the end of 2008.

Those wishing to find out more about the progress of PRAZE can do so at www.dis.unimelb.edu.au/staff/jon/praze/.

Conclusion

Since this project has begun, the notion of peer assessment has attracted an enormous amount of interest around this university and beyond. While developing the pilot program (APRES) was relatively straightforward within the restricted requirements of one department, creating PRAZE, with a variety of options for more general use, has been a significantly greater challenge. Nevertheless, the system is working well and has been well accepted by students in the trial subjects. As we move towards a more widely accessible system that any staff can use within their teaching, we expect to be able to address a variety of issues relating to peer assessment and improving learning in tertiary settings.

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