

*This issue of CDTL Brief on **Plagiarism** features some issues and concerns about plagiarism discussed during a CDTL workshop on plagiarism in October 2007.*

Some Problems with Plagiarism

Associate Professor John Richardson
Vice-Dean, Faculty of Arts and Social Sciences

Experience of interviewing student plagiarists suggests that many are confused about what they have done wrong. Their responses vary from brazen denial to contrition, but perhaps the most common reaction is baffled incomprehension. These students insist, sometimes tearfully, that they simply did not know that what they did was cheating. Of course, some of those who say this may simply be spinning a clever line, but others are genuine, and genuinely confused.

The source of that confusion could either be the inadequacy of our anti-plagiarism messages at NUS, or more likely, something inherently difficult in the concept itself. Intellectual property is not a simple thing like physical property. In the abstract world of ideas and creation, it is often hard to define what is shared, public property and what belongs to an individual. That problem is compounded in a university where the different kinds of knowledge of different disciplines lead to varied understandings of exactly what constitutes ownership and what constitutes theft or plagiarism.

This became clear during a cross-faculty discussion at a recent CDTL workshop. Colleagues from the humanities argued that their ideas are not simply expressed through words, but actually exist in those words. Without the words they are nothing. This means that words themselves become sacrosanct, and the reproduction or theft of words is plagiarism. Colleagues from some of the natural sciences saw things differently. Their ideas are in the data or the analysis or (sometimes) in a mathematical formulation. The words themselves, at least in some sections of a paper, are not essential

to what is original and new and belongs to the author(s). Indeed, in some cases, the words could be conventional formulations that are the property of the community more than that of an individual or team.

This is straightforward enough for people working in each discipline, and generally we know what is considered proper in our own field and what not. It can, however, be confusing for students moving between faculties, as ours do now, or even between disparate disciplines in a single faculty. So, the question becomes how can we help them overcome that confusion?

There is, of course, no single or simple answer. But one partial solution could be increased self-consciousness on the teachers' part. Perhaps that self-consciousness already exists, but I suspect that many of us (myself included) usually assume that plagiarism is a single thing and that students more or less know what it is. If it is indeed the case that we tend to assume that, then it might be helpful for us to think of plagiarism more in disciplinary terms—in terms of the nature of knowledge in our field and how it may be stolen—and describe plagiarism to students in that way. In other words, we should not simply tell students not to plagiarise, but should explain to them something about the nature of the discipline and the nature of intellectual property within it.

We know that we need to educate students about plagiarism as well as punish them for it. The question I am raising is simply whether more of our education should be set in a specific disciplinary context. ■

Turnitin

Associate Professor Brian Farrell
Department of History

Three years ago, many members of our department started using the Turnitin software purchased by the university. Turnitin is an information technology-based resource faculty members can use to try to combat plagiarism. Undergraduate plagiarism entered a new and more challenging phase with the spread of the Internet. Downloading anything from small passages to entire papers became effortless, and to many very tempting. In my own experience with Turnitin, I have found it to be useful in doing three important things: categorically exposing crude and massive plagiarism; providing a graphic illustration of general student practices regarding the use of sources and the composition of research essays and providing a graphic teaching aid to instruct students on the problem of cut and paste. All three capabilities make Turnitin an important tool, and let me add a fourth: the general signal it sends about plagiarism, academic culture and responsibilities.

Turnitin seeks out word matches between the paper submitted to its database and anything else already in that database. It then 'paints' them on the screen for you by colour-coding the word matches according to the source matched. A paper can have dozens of different sources showing up as word matches (e.g. if you include a bibliography in the paper, it will show up in the Turnitin report). You can tell at a glance whether the student has made an honest effort to compose rather than compile his/her analysis just by noting the extent to which word matches are reported and the distribution of those matches. This takes care of the simplistic 'wikipedia' type of web plagiarism, some of which I have encountered through using Turnitin. The software allows us to deal with such basic plagiarism quickly and effectively as we can move right to the problem (i.e. what are we going to do about this?), cutting out the annoying interval of students' heated denial followed by time-consuming library search.

Not having collected any data, my impression is that the widespread use of Turnitin has already reduced such crude plagiarism by providing a credible deterrent. Turnitin can only search its own

database, but this grows steadily and will be more useful in the future. Turnitin also helps you better understand the norms, habits and trends among students when they submit the same assignment through the application. Comparing all their reports provides us with a picture of students' varying skills and approaches towards the use of sources in the group. For example, if the majority of students are turning up too many word matches because they are footnoting but quoting verbatim without quotation marks, then you know you have a teaching task at hand. If only a few do this, then the problem lies with the few individuals.

