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Comparative study on the usage of an online plagiarism-detection service when presenting distance learning courses

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Abstract

The Internet opens a library of wealth to the student and educator but it also makes it easy for students to copy when writing assignments. In this paper, we will look at how Wawasan Open University implemented plagiarism-detection software in its course delivery. In 2010, the university introduced the compulsory usage of an online plagiarism-detection software known as Turnitin (Turnitin TM). Students are required to scan their assignments using the service before submitting them for grading. In this study, we observed two different course clusters; one cluster is numerically-based and the other is narrative-based. We observed the Similarity Index Report on student assignments from four courses in two programmes from the 2011 cohort. The courses are Business Accounting II, Auditing and Assurance in Malaysia, Human Resource Management, and Organisational Behaviour. Our findings suggested that plagiarism detection software can be useful for courses that require a student to demonstrate a strong sense of originality in their assignments. Essentially, the software would provide additional advantages in any narrative management course where it is the intention of the instructor to ensure that students demonstrate a high level of creativity. However, courses that require students to conform to any regimen should not be subjected to the anti-plagiarism process as this is futile, as in the case of many numerical and mathematical courses. Courses that require a high level of verbatim citation such as law, assurance, literature and divinity would not work very well with the software. The inability of current software to differentiate between patterns and strings of plagiarism and cited work makes this exercise futile.

Introduction

Electronic media has resulted in today's society becoming more informed. However, the ease of having instantaneous information from the Internet has resulted in the prevalence of plagiarism. The Internet brings great opportunities and challenges to educators. The Internet opens a wealth of knowledge to students and educators. However, the *ease of copying* becomes a bane to the educator. Educators in Wawasan Open University, an open distance learning institution in Malaysia, experience this problem as well.

Technology in education often presents challenges and surprises to both the educator and the student. In 2010, the university introduced the compulsory usage of an Internet-based plagiarism-detection service known as Turnitin. Students are required to scan their assignments using the service before submitting them for grading. It has been argued by some educators like Brown et al. (2010) that the usage of plagiarism-detection software may not be suitable for *all disciplines*. In this paper, we look at the usage of Turnitin in four courses from two undergraduate degree programmes at Wawasan Open University. The first discipline contains courses that are calculation based and the second is more narrative in nature. From each type, we studied the results of one intermediate-level course and a final-level course in order to analyse the implications and appropriateness of the system.

Literature review

Brown et al. (2010) reported that the usage of the plagiarism detection software Turnitin is low among faculty members in an unnamed university even though it helped faculty members identify incidences of plagiarism among students. