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POSTGRADUATE CERTIFICATE IN TEACHING IN HIGHER EDUCATION

Cylch Dysgu 1 | Teaching Cycle 1

Formative Assessment for Encouraging Student Learning

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Teaching Cycle 1 – Formative Assessment for Encouraging Student Learning

1. The Issue

There are many reasons why students are assessed in the teaching/learning environment, these include selecting students, motivating students (attendance and doing course work) and to meet public expectations as to standards and accountability (Biggs, 2003). However two forms of assessment are particularly important. The first, summative assessment is used to grade students at the end of a module and or to accredit at the end of a degree scheme or course. The second is formative assessment which can be used to generate feedback information that can be used by students to enhance learning and achievement (Juwah et al., 2004). This feedback information can also help teachers realign their teaching in response to learners’ needs.

Formative assessment aids learning by generating feedback information that is of benefit to students and to teachers. Feedback on performance, in class or on assignments, enables students to restructure their understanding/skills and build more powerful ideas and capabilities. It is argued that formative assessment should be an integral part of teaching and learning in HE and that ‘feedback’ and ‘feed­forward’ should be systematically embedded in curriculum practices (Juwah et al., 2004).

From the research literature on formative assessment it is possible to identify some broad principles of good feedback practice (Juwah et al., 2004) including:

1. Facilitates the development of self assessment (reflection) in learning.
2. Encourages teacher and peer dialogue around learning.
3. Helps clarify what good performance is (goals, criteria, standards expected).
4. Provides opportunities to close the gap between current and desired performance.
5. Delivers high quality information to students about their learning.
7. Provides information to teachers that can be used to help shape the teaching.

Sadler (1989) in Black and Williams (1998) identified three conditions necessary for students to benefit from feedback. The student must understand the goal or standard being aimed for, must be able to compare their current level of performance with that goal or standard and must engage in appropriate action which leads to some closure of the gap between the two. In this way student will best be able to advance their learning.

The provision of feedback information is not the solely down to the teacher. Peers often provide feedback when students undertake group work and students generate their own feedback while they are carrying out academic activities such as research and writing essays. Opportunities to work in groups can also improve the quality of feedback although many students have to be helped to work
collaboratively (Bransford et al., 2000). Self and peer assessment has a number of benefits beside feedback. It allows students first hand knowledge of the criteria for good learning, it enables students to learn how to select good evidence and it teaches students to be able to make judgements about whether a performance or product meets given criteria which is vital for effective professional action (Biggs, 2003). Each of these three aspects of self and peer assessment are about learning, not assessment and therefore self assessment and peer assessment can provide this vital link between learning and assessment.

In summary formative assessment is a valuable learning and teaching tool for the following reasons, it provides feedback on the learning process, enables students to revise and improve their thinking, enables teachers to identify and remedy problems throughout the learning process, encourages student motivation; enables variation and practice, enables peer assessment and self evaluation and enables information sharing.

2. The Plan – Introducing Formative Assessment for Encouraging Student Learning

Background to module and rationale

The intervention took place in a third year undergraduate Institute of Biological, Environmental and Rural Sciences module entitled The Management and Health of Organic Livestock. The module consisted of only 4 students from a range of degree schemes within IRS, including organic agriculture, animal science and general agriculture. Students therefore had a wide range of experience in terms of the content of the module and all started from varying degrees of base knowledge. The module was co-taught with a postgraduate module which differed somewhat in the form of assessment (includes formative essay and group project). Because of the small numbers of students in the undergraduate module, the postgraduate students (2) participated in the process of the intervention but for simplicity evaluation of the intervention was confined to the undergraduate module.

The summative assessment for the module consists of a 3000 word essay and presentation worth 40% of their mark and an examination worth 60%.

