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2008

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TYSTYSGRIF UWCHRADDDEDIG ADDYSGU MEWN ADDYSG UWCH

POSTGRADUATE CERTIFICATE IN TEACHING IN HIGHER EDUCATION

Cylch Dysgu 2 | Teaching Cycle 2

Improvement in Undergraduate Essays by the Provision of Timely Feedback and Responsive Guidance

Mae’r Cylch Dysgu hwn o’r portffolio TUAAU wedi’i gyflwyno i CADAIR gyda chaniatâd yr awdur uchod. Adnodd i’w ddefnyddio gan ymseiswyr y TUAAU yn y dyfodol a staff eraill ydyw, fel rhan o’u datblygu proffesiynol ym Mhrifysgol Aberystwyth. Erys yn eiddo i’r awdur a Phrifysgol Aberystwyth. Os hoffech dyfynnu’r gwaith hwn neu gyfeirio ato, cysylltwch â’r awtur. Ceir y manylion cyswllt yn http://www.aber.ac.uk/cy/directory/.

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Teaching Development Two

Improvement in Undergraduate Essays by the Provision of Timely Feedback and Responsive Guidance

This section includes the teaching development agreement and the initial plan showing modifications before the teaching development was carried out. Reflection and plans for future delivery are to be found within the body of the report.
THE Scheme
Teaching Development Agreement

You should discuss your planned development with your Mentor, and consider how you plan to gather feedback and evaluate what happened.

<table>
<thead>
<tr>
<th>Class/Module</th>
<th>Microbial physiology, biochem. &amp; biotechnol. (BS33920)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>Third year undergraduate</td>
</tr>
<tr>
<td>Numbers in class</td>
<td>23</td>
</tr>
<tr>
<td>Meetings (timetable)</td>
<td>30 lectures</td>
</tr>
<tr>
<td>Semester</td>
<td>1</td>
</tr>
</tbody>
</table>
| Venue        | Mon 12.10-13.00 PhysB
Thurs 11.10-12.00 G22
Fri 12.10-13.00 B46 |

The intended development:

Purpose
This teaching development will assess the value of providing feedback to students at an early stage in order that they can incorporate it into their submitted work.

Expected outcomes
The desired learning outcomes for this exercise may be summarised as follows:

1) The provision of feedback will help direct students along the appropriate path to effective completion of the work.
2) Students will engage with the coursework at an earlier stage.
3) A combination of the above factors should lead to improvement in the standard of work submitted

Approach
A coursework essay will be set on the role of biotechnology in bioterrorism. The students will be expected to produce an essay plan (worth 5% of the overall essay mark) and individual feedback will be given in response to this. Students will be encouraged to seek guidance and answers to any questions will be made available to all students on Blackboard®.

Evaluation Strategy and Criteria
Student feedback will be sought in written form in the module evaluation conducted during the last lecture of the semester. Results will be compared to a previous cohort of students who completed the coursework without the benefit of feedback at the essay plan stage.

Signature of Mentor

Please ask your Mentor to countersign this form. The top sheet should be kept in your Portfolio. A copy should be given to your Mentor.
**Teaching Development 2: Design and Log**

### Course Details
1. Third year microbiology module
2. Around 20 students per year
3. Coursework assessment based on essay format
4. Students should be able to explain with examples the role of biotechnology in bioterrorism

### Considerations
1. In 2005 some essays lacked focus
2. In 2005 some students did not submit work
3. Students generally would like more feedback
4. Formative feedback is desirable

### Design
Introduce compulsory essay plan on which students will be given feedback. This will promote early engagement with the task, provide guidance at a formative stage and facilitate reflection.

