

[O4] Development of a workshop to enhance scientific writing skills and reduce plagiarism

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Introduction

It is well-documented that plagiarism in higher education and research is a growing problem both in the UK and worldwide (Roberts, 2008). This growth may be explained by the universal use of word processing techniques, such as the facility to cut and paste text at the click of a button, as well as the unprecedented information explosion produced by the Internet. University students are faced with a bewildering amount of information that must be incorporated into the large variety of written tasks they are required to undertake. Meanwhile many students are still trying to find their own style of writing. This is a process that needs both confidence and time to develop. Given this context it is not surprising that plagiarism, whether inadvertent or intended, occurs. Many reasons for plagiarism have been reported, such as lack of scientific knowledge, lack of writing skills, and lack of understanding, confidence or time (Carroll, 2002). To deal with the multifactorial origins of plagiarism therefore, solutions must be found that address this from many different angles. Rather than just relying on the disciplinary route, which is already firmly enforced in Glasgow University at Departmental and University levels, we have chosen to concentrate on an educational solution. We designed a Scientific Writing workshop to help students improve their academic writing skills and scientific literacy in general. In this way we hoped to reduce plagiarism. We have previously reported on an early version of this workshop (Cogdell and Aidulis, 2008), which aimed to raise student awareness of what plagiarism is, give students practice at summarising information, and look at how to reference sources correctly. The current paper describes how the workshop has developed since then, from one looking mainly at the issue of plagiarism to one focussing on improving scientific literacy in general. This approach builds on some of the ideas presented at a Centre for Bioscience meeting on Preventing and Designing Out Plagiarism (Aidulis, 2008). It is our belief that improving scientific literacy will enhance understanding of plagiarism and writing skills, and lead to a reduction in plagiarism in a much more positive manner than simply focussing on plagiarism avoidance. Indeed, Jude Carroll has recently put forward the idea that anti-plagiarism strategies can actually be used as a vehicle to facilitate learning and teaching (Carroll, 2008); therefore, positive outcomes can result from what is initially perceived as a major problem, and it is this philosophy that is driving our future workshop developments.

Early versions of workshop

Our initial workshop first ran in 2004-5 (Cogdell and Aidulis, 2008). A brief outline of this is given and the subsequent developments then described.

The participants of the workshop were Level 3 students all studying a branch of human biology, with 25 to 40 students at a time, and each session with students from one named degree subject. The workshop was designed to be mainly discussion-based rather than a more standard lecture format. There were three main sections: (i) clarifying what plagiarism is; (ii) practice in summarising information, where students were asked to write a summary of a topic from three different sources using their own words; (iii) guidelines on referencing sources. Students worked through exercises in each of these sections in small groups. The workshop material was chosen to be specific to the group of students involved, so for example articles from pharmacology journals were used for the pharmacology students. The workshop was staffed by a class teacher and postgraduate demonstrators who helped encourage discussion and clarification of issues. An Effective Learning Adviser (ELA), who is a member of the University dedicated student support staff, was also present at various points throughout. Between the exercises whole class discussions were led by the class teacher. At these points issues that came up either during the group work or from individuals were

raised. This helped to identify misconceptions, clarify any grey areas, and consequently enhance understanding. Throughout the workshop, students were encouraged to think honestly about how they usually write and if there was anything they now needed to re-think.

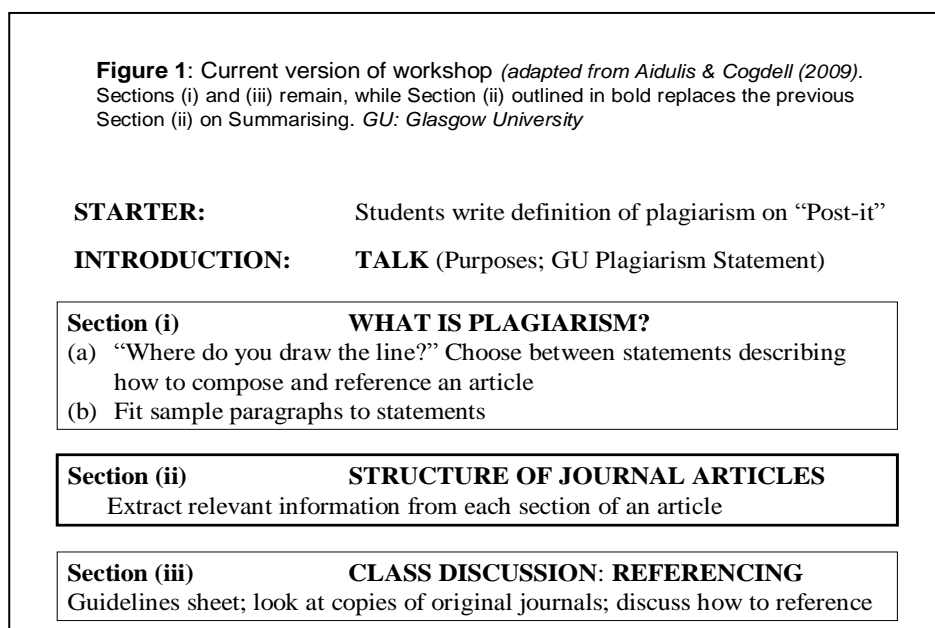
Evaluation and reflection

The workshops were evaluated using a variety of methods, including class feedback forms, speaking to students, and discussion with the demonstrators and the ELA. The teaching methods and discussion format worked well, and incorporation of the workshop into the class timetable rather than optional attendance was appropriate.

However, the three hour slot used was too long. The summarising section was not found to be particularly helpful; the students found it difficult to write on the spot in the middle of a busy class, and some students finished before others while others could not complete the task in the available time. However, out of 110 students, 80% found the workshop 'helpful' or 'very helpful' and there was much less plagiarism in laboratory reports submitted after workshop attendance, compared to the previous year (Cogdell and Aidulis, 2008).

Changes to the workshop, and subsequent development

In the light of these reflections, various changes were made to the Scientific Writing workshop. The elements that had worked well, including the discussion-based format, mix of group work and whole class teaching, and assistance of demonstrators and the ELA, were preserved. However, the workshop was shortened to finish in two hours. The first and last sections ((i) clarifying what plagiarism is, and (iii) information on referencing) were kept in, while the section on summarising was replaced by one looking at journal articles in more detail. Figure 1 outlines the current structure of the workshop.



When the workshop first ran (2004-5), the focus was mainly on trying to increase the students' awareness of plagiarism; its existence, the various forms it can take, and how not to inadvertently plagiarise. Over the last few years, the focus has gradually changed to include more information about what science is and how it 'works'. Discussion of how experiments are conducted and written about is often neglected, but an understanding of these issues is likely to improve students' academic writing, and help avoid plagiarism.

Another reason for the shift in focus was prompted by other anti-plagiarism strategies delivered elsewhere in the curriculum for these students. During 2004-5, measures were put into place at Level 1 to raise students' awareness of plagiarism and how to avoid it (Tierney *et al*, 2006). So,

when these students then progressed to Level 3 where they encountered our workshop, some of the material was perceived to be a repeat, and comments included *'Oh no, not plagiarism again'*.

Current version of the workshop

The current version of the Scientific Writing workshop was described at the Science Learning and Teaching Conference (SLTC) in Edinburgh in June 2009, and is outlined in Figure 1.

The middle section of the initial workshop, has now been replaced with 'Structure of Journal Articles and Laboratory Reports' (Figure 1 (ii)), where students were given a copy of a journal article and asked to make a table with the following headings: Introduction, Methods, Results, Discussion and References. Using the journal article, they were then asked to fill in examples of relevant information from each heading in the article. The students worked together in groups as before. It was thought that this would help students to approach what may at first seem a daunting task, reading and analysing a scientific journal article, in a simpler step-wise manner. This helped them to become more familiar with the structure of a journal article and the types of information found in each section.

Issues to consider

(i) Threshold Concepts:

It is clear that looking at the wider issues relating to students and how they write is central to getting them to think for themselves. Giving out a set of rules on how to avoid getting into trouble with plagiarism is not enough; true understanding, as opposed to 'learning' a formula, is key. Likewise, students need to understand *why* references are required in order to cite them properly.

