Plagiarism: Bringing Economics and Education Together (With a Little Help from IT)

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Abstract

Plagiarism has been acknowledged to be a growing problem for Higher Education Institutions, and indeed in other areas of society. Various reasons have been advanced to explain the growth of this problem, including improvements in IT in general and the Internet in particular, along with changed attitudes towards study amongst some of today's students. Improved access to the Internet, combined with the development of simple-to-use search tools such as Google, have enabled students quickly and easily to locate relevant material, while improvements in IT training have meant that a greater number of students possess the skills for copying, pasting and reformatting text. In addition a number websites have sprung up offering for sale essays and dissertations to order.

Universities have sought to combat plagiarism by making use of text matching tools linked to databases of essays and other content to track down plagiarists. They have also sought to educate both students and staff about what is meant by plagiarism and how to avoid it. This paper describes the experience of one department in a university that has been running a pilot project using the Turnitin software available via JISCiPAS (the JISC Internet Plagiarism Advisory Service) as part of an anti-plagiarism initiative. The discussion also reports on a research project that is underway in the department which seeks to set the problem of plagiarism in an economic context.

Introduction

The problem of plagiarism is not new but in the past decade it has been perceived to be one giving rise to increasing concern (BBC, 2008; Carroll, 2002, 2004; Tennant and Duggan, 2008). Tennant and Duggan state that in a survey they conducted in 2007 of UK Higher Education Institutions (HEIs), there were 9229 reported cases of student plagiarism. Although this only equates to 7.2 cases per 1000 students, there were pronounced variations in rates between institutions, and in the penalties applied.[1]

Over the past three years I have been involved in two plagiarism related projects at the University of Portsmouth. One evolved out of a teaching idea that I had, which then grew into an economics research project involving colleagues here and at the University of Surrey. The other is a university wide initiative to tackle plagiarism problems, where I have been involved as the faculty representative on the university steering group that was set up to manage the project. This project has been centred on the use of the plagiarism analysis software Turnitin, implemented through the JISC Internet Plagiarism Advisory Service (JISCiPAS) based at Northumbria University. The project involved a pilot stage, where the use of the software was first confined to a limited number of selected departments, degree programmes and units (modules) in order to assess its effectiveness, iron out any problems that might be encountered, gauge staff training needs and establish the best way of utilising it as part of a wider learning and teaching strategy. A key principle in this strategy is that the software should be used primarily by the students in a formative way as an educational tool, to help them to learn what is judged to be good practice in the preparation of academic papers, rather than as a post-submission detection device which might mean that it would be viewed by students only as a punitive instrument.

This paper reports on what has been achieved so far on each of these projects and the lessons learned. It brings together economics and educational perspectives on plagiarism with the technology, of course, playing a crucial enabling role. It then goes on to describe the evolution, current state and future plans of the detection of plagiarism in economics project, and then reports on the pilot stage of the university plagiarism project. In the conclusion we summarise the outcomes so far from each project and the extent to which lessons derived from each of them can contribute to the future stages of both projects.

The economics of plagiarism

Jude Carroll of Oxford Brookes University, author of *A Handbook for Deterring Plagiarism in Higher Education* is reported to have said that 'plagiarism started in 1998' (see Jack, 2008). Before the 1980s it was unusual for coursework assignment marks to contribute to degree awards (apart from dissertations) and it was not until the mid to late 1990s that most students obtained easy access to digital material on the Internet via web browsers. By this time students were also being encouraged to make use of IT in their work, developing in particular word processing and file handling skills. These developments enabled students to locate relevant material and to cut and paste it into their word processed documents for coursework submissions. The combination of the low transaction costs for acquiring and processing relevant text, along with the potential payoffs associated with inflated coursework marks that contributed to assessment grades and degree awards, meant that we began to experience greater numbers of plagiarism cases than had been encountered before.