The learning outcomes of the module to be addressed by the coursework include:

- Discuss the role and integration of livestock in organic farming systems;
- identify the regulations governing organic livestock production in the European Union, and describe the way these regulations are implemented in the UK;
- state the key factors governing forage quality and utilisation and its contribution to livestock nutrition, health and performance;
- assess the suitability of feedstuffs and their combination for optimal health and performance;
- state the key factors governing livestock health, and discuss their application in practice, with particular reference to nutritional deficiencies, fertility, parasites and disease prevention through the use of appropriate management strategies;
• determine appropriate uses of conventional therapeutic medicines, vaccines and alternative/complementary therapies for the control of disease;

• state the key factors governing animal welfare and behaviour, and assess the impact of organic practices with particular reference to housing and health;

• discuss the role of breeding in enhancing productivity and parasite/disease resistance and define appropriate breeding objectives;

• specify appropriate production objectives and management practices for individual livestock species.

The key skills to be developed through the coursework included: Research skills through review of literature; improving own learning and performance, critical peer review and feedback, essay writing, written communication and verbal presentation of own work.

The students were free to select a relevant essay topic of their choosing with the agreement of the teacher. This allowed the students to explore more deeply a topic they were interested in (increases student motivation) but unfortunately also means that not all the learning outcomes described above are addressed via the summative essay (they are however all addressed when combined with the examination assessment). The cycle of two stages of formative assessment was designed to increase the depth of student learning and coverage of the learning outcomes. By allowing the students to read and critically evaluate each others essays they were exposed to a broader range of topics relevant to the learning outcomes than they would get if they simply researched and wrote their own essay.

Overall the rationale for the intervention was to:

• Get students thinking about their essay topics earlier in the semester
• To allow students practice at planning and writing essays
• To allow students to review and critically appraise their peers work
• To enable students to share information and ideas
• To expose students to a wider range of subjects than just their own essays

The Steps in the Intervention Plan

• Students informed verbally and in writing of the process, timetable and rules for peer review for the intervention in the first week of semester after they had been informed of the summative assessment structure of the module (See Appendix 1 for written instructions received by the students). Students also given the evaluation criteria for the formative and summative essay work (Appendix 2).

• With teacher approval all the students decided on an essay topic by the end of Week 3.

• Students then put into peer review ‘triads’ depending on the topic of their essays – no two similar topics were in the same triad.

• Formative assessment round 1 – each student wrote an essay proposal which was then peer reviewed in triads and the essay proposal and two peer reviews were handed in by each student (Completed Week 6).
- Formative assessment round 2 – each student wrote a draft essay which was then peer reviewed in triads and a draft essay and two peer reviews were handed in by each student (Completed Week 8).
- Summative assessment – each student handed in a formal essay for assessment using set criteria (Appendix 2) (Completed Week 9). Students were requested to include a brief paragraph at the start of their essay giving feedback on the formative assessment process.
- Students were asked specific questions about the formative assessment process as part of the Module Evaluation carried out at the end of the course.

**Intended outcomes**

- Improved time management by students with respect to submission of coursework
- Students develop critical review skills
- Students increase the depth and breadth of knowledge related to the learning outcomes of the module

**Evaluation of the intervention**

Evaluation of the intervention took place with and after the submission of the summative essay. Students were required to include a brief paragraph at the start of their summative essay giving feedback on the formative assessment process – this was not marked it merely allows the students to give their views on the process and whether they felt it helped them or not in terms of the intended outcomes of the intervention. Once the essays were marked the results from this group of students were compared with the results from the 3 previous academic sessions to identify differences in marks. The ability to perform any statistical analysis of the marks was extremely limited due to the small number of students in the class; however a simple comparison of means was made. As well as feedback from the students and analysis of the essay marks, evaluation of the process by the teacher was provided.

### 3. Progress

The progress of the intervention was monitored in three ways:

1. Students were required to present written evidence of their essay plan and draft essay along with two sets of peer review comments for both. This allowed the teacher to see if a) all students were participating fully in the process and b) that the type of critical feedback being provided was in line with ground rules laid out for peer review. No feedback was provided by the teacher on the essay plan or draft.

