What is Feedback? Connecting Student Perceptions to Assessment Practices

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Abstract—This paper reports outcomes from an international study examining student perceptions of feedback. Recent work by Grahame Gibbs identifies linkages between current and subsequent course activities as a critical factor in whether students value the feedback they receive. We have investigated the frequency and nature of feedback given to students in two large introductory course settings in engineering and computing in Australia and Sweden and contrasted this with student perceptions of the quality of feedback they received.

Data analysed includes audits of levels of verbal and written feedback on assignment work returned to students, and an exploration of student attitudes to feedback in the context of the questions asked in course evaluation questionnaires. Drawing on the work of Gibbs on feedback, and Biggs on constructive alignment we propose four principles for achieving student relevant course feedback. The paper uses these principles as a framework with which to deconstruct and analyse the feedback processes and learning activities of the 2012 versions of the two target courses. The analysis demonstrates that several key principles have been violated. We also discuss how new learning activities could be designed and evaluated to address the concerns we have identified.

The results highlight the contextual nature of how feedback is perceived and valued by learners. This provides useful practical guidelines to academics wishing to optimise the value of feedback to students, and minimise wasted effort associated with giving types of feedback that have little value for learners, and which consequently often remain unread.

I. INTRODUCTION

Student evaluation of courses undertaken at universities has a long history. Increasingly, universities are using measures of student satisfaction as a metric for teaching quality, such as the Course Experience Questionnaire (CEQ), which is administered annually to new graduates from all Australian universities [1]. One of the key aspects of all such surveys concerns feedback on assessment activities, and in particular on the students’ perception of the feedback received. Student feedback ratings are often a source of frustration for academic staff, since students’ perceptions are often at odds with the academic’s perspective. Academic staff have a tendency to focus on the effort required to produce the feedback, rather than the effect of the feedback on the student [2].

Gibbs [3] postulates that student perceptions of feedback are strongly linked to their evaluation of the usefulness of the feedback for improving their outcomes in subsequent assessment activities. Hence, even if there is a huge amount of feedback on a given activity, students’ are unlikely to value the feedback (or perhaps even see it as feedback at all) unless they can clearly see it can be used to improve their grades in subsequent assessment activities.

In this paper, we investigate this hypothesis by analysing two similar courses (both entitled Intro. to IT) at the University of Uppsala in Sweden and at RMIT University in Australia. Both courses had relatively poor results on student evaluations of feedback in 2012, so we investigate the assessment activities used through the lens of Gibbs’ hypothesis. In particular, we look at the nature of the assessment activities, and the feedback that was given. For each course we propose a fresh approach to assessment based on four ‘feed forward’ principles, which are derived from Gibbs’ work on feedback and general observations on constructive alignment [4], [5].

The remainder of the paper is organised as follows. In Section 2 we discuss related work and our motivations, and in Section 3 we introduce our feed forward principles. In Section 4 we present the data from our two case studies, and in Section 5 our proposed changes to align their assessment activities with our four principles. In Section 6 we discuss how we will evaluate the effectiveness of these changes when they are implemented. Section 7 presents our conclusions and proposes areas for future work.

II. BACKGROUND

One of the major factors which has an impact on student evaluation of courses is the nature of the feedback on their work and interaction with academic staff. Many of us have experienced the situation where students never collect assignment work, or collect it and do not read the comments. Audits show that quantity of feedback alone is a poor predictor of high student ratings on feedback related questions on course evaluation surveys.

This paper takes a two pronged approach to exploring with this issue. First we draw on the recent research literature on feedback and constructive alignment to derive guiding principles for designing effective feedback and learning activities. Second, we examine current assessment practice in two large introductory courses taught at research universities in Australia and Sweden.
Using the principles we have derived we explore reasons for why these two courses are criticised by students. Since much of the student criticism surrounds feedback, and the manner in which feedback and learning activities are structured we also explore how our principles can inspire solutions to these criticisms.

III. ROLE OF FEEDBACK

Feedback is provided in different ways in different disciplines. RMIT, which is a university of technology and design based in Melbourne in Australia, is divided into three academic colleges: those of Business, Design and Social Context (DSC), and Science, Engineering and Health (SEH). As is common in Australian universities, each time a course is run, the students in the course are surveyed about a variety of aspects, including feedback. Hence it seems reasonable to expect that systematic differences in feedback scores might be identifiable. Disciplines such as design tend to workshop and showcase student work for public critique in a way that is uncommon in many of the science and technology departments. We hypothesised that higher overall ratings for feedback would be given by students in disciplines where an active feedback culture is more widely practiced, such as in design and architecture, in contrast to more traditional knowledge-based disciplines such as engineering and IT where summative feedback is more the norm.

We conducted an analysis of the aggregated student responses to question 9 of the Course Experience Questionnaire (CEQ) for academic year 2012. Our data covers the three RMIT colleges described earlier in this section.

Question 9 reads as follows.

“The teaching staff normally give me helpful feedback on how I am going in this course”.

Students from were asked to respond on a Likert scale, i.e. on a scale of 1 to 5, with 1 being Strongly Disagree, 2 being Disagree, 3 being Neutral, 4 being Agree and 5 being Strongly Agree. The results of the survey are given in table I, where N is the number of respondents from each college. The final row, labeled (CSIT) shows the distribution of ratings given by students from the School of Computer Science and IT, who are a subset of the SEH student cohort.

We are primarily interested in comparing the survey results for the DSC college with those of the CSIT students. If our intuition about the nature of the feedback culture in these disciplines is correct we would expect that students in the DSC college generally give higher ratings for feedback than CSIT students do. A one-tailed t-test on the 2012 data shows that this hypothesis is confirmed (t = 6.49, p < 0.001, df = 18,368).

This analysis supports our contention that the culture of feedback in the IT discipline is generally weaker than that in disciplines such as architecture and design. Given that the mean score for this question for the CSIT students is higher than that for SEH students overall, it seems that the difference between the DSC and SEH colleges on this question is even more pronounced than for the CSIT students alone.

IV. FEED FORWARD PRINCIPLES

Maximising learner benefit from self-directed learning activities has been extensively discussed in the literature, and a number of useful models, such as Kolb’s learning cycle, have been proposed. Applying this type of reasoning to assessment in Computing and Engineering is not new, however, most prior work focusses on promptness of feedback, and the nature of the interaction associated with feedback interactions between teaching staff and learners.

The emphasis of assessment is moving from essentially providing certification towards encouraging learners to continue their own learning and rewarding them for demonstrating competence and authenticity at various stages. Assessments are being designed to build on constructivist philosophies for students to acquire and test their own knowledge through their interactions with the learning environment. What is of most interest to us is the actual nature of feedback and how it can be used to foster learning.

Boud [6], [7] argues that we need to be creating sustainable assessment by focussing on ensuring that learning occurs. The neglect of assessment for learning undermines students and staff. It drives towards compliance and fosters a dependence on the judgement of the teachers. It is backward looking, at what has been achieved, and not at what capacities need to be developed. If we make assessment the centrepiece of the learning environment, teachers and students can be partners, but active and appropriate feedback must be consciously designed for appropriate productive learning activities.

The concept of feeding forward is essential for this kind of learning process. As we are moving from teacher-centred to learner-centred generation of knowledge, so we are moving from simply testing students to producing lifelong learners and we require our responses to their assessment to be moved forward and used to improve their next learning step.


- **Learning activities should be linked to a high level goal**
- **Assessment activities should be constructively aligned and should build on one another**
- **Feedback should directly enhance student outcomes on subsequent tasks**
- **Feedback should be interactive**

So how are these principles applied in practice? The first principle draws on research into student motivation and en-
gagement. We conclude that this research demonstrates that learning motivation and student engagement are maximised when learning activities are connected to a broader application context appropriate to the subject being taught. In programming this can be expressed as a software systems need, for instance the development of a rostering systems to allocate patients and surgeons to operating theatres in a hospital. The goal is to enhance motivation and engagement with the activities by demonstrating how they contribute to solving a more realistic challenge. This is also one of the key principles of problem based learning [8].