This is not to say that students had not engaged in plagiarism before. There is little doubt that unprocessed sections of books or journal articles have in the past found their way into submitted essays. But when these essays were seen as purely formative devices, and their marks did not contribute towards the final degree classification, the benefits from engaging in plagiarism were limited. Furthermore the costs of engaging in this kind of plagiarism were relatively high in that the text would have to be copied by hand and woven together from different sources that also had to be sought out from the library.[2]

When preparing my book *Computing Skills for Economists* I gave clear warnings to students that they should not engage in plagiarism. I emphasised the importance of expressing ideas in one's own words (unless one was quoting directly from another author, in which case the quoted text should be in quotation marks and properly referenced) (Judge, 2000: 62 and 75).

At that time if a piece of coursework was suspected of being wholly or partially plagiarised I used the Advanced Search feature of Google to track down original source material, entering whole sentences or paragraphs of suspicious looking text into the 'exact wording or phrase' box. If that didn't work I would search the home pages of authors cited amongst the references, or put an author's name into a specialist bibliographic or journal database. Although Google had indexed around a billion web pages in 2000[3] it didn't track everything on the Web.

In 2004, whilst revising course materials for my level 2 unit, 'Further Mathematical Analysis for Economists' (now part of a combined double unit called 'Statistics and Mathematics for Economics'), I decided to create an example to illustrate the application of Lagrange multipliers to the issue of student plagiarism, placing it in a Becker style 'Crime and Punishment' framework (Becker, 1968). In the example a plagiarising student incurred some costs in assembling material taken from the public domain for his coursework but, provided he was not caught, these costs would be outweighed by the benefits of freeing up

time by engaging in this form of cheating. If the probability of being caught is not too great and the penalty imposed on those found to have been cheating is not too high, a rational student may well feel that is worth taking the risk. In presenting this example I mentioned in passing that the department took the matter of plagiarism very seriously and did possess the skills and the will to track down plagiarists: in other words, the risk of being caught at Portsmouth should be perceived as being quite high. This was all done, as Kenny Everett used to say, 'in the best possible taste', and I made it clear that I didn't for one moment believe that most students would cheat. Nevertheless I was sending a coded message to those who might be thinking about it that they shouldn't downplay the risk too much.

Later, after I had I mentioned what I had done to colleagues here and at Surrey, we started to consider further cases consistent with the stylised facts gleaned from surveys that had been reported in the press – see for example the BBC news report (BBC,2004).[4] We extended the analysis to include the case where a student could purchase commissioned work from an essay writing site (where the cost will be greater than in the cut-and-paste example but perhaps the risk of apprehension is lower). We also brought into the model a mark enhancing motivation rather than a time saving one, where a student paid for someone else to do the work for him because he felt unable to produce work of a sufficiently high quality himself. This led first to a discussion paper (Collins, Judge and Rickman, 2005) and then to a publication (Collins, Judge and Rickman, 2007).

Academics from other departments who have seen our work have sometimes objected that we are adopting too narrow a focus for student motivation, arguing that attitudes to plagiarism are affected by cultural norms and psychological factors, or that some students (particularly overseas students) are 'unintentional' plagiarists (that is they don't mean to cheat, they just don't know what is acceptable and what is not). Further, we are told, that if we could adopt a different attitude to the design of coursework, requiring students to undertake individually focused tasks, the problem would be solved. However, we have never pretended that our models capture all the reasons that students plagiarise, or doubted that there should be greater clarity in what is meant by plagiarism. Additionally many assignments that have been set for economics students are already individually structured and require the analysis of unique data sets and are therefore not subject to an easy off-the-shelf solution.[5] What we have tried to argue is that an economic perspective on plagiarism is valuable because it directs policy attention towards explicitly raising the probability of detection, raising the costs of plagiarism and eroding the utility of plagiarised academic work.

Having focused thus far on the demand side of the market we have now turned to the supply side, the companies selling essays and 'student support'. The market for purchased essays is relatively under-researched. There is significant and timely policy relevance here in addition to natural academic interest. There now exist numerous enterprises across the world that offer plagiarism assistance

to students.[6] The prices charged typically reflect the degree of difficulty of the work, the degree level (year 1 undergraduate essays through to Masters Dissertations and even PhD chapters) and the level of specialised human capital required to complete a particular assignment. There may also be a premium for a rapid turnaround and delivery. Depending on the nature of the assignment, fees may range from around £50 to over £1500. Such enterprises raise many interesting questions relating to their evolution, industrial organisation and the sources of their specialised labour inputs. One wonders about the extent to which they rely on academic staff, postgraduate research students, ex-academic staff and former postgraduate research students.[7] There are various regulatory measures that may be applied to restrict the functioning and market profile of these firms. But, given their largely web-based presence, attempts to curtail trading seem likely to be doomed to failure. Even worse they might encourage a move to even more difficult to monitor hit-and-run entry by such firms around the world.

One aspect in particular that we hope to address is the quality of the work that is obtainable from these firms. Using Delphi-type panels of experienced academic peers with the appropriate subject expertise we will attempt to assess the quality of some purchased products and also compare these results with those emerging from panels assembled from potential target consumers (students).[8] It seems likely that, as in other quasi-legal markets where disappointed consumers are hardly likely to complain to the Office of Fair Trading (illicit drugs, pornography, etc.), there may be a gap between the advertised and actual quality of the product. Being able to demonstrate this would hopefully have a dampening effect on demand.

The University of Portsmouth Pilot project

As at other universities in the UK and elsewhere the issue of what to do to address problems of plagiarism has been under discussion for a number of years at the University of Portsmouth. A clear statement about what is meant by plagiarism and the university's attitude towards it had been included in the Student Handbook (University of Portsmouth, 2007) which is issued to all students each year.[9] Staff development workshops have been organised to help staff to understand the issue, to improve the design of coursework in order to reduce the scope for plagiarised work and to detect plagiarised material by entering into Google blocks of text that have raised suspicions. In some departments staff experimented with the use of dedicated software tools such as MyDropBox. A University Working Task Group on Plagiarism was set up to provide advice on what might be done in a more coordinated manner and, as a result, in June 2006 the University of Portsmouth decided to begin a pilot study of the use of the Turnitin plagiarism analysis and detection software (made available through the JISC service based at Northumbria University).[10]

The purpose of the pilot was to assess the effectiveness of Turnitin in matching text in student essays and other work such as dissertations with material from other electronic sources, both online and with other files in the Turnitin database, and to consider how the software could best be used as part of the university's learning, teaching and assessment strategy. Each faculty nominated a small number of pathways (degree courses) and units (modules) for inclusion in the pilot, together with a Faculty Advocate to co-ordinate the work and to sit on the university Turnitin and Plagiarism Steering Group. I was the nominated representative from the Portsmouth Business School (PBS) and the units chosen for the initial pilot were limited to the accounting undergraduate degree and the MBA programme. The units chosen were all in the areas of study skills, research methods or the dissertation, where it was felt the use of the software would have the greatest relevance and impact. In all only six units and associated members of staff in PBS were involved in the first stage of the pilot which limited the amount of training necessary and allowed us to track closely how things were going. A greater number of units were included in the pilot in some of the other faculties, particularly in the Technology Faculty, where there was already experience in the use of MyDropBox. Overall the pathways and units were chosen across the university to ensure that we had a representative mix at different levels and included teaching staff with varying amounts of previous experience in using plagiarism analysis software. Training in the use of the software was provided by the central university Department for Curriculum and Quality Enhancement (DCQE) who were also represented on the Steering Group, as were the Registry.

Early on the Steering Group decided that units would be operated as self-registration classes for students. This meant that the person setting up the class did not need to have a full list of names or hemis numbers for the students on a unit. All that was required was the agreed name for the unit (we adopted the university's U code for this purpose) and the e-mail address of the member of staff responsible for the unit (tutor). The JISCPAS software would then generate a password for the unit which would be sent by e-mail to the tutor. They would then forward this information to the students on their unit, leaving the students to register themselves online using whatever e-mail address they wanted to use.[10]

Logging in to Turnitin is then straightforward for a student. All he needs to do is to go to www.submit.ac.uk and enter his e-mail and the password that has been given to him (see Figure 1): it is the same login procedure for staff.

This distributed approach to the use of the software not only reduces the administrative cost of operating the

Figure 1. Logging in to Turnitin

system by putting the burden of registration and submission on the students,[12] but is also intended to signal the fact that the software is being viewed primarily as a formative and constructive tool for students to use to help them develop good practice in producing academic work, rather than as a post-submission tool to check up on them in an accusatory manner. For this reason in all the documentation produced for students and staff involved in the pilot Turnitin was referred to as 'plagiarism analysis software' rather than as 'plagiarism detection software'.[13]

Readers who have used the Turnitin software will know that when a piece of work is submitted you have the choice of making text comparisons with student papers already in the database only, or including journals, periodicals and other relevant Internet sources that have been included in the Turnitin database (see Figure 2).

After uploading a file (which can be in MS Word, WordPerfect, PostScript, PDF, HTML, RTF or just plain text) you will subsequently be provided with an 'originality report'. This report will highlight portions of text that match material in the database, giving an overall score of matching text (see the example shown in Figure 3).

Depending on the extent of the matching text the similarity score can appear in blue, green, yellow, orange or red (with red indicating a very close text match of 75% or over). The Steering Committee stressed to staff involved in

Figure 2. Customising the search in Turnitin

Figure 3. Part of an originality report from Turnitin

the pilot that the similarity scores should be interpreted carefully and not mechanically. Looking at Figure 3 you can see that the report can be produced including or excluding both quoted text and bibliographic references. Here these types of matching text have been excluded. An even higher match might be found if the options to include either or both of these categories had been chosen. In the case shown here it does look as if there is a problem with large sections of text being copied from the journal *Management Decision*, but it is unlikely that even completely original work would produce a score of zero. Some positive scores are inevitable due to the standard phrases that are used in any subject (e.g. supply and demand, elasticity of demand, regression results etc.). Discretion must be used by staff in judging whether submitted work falls foul of anti-plagiarism requirements or not.

As part of the pilot the Steering Group produced a template introductory guide to be used with students (into which specific course information could then be placed) and a guide for staff on how to advise students about the use of the software and the interpretation of originality reports.

The first year of the pilot generally went well, although there were some teething problems as administrators, instructors and students became familiar with the software. However there were noticeable differences in the success in using the system between units taught by lecturers with high level IT skills and those with a weaker grasp of IT, suggesting perhaps that less confident staff were less able quickly to correct any misunderstandings or misapprehensions on the part of students. Some staff remained unclear about how to embed the use of the software into their teaching and seemed to continue to regard it mainly as a detection tool rather than an analysis tool. In some cases staff had not fully recognised the need to provide sufficiently long lead times when setting work so that it could be submitted and checked through Turnitin. Submission of draft work to Turnitin needs to be much earlier so that discussions with tutors and remedial action can occur in time for revision before final submission.

The reaction from students was generally favourable (although unfortunately there was no systematic approach to the collection of student responses). However student participation was seen to vary across units and it was felt that some students would not use this service voluntarily (especially those who really should!). Thus, its importance needs to be regularly emphasised by course managers and unit coordinators. Turnitin needs to be introduced in induction classes *and* reinforced thereafter by tutors in their own units.

The Steering Group recommended that the pilot should be extended for another year (the Academic Year 2007–2008) with further pathways and units being added (including all research methods, dissertations and independent study units[14]) with renewed emphasis being given to the training of staff.

In the second year of the pilot we have typically provided information to students about the use of the software via a web page rather than a printed handout.[15] Fewer problems have occurred with the use of the software despite the
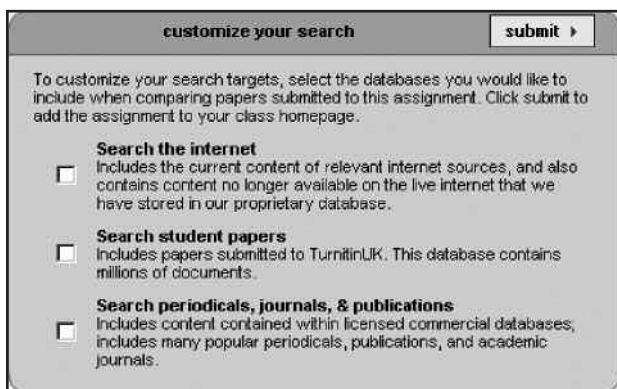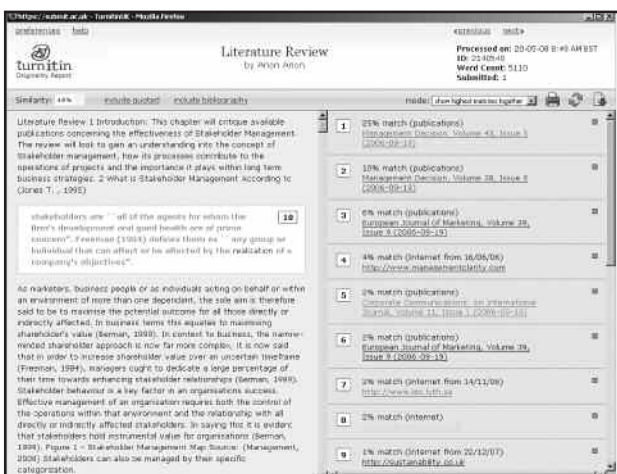
greater numbers of staff and students being involved, and the rate of uptake has been better. There is evidence that there is a 'demonstration effect' (that the university takes the issue seriously) and a 'deterrent effect' (the number of plagiarism cases being reported is down).[16] However it appears that we need a further faculty and university wide debate on what constitutes plagiarism and poor scholarship as there is some anecdotal evidence of differences in interpretation between and within departments.

Staff have also noted that the Turnitin database does not always turn up matches that can be found even with Google. Hopefully as more and more universities participate the database will become more exhaustive. Another problem that may have to be addressed in the future is purchased plagiarised work. There has been one such case proven this year at Portsmouth (although it was not in the Economics department).

Where are we now?

When I began writing this article the consensus on the Turnitin Steering Committee was that there should be a full roll out of Turnitin next year to all units. However, the university has now decided to extend the pilot for one further year. The reason for this relates to where we find ourselves with the university's Virtual Learning Environment, Victory. Victory is a customised version of the Blackboard system. The producers of Turnitin claim that it can be integrated seamlessly within both WebCT and Blackboard. But trials so far with Victory have revealed some problems. Furthermore the producers of Blackboard have recently acquired the rights to MyDropBox, which they have now reconfigured to work within Blackboard (under the name SafeAssign). Thus it may be that the university eventually decides to use this tool as its main anti-plagiarism device, within Victory. Until we can see clearly where we are going it is prudent to delay the full roll out.

Nevertheless in PBS we have decided that next year we will *require* all the units that used Turnitin last year in the pilot do so again, and we are taking steps to *enable* all staff on other units who feel confident about the use of the software to use it with their students. To this end a member of the support staff has been trained so that she will be able to create Turnitin classes at the JISCPAS website for all PBS units (plus a special section for PhD students).