All students participated fully in each cycle of the intervention (plans and drafts) and all the review comments given by the students were in line with the ground rules. If anything the comments were very “nice” and students perhaps found it difficult to be particularly critical. Having said that, many
of the comments were very constructive and identified issues that the author had not thought about. It appears that the students who had studied organic agriculture previously felt more confident to comment on content than those that had not. However, all students were able to contribute useful feedback to the author.

2. The draft essays and feedback comments were also used by the teacher to gauge the level of student understanding of the course material.

Any common errors or misunderstandings on the part of the author and/or reviewer were identified and used to adjust subsequent lecture material to remedy uncertainty in curriculum areas. Only small problems were identified, mainly relating to specifics of the organic farming regulations, and these were discussed in class. Another area that was highlighted as a slight problem was the citing and referencing of research material used in the essay – all students were referred to help pages on referencing material on the University Information Services website.

3. The final progress monitoring stage was the submission of all essays on time and including a short paragraph on how the students found the intervention process. This was completed by all the students.

4. **Summary of Feedback**

**Student Feedback on Process**

Comments from the students on the process were in general very positive and several made suggestions as to how it could be improved for future use.

Positive comments received included:

- “useful exercise in developing my skills in critical reading”
- “improved my time management skills in relation to essay writing”
- “good confidence building to receive positive feedback”
- “it was a good exercise from a planning perspective; creating a formal essay plan allowed me to go through the writing process in a more methodical way”
- “I found it a little bit uncomfortable sharing my essay with people I hardly knew, at first. However, I was pleasantly surprised by the constructive comments I received and overall it was a very useful method”
- “I always write a rough essay plan...however, I rarely have someone look over it for me and comment on my ideas. I found it very useful to receive feedback”
- “in reading someone else’s plan and being made to scrutinize it I believe gave more depth to the assignment, for myself and I hope for the other members of the class who I was over-viewing”
• “it broadened my thoughts on other topics I could include and any positive response gave me confidence in my assignment”

• “the benefits of this assignment is that you are allowed to choose a topic of your choice, this means you are not forced to do a set essay on a topic that you might not be familiar with.....allowing students to choose a topic that’s of interest to them increases that students knowledge of the subject”

• “having an essay draft due in earlier makes you think about the assignment and have it proof read is a great advantage”

• “instead of reading an essay and taking it at face value as I would usually, I was required to look further into the work and form my own opinions on the points made, my own questions about statements produced, and my own ideas about potential modifications”

Problems and constructive comments on the process:

• “more time between the handing in of the draft and the final hand in date to allow for more feedback and discussion”

• “I found it difficult to get comments from people outside of lecture time – wondered if it might be possible to discuss essays immediately after lectures instead”

• “I found the draft a lot more difficult than the plan.....I found it difficult to improve the drafts that I read from other members of the class, they both seemed very competent and made mine seem inadequate. This was worrying at first but then gave me the determination to strive on with mine and try and improve its standard......this was aided by the comments I received from the other members of the group”

• “the task, whilst difficult due to the fact that I felt I didn’t know enough about some of the topics to be able to critically evaluate them fairly, proved useful in confirming the standards expected and the depth of detail required of the assignment”
Marks Analysis

Figure 1. Analysis of RS36620 Coursework Marks

An analysis of coursework marks (Figure 1.) for the Academic years 03/04 to 06/07 (year of the intervention) indicate that both the essay and total coursework marks were higher for the year in which the intervention took place. There is a greater degree of variability in the 06/07 results due to the small numbers of students on the module, but standard error bars indicate that the improvements in 06/07 are relatively significant. Marks for the presentations did not differ greatly between years.

Figure 2. Analysis of RS36620 Module Marks
An analysis of coursework (Figure 2.), exam and overall module marks for the academic years 03/04 to 06/07 indicate that coursework, exam and total module marks were higher in the intervention year (06/07) than previous years. It is interesting to note that exam results are higher for the 06/07 cohort as well as the essay results. Again the error in 06/07 is larger than other years due to the small number of students in that year, but the general trend indicates better student performance in the intervention year.