Meyer and Land (2003) coined the term 'Threshold Concept' to describe a stage in a student's learning where barriers have to be overcome in order to fully understand a concept and move on to the next stage of learning. Plagiarism can be viewed as such a threshold concept, where barriers to be overcome may include understanding the concept that science moves on; 'facts' are not set in stone but can be challenged, and alternative viewpoints are acceptable if supported by relevant evidence or reasoned argument. Realising this may help students avoid simply reporting or regurgitating what others have found, and consequently write in a more mature way that is less likely to result in plagiarism. Identifying opportunities to bring such ideas into discussions helps to keep the workshop material fresh and relevant.

One of the best ways to encourage students to cite sources appropriately, for example, is for staff to do this routinely when preparing class materials. Similarly, continually taking time to adapt the workshop in response to particular issues that come up is one of its main strengths. It is not simply a matter of getting through the material, or completing the exercises, but rather using the materials as a prompt for bringing up relevant issues and to facilitate discussion. This helps students to move their own understanding on in some way.

Students are encouraged throughout the workshop to think about how they usually write or construct an article, and whether anything they do (or have done) could fall into one of the greyer areas of what might constitute plagiarism. Having examined such grey areas at length, students are in a much better position to examine their own writing practices and reflect on whether there is anything they need to change in how they write. Recognising plagiarism as a threshold concept can help in designing appropriate strategies, or to identify opportunities as they arise to address misconceptions.

Students often find it difficult to express a sentence or description from a paper in their own words, so they attempt to 'change it a bit' to avoid directly copying. On discussing this during one of the workshops, we suggested that one way to try to find the words is to imagine explaining or describing the point to someone else. When someone asked 'but what if I don't understand it?', we replied, 'then there is not much point putting it in, if you are simply repeating what someone else has said without understanding it'. It became clear to the students that if you actually understand something, then you can describe it in your own way. Therefore, the focus moved from 'how can I

write this differently so I am not copying it?' to 'how can I understand something properly, so that I can write about it myself?'

(ii) International students:

In developing the Scientific Writing workshop, it is important to consider international students, who can face incredible hurdles in their academic writing (Pringle, 2009; Tobin and Granger, 2009). Interestingly, many of their difficulties and the possible strategies used to overcome these are common to home students too, so encouraging dialogue between those involved primarily with international students and those dealing mainly with home students could benefit both student groups. It also increases staff understanding of the challenges faced. At present, home students make up the vast majority of those attending the workshops. However, the proportion of international students is steadily increasing, and this must be taken into account when designing future workshops. In addition, our current workshop design builds on material delivered during earlier levels of the curriculum at the University as described above. While this can be regarded as an example of a spiral curriculum (Bruner, 1960) and as such is desirable, many of our international students (or indeed other students) enter directly into Level 2 or Level 3 and will not have had this prior training.

Future plans for the workshop

The most immediate plan for revising the Scientific Writing workshop is to modify the journal article exercise. Following consultation with the ELA and observation of the students it was apparent that this exercise was too complicated for the available time. An improvement would be to use a shorter journal article, but suitable short articles relevant to the course material are difficult to find. If a shorter (and still suitable) article cannot be identified then blanking out some of the more difficult parts of the article while still leaving a coherent whole is a possible improvement. The ELA has also advised us to be much more specific about the information we ask the students to find from the article. Therefore, a list of questions will be prepared asking for specific information from each section of the paper, and the students will answer these rather than just 'picking out some information from each section of the paper'. In addition, the article chosen can be posted on the course Virtual Learning Environment, Moodle, so the opportunity exists to look at the material before the actual session.

The importance of students understanding what they are writing about will be emphasised more, to help them develop the confidence to use their own words. In addition, more emphasis will be placed on *why* referencing is necessary, as opposed to just how to do this. A sheet of guidelines cannot possibly cover all the possible types of sources and how they can be referenced, and is of no use if students are not aware where or when (or indeed why) a reference is required. A more complex issue than compiling a reference list however is in-text referencing. Common questions include 'where do you put these? Should it be after every sentence? Every paragraph? How many per page? How many in each bracket?' These cannot be answered easily, so helping students develop their own sense of what is appropriate is a challenge and will also be addressed in future workshops.

