

Making feedback more immediate

K. M. McGregor and
A. R. Merchant
Applied Physics
School of Applied Sciences
RMIT University
Melbourne, Australia
ken.mcgregor@rmit.edu.au

and

M. Butler
formerly Science, Engineering &
Technology Portfolio
RMIT University
Melbourne, Australia

Introduction

How often have we marked students' assignments, wishing that they were present there and then to hear and consider our comments? Since this cannot usually happen, we write down our observations and trust that the student will read them, take in the message, give it some thought and modify their next attempt in light of our comments. In many instances however, the feedback seems to fall on deaf ears and our effort is wasted.

This may be because the feedback is too late; student interest may have passed and they have mentally gone on to the next assignment. It may also be that the written comments were too cryptic and the students didn't understand the message (Gibbs and Simpson 2004). Whatever the cause, it is a waste of staff and student time. We may hope that the students benefit from our efforts, but too often they become disillusioned with the course, claiming there was no meaningful interaction or feedback from the staff.

Our aim in this study is to explore two methods intended to improve the quality of feedback – one being self marking of tests, the other being voice audio files. Both methods address the immediacy of feedback, each for different scenarios.

Literature review

Instructor interaction and feedback consistently appear in research literature, including several large meta-analyses, as key elements of good teaching practice in higher education (Pascarella and Terenzini 1991; Sadler 1989). Nicol and Macfarlane-Dick (2006) define feedback as 'anything that might strengthen the students' capacity to self-regulate their performance' (p. 205). This definition reflects the increasing interest in formative assessment and the move towards greater student engagement in the assessment process. Boud (2000) emphasises the need for 'sustainable assessment', wherein students learn to self-assess as a transferable skill required for lifelong learning. With today's large classes, there is a danger that the only feedback students obtain will be a final mark for their assignments or examinations, with little or no instructor interaction to help in tackling misconceptions or errors. In Boud's view, 'the development of self-assessment is vital' (2000, p. 157).

Students perceive timely, meaningful feedback as fundamental to good teaching. The quality of feedback is the key determinant in whether a course is rated as good in Australia's higher education Course Experience Questionnaire (Ramsden 1992). Yet a national survey of first year students indicates that 40% are not satisfied with the feedback they receive from their tutors (McInnis, James and Hartley 2000).

Gibbs and Simpson (2004) identify seven factors which may prevent students from acting on feedback: it comes too late; it refers to material which will not be taught any further; it may make unrealistic suggestions; it may suggest things that students don't know how to do; it may be non-transferable to other contexts; it may be discouraging; and there may be no follow-up to provide incentive. Weaver (2006) identifies four characteristics of feedback which students find unhelpful. Students disliked comments which were too general or vague, lacked guidance, were negatively focused or were unrelated to assessment criteria.

We have previously outlined two major methods we have been studying with which to improve the quality of student feedback (Merchant and McGregor 2006). One aspect is reducing the turn around time for feedback, providing the feedback in the same session as when the question is posed. The other aspect concerns the use of recorded voice feedback to provide the depth of feedback on a report or an assignment.

Current research relating to recorded voice feedback is surprisingly scarce, particularly using currently emerging technologies. Tape recorded feedback has been reported in educational contexts for over 30 years. Pearce and Ackley (1995) surveyed a range of studies which report positive outcomes from audio feedback, including improved exam results and better report writing. On an affective level, students reported feeling more motivated to start revision, and found the taped feedback more personal, as well as providing a greater quantity of content, which was more complete and informative than written comments. Teachers reported spending the same amount or less time taping than writing feedback, feeling less stressed and being able to give richer feedback through using intonation. Chalfonte, Fish and Kraut (1991) report that text and voice annotations were better suited to different types of feedback. Text was most effective for low level technical corrections (such as spelling and grammar) while voice provided a better medium for high level, global and conceptual commentaries, also eliciting more personal and socially communicative comments. These findings are confirmed by Wolfe and Neuwirth's (2001) collaborative annotation study.

The University of Michigan School of Dentistry undertook a formative evaluation strategy to determine the best medium to provide students with podcast lecture materials (Brittain, Glowacki, Van Ittersum and Johnson 2006). The students originally requested video recordings of lectures. The evaluation process identified that students' needs were actually best met by the provision of audio only materials, rather than video or *PowerPoint* with synchronised audio. When students were given the option to download whichever of the three media they preferred, 60% downloaded audio only, 20% video and 14% *PowerPoint*. Students' use of the audio files while commuting and working out suggest that audio only provides valuable flexibility in reviewing. The smaller file size, compared with video, also makes it a desirable medium for its relative convenience and speed of downloading. This was pertinent to our decision to trial audio feedback only and not to attempt video feedback.

Only two published studies were found which mentioned the use of digitally recorded voice feedback. Lewis and Abdul-Hamid (2006) make passing mention of this technique in their study of effective online teaching practices. They note that teachers are using voice technology to save time while providing rich feedback. The other study by Johnson and Keil (2002) compares the media richness and social presence of e-mail and v-mail (digitised voice files sent electronically as attachments) in providing feedback to students. They found that students perceived similar levels of media richness in the two forms, but that v-mail had a significantly greater level of social presence.

Reducing the delay time in giving feedback

The adequacy of the feedback has always been a major concern for students. In particular, a number of course (subject) experience surveys conducted in 2005 showed that students considered 'the returning of marked assignments on time' as critical. For example, it can be several weeks

from the time the student does an experiment to when he/she hands it in, has it marked and then returned. By that time the usefulness of any comments on the report will have been lost for the student and little may have been learnt. To reduce the time lag, we replaced the student written report with a self marking test in which students mark their own work; something that they are unaccustomed to doing.

Self-marked tests

In this method, we tested students' understanding of a number of laboratory experiments which they have recently undertaken. This typically involved students undertaking an hour's test, and in the subsequent hour, the test was discussed in class and the students were required to mark their own work. Students were given red pens with which to mark their work and to make comments during this marking stage. The demonstrator provided an answer for each question in turn and then solicited responses from students. The intent was that by the end of the session, students would know (i) what the expected answers to the specific questions are, (ii) how well they have fared in answering the questions and (iii) what is important is expressing the answer and how marks may be distributed.

Both students and demonstrators were unfamiliar with this method and the demonstrators had to be well prepared so as to be able to handle the questioning from the class. After the tests had been self marked, the demonstrator would check the scores given by the students, ensuring that the self marks were justified. Generally, the marks allotted by students were valid, although a few students underscored themselves. The burden of marking for staff has been reduced, since the task is made easier by the marking that has already been done by the students. Students' written comments on their answers provided additional feedback to demonstrators which helped them in allocating a suitable grade.

Focus Groups

Groups of first year engineering students were invited to a number of focus groups being conducted by one of the authors who was not directly involved with the teaching in the course. These physics laboratory classes, which ran for the whole year, had previously been assessed by reports, but for this cohort of students they were assessed in both semesters by tests. Students in the focus groups were initially asked a few common questions, after which open-ended, unstructured discussion was encouraged. Students were asked to quantify on a 5-point Likert scale their responses to two opposite views and Table 1 shows the averaged response to the questions.

Among the comments made by students supporting the first option for a test were:

- 'With reports you need only study/research only particular areas. However with tests you need to study everything! Also reports seem like it needs to be perfect. Not so with tests.'
- 'I guess tests are more effective than reports. It really values our knowledge.'
- 'Reports help you to research and learn everything about the topic you're doing. Tests put you under

pressure like an exam and really test what you've learnt.'

These comments indicate that students perceive the learning required for the tests to be more 'effective' in testing their knowledge than that obtained by writing a report.

Table 1. Response rate in the top two-points of the Likert scale (N=15)

Survey Question	Positive Response Rate
Those who preferred doing a test to a report.	79%
Those who were quite comfortable marking the test.	74%
Those who thought the marking scheme was quite clear.	79%

We had concerns that a significant percentage of students might be uncomfortable in marking their own tests, perhaps because it might show up their 'inadequacy' too much. One student commented that: 'This is a bit uncomfortable because most of us will not be honest with marking our own things.'

Two further comments were 'Everyone is pretty much mature and won't make me feel uncomfortable or inadequate by asking me what I got. Maybe it might push students to do better if they feel uncomfortable.' and 'I was very comfortable. It does sometimes expose lack of knowledge, but it a good idea to get immediate feedback and know what you have done wrong or right.'

Generally the marking scheme was adequately explained, some comments being: 'There was not much argument over the results as everyone accepted their results.' and 'We had clear instructions so we didn't have to clarify or haggle for marks'.

More general comments included: 'I really like the immediate feedback and the chance to ask questions about my results. I really learn a lot from this process' and 'The marking of tests isn't exposed much to other people. It does however show us where we went wrong as soon as we finish the test. Most other feedback I do not read.'

Cheating by students did not appear to be as issue, and although some students might have 'sneaked' a look at their neighbours response and the mark that was given, the use of a red coloured pen for marking lessened the chance of plagiarised answers being appended.

Improving quality of feedback

Laboratory work and reporting is a key aspect of physics education and marking of such reports has always been a onerous task. Feedback on reports may be given as written comments, but this usually requires considerable effort on behalf on the marker to provide adequate explanation. It is often the case that talking with a student provides far greater clarity of explanation in the same time frame.

With the convergence of modern communications, the use of voice is becoming more ubiquitous and easier to use. The voice recording of lectures is becoming common and is used to complement the information given in visual presentations. Students generally greatly appreciate the additional information that the lecturers give when talking to a slide.

However the intent of this study was to see how effectively feedback might be given on an individual basis. This obviously requires more effort than when say offering comments to a group on some assignment. But does it provide better feedback than written comments?

Trials were conducted on a group of students submitting physics laboratory assignments in which individual feedback was sent by email as audio files. Each assignment was marked normally and then an audio comment was produced lasting about 1.5 minutes on average.

Meetings of two focus groups were convened, each with about 10 students, and all the students bar one appreciated the voice feedback. Most students listened from the computer loudspeakers at home and a few downloaded the file onto their MP3 player. No one had problems downloading the audio due to bandwidth limitations.

Quality

Little or no attempt was made to edit the file before being sent out since it was felt that any workable system had to be one that required only a minimum of additional effort on behalf of the staff. The recording therefore was similar to how the student might have been addressed in a face to face conversation. This lack of polish was not an issue for the students. Audio is essentially a serial medium and when recording lectures, it must be broken up into more sizeable bites. However for these short times, it was felt such editing was not required.

The audio quality (MP3) was quite adequate, although one or two students had difficulty with what was being said, rather than with the audio quality. Each recording was tailored to the specific student's work, so it was important that they had a copy of their assignments to hand when listening to the feedback. Some students would have liked video feedback as well for that reason. (Due to the nature of the assignment, we did not specify whether the assignment was to be hand written or word processed and so we did not use a completely paperless communication system.)

Students did appreciate that the feedback came from their teacher and said that they were far more likely to take note of what was being said and less likely to discard the audio feedback compared to written comments.

The time required to produce the voice recording was generally not much different to that which would normally be spent on giving written comments on an assignment. Often it was felt that the overall quality of the feedback was better in that for the same time period, voice feedback allowed for greater expansion on the comment than might be achieved by the written word. The intonation of voice helped.

Additional work was involved in attaching the voice recording and then sending them to students individually. RMIT uses *Blackboard™* as the Web delivery system and the Gradebook within *Blackboard* allows for electronic submission of assignments and the attachment of electronic feedback. Such systems are useful in making the whole process easy to use and therefore practical.

Conclusion

The focus groups that we have conducted into the self-marking tests and assignments have confirmed the positive responses expected from students concerning the speed and effectiveness of the feedback. Students are strongly engaged in the material for which they have just had a test. Such feedback could also be beneficially given to students after their final examination for a semester, something that is rarely done and usually only at the specific request of a student.

The history of audio feedback goes back many years. Some lecturers would produce audio recordings on small audio tapes and mail those to their students. But it was a long process, one that stopped because the additional effort was just too great. However simple voice feedback to students does now appear to be a practical method of providing meaningful commentary on a student's progress. When simply done without any editing, audio communication to individual students can be provided without overburdening staff. As convergence of communications continues, it is inevitable that voice communication with students will become ubiquitous. For example, in the near future it is likely that voice messages will be sent both as an email attachment and as a voice recording to a student's mobile phone. It is important to have a system which works as smoothly as possible.

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References

- Boud, D. (2000) Sustainable assessment: Rethinking assessment for the learning society. *Studies in Continuing Education*, **22**(2), 151–167.
- Brittain, S., Glowacki, P., Van Ittersum, J. and Johnson, L. (2006) Podcasting lectures: Formative evaluation

- strategies helped identify a solution to a learning dilemma. *EDUCAUSE Quarterly*, **29**(3), 24–31.
- Chalfonte, B., Fish, R. and Kraut, R. (1991). Expressive richness: A comparison of speech and text and media for revision. *Proceedings of the SIGCHI conference on Human factors in computing systems: Reaching through technology*. New Orleans, USA, 21–26.
- Course Experience Survey (2005 Semester 1). PHYS1046 RMIT University.
- Gibbs, G. and Simpson, C. (2004) Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education*, **1**, 3–31.
- Johnson, R. and Keil, M. (2002) Internet-Enabled Audio Communication: A Richer Medium for Students Feedback? *Proceedings of the 17th International Academy for Information Management (IAIM), Annual Conference*, Barcelona, Spain, 99–110.
- Lewis, C., & Abdul-Hamid, H. (2006). Implementing effective online teaching practices: Voices of exemplary faculty. *Innovative Higher Education*, **31**(2), 83–98.
- McInnis, C., James, R., & Hartley, R. (2000). *Trends in the First Year Experience in Australian Universities*. Canberra: DEETYA.
- Merchant A. and McGregor K. (2006) Improving the immediacy and quality of feedback for physics students, *AIP 17th National Congress 2006 – Brisbane*, 3–8 December 2006
- Nicol, D.J. and Macfarlane-Dick, D. (2006) Formative assessment and self-regulated learning: a model and seven principles of good feedback practice. *Studies in Higher Education*, **31**(2), 199–218
- Pascarella, E. and Terenzini, P. (1991) *How College Affects Students: Findings and Insights from Twenty Years of Research*. San Francisco: Jossey-Bass.
- Pearce, G. and Ackley, R. (1995). Audiotaped feedback in business writing: An exploratory study. *Business Communication Quarterly*, **58**(3), 31–35.
- Ramsden, P. (1992) *Learning to Teach in Higher Education*. Routledge: New York and London.
- Sadler, R. (1989) Formative assessment and the design of instructional systems. *Instructional Science*, **18**, 119–144.
- Weaver, M. (2006) Do students value feedback? Student perceptions of tutors' written responses. *Assessment and Evaluation in Higher Education*. **31**(3), 379–394.
- Wolfe, J. and Neuwirth, C. (2001) From the margins to the center: The future of annotation. *Journal of Business and Technical Communication*, **15**(3), 333–371.