The second principle emphasises the importance of providing a clear link between the learning activities and desired learning outcomes. Typically this implies that activities are designed based on the learning outcomes specified for the course. For instance, we assist students to discern how learning activities contribute to achieving the course learning outcomes. This is managed by leveraging the problem context. In addition it is vital that activities feed into one another, so that feedback received on earlier activities contributes to enhanced opportunity to excel on subsequent occasions. For instance establishing coding standards that will be rewarded in all subsequent programming. Another example concerns report writing, where extension and revision are rewarded. For instance writing of a report in several stages leading from requirements elicitation to a final report that defines functional requirements for a system.

Principle three builds directly on principle two, though we wish to distinguish between constructive alignment and feed forward. For instance a set of activities can be completely aligned with defined learning outcomes and related to one another, but not be structured in such a manner that feedback in earlier stages contributes to enhanced subsequent performance. Feedback that violates the principle provides summative rather than formative impetus, even when the exercise is incremental.

An example of such a situation might be that feedback was provided regarding a set of use cases. If we merely observe that the cases described lacked coverage, this is summative. If the feedback prompts the learner to consider new situations and links this to the ability to enhance the functional requirements that are the next learning goal, this is formative.

Principle four draws its inspiration from the social theory of learning promulgated by Lave and Wenger [9]. They postulate that knowledge is constructed in the context of social interaction and communication, as norms are negotiated in relation to knowledge and learning behaviour. These ideas have also been applied to university learning, for instance by Blackmore [10], who explores learning landscapes degree programmes in rural development. Feedback is strongly linked to communication of academic values and contributes to the dialogue surrounding normative conceptions of knowledge in the discipline and ways of learning that are given status within the discipline. To enhance the richness of this interaction we argue that interactive feedback strengthens communication of values.

V. A TALE OF TWO COURSES

Can one conclude that communication and feedback culture in CS and IT is weaker than in other disciplines? We drew on two large pools of course evaluation data from introductory courses in IT, one at RMIT and one at Uppsala University. Both have poor overall feedback ratings, and the Uppsala course had also been severely criticised by students for having too many small disconnected exercises which were largely of a cut and paste character.

A. Uppsala University

The Introduction to IT course is a 10 European credit point course taught during the first semester of the IT engineering programme at Uppsala University in Sweden.

The course provides an overview of the IT discipline including material on systems design, algorithms, computer networking, computer architecture and file systems, programming tools such as editors and compilers, and an introduction to programming. The course also introduces students to some project based learning, and expects students to demonstrate the ability to present their work in written and oral form.

The ambitious course content and wide variety of topics covered have lead for practical reasons, to an assessment and feedback strategy that is highly compartmentalised. This reduces the need for the staff teaching the course to collaborate and synchronise course delivery, but leads to student criticism of the course, particularly that the assessment exercises seem unconnected, and very prosaic, in many cases nearly at the level of web search and cut and paste.

Many students bring up this problem in their course evaluations. For instance, Leah, who says.

"Don’t have so many small exercises, everything is very confusing and unrelated. I would personally have spent more time on the assignments if they had been fewer in total and larger, which would have resulted in me learning more. When the exercises are more of a cut and paste character it is hard to take them seriously and you just do them as quickly as possible, and thus don’t tend to learn much that is useful at all.”

The Autumn 2011 course assessment consisted of the seven small assignments designed to enhance written and verbal presentation skills, three technical assignments in digital electronics and computer architecture, and three group dynamics exercises and a final project and report. The written and verbal presentation exercises were the following.

Assignment 1 asked students to write a page of text reflecting on their reasons for choosing the programme and prior experience with computing and IT.

Assignment 2 required students to read part of the prescribed text and present the material for others in the course.

Assignment 3 involved students in some simple research into an
area of CS that interested them. They were asked to summarise their findings in a 3-4 page essay, and present the content in a seminar.

Assignment 4 involved familiarising oneself with degree programme, identifying a course one would like to take in the future, summarising how it was assessed, who taught it, what prerequisites it had, and what year level it belonged to.

Assignment 5 involved formulating study and working life based questions to ask alumni from the programme in a seminar setting. This was linked with a guest lecture from a prominent former student.

Assignment 6 dealt with writing requirement specifications, converting a requirement into a design document and finally exchanging designs with another group and then trying to build what was described.

Assignment 7 presentation technique was practiced in seminars where small groups of 2-4 students prepared presentations and presented them to the entire class.

Students in the course received very detailed feedback on their written research report, and on the seven assignments described above. As feedback the students received a summary of the assessment of the strengths and weaknesses of their reports, and commented PDF files returned via the course LMS. Approximately 600-800 words of written feedback were returned to students in conjunction with the assessment of assignments and practical work during the 17 week semester. Students also participated in 8 hours of seminars, 12 hours of supervised tutorials and about 4 hours of hardware related practical work. Despite this the overall evaluation of the course in 2011 was 2.7 on a scale of 1-5. A typical course evaluation for the programme courses that year was 4.1 on a five point scale where 5 was the highest approval level.

Clearly students are of the opinion that many of the current course activities do not make a meaningful contribution to their intellectual and technical development. Three indicative observations are included below, and many (34 of 65) of the course participants recorded similar comments.

“First of all I think that even the teachers should be able to stick to their own deadlines, delays in correcting work sends a poor message to students. A good example is the marking of reports. This was delayed an entire week, this is unacceptable, especially when students were required to revise and resubmit work. A whole week of study time was lost in which one could have made the necessary corrections.

“This was an exceptionally chaotic course with a minimal overview of what was in fact required and many exercises which did not contribute to learning anything for most of us, such as presentations and written reports. These should be optional for those who think that they need to improve their abilities in these areas.”

B. RMIT

COSC1078 Introduction to Information Technology is taught in the first semester of the three-year IT program in the School of Computer Science and Information Technology at RMIT University in Melbourne, Australia. The aim of the subject is to introduce students to the concepts, language and techniques of IT, and hence is very broad, and not of great technical depth. In semester 1, 2012, there were 180 students enrolled in this subject.

The assessment in this subject consisted of an exam (worth 40%), three assignments (worth 10%, 10% and 20% respectively), three online tests (worth a total of 10%) and self and peer assessment (worth 10%).

The assignment tasks involved the progressive production of a video of at least three minutes duration, with at least 30 seconds coming from Assignment 1, 60 seconds from Assignment 2 and 90 seconds from Assignment 3. For each assignment, the students had to keep a blog of their activities, and to submit a written report as well as the video itself.

The content of the report and video for Assignment 1 was an image chosen by the students, together with various transformations of the image (negative, greyscale, thumbnail, “artistic rendering”) and two audio files (one of a human voice speaking, one consisting purely of instrumental music). The video was to be constructed from still views of the various images accompanied by some combinations of the spoken voice and music as the sound-track.

Assignment 2 required the students to provide a video presentation and a written report on two options for a new computer for their grandmother. Some specifications were given (such as a minimum amount of disk space and size of monitor) and a strict budget limit, but otherwise the students were free to find options that would suit, present two of them in the video and record the detailed characteristics in the report. They were also required to choose a particular option as their recommendation. The 30 seconds of video used in Assignment 1 had to be submitted as part of Assignment 2.

Assignment 3 required the students to write up answers to a series of 12 reflection questions, and choose two of them whose answers would be represented in the video. An example of such a question is “Sometimes users want to do things that aren’t good for them. How far should an operating system go to try to protect a user from themselves?” They were also required to research an IT topic of their choice (with the guidance of the lecturer), and to present their findings both in the report and in the video. The 90 seconds of video used in Assignments 1 and 2 had to be submitted as part of Assignment 3.

Assignment 1 could be completed either individually or in groups of 2 or 3. Assignments 2 and 3 had to be completed in groups of 2 or 3. In all cases, each group member got the
same marks (so that there was one mark given for the group assignment as a whole).