Conclusion

This short paper has outlined the progress made so far on two plagiarism related projects at the University of Portsmouth, one academic and one rooted in Learning, Teaching and Assessment processes. Economics, education and IT are important to both. In the academic work we sought to provide a model that was compatible with the survey evidence that plagiarism has been increasing and that it occurs for a variety of reasons: a misunderstanding of good practice in the use and citation of other people's work, copying and pasting when time is short or the perception of the risk of being found out is low, or downright cheating by paying someone else to do the work for you. Our analysis pointed to measures that

would: a) correct any misunderstandings about what is meant by plagiarism; b) increase the risk of being caught when plagiarising; and c) increase the penalty for cheating. In the pilot Turnitin project we found that plagiarism does decline when such software is used, particularly if it is used primarily as an educational tool, but that unless its use is made compulsory some students won't use it. The right incentives need to be provided. Attempts to design an anti-plagiarism strategy that reduces the costs of administration falling on staff in detecting plagiarism have educational as well as economic benefits.[17] McKeever (2006) has warned that online plagiarism detection services might be misused by students attempting to 'fine-tune' essays with repeated submissions of their work until a sufficiently low similarity score has been obtained. This is not something that we have observed at Portsmouth.

The major issue that remains to be faced, both in our academic work and in learning, teaching and assessment, relates to the mushrooming trade in purchased customised assessed work that will never appear in coursework and webpage databases.

Notes

[1] Perhaps surprisingly, the incidence of plagiarism was also found to be higher amongst taught postgraduate students compared with undergraduates. However there may be a number of reasons for this, such as the fact that at postgraduate level a greater proportion of coursework tends to take the form of an essay or dissertation, a greater proportion of students in the cohort come from overseas and do not have English as their first language, and teaching groups tend to be smaller giving a higher probability that plagiarism would be detected.

[2] Although not relating to plagiarism as such, there is published evidence that students have cheated in tests and examinations going back as far as Drake (1941).

[3] Source: 'We knew the web was big', googleblog, 25 July 2008, http://googleblog.blogspot.com/2008/07/we-knew-web_was_big.html Google engineers estimate that the current number of unique URLs on the web is 1 trillion, 10^{11}.

[4] More recent reports include The Times (2006) and BBC(2008). We were also influenced by Stevens and Weale (2004).

[5] Even if we try to avoid simply setting undergraduate students standard essay topics, which may invite plagiarism, we will continue to expect students to undertake literature reviews and descriptions of their methodology as part of their final year or postgraduate dissertations, or doctoral thesis work.

[6] Examples in the UK are Degrees Essays UK http://www.ukessays.com, coursework.info http://www.coursework.info/ and Elizabeth Hall Associates http://www.elizabethhall.com/

[7] It would be naïve to think that academic staff would not be tempted to engage in such activities. There is already evidence of plagiarism in the writing of journal articles (Enders and Hoover, 2004).

[8] This has the added educational benefit of getting students to look carefully at how work is graded and recognise what makes a good essay. In my experience a substantial number of students seem overconfident about the quality of the work they have submitted.

9   See for example the statement on Academic Honesty and Integrity on page 11 of the 2007 Student Handbook.

10   According to Badge and Scott (2008), Dawson had noted on the JISCPAS website in 2007 that over 80% of UK HEIs subscribed to the TurnitinUK system.

11   Registration and submission of work is via the website at http://www.submit.ac.uk/

12   By establishing a Master Class for each faculty, under which all the classes in the pilot were set up, the Faculty Advocate could keep track of how tutors and students were getting on.

13   Nevertheless the Faculty Advocates did operate a post-submission check for tutors on any units in the faculty not involved in the pilot where plagiarism was suspected.

14   So in this last academic year research methods, dissertations and independent study units on economics pathways have been included in the pilot.

15   See for example the online guidance provided for Economics Postgraduate Dissertation students at http://userweb.port.ac.uk/~snellm/pgdiss/originality.html

16   The total number of cases of plagiarism reported to the Registry in PBS in 2007/08, up to the end of May, was 28, compared to 36 in the equivalent period for the previous year. In Economics it went down from 17 to 2.

17   The University of Portsmouth, with a student population of around 18,000, had 80 cases of plagiarism reported in 2006–07. Based on an average rate of plagiarism in the UK in 2007 of 7.2 cases per 1000 students as cited in Tennant and Duggan (2008) we might have expected a figure closer to 130.

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