Beyond this useful feature, Turnitin can also be helpful in training students to understand the difference between compiling work by cutting and pasting from their sources and composing work by drawing facts, arguments and inspiration from their sources in order to formulate their own argument. We all tell them they must do the latter, but explaining this in concrete terms is very difficult. In my experience, Turnitin can help with the very students who most need to know (i.e. those who are not willfully plagiarising but have never learnt or been taught how to analyse rather than cut and paste). It is again the vividly coloured word matches that do this. When all the main points in a particular paper are all expressed in passages that Turnitin indicates come from the sources, not from the student, you can use this to take him/her through the paper and give the student a practicum in going beyond cut and paste.

I am neither suggesting that Turnitin is a 'magic bullet' solution to plagiarism, nor am I going to argue technology will solve our problem. But technology provides us with this useful tool, as well as makes our problem worse. Using Turnitin does no harm, and can do much good. Beyond the three specific issues discussed above, requiring your students to submit their work through the application sends the right kind of message—plagiarism is wrong and we will not tolerate it. Students are here to learn, not to regurgitate. Turnitin has helped me most in teaching students, not punishing them. A picture is indeed worth a

thousand words, and using a concrete and graphic example to explore the relationship between compiling and composing has helped me train students to go beyond churning out C-grade (or weaker) work to composing papers that are worth reading, because the application forces students to confront their own capabilities without

hiding behind the superior prose of others. Since downloading material from the Internet is a trend that is here to stay, applications like Turnitin needs to be part of our pedagogy from now on, not only to deal with that fact, but also to help us teach this visually- and IT-oriented generation how to recognise and pursue enduring standards. ■

Plagiarism in Chemistry Education

Dr Adrian Michael Lee
Department of Chemistry

“Plagiarize, Let no one’s work evade your eyes!”

Lyrics from *Lobachevsky* by
Thomas Andrew Lehrer (1951)

The majority of scientific research is funded by the public purse and frequently, this research is called upon to inform both national and international policy. The need for probity is absolute if public confidence in science is to be maintained. Plagiarism is but one aspect of the betrayal that scientists can perpetrate on their colleagues and the public at large. During an undergraduate student’s education, the socialisation of unethical behaviour, of which plagiarism forms a large part, has significant repercussions for that individual’s professional conduct after leaving university.

In chemistry education, term papers are an infrequent form of assessment. A ubiquitous form of assessment in chemistry education is the laboratory report. Plagiarism of laboratory reports has probably plagued chemistry education ever since chemical laboratories were introduced into university teaching by Justus von Liebig in the early 19th century. In one of first reported assessments of plagiarism in the laboratory setting, Deal (1984) recorded that some 81% of students stated on questioning that they had observed either plagiarism of laboratory reports or falsification of data—I doubt that this statistic has improved. In this paper, I would like to discuss some of my own personal observations with regard to plagiarism in the laboratory setting.

Chemical laboratories play a fundamental role in the education of a chemist. As an educational

medium they provide an environment that is intrinsically student-centred. Many experiments are problem-based which should help students understand concepts and theories. In the laboratory, students get to create things; and quite frankly, creating things is fun. It is the reason why many students choose chemistry for a career. It is therefore unfortunate to note that laboratory classes are failing to realise their potential. Byers (2002) commented, “All too often students see laboratory work as a form of assessment... [rather than an] opportunity to learn” (p. 29). It is natural for students to possess an achieving motivation in their studies. Within the context of the laboratory report, the simplest achieving strategy for students to adopt is one based on plagiarism. As educators, we can point out to students that in adopting such a strategy they are circumventing the learning process. However, we cannot teach students successfully if we do not know what students truly understand. As Ausubel (1968) stated, “If I had to reduce all of educational psychology to one principle, I would say this: the most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly” (p. 18). Plagiarism, in most cases, artificially inflates students’ perceived knowledge. Students need to appreciate that they miss the opportunity to learn when they plagiarise.

It is, however, unrealistic to hope that students who engage in plagiarism would be easily persuaded to adopt a deep learning strategy to their studies. Chemistry educators are not without blame with regard to the level of plagiarism that takes place in laboratory reports. There are a number of

aspects of traditional laboratory reports which make plagiarism particularly amenable: reports are formulaic; experiments are unchanging; pre-laboratory assignments and discussion questions are the same every year; and in almost all laboratory classes, reports are written at home. With the exception of changing experiments which in a laboratory class would prove to be prohibitively expensive, many of these aspects could be addressed.

There is an obvious technical solution that many of us have used for several years to detect plagiarism in term papers and that is Turnitin.¹ However, this should be seen as only part of the solution. At the outset, students should be reminded about plagiarism and their acceptance of the University's Honour Code. I would like all laboratory reports to include the following words or something similar to: "I certify that the work submitted here represents solely my own efforts. I am aware of the University's regulations about, and penalties for, plagiarism." Students should also be required to do the e-module on plagiarism (<http://emodule.nus.edu.sg/ac>) and sign a declaration to that effect.

We can also make changes to what we expect from reports. Laboratory reports are deliberately formulaic; it is important for students to know how to write a formal report. Clear guidance of what is expected from a formal report should be made far more explicit. Students come to university with many erroneous ideas of how a report should be set out. Many students believe that a good report needs to be long no matter how simple an experiment it is based upon. It needs to be impressed upon students that conciseness in scientific writing is greatly desired. Furthermore, it is not necessary for all reports to be written in this manner. Many experiments are suitable for a pro forma report to be employed. Not only would this reduce students' workload (a frequent excuse of students faced with an accusation of plagiarism) as such reports could be completed during class, but it would also greatly facilitate the marking of reports by teaching staff.

Many examples of plagiarism are of reports from earlier years; such examples could be avoided if the experiments changed. However, the wholesale introduction of new experiments every year would

be prohibitively expensive. That said, it is not unfeasible to introduce one new experiment into a module each year. However, expense is not an issue for pre-laboratory exercises and discussion questions. Thus introducing changes in these areas on a yearly basis, between different classes doing the same experiment, is warranted.

The impression among students that they must plagiarise to achieve high grades is reinforced by an overly pedantic attitude to assessment. Students are less likely to be tempted to plagiarise if they feel that making minor mistakes will not substantially affect their grades. The less formal structure of a pro forma report may encourage students to worry less about assessment and instead focus on the educational benefits of the laboratory class.

An important objective of laboratory classes is the training of students in key technical skills. Assessing students on these skills during the laboratory class or in a practical examination rather than basing assessment solely on written reports would focus students' minds on learning these skills. The suggestion that laboratory data can assess a student's knowledge of such skills is naïve, given the ease with which 'perfect' data can be fabricated.

In conclusion, I would note that plagiarism has long plagued chemistry education, especially in the laboratory setting. The ease with which material can be plagiarised in the internet age in no way excuses the perceived social acceptability of plagiarism. It is incumbent upon educators to in no way aid or allow plagiarism to take place. The introduction of relatively small modifications in how we assess students would greatly reduce plagiarism in the laboratory setting. A reduction of plagiarism benefits both students and educators in that students would be more engaged in learning. After all, to paraphrase Haldane (1923), it is our obligation as educators to induce students to think. The laboratory offers a marvellous medium to encourage this and perhaps by employing the suggested mechanisms for reducing plagiarism, students will come to the laboratory with a thirst for learning rather than achieving.

1. The NUS portal to Turnitin can be found at <http://www.cit.nus.edu.sg/plagiarism>

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Notes on Plagiarism: Did I Do It?

Dr Annett Schirmer
Department of Psychology

Presenting the ideas of others as one's own is considered academic misconduct and typically punished not just at NUS but in academia in general. To discourage students from plagiarising, NUS outlines the academic consequences of detected plagiarism on its websites and encourages lecturers to discuss plagiarism during classes. Nonetheless, there are incidences of students plagiarising assignments and one therefore must ask the question whether our efforts to educate students on this issue are sufficient. Can students make informed decisions about the use of published and unpublished sources for their own work? The answer to these questions probably depends on the type or degree of plagiarism (Wilhoit, 1994). One may expect students to be aware of the implications and consequences of submitting a paper as their own that, in its entirety, has been written by someone else. However, students may be uncertain about more subtle forms of plagiarism, such as the omission of quotation marks in verbatim citations, particularly if such omissions were acceptable in prior educational settings (e.g. high school).

I came to realise students' uncertainties about plagiarism when I first started interacting with NUS undergraduates in 2006. At that time, I was teaching an honours seminar during which I assigned a term paper on the role of emotions for cognition. Although on average students demonstrated good academic writing and reasoning, the quality of their manuscripts varied greatly. Specifically, two manuscripts caught my attention because the writing and reasoning presented there was far superior to that of the other manuscripts. In an effort to identify potential cases of plagiarism, I studied the references cited by the two students. I found a book and a journal article containing paragraphs that matched one of the students' submission perfectly. Moreover,

the student had copied these paragraphs verbatim without the use of quotation marks but took pains to indicate the sources in parenthesis. As her entire manuscript comprised a patchwork of published material, I considered this a case of plagiarism that I had to act on. Fuelled by this discovery I went on to determine potentially plagiarised sources for the second outstanding manuscript. However, in spite of my familiarity with the term paper topic and extended additional reading of available publications, I was unable to identify books or journal articles that were corresponded to the student's manuscript.

Since I was hesitant to reward potentially undeserving students with a good grade, I decided to confront the students in my seminar. At the end of one of my classes, I announced that I have had identified one case of plagiarism and that I suspected another. Moreover, I asked the students who committed these acts to contact me within the next three days so that we could resolve the matter. After I finished the class, students remained in their seats and talked excitedly with each other. Some of them approached me to ask what specifically was wrong with the plagiarised manuscripts. I explained that information had been copied from other sources and was not properly acknowledged. This did not settle the discussions and even after I left the classroom, many students remained in, what appeared to me, a 'state of panic'.

Over the next few days, I was contacted by 33 students (two thirds of my seminar). I received messages such as: "This is XXX from your Cognitions class. After the class today, I was very concerned about the plagiarism issue. I re-read my paper, but I'm not sure if what I wrote constitutes plagiarism. So, can I check with

you if my paper was ok? If not, I hope to be able to make up for it.” Another student wrote “I refer to your plagiarism announcement. Initially, all was fine, but then everybody starts asking everybody else about the issue and everybody asks ‘Am I the one’? Did I unconsciously do so? Did I not paraphrase sufficiently?”

Among the students who contacted me were also the students whom I suspected of plagiarism. During a private interview, I asked both of them to describe the process in which they generated the manuscript. The student, whose work I suspected was plagiarised, told me that her brother, who had just finished graduate school, helped her with the English but that the structure and ideas presented in the manuscript were hers. Subsequent interactions with the student convinced me of her intellectual merit and she is now working with me as a graduate student. The student, whose work I knew was plagiarised, was very anxious during the interview but had no clear perception of having done wrong. She believed she had correctly acknowledged other sources because she had provided the respective references in the manuscript. This latter student received a fail-mark for her assignment and had to submit a second assignment together with the material that she used to prepare the manuscript. This second assignment still contained a few unnecessary verbatim quotations suggesting that the student had difficulties distinguishing between utterances that are important enough to be cited verbatim and utterances that should be paraphrased. Hence I invited the student for a second interview to explain this matter as well as the grade she received for her assignment.

The experiences with the students in this seminar have taught me a valuable lesson. They drew my attention to the fact that the academic curriculum focuses on content matters but provides little, if any, instructions on how to use and present the information obtained from others. Moreover, while there is a great emphasis on educating students on what goes into an academic paper, students are more or less expected to know how to write it. As informed decisions about the use of published and unpublished sources can only be made if the relevant knowledge is available, we as instructors need to do more than simply raise the issue of plagiarism to students. Specifically, we need to make an effort in explaining and illustrating the various types of plagiarism and promote good writing practices in dedicated writing modules.

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The Centre for Development of Teaching and Learning (CDTL) engages in a wide range of activities to promote good teaching and learning at the National University of Singapore, including professional development, teaching and learning support, research on educational issues, and instructional design and development.

contributors

John Richardson
Brian Farrell
Adrian Michael Lee
Annett Schirmer

advisor

Daphne Pan

editors

Teo Siok Tuan
Liew Shin Dee

layout

Ma Lin Lin

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Comments, suggestions and
contributions should be addressed to:

The Editor, *CDTL Brief*
Centre for Development of
Teaching and Learning
Central Library Annexe, Level 6
National University of Singapore
10 Kent Ridge Crescent
Singapore 119260

Tel: (65) 6516-3052

Fax: (65) 6777-0342

Email: cdtpost@nus.edu.sg

<http://www.cdtl.nus.edu.sg>

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