Each assignment specification contained a breakdown of the marks involved, such as the one below for Assignment 2.

<table>
<thead>
<tr>
<th>Assessment Components for Assignment 2</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Inclusion of Assignment 1 clip</td>
<td>10</td>
</tr>
<tr>
<td>2 Option 1 price and view</td>
<td>5</td>
</tr>
<tr>
<td>3 Option 1 justification</td>
<td>20</td>
</tr>
<tr>
<td>4 Option 2 price and view</td>
<td>5</td>
</tr>
<tr>
<td>5 Option 2 justification</td>
<td>20</td>
</tr>
<tr>
<td>6 Video (clarity, length, fit to specification)</td>
<td>20</td>
</tr>
<tr>
<td>7 Blog</td>
<td>20</td>
</tr>
</tbody>
</table>

The assignments were marked by a team of 8 tutors, with each tutor marking between 7 and 24 assignments each. The tutors were given a marking guide of around a page in length, with specific criteria for each of the components in the mark breakdown table. A matching online feedback sheet was prepared in the WebMark¹ system for the tutors to enter marks for each component, and optionally comments for each component. Once all marking was completed, this feedback sheet was emailed to the students. All students in a group received the same feedback sheet. Assignment marking was completed within two or three weeks for all three assignments.

The mean and median marks for each assignment are given in the table below.

<table>
<thead>
<tr>
<th>Assignment 1</th>
<th>Assignment 2</th>
<th>Assignment 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>85%</td>
<td>93%</td>
</tr>
<tr>
<td>median</td>
<td>90%</td>
<td>96%</td>
</tr>
</tbody>
</table>

TABLE II
ASSIGNMENT GRADES RMIT

Typically, comments were not entered when the students scored the maximum marks for a given component. Assignments scoring full marks or close to it were common, many students received little or no comments on their assignment. A typical comment was “Price list is not clear (-1)”. Comments were typically one or two short sentences, and hence even the lowest scoring assignments would get around 5 sentences of comments. One of the longest sets of comments is the one below for an Assignment 2 submission.

The tutors were allocated marking time of 40 minutes per student to mark all three assignments. Most of them spent at least this long, and often longer. This time pressure presumably explains the brevity of many of the comments.

At the end of the semester, students voluntarily filled in an online survey form. This is a standardised set of questions, to which the students respond on a Likert scale (with 1 being Strongly Disagree, 3 being Neutral and 5 being Strongly Agree). Of the 180 students enrolled, 59 responses were received. The two questions directly relevant for feedback were “9. The teaching staff normally give me helpful feedback on how I am going in this course” and “13. The staff put a lot of time into commenting on my work”. Scores are calculated on a percentage basis, with the percentage being the number of students who respond with Agree or Strongly Agree for the particular question. For these two questions, the scores were 64% and 56% respectively. The score of 56% was the lowest such score on any of the 13 questions, with 64% being the equal third-lowest. The score breakdown for these two questions is given below, as well as the average scores.

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>1</td>
<td>5</td>
<td>15</td>
<td>23</td>
<td>15</td>
<td>3.8</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>4</td>
<td>21</td>
<td>22</td>
<td>11</td>
<td>3.6</td>
</tr>
</tbody>
</table>

TABLE IV
CEQ FEEDBACK SCORES RMIT

From these scores on the feedback questions, it seems reasonable to conclude that the students do not value the feedback received very highly. The tutors generally spent a minimum of 40 minutes marking the three assignments, and often more (especially when it came to viewing videos and reading reports). This suggests that the effort that goes into providing feedback wasn’t appreciated, and we need to determine how these resources could be used more productively.

VI. WHAT WENT WRONG?

It is readily apparent that the assignment specifications and assessment practices and process in both these courses depart substantially from the four principles presented in Section IV. What can and should be done, and how do the principles we have derived assist in that process.

¹https://webmark.cs.rmit.edu.au
A. Uppsala University

In Uppsala the course we have described violates principle 1, by requiring that students complete a large number of small largely unrelated exercises. The situation is exacerbated by what the students perceive as a weak communication culture with very low levels of interaction, at least from their perspective as expressed in the course evaluation data. Thus the course, at least from a student viewpoint, fails to adhere to principle 4.