Conclusions

This paper has described how our Scientific Writing workshop, initially designed to combat plagiarism in student writing, has developed to encompass wider aspects of science and scientific writing in general. The workshop is constantly evolving in the light of observations during the class, feedback from students and staff, discussions with relevant individuals, and further reflection, as well as examining relevant literature. Its structured approach is combined with flexibility so that each session is meaningful to the students concerned. The strengths of our scientific writing workshop therefore include: (i) its structured nature, addressing three key areas (plagiarism, analysing journal articles, and referencing sources), (ii) opportunities to clarify areas of uncertainty, (iii) flexibility to respond to student concerns during sessions, and (iv) its continual development. The latter is perhaps its most important strength. Change is constantly occurring, in how information is accessed and disseminated; in the types of students and student skills; and not least

in the constantly changing world of science. It is therefore vital that we review regularly how students are guided through the process of scientific writing.

It has been said that plagiarism or other forms of cheating can be viewed as failing to learn (Carroll, 2008; Dick *et al*, 2008), and it is this failure to learn that is the main issue. Therefore, it could be argued that strategies to combat plagiarism are a potentially powerful tool to enhance both learning and teaching, and as has been shown with our workshop, can be used specifically for this purpose. Re-focussing on the importance of learning is crucial as is an emphasis on the positive rather than the negative. This in a nutshell encapsulates the philosophy behind our Scientific Writing workshop.

References

- Aidulis, D. (2008) Improving scientific literacy to prevent plagiarism. In: HEA Centre for Bioscience. *Preventing and Designing Out Plagiarism*. Leicester, UK 8 April 2008. Available at www.bioscience.heacademy.ac.uk/ftp/events/leic080408/aidulis.pdf (accessed 14 September 2009)
- Bruner, J. (1960) *The process of education*. Cambridge, Massachusetts: Harvard University Press
- Carroll, J. (2002) *A handbook for deterring plagiarism in higher education*. Oxford: Oxford Centre for Staff and Learning Development
- Carroll, J. (2008) Plagiarism as a threat to learning: an educational response. In *Assessment, Learning and Judgement in Higher Education*, ed Joughlin, G., pp.115 – 131, Netherlands: Springer.
doi: 10.1007/978-1-4020-8905-3_7
- Cogdell, B. and Aidulis, D. (2008) Dealing with plagiarism as an ethical issue. In *Student plagiarism in an online world: Problems and solutions*. ed Roberts, T., pp. 38 – 59. London: Information Science Reference
- Dick, M., Sheard, J. and Hasen, M. (2008) Prevention is better than cure: Addressing cheating and plagiarism based on the IT student perspective. In *Student plagiarism in an online world: Problems and solutions*. ed Roberts, T., pp. 160-182. London: Information Science Reference
- Meyer, J.H.F. and Land, R. (2003) Threshold concepts and troublesome knowledge (1) – linkages to ways of thinking and practising within the disciplines. In *Improving Student Learning theory and practice – Ten Years On*, ed Rust, C., pp.412-424. Oxford: Oxford Centre for Staff and Learning Development
- Pringle, G. (2009) Dialogue with international students. In: University of Glasgow. *Scholarship of Teaching and Learning (SoTL) Symposium – Putting the learning into SoTL: student experiences of learning and implications for practice*. Glasgow, UK, 28 October 2008.
Available at www.gla.ac.uk/services/learningteaching/seminarsworkshopsandsymposia/scholarshipofteachingandlearningsotlsymposia/ (accessed 14 September 2009)
- Roberts, T.M. (ed.) (2008) *Student plagiarism in an online world: problems and solutions*. London, Information Science Reference
- Tierney, A.M., Brown, A. and Neil, D. (2006) Tackling plagiarism in the Level One Biology class – A work in progress. *Practice and Evidence of Scholarship of Teaching and Learning in Higher Education*, (1), 13 – 21.

Available at www.pestlhe.org.uk/index.php/pestlhe/article/view/7/20 (accessed 14 September 2009)

Tobin, C. and Granger, J. (2009) Raising awareness of plagiarism in international postgraduate students. In: HEA Centres for Bioscience, Materials and Physical Sciences. *The 3rd Science Learning and Teaching Conference*. Edinburgh, UK 16-17 June 2009 (*In press*)