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Formative feedback on practical reports

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Introduction

Formative feedback (or formative assessment) is provided during learning, telling students how well they are proceeding and what needs improvement, whereas summative assessment is provided after learning, stating how well students have learned what they were supposed to (Biggs and Tang; 2007).

Formative feedback is one of the most powerful tools in promoting learning (Gibbs and Simpson; 2002) and it has been shown that teachers' comments on students' work result in better performance and higher interest, than summative assessment (Butler; 1988).

Background

In 2008/2009 I was teaching the sub-topic aroma compound analysis in the course "Cheese technology" (Department of Food Science, University of Copenhagen) for the first time. The aroma analysis topic was new in the course so I developed it.

My part of the course comprised, among other activities, correction of practical reports. Eight groups of three students each were attending the course. After correcting the reports I sent out an e-mail saying whether the reports were approved or not and that the corrected reports were to be picked up in my mail tray. Four groups had their reports approved in the first go, but two of those groups did not collect their reports, hence they did not read my comments - apparently focusing on the summative evaluation

(approval of the report). The other 4 groups had to re-submit their reports. Despite my written comments many of the misunderstandings had not been sorted out after re-submission, hence the written feedback had not helped much. Two groups had to re-submit again, so finally I had to meet with those and discuss the misunderstandings, after which they understood the concepts.

There were two problems:

1. Students focussing on the summative part of the evaluation, thereby potentially not learning anything further from the comments, and
2. Students having difficulties in understanding the written comments in the reports

The objective of the present project was to evaluate the approach of oral formative feedback on practical reports in relation to students' learning.

Method

The present study concerned feedback on reports regarding a practical on aroma analysis of cheese. The practical was a part of the course "Cheese technology" which is a master course of 7.5 ECTS about cheese technology, structure and ripening of cheese, taking place in block 2, 2009/2010 at Department of Food Science, University of Copenhagen. 30 students (19 Danish and 11 International) were participating. 5 different practicals were included in the course, and it was a requirement for attending the exam that all reports were approved. Examination: written report on questions taught in the course, performed in one week.

My teaching consisted of:

- One lecture on nature of aroma compounds and aroma analysis in cheeses
- One laboratory practical analysing aroma. Each group had different cheeses
- Data treatment session
- Correction/feedback on reports

I made written comments in the reports and used those as basis for oral feedback: 20 minutes for each group, hereof approximately 15 minutes for discussion of the report and 5 minutes for "interview" evaluating the feedback form. During the discussions I took notes. The issues that were raised during the interview concerned:

- Reading written feedback or not, knowing that the report was approved
- Oral versus written feedback

In addition I was interested in discussing the set-up of the oral feedback: students' perceptions of individual feedback in groups versus plenary feedback

All the feedback sessions took place at the same day where the students had other activities relating to the course so they were at the campus anyway. I did not touch upon whether the reports were passed/not passed. The quotations refer to group numbers (2-11).

Results and discussion

In general the quality of the practical reports were somewhat higher than the previous year, perhaps I had been more specific in the requirements of the report and/or better at teaching and/or perhaps this year's students had better prerequisites.

The formative feedback situation as such

The time allocated for each group was appropriate. During the oral feedback the students appeared very engaged and interested in understanding their "mistakes'" and they defended their viewpoints when not agreeing on some points. During the feedback the discussion proceeded until the students had understood the concept, hence there was no need for re-submitting of reports (unless e.g. the final conclusion of the experiment had been completely different, but this was not the case). That saves everybody's time.

It was not touched upon whether the reports were passed/not passed, except one student asking afterwards *"so is it approved?"*, hence summative evaluation was apparently not a major issue, indicating success in moving focus away from summative evaluation.

In addition, the discussions were very useful for me as I got to know about other aspects of my teaching in the course like how the students perceived the data treatment session and elements of the lecture. These informations would probably not have become evident from the general course evaluation.

Question roughly phrased: "Would you generally read written feedback al ready knowing that the report was approved"

Some students (approx 1/3) would read the feedback comments anyway, e.g.:

- *"I would read the written comments - out of curiosity (11)"*

The other students were less certain about reading the feedback; hence the effect of the written feedback would be questionable in some cases:

- *"If busy, I would perhaps not read comments when the report had been approved (4)"*
- *"I would look at the comments depending on when it was handed back (7)"*
- *"I would only read comments if nothing else to do - prioritisation (5)"*
- *"If approved I would only skim the comments (6)*
- *"If they had been told straight away during this oral feedback session that the report had been approved I would not listen to the feedback (7)"*

All students contributed to the discussion and seemed to express their sincere opinion, but there is a risk of somebody not speaking frankly in the presence of others (could have been sorted by anonymous questionnaire - but a question of time).