While there is some linking of assignment activities in verbal and written presentation skills these are clearly not linked to each other, or the other technical content, in a manner which has proved meaningful to the students. In addition many of the learning activities with a technical focus are completely self contained and could have been scheduled in any order over the semester. In fact the course is taught by a team of several staff which increases the tendency toward fragmentation and compartmentalisation of content. In addition the character of the feedback is directly related to the current work and does not refer to the opportunity to use the feedback to improve future grades.

Principles 2 and 3 are also largely violated. While the tasks are aligned with the course goals, the link is unclear to students, and their frustration with what they perceive to be the chaotic nature of the course makes this a vital area to address. In addition there are assignments of varying complexity in a bewildering array of topic areas. To address this situation it seems desirable to have a unifying theme to provide a focus for the assessment activities in line with our first principle. One possible approach would be to align all of the activities with a systems development exercise. Thus, the written and verbal presentation exercises would deal with aspects of requirements elicitation, through interviewing a customer and documenting and analysing what was said. It is important that whatever the chosen exercises, that feedback deals with generic skill development, and is useful in improving performance on the next task in the sequence. Having a systems development project as a main driver for the course also allows us to integrate surveys of relevant contributing technologies, hardware design and purchasing, exposure to software engineering principles, and programming and debugging exercises. All of which are included in the current course, but due to the lack of a unifying IT systems goal is it hard for students to appreciate their relevance.

B. RMIT

The RMIT course also clearly violates principles 1, 2 and 3. The three assignments were comparatively small scale activities arranged in a sequence. They were also independent tasks, despite the cumulative nature of the video, as each task could be completed independently of the others; in particular, the ordering of the three assignments was entirely arbitrary — any of the six possible orderings of the three assignments would have been feasible. In terms of the feedback given, the only part that might have been helpful to subsequent assignments was that for the blog and video quality components. However, the majority of the marks were elsewhere, and these tasks were ones for which there was a limited scope for feedback. The feedback given was also largely via the text comments described above, emailed to the students two or three weeks after submission. This is clearly not interactive. There was also a small amount of discussion in class time before and after each submission, during which time students were encouraged to ask questions, but very few did so.

Hence in order to design better assessments, the first two principles imply that a single large project broken into three cumulative pieces is more appropriate. One possibility for this is to drop the first two assignments, and to enlarge the scale of Assignment 3. This could be done by still requiring the students to answer the 12 questions and present some research findings on a topic of their choice, but by dividing the task into three parts. The first part would be the first 4 reflective questions, and a preliminary report on their research topic focusing on the need for a particular technique or technology. The feedback about the questions should be helpful for the remaining questions, not least because of their open-ended nature, and the need for the students to get a feel for what constitutes the right depth of response. This would clearly be of benefit for the next piece of assessment, which would include not only further reflective questions, but also a further aspect of the research topic, such as the current state of the art. The feedback would also be designed to give general guidance on what constitutes a good assignment answer. For the reflective questions, this may be devising an example and working through the consequences of it, rather than giving an unsubstantiated opinion. For the research report, this may be describing the principles on which the particular technology is based, rather than listing the features of a specific product.

The process for feedback may take a variety of forms. One would be an academic leading a discussion of assignment expectations in class before the due date. Another would be group of students discussing the assignment (or perhaps working on it) in supervised environments such as tutorials, or in less supervised ones such as Internet chat rooms. Peer review (i.e. students reviewing the work of other students) could become a part of the assessment, such as each student assessing the final submission of say three other students, or an informal process, in which students are encouraged to swap draft assignments with each other. A formal interview process (either one-on-one or many-to-one) could also be used. For the RMIT Intro to IT course, the most likely process for interactive feedback will be academic-led class discussions and informal peer discussion amongst the students during tutorials before submission, and formal peer reviews by the students after submission.