### Reflection
Discussion with mentor and colleagues and reflection on the design of this teaching development raise the following concerns:
1. If the essay plan is not assessed the students will not hand it in
2. Any deviation from the standard essay will result in queries from students

### Modification
Include small element of mark for the essay plan.
Set up student support *via* Blackboard where student queries are answered anonymously and shared with all students on the course.
INTRODUCTION

By the time that students reach the final year of their degree in Biological Sciences it can be expected that they are well-practised in essay writing and that they will have had a great deal of experience in producing assessed coursework. In the majority of cases they will have been given a title or topic, produced a piece of work and been given a mark together with feedback. Unfortunately the feedback associated with a specific essay task is usually received too late to have an effect on the way that students approach the task, on their learning through participation in the exercise or indeed, on their mark. Guidance is available to students in generic or subject-focused “Study Skills” books (e.g. Jones et al. 2002) and in departmental handbooks and these, together with generic feedback should be of use in helping a student to work at improving their marks over the course of their studies. However, there will be particular requirements of tasks (and, despite departmental and faculty guidance on expected standards, variation in the preferences of individual markers) that are not covered by this generic advice. Consequently, the introduction of formative feedback at an early stage in the preparation of a piece of coursework might be
expected to improve the quality of the final work submitted and raise student confidence that they are approaching the task in an appropriate manner that will be valued by the marker. In addition, in order to be in a position to receive feedback at an early stage, early engagement with the task on the student’s part is essential. Thus, it might be expected that introduction of an early checkpoint for feedback would help to reduce the possibility that coursework would be ignored until the deadline approached. An earlier start permits reflection on the feedback but, of equal importance, space and time for reflection and revision of the essay itself is also facilitated (Campbell et al. 1998).

Appropriate feedback encourages ‘deep’ learning (Higgins et al., 2002) and helps students to develop generic skills such as critical analysis and logical argument rather than simply providing a route to the “correct” answer. In addition to knowledge about the particular subject being taught, these are the sort of skills that a lecturer is trying to encourage and develop. Entwistle (1995) found that there were substantial variations in the depth of understanding achieved when essay writing and that this depended on a student’s conception of learning and belief about knowledge. In his study of history undergraduates, Hounsell (2005) identified three different student conceptions of the essay – as an argument, as a viewpoint or as an arrangement – unsurprisingly these are found to be rewarded differently in the final mark (Higgins et al., 2002). Whilst generic advice can be used to help students move from an arrangement of discrete thoughts towards a logical argument supported by evidence, specific feedback on a particular piece of work at an early stage is likely to be more effective, meaningful and motivational.

In designing and planning this teaching development I decided to provide feedback at the essay plan stage prior to the students writing the full essay. Ideally, formative feedback would give a student the opportunity to “experiment” without penalty – i.e. there would be no coursework mark associated with the formative stage of the task. However, from my own experience and following discussion of this topic with colleagues, I decided that simply offering feedback at a formative stage would not have the desired effect as the students would not hand in the required essay plan if it was not assessed. Consequently, 5% of the mark for the essay (equivalent to 1% of the module mark) was dependent on the essay plan.

AIMS

This teaching development was designed to assess the value of providing feedback to students at an early stage allowing them to incorporate the advice given into the work that is subsequently submitted for assessment.

LEARNING OUTCOMES

The assessed work focuses on the role of biotechnology in bioterrorism. After completion of the assessed work the students will be able to give examples of recent biotechnological research that has increased and/or decreased the threat of bioterrorism. They will also be able to use these research examples to construct a coherent argument.
METHODS

THE STUDENTS INVOLVED

The essay formed part of a third year module (Microbial physiology, biochemistry and biotechnology) taken by 16 students in 2005 and 23 students in 2006.

GUIDANCE PROVIDED ON TASK COMPLETION

The students were provided with a working title of “The role of biotechnology in bioterrorism” but given the opportunity to modify this title to reflect the chosen angle of their essay. The word limit was set at 2000 words within which they needed to include an abstract (100-200 words). The students were advised that the essay should include references to the primary literature and to review articles. Students were encouraged to ask for guidance as necessary and anonymised questions together with responses were placed on Blackboard®.

The 2006 cohort were given further guidelines regarding the format of an additional assessed element – the essay plan, i.e. that it should be a maximum of one side of A4 and that it should highlight the areas that would be covered in the essay and some of the literature sources that would be used. Students were advised that a proportion of the marks would be awarded for the plan but that its main purpose was to enable feedback to be given at a time that would be useful to the student.

PROVISION OF FORMATIVE FEEDBACK

Essay plans were returned with comments within 24 hours of the essay plan deadline. An example is given in the appendix to this report. In all cases, the feedback highlighted good or relevant points, pointed out omissions (e.g. abstract / references) and gave suggestions regarding emphasis or structure of the essay. Where necessary, the feedback emphasised the necessity to use supporting evidence to construct the argument and encouraged expression of the student viewpoint.

ASSESSMENT OF TEACHING DEVELOPMENT

In order to determine whether the provision of feedback was beneficial to the students the results of the 2005 and 2006 cohorts of students were compared. In addition, the 2006 students were invited to comment on the usefulness (or otherwise) of the essay planning element of the coursework.

RESULTS

SUBMISSION OF ESSAYS

In 2006 all students handed in both the essay plan and an acceptable essay. Amongst the 2005 cohort one student failed to hand in the essay and a second handed in only the abstract of the essay. Consequently there were two very low marks (0% and 1%) which introduced a considerable downward bias into mean average marks for the coursework and module in 2005. Notwithstanding this, there were some examples of good essays that were focused on the topic set amongst both cohorts of students.
COMPARISON OF COHORTS

As can be seen in Figure 1, the modal average score increased from a III class mark in 2005 to a II mark in 2006 (although the data are far from normally distributed). Figure 2 shows the relationship between essay score and exam score. This comparison was carried out to allow for inter-cohort variation as the exam structure did not change between cohorts. As can be seen in Figure 2, in the 2006 cohort there is a group of high-achieving students who performed well in both the exam and the essay. In 2006 there were 3 (out of 23) third class marks and this can be compared to the 2005 cohort where there were two very low scores (mentioned above) in addition to 5 (out of 16) third class marks.

![Figure 1: Distribution of Marks](image1)

![Figure 2: Relationship between Coursework Mark and Exam Mark](image2)

There is a frequently observed tendency for students to perform better on coursework assignments than under examination conditions and this has been reported elsewhere in the university (Thomas et al., 2002). There are a number of reasons for this including reduced pressure, more time for reading through work and reflecting upon it, less necessity to memorise facts etc. In addition it has been shown (Osborne, 1999) that students who are known to be dyslexic obtain lower scores than control students in both written coursework and written examinations but that the difference is significant in the case of examinations even with special provision such as extra time and/or the availability of a computer. Consequently, it is necessary to account for difference in performance between exams and coursework when determining the effect of feedback. It is also of interest to determine whether the provision of timely feedback (or lack thereof) makes a difference to students with differing levels of exam performance. As shown in Figure 3, the students were categorised by exam performance (equivalent degree classification) and the average difference between their exam performance and coursework mark was calculated. In the 2005 cohort those with poor exam performance (Fail or III class) performed, on average, ~10 percentage points better on their coursework assignment. There was little difference for II² candidates and II¹ candidates performed better under exam conditions than on the coursework assignment.
assignment. There were no first class exam performances in 2005. With the 2006 cohort timely feedback was given to the students and this is correlated with a greater boost to the coursework marks with poor students performing ~15% better on the coursework than they did in the exam, the differential for II² and II¹ students being raised to ~+7% and there being little average difference between exam and coursework performance for the first class students. Linear regression analysis of the 2006 data shows that, in addition to starting from a higher value, the slope is less steep than for the 2005 data and thus feedback would appear to of benefit to all categories of students in this study.

![Figure 3: Comparison between coursework score and exam performance showing the effect of timely feedback on different groups of students.](image)

**STUDENT FEEDBACK**

As part of the end-of-semester module feedback exercise, students were asked whether they felt that writing the essay plan and receiving feedback on it were useful in preparation of the essay. Representative responses are given below:

**Comments on constructing a plan:**

- The essay plan was good because it meant we had to think about what we were going to write about well in advance of the deadline, not something I usually do!!
- I felt the process of making an essay plan was useful, and an activity that should be encouraged for all essays.
- Writing the essay plan was useful - it gave a better idea of the approach to the essay and a way of deciding on areas to concentrate on. It also helped to select references, structure the essay, and give a physical guide to what to do which I don’t usually bother with - but have now been and will carry on with.
- Writing an essay plan led me to more concepts and ideas than I usually would have thought of.
- Writing the essay plan was very useful - it helped me to know where I was going with the essay. It made writing the essay quicker and more organised, especially when we had already found the refs we were going to use.
From comments such as these it can be seen that many of the students do not routinely plan their essays before they write them despite this approach being encouraged in study skills manuals and courses. The compulsory essay plan element of this coursework was valued by the students and, in some cases, there is expression of an intention to use this approach in their future coursework. None of the students expressed any negative opinions towards the inclusion of the essay plan on the evaluation form.

Comments on feedback:

- **Getting feedback on the essay plan was great, it was the first instance I've encountered it and really gave a much better indication of the way we should go with our essay. I think it led to getting a better mark than I would have otherwise.**

- I found it extremely useful handing in an essay plan and then receiving feedback, as it helped me concentrate on the question and pointed me in the right direction, and I think I have gained a better mark because of this. It helped me make sure I could do it to the best of my ability and do it well within the submission date.

- The feedback was definitely useful in making sure we included relevant things and that our references were suitable.

- I liked having feedback as it told me I was heading on the right track and hadn’t misunderstood what I was being asked to do.

- The feedback helped me focus on the important issues to be discussed in the essay.

For many of the students this was the first time that they had received feedback prior to production of their submitted essay. The main purpose of the essay plan and feedback was identified by the students and they appreciate the benefit of this approach. In some cases the comments provide an indication that the feedback helped to point them in the right direction, in other cases it provided the students with confidence that their approach was appropriate.

**Effect on time management:**

- I thought it was useful to do the essay plan because it made me start thinking about writing the essay early on in the semester and to think about resources I would be using.

- Having 2 separate deadlines for the plan and the essay helped me be more organised and gave me a good idea of how much work I would need to do.

- Writing the essay plan and feedback on it were useful in preparation of the essay. It ensured I was following the right ideas for the assignment. It made sure I looked and researched the essay well before giving plenty of time to write a good researched piece of work.

These students engaged with the coursework in the way that I had hoped and used the two-stage process to help plan their time, giving themselves longer to think about the work that they were doing.

- I felt the feedback from the essay plan was extremely useful but it might have been better if we were given the plan back slightly later or had to hand it in slightly later as once I had the plan back I left the essay and had to re-focus and revise the research again before doing the essay.
Unfortunately, it appears as though this student treated the work set as two separate exercises and did not use the intervening time constructively or reflectively.

General comment:

- The essay title was very vague and open ended which was good in this essay as it gave more scope to concentrate on areas which I was interested in instead of trying to work in an area where I have no interest and I found it easier going. This did mean that the essay took longer, but again the essay plan helped and the ideas on what to concentrate on in the essay posted on blackboard and as a part of the lecture gave, some direction, but didn't limit the flexibility.

This student highlights a very important aspect of what becomes possible but still controllable by introducing a feedback checkpoint during the essay preparation. A ‘very vague and open-ended’ title allows students to exercise choice of angle and approach but without the feedback it is likely that some students would have produced an essay that was rather tangential to the topic required. This was indeed noted with the 2005 cohort where some students wrote very general essays about bioterrorism (or in one case the related but distinct subject of biowarfare) with little comment on the role of biotechnology. In contrast, with the 2006 cohort the importance of inclusion of the biotechnological aspects was grasped by all of the students following reinforcement at the essay plan stage.

**Reflection on the Teaching Cycle**

This teaching cycle has demonstrated the effect that timely feedback can have on the improvement of student essays. The approach that I took worked well and the students were receptive to, and benefited from the feedback check point during their essay preparation. The effect on raising the standard of the essays submitted was pleasing to see and the fact that it appears to have benefited all students irrespective of ability is reassuring. The comments obtained from the students indicate that this approach is not often used but that it is one that they value. In a wider context, feedback is one of the aspects that contribute to the student satisfaction survey (http://www.hefce.ac.uk/learning/nss/data/2007/) and although Aberystwyth consistently scores highly in this survey, (lack of) feedback tends to be one of the lower scoring elements, here as elsewhere. The approach taken here was not too onerous (although see drawbacks below) and provides a model for raising student satisfaction as well as supporting their learning.

**Are There Drawbacks to the New Coursework?**

The inclusion of a feedback stage in the assessment introduced additional marking but, as this was a small third year module and as all of the students kept to the guidelines of producing a single page essay plan, the increased workload was insignificant compared to the time taken to mark the finished essays. As this was a variation to the assessment format that most of the students were unfamiliar with, it did raise a number of queries from the students but these were generally easy to deal with. However, it should be noted that whilst this approach is appropriate with small numbers of students, with larger groups the additional administrative and
Future Modifications

I will review the time intervals between setting the work and the essay plan and final essay deadlines through discussions with other staff on the module to determine whether shorter intervals would help students to stay focused between the two stages or whether this would discourage the reflection and revision possibilities that the teaching development was designed to facilitate. As the teaching development involved quite small numbers of students I will be providing feedback to the next cohort of students and extending this where appropriate to other groups of students.

Conclusions

Feedback is a valuable tool for supporting student learning but is often provided only after work has been assessed. Lack of feedback is a source of dissatisfaction generally amongst students and in this teaching development I have sought to use feedback in the most effective way to support the learning outcomes of the coursework. The data collected indicate that the aims of the teaching development have been fulfilled as the feedback given was valued by the students and led to an improvement in the standard and focus of the essays subsequently submitted for assessment.

References


Appendix: An example of Feedback

Student Essay plan in regular text, feedback in bold.

The role of biotechnology in bioterrorism – Essay Plan

Remember to add abstract (100-200 words) summarising essay content

Introduction

Outline what bioterrorism is – Using any micro organism, virus or toxin from an organism as a weapon against others in war or terrorist attacks.

Show that a variety of micro organisms can be used in bioterrorism such as Anthrax, Smallpox, Ricin. Giving examples of how they have been used in the past by terrorist organisations.

Section 1

Why use biotechnology (do you mean bioterrorism rather than biotechnology? This section seems to be more about the benefits of using bio-agents. ) what are the benefits to terrorists in doing so. Such as nuclear warfare nowadays is at a stand off since the end of the second war and certainly after the cold war. History into past uses such as native Americans being killed by European conquerors using smallpox, in the Vietnam war the Americans used herbicides as counter measure against the enemies crops, gave the first large scale idea of using biological weapons in war. Eventually terrorists had the same idea in anthrax attacks in 2001 by mail.

Section 2

Possible uses recombination DNA. Using genetic engineering to use the desired characteristics from an organism, for example gene for an exotoxin, and inserting it into the genome of another organism such as e.coli to produce it on a large scale. Discuss problems such as creating eukaryotic genes in prokaryotes with regard to export, glycosylation and how can be overcome using a virus to get DNA into various cells and create protein. Good examples

Section 3

Traditional methods of biological weapons such as anthrax in detail with regard to size, spores, what the bacterium does in nature, why it’s selected in terms of an inhalant making it attractable for aerosol weapons. Keep brief unless you are going to bring in role of biotechnology in improving e.g. consistency of particle size / weaponisation properties.

Section 4

Solutions used to protect and limit the effects of bioterrorism such as drug resistance, treaties by various conventions making it illegal. Try to focus on biotechnological solutions to the problem.

Section 5

Conclusions summarising the main points discussed in the essay. Include your own viewpoints

Section 6

References

It would have helped to include some in the plan! In the finished essay use a consistent style to cite them.

Use meaningful subheadings in the finished essay to make structure clear. If it helps, add diagrams and or tables.

I look forward to reading the finished essay: 60%