Question roughly phrased: "What do you think of oral feedback based on the written comments versus written feedback on its own?"

Most students expressed that they learn more from oral than only written feedback, and that written comments are sometimes not understood or is not very detailed:

- *"It is nice that somebody is taking the time to talk about it (the report) (6)"*
- *"Good with oral feedback, the report does not have to go back and forth (2)"*
- *"Sometime we get very few comments in a report - makes it difficult to find out if it is good or bad (10)"*
- *"I do not always understand the written comments (9)"*
- *"Oral feedback is better. It can be difficult to understand the written comments in reports. Follow up by oral discussion results in better understanding of what are major and what are minor problems which does not as well appear of written comments (3)"*
- *"We learn more by sitting together with the tutor than by only reading the written comments (11)"*

This is in agreement with the findings of Weaver (2006), that feedback provided by tutors are not always understood by the student.

A couple of groups had difficulties with some more basic knowledge, such as how to structure a report, so more profound feedback can catch mistakes than should have been learned earlier:

- *"We learn a lot from these comments - some things we do not know about what to put in introduction and in results (2)"*

On the other hand the discussions lead to students in two groups expressing also that it is up to the students themselves if they have problems:

- *"Up to the students themselves to ask the teacher if they have a problem (9)"*
- *"Okay that the students have some of the initiative themselves (6)"*

These viewpoints are perhaps to some extend true, but on the other hand some students choose, as discussed above, for some reasons, not to profit from feedback that would benefit their learning.

The students expressed in general to be fine with having to be spend time with the feedback - they were at the campus anyway.

Question roughly phrased: "What feedback set-up would be more optimal for learning - individually in the groups or the whole class or plenary meeting?"

Opinions differed as to whether feedback should be individually in the groups or with the whole class together. Some (4 groups) preferred plenary, as it would sum up the results of all cheeses and/or that they could learn from the problems of the other groups, e.g.:

- *"Plenary is ok - no harm to hear again what you already know (8)"*
- *"Prefer plenary, we can also learn from the results of others (5)"*
- *"Plenary is good - to see the results of others (10)"*

A couple of groups believed they would benefit from both:

- *"Individual feedback is more specific - but you can also learn something from other group's problems (7)"*
- *"Plenary would be ok, but in the groups we get better around it all and can have an individual discussion (6)"*

Some groups (4) would like to focus on their own issues:

- *"It is best to focus on your report rather than plenary - more efficient. The problems of other groups are not that relevant (2)"*

- *"Plenary might be a problem because everybody has different cheeses (4)"*
- *"Better to go through it in the individual groups than in plenary - gives more sympathetic understanding (9)"*
- *"In plenary I would loose interest in other people's problems (5)"*

Time expenditure on plenary versus individual group feedback: individual feedback would take approximately 2.5 hours (10 groups x 15 minutes). Plenary would take some time to prepare for, together with the holding of it, so it would sum up to the same time consumption. In addition, in plenary the tutor has less feeling with each student understanding and hence can not be sure that their individual mistakes are cleared. Hence, the tutor might to a larger extend have to ask for re-submission of reports - more time consuming!

Students' learning from practicals

Another topic that appeared in the discussions with some groups was that laboratory exercises/practical is motivating/valuable:

- *"It is more exciting to do experiments ourselves than reading it in a text book (11)"*
- *"It is good to understand where the data are coming from (8)"*
- *"I better understand the topic/problem when using it myself (8)"*
- *"Remember better the subject matter when seeing and doing than just read (5)"*
- *"I learn most when working on the report (4)"*

However:

- *"It is important to know that the topic/practical is relevant for the exam (7)"*

Conclusion

- The formative feedback moved focus away from summative evaluation.
- The students expressed that they learn more from oral feedback than only written comments which are not always understood.
- Oral feedback can reduce the need for re-submission of reports.

- Some students prefer individual feedback because it is more specific for their own understanding while others prefer plenary feedback to learn from the problems of others.
- The oral feedback sessions gave me additional valuable information about other aspects of my teaching, too.

All contributions to this volume can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/2009-2-1/

The bibliography can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/
kapitler/2009_vol2_nr1_bibliography.pdf/