Student Self-evaluation of Coursework Assignments: a route to better perception of quality

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The initial problem

Lecturers routinely put in hours of work marking assignments and providing individual feedback only to find that the next piece of work submitted by the same student shows precisely the same qualities — and the same flaws. I became aware that my students seemed only to notice the 'bottom line', i.e. the grade allocated, with a perfunctory scan of the rest of the document in case it was apparent they could increase the mark allocated through appeal. Rarely was there evidence of students taking the advice offered and making an effort to address the particular areas of weakness. Some seemed unable to understand how one piece of work was worthy of a higher grade than another; taking it as just a fact of life that other students would score more highly than they. After all this is what they had experienced for more than a dozen years of education thus far, so why should anything change now?

Some students have the ability to perceive what is required of them and the quality of work that warrants a high grade from the beginning. It is those others, who seem not to be aware of the difference between what they submit and what was deemed worthy of commendation, whom I wanted to address. By engaging the students in the grading process, thereby making them aware, very clearly, of what was missing from their work, I hoped to encourage them to be more critical of their own work, to change their practices and to enable them to generate assignments of a higher quality.

I initially devised a self-evaluation document to supplement an assignment in which students were asked to generate a 250-word précis of a 4-page article on the 'Acoustics of Concert Halls'. The intention of the assignment was to make them read the article critically and extract from it the most pertinent facts and redraft them into a readable piece not exceeding the word limit.

The self-evaluation document (Appendix 1) listed 15 important points that students may have included. Students were required to identify which points their précis contained plus any other points they had included that were not on the original list. A grade was allocated depending on the total number of points included. However, beyond this students had to write a brief

evaluation of their work to say why it was worth the grade they allocated. This was particularly pertinent if they were seeking credit for points they had identified but which were not on the list. It was at this point that students could argue for a higher grade than simply counting the points would warrant.

How practice was changed

The initial trial worked well overall with over 80% of students allocating themselves the grade I considered appropriate. However, this was a very new experience for the students and they were most suspicious of how it could work and very wary that less honourable students may try to lie to achieve a higher grade. There is no doubt they have a innate sense of justice coupled with complete trust in the ability of lecturers to mark fairly and are most concerned by the possibility of fraud when faced with a new system. The fact that the self-evaluation itself is subsequently 'marked' has to be made clear.

Some of the students took exception to having to do what they saw as 'my work' (even though I went through all the work to check their evaluation subsequently!), so the task has to be presented to them as an integral part of their learning process with the benefits to them spelt out clearly.

It was apparent also that the wording of the self-evaluation document had to be less confrontational; e.g. changing the phrase 'points you should have included' to 'points you may have included', as this wording immediately caused some students to see it as a matter of principle to challenge the mark allocation criteria (something they rarely do when faced with a lecturer-marked assignment).

Using the same format to enable students to evaluate an essay they write later in the year (see Appendix 2) proves more successful both in terms of their ability to allocate the appropriate grade and their attitudes to the process as a whole, which would indicate that their increase in experience facilitates the effectiveness of the process.

Gains and losses

The biggest gain is the fact that students are provided not only with a grade for their work but a clear indication of why it was worth the grade awarded and, therefore, what they could have done differently to achieve a higher grade. This does not, however, guarantee that they will make the necessary changes to their working practices next time around, but it does increase their awareness of why they, perhaps, are not achieving as highly as their colleagues.

I also discovered another interesting element regarding the psychology of valuing oneself. I commonly find that the female students will underestimate their grade and will be very modest in how they evaluate the quality of their work, waiting for me to tell them it's much better than they have claimed. I (as a woman) put this down to the fact we are taught from a very early age that it is not polite to sell oneself overtly and that

modesty is a virtue. Male students, on the other hand, seem to consider the whole process as a competition in which their role is to acquire the best grade possible by working out what the rules are and playing them to their best ability. I'm sure that experts in psychology will be able to tell me if this observation is more general than simply an undergraduate physics class. If it is more general then there is likely to be a benefit for girls who may realize there is no good reason to be overly modest in this very competitive world.

The biggest loss is the fact that it is harder work to persuade the students that this self-evaluation exercise is valid and fair. You have to be prepared to talk it through with them both as a group and as individuals and be prepared to argue the case that it is a useful educational experience. The fact that they will be required to undertake self-appraisal in the workplace is, in my opinion, a valid 'real world' reason for such exercises beyond the benefits they gain educationally.

Future development

The same approach has already been applied to an extended essay that students are required to write. Students are certainly more accepting of the process when they meet it for the second time. We are now working on developing a similar process whereby students will evaluate the quality of their practical write-ups. It has been observed for a long time that lecturers find themselves writing the same comments week after week while first year students seem immune to the idea of including errors, for example, no matter how often it is pointed out to them. The plan is to require students to indicate what has or has not been included in their write up, as per the exercises described above. However, they will also have to draw out particular pieces of information from their logbooks, such as the units and uncertainty of a reading, the gradient of a graph, the final value obtained and the error in the final value. If the student has kept a log of reasonable quality then these facts should be easily found whereas those who are more lax about keeping note of experimental details or who have not completed their write-up will be unable to provide the information. In using their log directly this way they should see the need to ensure their work is both legible and sufficiently detailed.

Keywords

Assignments, feedback, self-evaluation

Biography

Averil Macdonald works part-time in the Physics department of University of Reading and part-time as an educational consultant. She has contributed to 16 school textbooks and written web-based teaching resources making university research accessible for use in GCSE and A-level Physics classes. She was awarded the 1999 Bragg Medal by the Institute of Physics for her distinguished contribution to Physics Education and popularising Physics.

Appendix 1

Professional Skills **Name**

Executive Summary of 'Concert Hall Acoustics': self-evaluation

The aim was to include as much pertinent information from the paper within the word limit. Below are listed some of the most significant points which you may have included:

Introductory sentence:

1. Paper considers the association between the physical characteristics of a room and the subjective appreciation of sound quality

Background:

2. Early work identified relationship between reverberation time and sound absorption and volume of room
3. Studies in 1950s showed importance of early reflections
4. Early reflections reinforce direct sound and hence increase clarity
5. Reverberation time defined as time for total sound amplitude to decrease by 60 dB
6. High reverberation time (or high level of reverberant energy relative to direct sound) tends to blend sound — preferred for music
7. Reverberation time should be constant throughout hall
8. Shape of hall determines direction and time of arrival of reflected sound
9. Square hall has first reflections from side walls
10. Fan shaped hall has weak reflections from side walls but has first reflections from ceiling
11. Studies in 1960s showed early side (lateral) reflections increase audiences' perception of spaciousness (feeling of being in a room)
12. Strong, early lateral reflections increase apparent width of sound source (as source position is ambiguous)
13. Strong, late side reflections increase sense of listener envelopment

Conclusions/final paragraph:

14. Designers now include large side wall reflectors in new halls to increase the number of possible hall shapes
15. Surround sound entertainment systems have to consider late lateral reflections to recreate concert hall effects.

Evaluate your report. Firstly tick off the listed points you included. On the reverse of this sheet write an evaluation of your work. You may also have included additional points which you consider equally important. Justify any additional points for which you wish to claim credit. Consider also the layout of your work, accuracy of punctuation and comment on the overall quality of the work and why it is worth the grade awarded.

Grades as below:

12+	9 - 11	6 - 8	3 - 5	1 - 2	points
A	B	C	D	E	

Appendix 2

Professional Skills **Name**

Self-evaluation of essay based on 'In Search of Schrodinger's Cat' by Gribbins

'The Bohr model of the atom has been useful despite, or perhaps because of its flaws.' Discuss.

Below are some of the most significant ideas which you may have used in your essay:

Introductory paragraph:

1. Definition of 'classical' Rutherford atom with randomly placed electrons as basis for Bohr model
2. Bohr noted it should not work — electrons should spiral in radiating energy
3. Bohr postulated :
   - allowed energy shells where electrons just do not radiate
   - particular values of angular momentum
   - quantum leaps — electrons move between energy levels emitting radiation as photons

   (may list all postulates here)
4. Result of Bohr's postulates is an atom linking quantum theory to the classical atom

(N.B. there was no theoretical justification for these ideas — they were just ideas)

Successes of the Bohr atom:

1. Explained spectral lines especially of hydrogen
2. Explained chemical interaction, k.l.m. shells etc
3. Predicted unknown elements

Flaws in Bohr's atom:

1. Predicted too many spectral lines
2. Doesn't explain energy BANDS and broadening of spectral lines
3. Assigns quantum numbers randomly to fit observations — no underpinning theory
4. Needed too many adjustments — Somerfield spent ages refining the model to fit each new observation (the Bohr – Somerfield atom)

Usefulness of Bohr atom despite its flaws:

1. The classical orbital model is easy to visualize — especially useful as first version of atom to teach to younger students
2. Made people think seriously about bringing quantum theory into the model of atom — a very brave thing to do

Usefulness of Bohr atom because of its flaws:

1. Flaws are obvious so demand criticism and improvement — set other scientists thinking and led to further models

Concluding paragraph stating personal view:

Evaluating your essay. Tick off the ideas overleaf that you included. You may also have included other ideas which you consider important. Identify these on your essay. You may justify inclusion of any additional ideas for which you wish to claim credit in your evaluation below.

Write an evaluation of your work taking into account how many of the points you included from the list overleaf and any additional ideas you raised. Consider, also, the layout of your work and the accuracy of punctuation.

Grades as below for number of ideas included:

13+	**12 - 10**	**9 - 7**	**6 - 4**	**3 - 1**	**points**
A	**B**	**C**	**D**	**E**	

Here write your justification for the grade you award:

GRADE AWARDED