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The Trial of Damocles: an investigation into the incidence of plagiarism at an Australian university.

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What is originality? Undetected plagiarism.
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Abstract: Numerous studies have postulated that academic cheating in Higher Education is on the increase. Access through the Internet coupled with the increase in student numbers have both been cited as contributing factors to the incidence of cheating. Students appear most likely to cheat when the risk of being detected are estimated to be lower than the potential gain. Previous studies have found that students do not regard academic staff as being efficient in the detection of plagiarism. An increase in staff efficacy should therefore be coupled with a reduction in the incidence of plagiarism. The purpose of this paper is to discuss the trial of a plagiarism detection device known as Damocles. The paper also reports on research involving 198 second and third year university students who were instructed to hand in an assignment on disc that would then be run through the plagiarism detection software. Students were further instructed that anyone found to have plagiarised would receive zero for that assessment and have to face disciplinary procedures. It was expected that this would dissuade students from plagiarising, however, 5% of students were found to have intentionally plagiarised works not their own. The paper suggests that recklessness is a contributing factor that helps explain the behaviour of this consequence-resistant group of students.

The Behavioural Studies teaching staff was surprised to discover that several students had
attempted to plagiarise their assignment in the unit ironically named 'The Criminal
Mind'. This was a class that had received the most convincing of warnings that their
essays were to be checked by the Damocles plagiarism detection program. Assignments
were to be submitted on disc, and a series of warnings had been delivered over the
preceding weeks that this detection device will pick up anything that could be found on
the Internet including journal articles from various academic databases. All the students
were at least in their second year, and had been lectured on the perils of plagiarism at the
beginning of this unit. There was no doubt that they knew that plagiarism was a
university offence and that if caught students would face disciplinary action. In particular,
the practice of 'cutting and pasting' from Internet sources was the most readily detected
form of plagiarism. Teaching staff were certain they had done everything they could to
assure students that if they plagiarised they would be found out and punished. An
external observer would consider the odds for engaging in plagiarism and not being
detected, as being almost zero.

It was therefore of great surprise that 10 students of a group of 198 (5%) did plagiarise by
cutting and pasting. The question arises: Why plagiarise when the odds of being caught
are so high? It is the object of this paper to postulate possible answers, but more
importantly reflect on assessment practices in higher education that might lessen the
opportunities for plagiarism or cheating. Whatever explanations may be hypothesized, it
is the evolution of practice based assessment that will make a difference.

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There is little uniformity in the definition of the term 'plagiarism'. An Internet excursion
into the web sites of some of the 3,000 universities and colleges listed at sites such as
MIT's Colleges.com or UniXL.com, will yield considerable variation in definition,
differentiation, detection and disciplinary response. Definition therefore is a critical
determinant of any university's position on plagiarism.

It is not uncommon to find higher education institutions identifying a series of
unacceptable behaviours under the one heading of plagiarism. Marsden, Carroll and Neill
(2005) are clear that grouping differing types of academic dishonesty under a single
heading disallows an appreciation of the sources and characteristics of such deviant
behaviour. Differentiation of the acts of plagiarism and cheating is critical if greater
understanding is to be gained of each.

Monash University defines plagiarism as:
> "…to take and use another person's ideas and or manner of expressing them and
> to pass them off as one's own by failing to give appropriate acknowledgement."
> (Monash University Secretariat, 2003)

Cheating is defined quite differently as:

"…seeking to obtain an unfair advantage in an examination or in other written or practical work required to be submitted or completed by a student for assessment." (Monash University Secretariat, 2003)

This difference causes an emphasis to be made of intention. If a student can be shown to have intentionally sought to obtain an unfair advantage they will be regarded as having cheated, whereas unintentional behaviour is regarded far more leniently.

Sutherland-Smith (2003) also discriminates between intentional and unintentional plagiarism but poses the dilemma that the identification of intention is not always clear. Other sources completely disregard intention, claiming "…plagiarism to be the failure to properly acknowledge the work of another, regardless of intent." (Rawson, 2005)

Although media reports (Caterson, 2004; Langsam, 2001) suggest that cheating and particularly plagiarism is on the rise in higher education, it is difficult to sustain these assertions without more standardised studies. In recent times Foster (2002) claims 14% plagiarism rates based on the outcomes of detection programs. Older studies which base their plagiarism estimates on admissions by students have been recorded at 91% (Roberts, Anderson, & Yanish, 1997), 89% (Graham, Monday, O'Brien, & Steffen, 1994), 80% (Brown, 1995) and 75% (Maramark & Maline, 1993). Nonetheless it is impossible to develop baseline measures and then make sound comparisons when definitions are so diverse.