5. Evaluation of Student Learning Experience

The intended outcomes of the teaching intervention were:

1. Improved time management by students with respect to submission of coursework
2. Students develop critical review skills
3. Students increase the depth and breadth of knowledge related to the learning outcomes of the module

The analysis of module marks presented above indicates that the 06/07 cohort had better coursework, exam and overall module marks than cohorts from the three previous academic years. This would indicate that intended outcome 3. (see above) has been addressed. There was initial concern that the teaching intervention would only address the depth and breadth of knowledge of those module learning outcomes directly associated with the topic of the essay the student wrote, however the fact that overall exam results are up in 06/07 as well as coursework marks indicates that the depth and breadth of knowledge was increased for all learning outcomes. This is possibly due the fact that by reading each others essays in a critical manner, students were exposed to a number of subjects in greater depth than if they simply worked on their own essays. This is supported by student comments such as:

"In reading someone else’s plan and being made to scrutinize it I believe gave more depth to the assignment, for myself and I hope for the other members of the class who I was over-viewing”

"Instead of reading an essay and taking it at face value as I would usually, I was required to look further into the work and form my own opinions on the points made, my own questions about statements produced, and my own ideas about potential modifications”

"It broadened my thoughts on other topics I could include and any positive response gave me confidence in my assignment”.

With respect to intended outcome 1. (see above), several students indicated in their feedback that the teaching intervention helped them with both the time management and planning aspects of the coursework.

"improved my time management skills in relation to essay writing”

"it was a good exercise from a planning perspective; creating a formal essay plan allowed me to go through the writing process in a more methodical way"
"having an essay draft due in earlier makes you think about the assignment and to have it proof read is a great advantage"

All students submitted their formative and summative pieces of work on time and this combined with the comments from students suggests that the intended outcome of improving time management by students with respect to submission of coursework has been addressed by this teaching intervention.

Student feedback on the intervention also indicated that intended outcome 2 (to develop critical review skills) was also achieved. Evidential comments included:

"useful exercise in developing my skills in critical reading"

"I found it a little bit uncomfortable sharing my essay with people I hardly knew, at first. However, I was pleasantly surprised by the constructive comments I received and overall it was a very useful method"

"in reading someone else’s plan and being made to scrutinize it I believe gave more depth to the assignment, for myself and I hope for the other members of the class who I was over-viewing"

"instead of reading an essay and taking it at face value as I would usually, I was required to look further into the work and form my own opinions on the points made, my own questions about statements produced, and my own ideas about potential modifications"

Overall the experiences of the students in relation to the intervention were very positive. One student made useful suggestions on how the process itself could be improved in the future (e.g. allowing more time between draft submission and final essay submission and setting times after lectures for students to interact). Two students made similar comments regarding how they thought they lacked the background knowledge to critically evaluate other students who they felt had greater subject knowledge than them. As previously mentioned, the class consisted of some students who had considerable experience of studying organic agriculture and there were others that had not studied it before at all.

Looking at the comments provided by the students on essay plans and drafts is appears that all students regardless of background were able to provide constructive comments and it may be a simple case of providing reassurance in future to those students that do not feel confident in the subject area. It may in fact be advantageous to receive comments from someone who has little previous experience of the subject as they will review with relatively fresh eyes and without pre-conceived ideas or opinions. The students who made this comment initially both went on to say that they found the process useful and positive comments received from other students increased their confidence.

6. Implications for Professional Development

The teaching intervention provided clear benefits for students on this module in terms of both their learning experience and module mark. As a consequence the formative assessment process will be used in the future on this module. Things to consider for the development of the process would be the implications of carrying this out with a larger group of students as it was quite a time consuming process monitoring whether all students were participating fully, the timing between the stages of the rounds of
review (as indicated by the student comments), whether discussion time could be incorporated onto the end of lecture sessions (perhaps 10 minutes) to allow students to interact, and how training in peer review can be incorporated into the process. Several students seemed to lack confidence in their subject knowledge and providing training in critical peer review may give them some structured tools to work with. Extra support may need to be provided to students who are lacking in confidence. It is also important when carrying this out in future that the students feel comfortable with the process and the rules of peer review as it is often very difficult to expose ones work to criticism. The two stage process works well in this context as the plan submitted for review in the first instance is generally fairly brief and reasonably broad comments are made on topic matter rather than personal views and interpretations – this allows trust to be built in the triads before the second stage of full draft review.