It should also be noted that the students are not the sole beneficiaries of an interactive approach to feedback, as it gives the staff involved a much deeper appreciation of the students’ actual level of understanding.
VII. EVALUATING IMPROVEMENT

Building on the principles and actions we have discussed above our next step is to more fully assess the impact of new feedback practices and feed forward oriented learning activities on student perceptions of the feedback they receive. We intend to use the two courses described above as the context for an action research project, in which the situation described above forms the baseline, and our intervention is to re-design the assignments in accordance with the four principles. One of the key metrics used will be the responses of the students on the course evaluation surveys, on which it seems reasonable to expect some statistically significant improvement. However, as noted above, it is not always obvious what particular aspect of feedback is perceived by the students to be of most benefit, and so we plan to use a range of metrics in an attempt to establish which particular aspects correlate most strongly with the students’ perception of feedback. These metrics will include

- The time spent by both students and markers engaging around the assessment activity.
- The amount of feedback provided per student (measured by lines or words of text).
- The time spend in face-to-face discussion about the assessment, both before and after submission.

The first item is not necessarily part of the feedback process itself, but it does reflect an intuition that the more time the student spends on an assessment activity, the greater is their expectation for the amount of feedback. Measuring the time spent on marking student work is also an important pragmatic aspect of the feedback process, partly because this is a direct cost in resources for the university, but also because this cost is typically invisible to the students (as noted in the above discussion).

The second item is comparatively easy to measure, and will help establish that volume alone is not necessarily the key aspect of feedback from the students’ perspective; here we would expect to see a stronger correlation between student satisfaction and the part of the feedback that will have an impact on subsequent tasks than that between student satisfaction and other feedback content. It also seems reasonable to hypothesise that feedback on the final assessment item will be less critical than earlier ones, for similar reasons. Hence it will be necessary to be able to separate this metric into “forwardly useful” and “other” components. It would also be useful to have the students provide their opinion on the relative size of each component (e.g. for the students to indicate how much of the feedback received they think will be useful for the next assessment activity).

The third item relates to resource cost as well, but also to the students perception of the effort that goes into providing feedback. As with the previous item, it would be appropriate to specify the relative amounts of time spent on “forwardly useful” and “other” feedback, both as measured by the staff and as perceived by the students. This also raises the issue of whether it is sensible to blend the post-submission discussion of an assessment activity with the pre-submission discussion of a subsequent one, or to keep them separate. Whichever process is followed, it is easy to imagine an outcome along the lines of “Five minutes of pre-submission discussion leads to greater student satisfaction than twenty minutes of post-submission discussion”.

It is our intention to perform measurements of this nature in the Introduction to IT courses at both Uppsala and RMIT, and to report on the next phase of the research in a subsequent paper. We will also measure the impact of the initiatives on responses to the feedback questions on the CEQ survey.

VIII. CONCLUSIONS AND FUTURE WORK

Providing feedback on student performance remains a vital part of academic practice. We have seen how feedback is often perceived differently by students than by academics, and that students generally view feedback through the lens of the next assessment task. This often makes the amount of feedback and the effort taken to produce it irrelevant for students. Feedback seems only to serve a purpose if it is helpful for the next assignment.

We have proposed four guiding principles more closely align assessment activities with students’ perceptions of ‘good’ feedback.

An analysis of two similar introductory IT courses, one from Sweden and another from Australia, reveals similar feedback attitudes, despite rather different external circumstances. Using these courses as a focus we have discussed how the students’ perception may be improved by changing assessment practices, using the four feed forward principles introduced in Section IV. In particular, this involves constructively aligning the assessment tasks, and making sure they are linked to a high-level goal. Carefully designed feedback activities ensure that feedback can be used to enhance subsequent assessment outcomes, and that the process of feedback is interactive.

A clear item of future work is to revisit the course survey data on feedback submitted by the students after this change in assessment practice. We plan to write a further paper comparing this data (which will be available in the first half of 2013) with the data in this paper. We will also investigate any differences between these data sets, which we expect will show significant improvement in student perception of the value of the feedback they receive.

REFERENCES