The developing ease with which students may access online materials ready to 'cut and paste' may suggest that such practices are common, but in the absence of empirical data this notion cannot be sustained. So too the proliferation of paper mills such as 'essaycrawler' and 'CheatHouse.com' suggest there must be a sizeable customer base to support hundreds of sites offering thousands of essays for sale or free, but the dimensions of such facilities cannot be known.

However with the rise of opportunity to cut and paste from the Internet there has been a corresponding rise in plagiarism detection devices from the giant international "Turnitin.com" to smaller programs such as 'Eve2' and 'CopyCatch'.

'Damocles' (Squire, 2005) is a plagiarism detection program developed by Dr David Squire of the School of Computer Science and Software Engineering (CSSE) at Monash University. It was this program that was used to find incidents of plagiarism in this study. It may be asked why there is a need to develop alternative detection programs when extremely powerful programs such as Turnitin.com are available. In the first instance there may be significant costs involved, but some institutions seem particularly wary about intellectual property remaining with the detection provider (Savage, 2004).

Co-workers of Squire have made a substantial contribution to the Australian perspective on academic misbehaviour, with a number of studies offering to provide a sound foundation for ongoing empirical research (Dick et al., 2003; Dick, Sheard, & Markham, 2000, 2001a, 2001b; Sheard, Carbone, & Dick, 2003) (Sheard, Dick, Markham,

Macdonald, & Walsh, 2002). It is of interest to note that Marsden et al. (2005) report a scarcity of quantitative research in Australia, when, as demonstrated, there is an emerging accumulation of material, including a prodigious array of presentations with a specific focus on plagiarism from the 1st Australasian Educational Integrity Conference held in 2003. The conference proceedings were edited by H Marsden, M Hicks and A Bundy. A similarly bountiful body of work promoting quality in higher education can be found in the proceedings of the Australian Universities Quality Forum (2004).

Much of the CSSE group's work has examined attitudes and practices of Information Technology students. (Sheard & Dick, 2003). There are many questions about comparing the levels of academic misbehaviour, exploring which disciplines are most prone. A great deal of the international literature has revealed student cheating behaviours across many disciplines including medicine (Sierles, Hendricks, & Circle, 1980) biomedical science (Kalichman & Friedman, 1992), dentistry (Odom, 1991), optometry (Werner, Heiberger, Feldman, & Johnston, 2000), business (Caruana, Ramaseshan, & Ewing, 2000) business and economics (Nowell & Laufer, 1997) engineering (Harding, Carpenter, Montgomery, & Stenek, 2001), psychology (Rubin, 1983) social work (Saunders, 1993), and education (Ferrell & Daniel, 1995; Love, 1997). However there is no way to make meaningful comparisons across the literature when testing instruments and research strategies are so diverse.

One of the few studies comparing disciplines is that of Marsden et al. (2005) who found that Australian science and journalism/literature students plagiarised more than engineering students. The authors concede that these results may have been influenced by gender, and recommend further testing. Athanasou and Olasehinde (2002) undertook a meta-analysis that revealed little gender difference in self-reported cheating. Several earlier studies did find gender to be a substantive variable. Newstead, Franklyn-Stokes, & Armstead (1996) testing at an English university, and McCabe & Trevino (1997) testing American students, also found that younger students were more likely to plagiarise than older students. This demographic was not supported by Marsden et al. (2005) who suggested that older students were able to become more familiar with cheating strategies. Likewise, Alarape and Onakoya (2003) found older students were more likely to cheat because it was believed they had gained experience of how to cheat without being caught. Underwood and Szabo (2003) suggest that none of the variables of age, gender and academic achievement bore a simple relationship with dishonest behaviour and posited that dishonest behaviour rates fell as students matured.

Both Newstead et al. (1996) and McCabe & Trevino (1997) agreed that not only were younger students more likely to plagiarise, but males, and less able students were also groupings more likely to plagiarise. Both groups of authors have generated substantial numbers of papers that reflect their achievement on their respective continents, and each identifies an additional major factor. The Newstead team (1996) isolated student motivation to be of significance, such that students who studied to learn were far less likely to plagiarise than students simply seeking higher grades. McCabe & Trevino (1997) found that peer disapproval was the most significant factor in dissuading students from unacceptable behaviour.

Brownlee et al. (1999) draw on the recent neurobiological research made possible with the use of magnetic resonance imaging to suggest that whereas once it was "…believed that the brain was fully developed by the time a child reached puberty…" it is now understood that "…neural circuitry…isn't completely installed in most people until their early 20s." (Brownlee, Hotinski, Pailthorp, Ragan, & Wong, 1999). Plotnik (2005) draws on the research of Chambers, Taylor and Potenza (2003) to conclude that the "…underlying explanation for adolescents' tendency to take risks is that the executive manager of their behaviors, their prefrontal cortex, is underdeveloped, which means they simply don't have the neural bases to analyze risks and make intelligent decisions." (p.411)

Aim

This study came into being as staff were confronted with the perceived recklessness of the students who plagiarised. Questions arose such as: What would it take of staff to ensure no student engaged in plagiarism? Was such an outcome possible? If the answers to these questions suggest there will always be a level of recklessness, then should we not develop a form of assessment where plagiarism becomes irrelevant or impossible?

Methodology

One hundred and ninety eight students (75 male, 123 female) were asked to submit a 2000 word essay as part of the assessment for the unit *The Criminal Mind*. The unit was offered by the Behavioural Studies Section of the School of Political and Social Inquiry within the Faculty of Arts at Monash University. Although the unit was offered by the Faculty of Arts, several students were based in other faculties and schools.

The intention of the exercise was to test the Damocles plagiarism detection program to see how it might be integrated into the routine assessment of students' work. Teaching staff were interested in trialling the program for ease of use, and to help dissuade students from plagiarism. If the program proved to be useful other Arts programs would be notified and, once the program achieved commercial viability, it could be used across the university.

To that end students were told of the program and asked to submit their assignments on disk so as to be easily entered into Damocles. Students had also been warned about plagiarism several times in class and in their course notes. Teaching staff were of the belief that no-one would be foolhardy enough to submit plagiarised material, because they were convinced that students were convinced that any plagiarism would be detected.

A five part questionnaire was administered at the time of submission of the assignments. One of the questions asked "In general, do you think your tutors take the prevention of cheating and plagiarism seriously?" Ninety-eight percent responded "Yes."

Results

All 198 assignments were submitted to Damocles. The program which was set to detect strings of 10 words, returned:

- 10 cases of active plagiarism where material had been copied from another source without identifying it. This group became the focus of attention. A more detailed description is provided in Table 1. below.

- 17 cases where students did attempt to identify their sources, but had not used the correct method for identifying their citation. This group indicated that some students needed to be more cautious with their referencing, as most of the errors were minor. Nevertheless it may also suggest that some students need more assistance with academic writing skills.

- 10 cases of false positives which related to way the program read parentheses and could therefore be dismissed as meaningful data.

Student	Age	Gender	Number of paragraphs plagiarised	Grade point average	Number of failed units
A	21	F	2	61	2
B	18	M	5	57	3
C	19	M	6	57	5
D	20	M	3	63	1
E	20	M	9	63	2
F	19	M	5	62	1
G	18	F	12	59	3
H	21	M	3	60	2
I	20	F	6	58	3
J	21	F	6	57	4

Table 1. Details of students who plagiarised.

The sample size of 10 students is too small to produce meaningful statistical outcomes, but a cursory view may indicate some trends. Of the ten students, all were between the ages of 18 and 21, representing the younger portion of the unit. Males were over-represented with 6 out of 10 appearing in the sample while the class proportion of males

was close to 38%. The grade point average of between 57 and 63 for each of these 10 students was estimated as being lower than average, although there were no class figures available so as to make a direct comparison. Together with the range of failed units, it was estimated that this group was at the lower end of the academic achievement scale.

Insofar as age, gender and academic achievement this cohort of students corresponded to the studies by McCabe and Trevino (1997) and Newstead et al. (1996).

Discussion

This paper takes the position that it is of little benefit to polarize the prominent parties but rather find the means to promote understanding, and construct a learning environment that obviates the need to be concerned about plagiarism. If it is recognised that some students lack the maturity to regulate their 'consequent resistant' behaviour then it is futile to have expectations that these students will not engage in behaviour that has some elements of risk.

Metaphors may be powerful means to aid discourse in unfamiliar territory. Cheating practices by students may be quite unintelligible to teachers, and using certain frames of reference may well hinder an understanding of student behaviour. Much of the discourse found in journal articles reflecting on plagiarism, and informing university regulations, frames plagiarism as criminal or deviant behaviour arising from a lack of morals (Werner et al., 2000), incompetence (Saltau, 2000) or a belief that the perpetrator can get away with it (Love, 1997). Both Leask (2004) and Johnson and Clerehan (Unpublished Conference Paper) counsel against the use of metaphors which draw on the notion of criminality or that academia is fighting a war on plagiarism. Each proposes a less adversarial position where the situation of the other is identified and acknowledged. This then becomes the stepping off point to achieve greater understanding and more united approach to dealing with academic problems.

The new information provided by neuroscience forces a questioning of the criminal or military metaphors and demands a reconceptualisation of the dominant perspective. The literature on cerebral development does not provide exact parameters about when the course of development is finalised, or what fraction of the adolescent-young adult population is hindered by their tendency towards risk-taking behaviour. Clearly these are questions of degree, yet there is sufficient evidence to suggest that some young adults in their early 20s will, as part of normal development, be prone to risk-taking behaviours. The fact that risk-taking can be seen as the consequence of normal brain development forces the issue of labelling these behaviours as deviant, and requires an alternative discourse to gain a more accurate presentation of such behaviour. Part of that discourse must also address questions of accountability or blame.

This research has implications in many areas of young peoples' lives, and may help further in understanding the attraction of risk-taking behaviours such as extreme sports, dangerous driving, or even alcohol and drug use and misuse. It is with reference to these domains that an alternative metaphor may be constructed.

It is well documented that younger drivers are more susceptible to road accidents and the response to higher accident rates has been for the State government to identify and place limitations on the younger driver. Victorian drivers in their first three years of licensed driving are identified as probationary drivers and must display P- plates. They are not permitted to drive with any amount of alcohol in their bloodstream, and demerit points are more stringently applied than for fully licensed drivers. Other restrictions demonstrate the attempts by government to protect younger drivers from circumstances where they may be at risk (VicRoads, 2005).

Young drivers are viewed as needing protection from themselves. Indeed, compared to other young adults, university students are particularly prone to making the poor judgement to drink and drive (Paschall, 2003). Of course penalties for criminal acts contribute to the process of protection but the emphasis is on minimising harm, should the young driver make an error of judgement. Thus safety barriers, high visibility signage, specialised road surfaces, wide verges, and other safety features reduce the potential for harm. Those responsible for road safety take care not to exacerbate the outcomes of risk-taking driving.

Drug use presents as a second metaphor. The metaphoric "war on drugs" is deemed by many to be a lost cause. An alternative position of "harm minimisation" encourages authorities to frame legislation and treatment such that protections are put in place to lessen the chance that drug users will suffer from their usage (Hamilton, King, & Ritter, 2004). Again authorities recognise the futility of attempting to eradicate drugs and drug taking behaviours, and instead work towards helping protect people from greater harms. Strategies such as needle and syringe programs have significantly helped in keeping HIV and other infections amongst drug users to a minimum, and saved Australia an estimated $2.4 - $7.7 billion in health care costs (ADCA, 2005).

Drawing on the experiences developed in the domains of road safety and drug use, academia needs to recognise its strengths and its limitations. Among its strengths are the goodwill and commitment towards finding solutions to unacceptable behaviours, and the wisdom to make use of strategies already articulated. Its limitations include that it is powerless to stop opportunistic cheating practices using current assessment procedures. There are limitations too, of how far metaphors may be stretched. Cheating or plagiarism is rarely adopted for the thrill or the "high". The difficulty with high risk or consequent resistant behaviour is that it may be committed as a result of poor judgement. The sample of students found cutting and pasting their assignments were:
   a) young
   b) disproportionately male
   c) with low academic achievement.

These demographics mirror a number of other studies on plagiarism, but more significantly the youth of this sample suggests the research of Chambers et al. (2003) may well be of consequence. That is, it is the norm that many young adults are yet to develop sufficient neural hardware to be able to make sound decisions.

Is it reasonable to draw road safety and drug use parallels with education? What are the metaphoric safety barriers that will protect young risk-takers from engaging in plagiarism or other forms of cheating?

The answers lie with much of the work done to "cheat-proof" or remove the type of assessment that allows opportunity to plagiarise. Fortunately many of these approaches have been articulated and demonstrated to be effective. Carroll (2002), amongst others, (Harris, 2004; Zimbardo, Butler, & Wolfe, 2003) provides detailed and comprehensive strategies ranging from teachers being intimately involved with the process of writing of their students, to the use of reflective journals (pp31-38).

Principles, policies and practices continue to be worthy of debate, but safety mechanisms are vital if students are to be protected from making poor decisions that have lifelong consequences.
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