It is obvious from the comments from students that they appreciated the opportunity to interact with classmates, particularly when that interaction was designed to improve their breadth and depth of subject understanding and ultimately improve their module marks – the goal of most University students. Transferable skills such as improved time management and developing peer review skills were also valued. It is important, therefore that future teaching interventions and developments in teaching practice take into account these aspects as they have been proven in this case to have successfully resulted not only in achievement of the intended outcomes of this intervention but in all students having an improved learning experience.

References


Appendix 1 – Instructions provided to students

1. Formative Assessment

Students will be put into groups of three depending on the topic of their essay.

Each student is to prepare an outline of their essay on the topic agreed with the module co-ordinator (max. one page). These will be given to the other members of your group to read and comment on (a set of assessment criteria will be provided) – comments can be fed back to the writer either individually or jointly. Each student should submit one essay outline and two individual or one joint piece of feedback on their essay outline.

Date due: Friday 10\textsuperscript{th} November

Each student is then to draft their essay and go through the same process within their peer review group. Feedback criteria will again be provided to allow you to review the piece of work effectively. Again, each student should submit one essay outline and two individual or one joint piece of feedback on their essay outline.

Date due: Friday 24\textsuperscript{th} November

There are several reasons I want you to undertake this process and the level of effort you put in will determine what you get out of it:

a. It will ensure you start thinking about and planning your essay early
b. It will enable you to develop your reviewing and writing skills and ultimately produce a better essay
c. It will allow you to read essays on other topics and therefore improve the depth of your knowledge in topics other than what you’ve written your own essay on – this will be of use to you when it comes to answering exam questions.

The quality of the work you submit is up to you and it will not be marked by me, however, submission of the pieces of work by the due dates is compulsory (it will be registered by the administration team).

2. Final essay

This will be submitted by 9am on Tuesday 5\textsuperscript{th} December 2006 and will consist of about 3000 words (absolute maximum 3500 words) on the topic agreed between the module co-ordinator and the student. An initial reading list is provided at the end of this document. The essay should be a detailed discussion and must include reference to published material. \textit{The essay must also include two paragraphs (max. half a page in total) reflecting on the two stages of the formative assessment and what skills and knowledge this process may have provided you with, and whether you felt it was a useful exercise. These two paragraphs will not form part of the final mark but must be included for the remainder of the essay to be marked.}
Appendix 2 – Marking criteria for essay

RS3620 – Organic Livestock Health and Management

Essay Assessment and Feedback Form

| Student Name:                      |                      |
| Essay Title:                       |                      |

<table>
<thead>
<tr>
<th>Grade</th>
<th>A+</th>
<th>A</th>
<th>B+</th>
<th>B</th>
<th>C</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks equivalent</td>
<td>80+</td>
<td>70-79</td>
<td>60-69</td>
<td>50-59</td>
<td>40-49</td>
<td>0-39</td>
</tr>
</tbody>
</table>

Knowledge and Understanding

- Level of subject knowledge (breadth and depth)
- Able to identify key issues
- Factually correct

Evidence and Analysis

- Logical development of case
- Evaluation of source material
- Evidence provided to support case

(Worth 70% of coursework mark)

Reading and Research

- Consulted refereed academic journals
- Consulted material from reading list
- Consulted materials outside lecture materials and reading list

(Worth 10% of coursework mark)
Written Presentation

- Grammatically correct
- Correct layout
- Correct citation of references
- Appropriate formal writing style

*(worth 5% of coursework mark)*

Continued over page...

Strengths of this essay:

Weaknesses of this essay:

Additional comments:

Mark:

First Marker:                Second Marker: