

“Uni Cheats Racket”: A Case Study in Plagiarism Investigation

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Abstract

Some students cheat by buying solutions to assignments and paying other people to sit their exams. We investigated such a case in 2001, in which around thirty students appear to have obtained material from a private tutor. Some details were reported in the press during 2003 when a student and the tutor were sentenced in court. In this paper the case is reviewed. It has lessons for plagiarism management and disciplinary processes, and highlights gaps between academic perceptions of plagiarism, community attitudes, and student behaviour.

Keywords: Plagiarism, discipline, fraud, invigilation.

1 Introduction

There is widespread concern about plagiarism and cheating in universities. In recent years, many Australian institutions have taken steps to address plagiarism. These including adoption of new regulations and procedures, information services and general education programs for students, and purchase of plagiarism-detection software such as Turnitin. It is recognised that management of plagiarism—an extension of the usual invigilation processes that universities already have in place—is an additional burden on academics, but is essential for maintenance of university standards.

In the School of Computer Science & Information Technology at RMIT University, we introduced new plagiarism-management procedures in 2001 to address a culture of plagiarism that we believed had taken hold. These measures were successful in reducing the incidence of plagiarism (Zobel & Hamilton 2002) and anecdotally were successful in changing perceptions that students held about the university.

However, the investigation of specific instances of plagiarism led to the discovery that an external “private tutor”, who identified himself as Kyle¹ at mytutor@hotmail.com, appeared to be selling assignments to many of our students. In one assignment in one offering of one large subject, we found nineteen submissions apparently authored by the private tutor. Further investigation revealed that he appeared to have been active for at least three semesters, and was not only allegedly selling solutions but was sitting exams, that is, posing as particular

students and completing exams on their behalf.

Our attempts to end Kyle’s selling of assignment solutions to our students had far-reaching consequences. These included expulsions, sentencing of a student and external tutor in court, nationwide press coverage, and, possibly, a break-in. Disturbingly, our efforts were only partly successful.

The incident exposed the high stakes for all of the players. Media response showed that plagiarism is regarded by the community as a serious offence. Individual incidents illustrated that a small number of students are determined to plagiarise. For academics, management of plagiarism is labour-intensive and emotionally fraught. For the university, mistakes in handling the press reporting of what was perceived internally as a relatively minor issue led to strong public condemnation.

In this paper, the “mytutor” case is reviewed from initial discovery to final outcomes. The case is interesting in its own right, but additionally highlights many aspects of plagiarism and invigilation: a range of invigilation processes is required if students are to be convinced that they need to do their own work; purchasing of assignments may not be rare; lazy invigilation encourages plagiarism; students who cheat may genuinely believe that they are good programmers, regardless of their actual ability; plagiarism-detection software is not a panacea; and academics who do not take the trouble to establish whether students are doing their own work are undermining the quality of our degrees. These issues are discussed in the context of the details of the “mytutor” incident.

2 Plagiarism and Processes

Student plagiarism is a long-standing problem in academia. The proportion of undergraduates who cheat has probably increased in the last few decades, but only modestly (Clement 2001) or perhaps not at all (Caruana, Ramaseshan & Ewing 2000). Measures to deter plagiarism taken historically in my school included provision of copy-detection software and requests for reports on incidents at biannual program review meetings. Anecdotally, significant numbers of students were being caught in small numbers of subjects, but it was unclear how many staff were, for example, including plagiarism-detection in their invigilation processes.

Some aspects of the situation were of particular concern. When cases were reviewed in meetings—a relatively uncommon event—it was occasionally discovered that the same student had been caught in several subjects over several semesters. (In some of these cases, the student had successfully persuaded the lecturer to waive discipline.) The fact that such repetitions came to light at

¹To preserve the privacy of the individuals involved, the names of the tutor and students as given in this paper are aliases.

all suggested that plagiarism was more common than we might have guessed, perhaps even endemic. Another aspect of concern were allegations made by students about plagiarism, sometimes in the context of one plagiarist getting caught when another got away, but more often in the context of an honest student failing an assignment while dishonest peers passed. In semester 2, 2000, several students reported rumours such as that \$1500 was the going rate for arranging a substitute in an exam.² A further concern was the occasional discovery of senior students who were simply unable to write sensible code.

Were some students systematically plagiarising their way through the whole program? It seemed unlikely—at an individual level, staff felt this to be inconsistent with their experience in teaching—but we could not honestly claim that it was impossible. Were some students repeatedly plagiarising and escaping detection (or, at least, escaping disciplinary action)? If so, by school-level inattention to the issue we might have fostered a culture in which plagiarism was acceptable. How widespread was plagiarism? At the time we had no direct information, but the numbers of detected incidents in some subjects was up to a quarter of all students; recent studies have confirmed that the number of IT students who plagiarise is very high indeed (Sheard, Carbone & Dick 2003).

We therefore decided to systematically introduce new processes for detecting and managing plagiarism throughout the school, with emphasis on ensuring that core (mandatory) subjects were thoroughly invigilated and on detecting repeat offenders. Another priority was to ensure conformance with university policies and student rights. For these reasons we developed and implemented processes as reported by Zobel & Hamilton (2002). Key elements included clear guidelines to students explained in a variety of forums, targeted use of plagiarism-detection software, a requirement that staff report cases centrally and thus not collude with students in cover-ups, formal school-level hearings for repeat offences, careful record-keeping, and central coordination. At the time, these processes were rather more rigorous than those in use elsewhere in the university; our experience is that relatively little attention has been paid to the need for department-level management of plagiarism. Changes to university policy since that time, in part influenced by our experiences, have gone further still. While these procedures are certainly burdensome, they appear to be a strong deterrent to plagiarism, and arguably assessment can be close to meaningless without careful processes of this kind.

The project was successful in reducing plagiarism, and, anecdotally, in eliminating the view that copying is acceptable.³ Sheard et al. (2003) cite studies that argue that fear of consequences is not a deterrent, but from our experience it is perhaps the case that there is deterrence if students are convinced that if they plagiarise then it will be detected and penalised. A study by Braumoeller & Gaines (2001) reached a similar conclusion. Another outcome was creation of a school-level discipline coordinator. Having a single person overseeing plagiarism detection and received reports of plagiarism incidents was one of the reasons that the extent of the activities involving “mytutor” came to light.

²Coincidentally, photo ID was introduced on student cards in 2001, making substitution more difficult.

³For example, in 2001, it was common for students in a plagiarism hearing to justify themselves by claims such as that they did not realise it was an offence, or that they believed that what they were doing was not plagiarism, or that all their friends did it. Such justifications are now rare.

3 The “Mytutor” Case

Students seek help in their studies from a wide variety of sources, including friends, family, university-provided drop-in centres, staff, and external tutors. For high school students, there are substantial businesses based on providing tuition, such as agencies employing university students. A typical external tutor for university students is an individual or small agency specialising in a particular discipline or even in the offerings of a particular department, and providing one-on-one tuition. These tutors advertise in student unions and by word-of-mouth.

Although the numbers of private tutors are difficult to accurately estimate, for a large department (our EFTSU is around 2000) a figure of ten or so is probably a reasonable estimate of the number who are actively seeking clients among the students. In addition, many provide tuition on an occasional basis; some senior students are tutors of students in early years of their programs, for example.

One thing that these tutors have in common is that they operate largely or entirely outside the university, and are therefore difficult to monitor or police. Many of these tutors may be entirely legitimate, providing help while staying within the bounds of acceptable academic conduct. However, some do provide more assistance than is acceptable—and, as discussed later, must often come under pressure to do the wrong thing. In the context of standard approaches to detecting plagiarism, such misconduct is difficult to detect.

“Mytutor” was one such external tutor, providing tuition to students from his home. Only a combination of lucky events led to his exposure; even then, building a case for prosecution was far from straightforward, and ultimately was not entirely successful.

The history of the “mytutor” case is discussed below. While this is not a memoir, I have focussed on the main thread of the case as observed in my capacity as discipline coordinator, and some of the contributions of other staff are not discussed in detail. However, their work was critical. I note in particular Hugh Williams’s uncovering of “mytutor”’s activities in his subject, Peter McDonald’s and Jason Sobell’s detailed investigation of submissions in McDonald’s subject, Sheila Howell’s painstaking management of student hearings held over many months, Malcolm McCormick’s support of the investigation in the Faculty of Applied Science, and Robert Gray and Sue Jellett’s shepherding of the case in the chancellor’s office.

In hindsight, we made mistakes—some unavoidable, some unfortunate. A few of these mistakes are discussed in footnotes.

Detection of “mytutor”

In March 2001, at the start of first semester, a staff member in the School noticed that one particular external tutor had advertised particularly widely on campus. This tutor gave his name as Kyle, and provided the email address `mytutor@hotmail.com` and a contact phone number.

Initially we were unsuspecting. However, around this time, Doug Grant at Swinburne University became concerned about similar advertisements. He emailed “mytutor” to ask him to desist, and to warn other Computer Science heads that “mytutor” was offering to undertake “assignment solving”. We sought a translation of the notices on display at our campus—those we had collected were written in Mandarin—and discovered that the same service was on offer.

Conceivably, the service was legitimate, and the problem was one of translation. Posing as a student, we mailed “mytutor” asking for assistance, and received the response:

From: Kyle TANG <mytutor@hotmail.com>

Yes, tell me which subject and assignment you are getting stuck. Then I will help you out if I can.

The charge of tuitions:

1. For subject tutoring, the charge rate is \$30 per hour/per person. (lower if you come in groups.)
2. For assignment helping, the charge rate is \$40 per hour/per person. (Again lower if you come in groups.)
3. For assignment solving, fees vary, depending on the size of the assignment, work involved in completing the assignment and the desired quality of the solution.

From the distinction drawn between services (2) and (3), it was clear that “mytutor” planned, in Grant’s words, to assist “students in infringing the University’s assessment regulations”.

The email—in which Tang described himself as “Director [and] Senior Lecturer (Programming, Database, Software, Web Design), Leading Computer Learning Centre (LCLC)” —included a landline telephone number and the claim that he was a graduate of my school. Matching the name and number against our student records told us with reasonable certainty that “mytutor” was Kan Yee “Kyle” Tang, a graduate who had completed in 1999.

Our problem then was, had any students bought solutions from Tang? How could we identify who they were, and whether or not work was his? We knew little about him. Our archives of past assignment submissions did not include any significant work submitted under his name. However, the name “Kyle Tang” did mean something to one staff member, Hugh Williams. In 2000, a student, Ken Ding,⁴ had submitted an assignment with Tang listed as the author, then had overwritten the submission with the correct name.

That we found this information was lucky indeed. The mechanism of keeping all submissions—not just the final version—was only used in this one subject. That Ding made the error at all was, from our point of view, fortunate. Less fortunately, the incident only came to light during 2001, and Ding had completed and left.

However, this incident gave us our first clear connection between “mytutor” and the cases about which we were concerned: the assignment was written in a distinctive coding style. Williams searched for other solutions in the same style, eventually discovering several other instances. These students were invited to hearings, as discussed below; but even after these hearings it was unclear whether these were isolated incidents or part of a wider problem, particularly as only two of these students admitted to using “mytutor”, and they both described him as a friend. On the other hand, these instances convinced us that “mytutor” was active in the school and that action needed to be taken.

⁴An alias.

The one remaining lead was the email address. Our mail server kept a complete log of senders and recipients of email, though not the email itself. After obtaining legal advice, we processed the log to find all students who had communicated with “mytutor”. Many of these were likely to be students who were simply following up on his advertisements—indeed, given the number of students who made use of an external email service such as hotmail.com, it seemed improbable that a student who was planning to buy an assignment would be so incautious as to send email from within the university. However, if we were to pursue the investigation at all, there was no obvious alternative.⁵

Using the mail log, we found about eighty students who had received mail from “mytutor”. (Of the students who were eventually disciplined for plagiarism in relation to “mytutor”, only about one in three had communicated with him via university email.) Of these, the log showed that around ten had had repeated contact over an extended period, many of them during our summer semester.

Reviewing the assessment results of these students from the summer, two were immediately suspicious. These had failed core subjects in a previous semester, then in re-sitting the subject had done brilliantly; in one case, a student’s mark improved from a disastrous fail—with a mark of less than 30—to a distinction.

Only in one case was there grounds for serious suspicion, where the student’s coding style had changed dramatically from first semester the year before. The older code was ragged, unformatted, ineptly commented, atrociously designed, and could never have worked; it was almost a parody of poor coding. The more recent code was tidy and consistent to the point of obsessiveness. Indentation, style of variable names, placement of comments, and use of white space was perfect. Comments were correctly spelt, well-chosen, and grammatical. The code was defensively written with systematic use of error conditions. Some C language features that students rarely use had been employed, and several stylistic choices varied from those in the subject’s textbook. This coding style was much that same as that observed by Williams in the instances of plagiarism he uncovered.

Around this time we formed a discipline reference group. The case was referred to the group, which decided that there was insufficient evidence to proceed.⁶ At this stage, some staff still suspected that the concerns about “mytutor” were probably unjustified, and there was consensus that we needed to be certain of wrongdoing.

The summer subjects did not provide obvious material for further investigation. Considering students identified in the email log, the next step was to sift through their past submissions, with the hope of turning up some clearer evidence. In many subjects, and in particular subjects involving programming, students submit assignments via a Unix utility called `turnin`. These assignments were kept indefinitely in a file system. We extracted past assignments for the students, and looked through them for any indication

⁵It would have been straightforward—and, we believe, legal—to trawl through saved student email looking for messages to or from “mytutor”, but it did not occur to us to do so until later on. This simple exercise turned up several instances of programs that had been emailed to students.

⁶Under the policies adopted by RMIT at the start of 2003, “suspicion of plagiarism” merits a hearing. We discovered later that students whose assignments exhibited these kinds of variations often demonstrated complete ignorance of their own work; they were unable, for example, to explain a comment’s meaning, identify the purpose of a key variable, name any of several system calls they had used, explain simple loops, and so on. We now construe such inter-assignment differences together with student bafflement as clear evidence of plagiarism. In all likelihood a hearing at this stage would have resolved a great deal of uncertainty.

of mutual plagiarism. This was not initially successful, but there were several instances of the change-of-coding-style phenomenon, and the examples of high-quality code were in a similar style. Some of us felt that this was a smoking gun, but others differed.

As a compromise, we decided to investigate in two core subjects the submissions by approximately twelve of the students—those whose past work was particularly suspicious. In one of these subjects, the lecturer, Williams, one of had already identified several of the students as likely plagiarists. In the other subject, the lecturer, Peter McDonald, had not yet investigated the current round of assignment submissions in his subject, but provided the complete set of submissions for analysis. Checking through the students' work, it was immediately obvious that at least three of them were direct copies of each other, and were written in the same coding style as that seen earlier. Thus we clearly had a problem; we decided to investigate more thoroughly.

We examined the complete set of assignments in McDonald's subject, with the aim of identifying all instances of copying as well as finding code that shared the suspect coding style. The result was astonishing. Amongst 370 or so submissions, some degree of plagiarism is to be expected, especially in a climate where strong measures have not previously been taken to prevent it. Thirty-five or so cases of copying were found. However, nineteen⁷ submissions were essentially identical, and were written in the coding style we now believed was that of "mytutor".

"Mytutor" advertised his services in around a dozen subjects. Here was evidence of nineteen sales in one assignment in one subject; this was a substantial operation. But it was far from clear what could be done about it.

Disciplinary proceedings

The options for dealing with discipline issues are in principle straightforward. Student misdemeanours can be managed by university discipline processes, where penalties include failure, expulsion, suspension, and fines. Some incidents are also actionable through the legal system; for example, our discipline regulations include clauses relating to harassment and vandalism, which are also offences that can lead to police charges.

Students who purchased solutions were subject to university disciplinary regulations. However, "mytutor" was not, leaving us with the alternatives of referring the case to the police, preferring civil charges, or doing nothing. Through knowledge of some of the individual students who had submitted a "mytutor" solution, we had a growing belief that "mytutor" might not simply be selling solutions, but could be actively seeking out vulnerable students. For this reason alone, we felt that inaction was unacceptable.

However, while we were convinced that that "mytutor" was involved, to a non-expert the evidence so far was arguably slender. We decided to charge the students under university regulations, and use the internal hearings to attempt to uncover further evidence.⁸ There were two groups of hearings, a small number for cases arising from

⁷For reasons that are now unclear, at the time we were doubtful of one, and three were only discovered some time later—hence the figure of fifteen submissions reported in the press.

⁸Although we had not established whether selling solutions was an offence under which "mytutor" might have been charged, we should have involved the police at this stage—to ensure, for example, that evidence offered by the students was not tainted by university procedures.

Williams's subject and a much larger number from McDonald's subject.

The hearings for Williams's subject were held in May (while the investigation of McDonald's subject was still in progress), and established a pattern that was followed closely from then on. There was a chair, presentation of evidence, cross-questioning by the chair and a senior academic, a counsellor available for the student, and students could bring a friend or other support. We were careful not to ask leading questions or suggest "model" answers that students could repeat back to us. Thus, in particular, when students alleged that Kyle Tang had done their assignment work, or that solutions had been sent to them by "mytutor", they had not heard these details from us.

The early hearings set the pattern in another way. Most of the students came prepared with detailed demonstrations that the code was theirs, was original, and was not plagiarised. Many students with multiple stories. For example, the first story would be an initial explanation about how a disk had been lost in a lab. A fallback story would be about a friend—whose name the student had forgotten and could not be contacted—that stole the work to give to another friend (and who then, in several cases, went overseas). The last-ditch explanation would be about writing parts of the code independently but getting a little help with some details.

Some cases were ludicrous; one student alleged that a lab assistant had taken his disk to give to another student, because of his known excellence as a programmer; this student had not passed any programming subject at the first attempt. Another student failed to recognise either his tutor or his lecturer, and was uncertain of his lecturer's name. The students were rarely sufficiently competent as programmers to answer simple questions about their work, and the stories rapidly fell apart when probed for details. Yet even the obviously false elements of their stories were disturbingly similar. In one case, we asked a student at 9am some specific questions. Both of the students we saw later that morning had prepared answers to these questions.

Some of the students' stories were genuinely saddening. These were typically the students (a minority) who immediately admitted to plagiarism and gave reasons such as personal hardship for having done the wrong thing. One student alleged that "mytutor" had actively tried to sell him solutions that he could not afford. Another student, who we believed to be competent, alleged that he had gone to "mytutor" in good faith, to improve his skills; but that Tang had confused him with advanced materials and negative feedback on his programming skills, and that he had in the end been tricked into a buying a solution. This student has since done well.

Another element to these hearings were students whose demeanour was so menacing that we considered involving security personnel. In light of the shootings at Monash University the following year and other incidents of violence involving students under pressure, we perhaps should have done so. However, although one student did make grossly violent threats by email after he was expelled, there have been no physical incidents.

Almost every student seemed genuinely shocked when they realised that the assignment they had paid for had in fact been sold many times. Combined with the allegation by some students that they had been led against their inclination to buy solutions, the impression we gained was of a ruthless operator with no compassion for his struggling clients. By late August, almost all of the nineteen stu-

dents⁹ in McDonald's subject had independently alleged that their assignment work had been completed by "mytutor",¹⁰ as had several of the students in Williams's subject. Most of these students stated that they had paid for the work, with typical figures from \$150 to "several hundred dollars" and, in one case, a total fee of around \$1000 including a series of one-on-one tutorials.

Exams and substitutes

When the hearings began, rumours quickly spread amongst the students. We decided that one element of our revised anti-plagiarism procedures would be a standard statement made in the first lecture in every class that new measures were in place and that significant numbers of students were being identified as having plagiarised. Rewardingly, the consistent response in lectures was of support. Another response was a steady trickle of information from students, often made anonymously, about incidents of plagiarism.

The most significant of these allegations was made in July 2001 by "serious report", who said in an email from hotmail.com that "there is a Student HONG Wai Koo¹¹ ... someone helped him to go to the exams". We had already been suspicious of Hong's work—he had been caught in Williams's subject, and was implicated in another plagiarism incident.

After an email exchange, "serious report" came forward in person, and convinced me that his story was accurate.¹² At RMIT, exams only need be kept for six months, but many staff keep them longer, and we collected eight papers notionally completed by Hong. Even to an amateur it was clear that the authors of three of these exams were not the same person as the author of the other five.

On a hunch, we obtained samples of Tang's handwriting from student records. One exam was a clear match. We now, for the first time, had direct evidence that "mytutor" was active in the school.

Another key action we took at this stage was to search the entire turnin archive for possible instances of past plagiarism involving students who had alleged an involvement with Tang. The most startling case was that of Hong. We found eight assignment submissions, and none appeared to be his work. We discussed these with the lecturers concerned and found that in at least two cases he had previously been identified as involved in likely plagiarism. In each of these cases he had persuaded the lecturer that it was a one-off incident due to personal problems, and had escaped all discipline.

It was now much clearer to us how we should proceed. Exam booklets are signed, thus creating an opportunity for charges of some form of fraud. We now decided to notify the university, with the expectation that we would

⁹One student did not respond to our invitations to attend hearings. He was subsequently expelled.

¹⁰We had expected to discover that some of the instances of plagiarism were due to clients of "mytutor" defraying their costs by onselling of the solution. This was not the case, perhaps because "mytutor" appeared not to provide the solutions until shortly before the deadline: typically a student's copy of the assignment first appeared in their account on the day it was due. This information—of when the file was first placed on a university computer—was a further valuable element in establishing plagiarism.

¹¹An alias.

¹²I should have looked more closely. "Serious report" left the country shortly afterwards, having completed his degree, and graduated. It later developed that he had been involved in plagiarism himself. Under a one-year rule, old cases are not pursued, as it is too difficult for students to defend themselves, but if the evidence had been confirmed at the time in a hearing in all likelihood he would have been expelled.

eventually involve the police,¹³ and attempt to discover further instances of exam substitution.

To find these instances, we collected all past exam scripts for ten or so subjects. These 5000 papers were then filed by student number. In the first instance, we checked through the exams of every student who we believed had had some contact with Tang. Two further cases of substitution were discovered immediately, and in one case, Hartono Purnama,¹⁴ there was a match with Tang's handwriting. We then undertook the gruelling exercise of checking through all the exams, but only one further instance of substitution was discovered; this student had already dropped out.

To make absolutely sure of our evidence, we paid an expert in handwriting comparison to evaluate the various samples of handwriting: the exams and student records of Tang and the students. His report confirmed our belief that Tang was the author of Hong's and Purnama's exams.

Having compiled a substantial dossier of evidence, we then passed the most serious cases—exam substitutions and students with multiple instances of plagiarism—to the university disciplinary panel. The university acted rapidly to both convene hearings for these students and notify the police.¹⁵ In October, Hong and three other students were expelled for plagiarism. In the case of Hong and Purnama, the key evidence was the report by the handwriting expert that their exams had been taken by Tang. For the third student, the reason was that an exam had been sat by an unknown person. For the fourth student, Han Kew,¹⁶ we had identified three clear cases of plagiarism. In one of these, the solution to an assignment set in 1999 had been submitted in response to an entirely different assignment set in 2000; the code was copied from a submission that had been made in 1999. The style of the code was that we had observed in the other cases.

Meanwhile, "mytutor" was continuing to advertise, and it was with the hope of ending this that the police were involved. Full details were provided to them, but several serious obstacles arose. First, for the cases of exam substitution, we had clear evidence that could be used to lay charges, but the students involved were international and had left Australia following their expulsion. The police believed that without their statements the case could not proceed. Second, for the cases of assignment plagiarism, it was not clear whether an offence had been committed,¹⁷ and only one or two of the students were willing to cooperate with a formal investigation. Third, the police indicated that any charge would have to involve the students as well as Tang. There was a delay while the university confirmed that the student names could be provided to the police without infringing privacy legislation. By the time this was resolved, semester was over and many of the students had left the country, while some had dropped out. The police spoke to Tang but took no action, and the case lapsed.

There was a dramatic coda to this sequence of events that remains unexplained. In late January 2002, my office

¹³Several staff were vehemently opposed to police involvement. While I believe that referring the case to the police was the right decision, their arguments—for example, that international students from countries with authoritarian police forces are going to react extremely negatively to a school that offers up its students to police investigations—are certainly reasonable.

¹⁴An alias.

¹⁵The initial newspaper reports implied or stated that the university had been unsupportive of disciplinary processes or of exposure of plagiarism. This was not the case. The university provided all the support we requested and did not hesitate to take difficult decisions.

¹⁶An alias.

¹⁷To my knowledge this issue has not been resolved.

was broken into after 10am on a Saturday and probably late that evening, as was that of Sheila Howell, who had chaired the discipline hearings in the school. Every drawer of my filing cabinets and all my shelves had been looked through, and every file labelled plagiarism was gone. This was a serious loss. Several cases were still unheard—deferred due to student absence and the Christmas break—and a great deal of handwritten material was taken. (Also taken were two files of research papers on the topic of plagiarism.) Curiously, the computer was not touched, but it was crucial to the investigation. Without it, it would have been difficult to reconstruct the evidence in the outstanding cases.

At around 4am on the Sunday, we received an email apparently from Han Kew, addressed from Singapore, telling us that he planned to appeal his expulsion because a key document had been kept from him. The email included a PDF file with a scanned copy of the document in question (a memo from the school to the university discipline panel formally referring his case). This document had a stamp that showed us that it had been the version kept in Howell's office. It could only have been obtained in the break-in.

We pursued all other evidence, including tape from video cameras around the building and logs of security cards used to enter, but identified nothing that could be used as the basis of an investigation.

In a final frustrating episode, we discovered that someone signing himself "Kyle" was communicating with students from the email address `mytutor@start.com.au`. Advertisements including this address and the phone number used by Tang the previous year appeared in the student union. We decided to monitor traffic on this address, but the web site `start.com.au` folded and we were left with no leads.

"Mytutor" in court

Although much of our effort had focussed on dealing with plagiarism problems associated with "mytutor", there were many other instances of plagiarism over this period, and these were being handled by the processes we had put in place (and which the "mytutor" experience had helped to define). One such case was that of Alex Yuen.¹⁸

Concerns were raised about Yuen in June 2002, when his results in an advanced database subject were dramatically inconsistent with those for the prerequisite subject in 2000—an incident that came to light because the same lecturer was involved. Intrigued, we fetched his 2000 exam from the collection that had been built a year earlier. It was immediately obvious that the handwriting was that of Tang. For the first time in over nine months, we had new evidence on which we could proceed.

In the previous cases of exam substitution, we had invoked disciplinary procedures prior to notifying the university, who had in turn held hearings before notifying the police. However, since that time the police had become involved, and had asked that we provide new evidence as soon as it was discovered. We chose to immediately notify the university, and the decision was taken to suspend disciplinary proceedings against Yuen pending the outcome of the police investigation. Yuen and Tang were charged by the police with the offence of making a false document; in Tang's case, the major evidence used was the handwriting report on Hong originally undertaken for the university.

¹⁸An alias.

Yuen pleaded guilty after unsuccessfully seeking a diversion order (a mechanism for sentencing without a criminal record following a minor offence), and was sentenced in January 2003. The case was widely reported, with articles in most of the state-based dailies, and radio and web features. The coverage was strongly negative, informed by a statement made in court that Yuen had been allowed to re-sit the exam—he has not done so—and describing RMIT as "soft on plagiarism". Although based on errors, these stories were, unfortunately, not immediately corrected.

The case was heard in court on January 8, just a few days after press coverage of a Monash report on undergraduate plagiarism, helping to build a cycle of news stories. A media summary provided to RMIT by Media Monitors identified 42 separate runnings of the story in Australian media on January 9 alone, and categorised 41 of these as negative. A forum on cheating on the ABC website `www.abc.net.au/news` was similarly negative.

Tang also pleaded guilty after unsuccessfully seeking a diversion order, and was sentenced in May. After Tang's case was heard, the Herald-Sun again reported our "Uni Cheats Racket" on the front page, and the Bulletin and The Age ran feature articles reviewing the case. These articles, which drew considerable amusement from the fact that Tang had failed one of these exams, substantially corrected the earlier mistakes.

Compared to our expectations, the court-imposed penalties seemed light, and the evidence presented in court was incomplete. (The university was not represented as it was not a plaintiff and witnesses were not called.) For example, it was stated that Tang had sat other people's exams on two occasions, whereas there was clear evidence for three: Hong, Purnama, and Yuen. Evidence about assignment solutions, the period for which he had been providing services, and wording of his advertisements was not presented. It is possible that this information would have altered the court's view on the significance of the case.

4 Lessons

The case of "mytutor" may be an isolated incident—although as discussed below there are reasons to suspect that there are others. However, had Tang been even a little more careful, it could well have remained undetected. The case illustrated flaws in our processes, and exposed issues such as causes of plagiarism. There are many general lessons that can be learnt from the incident.

Invigilation

In computer science, it is widely assumed that most plagiarism consists of students copying one another. Most attempts to discover plagiarism rely on this behaviour to find multiple copies of the same work submitted for the same assignment, either through discovery in assessment or through explicit use of plagiarism-detection software. Such software is a useful tool, but can easily become a crutch. As the "mytutor" case illustrates, there are serious forms of cheating that such tools are not going to detect.

For example, if a "tutor" writes a fresh solution for each client, no copies are introduced. The incident can only be detected through other avenues: inconsistency between assignments submitted by the same person, invigilated in-lab programming exercises, and inconsistency between assignments and exams. Thus exams must explicitly seek a demonstration of programming skills, even

though it is difficult in the scope of an exam to determine whether a student can carry through a non-trivial coding exercise. The Yuen case only came to light because a lecturer happened to observe an inconsistency of this kind.

Another form of cheating is when students exploit weaknesses in the examination system. Most universities have a system of deferred or supplementary exams for students who miss an exam, due for example to illness. In our school, only a small fraction of students apply for such exams during their candidature; but the majority of the students who alleged that they had used Tang to complete their assessment had at one time or another sat deferred exams. These students may have been exploiting the fact that staff who carefully develop a new exam may not be so careful when writing a supplementary examination that only two or three students will sit. Such exams are often constructed from existing materials.

With better processes in the school for plagiarism management, the number of instances of plagiarism—and in particular, repeated offences—has been reduced (Zobel & Hamilton 2002). A corollary is the inference that lack of such processes encourages plagiarism. However, with the decline in detected instances of plagiarism there has been a rise in the number of instances of students detected cheating in examinations: notes found unsuccessfully flushed in toilets, students observed caching notes in their clothes, and so on.

The “mytutor” case was costly for the school. In addition to cash expenses for consultants, the administration of the case was a full-time task for an academic for three months or so, including the time spent in hearings. The impact on individuals of plagiarism management should not be underestimated. Whether it is possible to have a reputable degree without such management is, however, debatable.

Student issues

From the perspective of an academic investigating plagiarism in the context of a particular subject, there is a natural tendency to view the incidents as arising from more or less homogeneous causes. This case clearly illustrates that such a view is false. The students included Hong, and others, who appeared to have no programming skills whatsoever and had repeatedly plagiarised; students who were struggling in their first subject that had reasonably challenging material; and at least one student who had in all likelihood simply been seeking additional training. These students all stood as a contrast to another class of students who plagiarise: those who work together too closely, and perhaps never make a definite decision to copy, but do so in small increments.

Information on the extent to which students purchase solutions is anecdotal. In the “mytutor” case, it appears that nineteen students independently chose to pay for a solution. Clement (2001) and Quinn (1999) report that paper mills claim to have large numbers of clients, though, in a careful investigation of one assignment, Braumoeller & Gaines (2001) found no significant use of paper mills.

The bulk of the academic studies of cheating in universities appear to have focussed on copying of assignments. This may be because such cheating can be detected and quantified using reasonably rigorous tools, and because it is widespread (Caruana et al. 2000, Clement 2001, Dick, Sheard & Markham 2001, Ketchell 2003, Maslen 2003, Schneider 1999, Zobel & Hamilton 2002). However, some studies have looked at other forms of cheating. Dick

et al. (2001) found that 3.9% of students knew someone who had used an exam substitute, and 11.7% knew someone who had purchased an assignment solution. Clement (2001) reports a study by Whitley showing that at least a few percent of students cheat on exams. Intriguingly, two of my acquaintances—one now a mature-age PhD student, the other outside academia—have, since the “mytutor” case was reported, told me that as undergraduates they sat exams for their friends.

There is no doubt that some students actively seek opportunities for plagiarism. Sessional tutors working within the school have reported incidents of students asking them to complete assignments; in 2000, a sessional tutor was sacked for providing a solution to a student. Following the press coverage of the “mytutor” case, a private tutor contacted us to allege that the majority of approaches to him are from students seeking to get their assignment work done. This allegation was substantiated when a student he named was checked, and had that week submitted work that had been written by another private tutor. Some of the advertisements for private tuition placed on school noticeboards have been followed up by simple enquiries by staff, such as “Are you a current student or sessional tutor?” (Often, the only contact details in these advertisements is a hotmail.com address.) Such private tutors rarely respond to these enquiries. It is difficult to avoid the suspicion that incidents of purchase of assignment solutions are not isolated.

Indeed, evidence in other instances strongly suggests that some students cannot be deterred from plagiarism. In what is perhaps our most extreme such example, in a professional development subject the students received a two-hour lecture on ethics, a significant part of which was on plagiarism and its ramifications. For the key assignment, they were cautioned verbally and in writing not to plagiarise, and were warned that electronic plagiarism-detection tools would be used. Nonetheless, three of the forty students were caught in outright plagiarism.

The break-in is further evidence that plagiarism is not easily deterred. Given the guards on patrol and the video cameras, and the fact that staff come and go at all hours, this was a risky act.

Several studies have observed that a large fraction of students believe that it is acceptable to cheat (Clement 2001, Dick et al. 2001, Maslen 2003, Quinn 1999). Attitudes expressed by several of the students involved in the “mytutor” incident provide an alternative perspective: these students appeared to be convinced that they could do the work to the same standard as the plagiarised assignment that they had handed in. Individual students offered views such as that, as they understood the code, they could have written it themselves (a curious view—one would not hold it about, say, a textbook), or that they had planned to do the work again by themselves when they had some spare time. In contrast, our judgement of these students was that they had at best only a weak grasp of the subject material and would be unable to write even an elementary program.

This experience suggests strong pedagogical reasons for careful invigilation and investigation of suspected plagiarism, especially in the first year of a computer science degree (when plagiarism detection is often deemed to be too hard because the programs that students write are so small). A student who cheats in the hope of catching up later is almost certainly deluded, and in all likelihood will become caught in a cycle of plagiarism as subject material becomes increasingly advanced. It is not, then, that stu-

dents are necessarily seeking credit for work they know they cannot do; but, rather, that they believe they have the knowledge and skills but have simply run out of time. Demonstrating to these students that they do not know the work—before they have passed a point of no return—is a responsible educational measure.

Money is a key driver of plagiarism, as to a lesser extent is face. The cost of *not* plagiarising is high; for an international student, failure involves paying a large fee to repeat the subject, and, often, the complexities of visa extension and an additional semester of residence in Australia. Unless the chance of being caught is high, and the penalties are severe, plagiarism is the logical alternative. In our hearings, student after student told us that financial problems or family pressures meant that they had to pass.

Thus many students simply cannot afford to fail. Sheard et al. (2003) reported other factors as more significant, but, in our sample of students who admitted to the drastic step of buying an assignment, it was clearly dominant.

Another perspective is that with a small increase in resources there would be much less plagiarism. Our experience, and experience elsewhere (Foster 2002), is that the incidence of plagiarism can be significantly reduced by procedures that are not too onerous. Many of the cases we detected in 2001 were repeat offences; if students had believed that they would probably be caught, and that expulsion was a real threat, many of these incidents would in all likelihood not have occurred. Braumoeller & Gaines (2001) reports that warning students, “even in the strongest terms, appears not to have had any effect whatsoever. Revealing the use of plagiarism-detection software” was however highly successful. Looking back through the work of the “mytutor” students, some were struggling from their first semester. Taking steps to identify and support weak students from the beginning would have a significant positive effect.

Furthermore, many of the incidents were marked by stupidity, such as submitting work with someone else’s name in it, or not checking whether assignments had changed from year to year. Explicitly looking for such incidents would not be costly.

Legal issues

Students can be dealt with via disciplinary procedures, external tutors cannot. It is clear from our experience that a single external tutor could be involved in a great many instances of plagiarism. On the other hand, taking action against such a tutor is far from straightforward.

If the tutor has sat an exam on behalf of a student—a difficult thing to detect in the absence of an informant—in Victoria at least charges can be brought. However, the student’s evidence is likely to be necessary to secure a conviction. It is not in the student’s interests to provide such evidence, and an international student who is charged may well choose to leave the country. For a university, arranging to have students charged is a dramatic step.

If the tutor has provided a solution to an assignment, it is unclear whether a criminal offence is involved.¹⁹ For a successful prosecution, the advice we received was that gains obtained by deception should be material, typically cash or assets that can be readily liquidated. Whether an intangible such as a university degree is a material asset

is itself arguable; and an assignment is just one small step towards a degree, not the degree itself.

There is the possibility of civil charges. For example, the tutor may be bringing the university into disrepute, assisting students in breach of contract, or incurring inconvenience. Whether such a suit would be successful remains untested.

Overall, while exam substitution is risky, with likely expulsion or court hearings if detected, there are few deterrents to a student who purchases a solution, and, arguably, no deterrents for the “tutor”.

Public relations

The “mytutor” case resulted in front-page headlines, and some strongly adverse comments. Both of the Melbourne daily newspapers ran negative editorials. One reason was that the university had not anticipated press interest. When journalists contacted the university in early January, 2003, every staff member with knowledge of the case was on leave for the Christmas break, and the coverage was not well informed.

The initial decision by RMIT to make only limited statements to the press turned out to be a mistake, as journalists concluded that the university had done the wrong thing and was covering up. One journalist asked me at the time how it felt to be “the Lone Ranger”, apparently under the impression that I had referred the case to the police because the university refused to pursue it, and several journalists were convinced that a soft-on-plagiarism line had been taken because the university did not want to jeopardise student fees. (In fact, the case had been referred to the police by the chancellery, and to my knowledge the question of lost fees was simply never raised.) The subsequent decision to tell the full story, leaving out only details where student privacy issues were concerned, led to much more informed and balanced coverage, as for example in the feature articles by Ketchell (2003) and Maslen (2003).

Media interest was not limited to Australia. The case was also reported in countries such as Hong Kong and Malaysia, home to many of Australia’s international students.

There was strong public comment, for example on the ABC website, whose forum attracted 370 contributions. The tenor of these entries was strongly condemnatory of universities in general and, for example, “weak disciplinary processes which lack teeth and independence”. Many contributors could be categorised as believing that cheating was rampant and that the attitude of universities to cheating was to turn a blind eye, whereas “cheaters should be treated with the disgust that they deserve”. A forum is far from being a representative survey, so strong conclusions cannot be drawn from this data.

To academics dealing with plagiarism, and observing it as a routine event, the strength of media comment on the topic may be a surprise. The media’s position is in marked contrast to the views held by a significant minority of academics in my school, some of whom have repeatedly expressed the view that a friendly warning in the first (or first few) instances was discipline enough. In my school, perhaps only half of the staff have ever made a systematic attempt to identify plagiarism. Some staff go further, and argue that pursuit of plagiarism has not part of their role. Some even hold the view that they would rather abolish assessment—including its benefits such as the opportunity to encourage students to develop key skills—than investigate plagiarism.

¹⁹“Massachusetts law makes it illegal for companies to sell term papers for students to submit as their own work.” (Quinn 1999)

Set against a common media view that strong penalties are entirely reasonable, with the implication that failure to investigate plagiarism is negligent, there is a wide divide between public perception and academia in practice. Quinn (1999) quotes the Boston University president as stating that “the public has . . . a right to expect that degrees awarded by colleges and universities are accurate assessments of the work of the person”. While most academics would, in my experience, share this view, many are unwilling to take the actions necessary to implement it. Schneider (1999) quotes Daniel H. Garrison as stating that “there’s no future in pursuing cheating from the standpoint of a professor’s self-interest”. I suspect that many of my colleagues agree.

On the other hand, student response to the case—once the correct details were aired—appeared to be positive. There was general approval that we were taking a strong position on plagiarism, and students made comments such as that our pursuit of plagiarism meant that they would get a degree that employers would respect.

5 Conclusions

It is easy to conceptualise plagiarism management as a straightforward process of publicising university policy, checking for instances of plagiarism, and using hearings to deal one by one with suspected offenders. Our experience in the “mytutor” case shows that a case of plagiarism can become much more complex. This instance ultimately involved around thirty students who submitted work we believed to be authored by “mytutor”, four expulsions, several drop-outs, around ten staff actively participating in the investigation, a prolonged police enquiry, court proceedings, and extensive media interest; and a break-in may have been connected. Resolution of the case took over two years. Detection and resolution would have been difficult without central plagiarism management.

During the investigation, we were faced with many unpalatable decisions, and exposed to issues we had not anticipated. One issue was the extent of wrong-doing exhibited by a small number of students, and the level of their determination to pass. Another was the intensity of public interest, in an aspect of university education to which many academics pay little attention. Yet another was the question of whether we should even attempt to restrain external tutors, or only focus on their clients.

Much of the debate on student cheating has focussed on copying, with a corresponding focus on technology for copy-detection. Such technology provides no ability to detect whether students are obtaining work from other sources, while, as illustrated by our recent chance discovery of such a case, it may not be rare for students to do so. Systematic invigilation and cross-checking is required if the opportunity to pass a degree by cheating is to be eliminated, and if students are to learn that they need to do the work themselves if they are to become competent programmers.

Students appear to support tough policies on plagiarism, and policing of plagiarism enhances the perceived quality of programs. It is for reasons such as these, as well as a firmly-held principle that it is necessary to take a stand against cheating, that we will continue to pursue such cases.

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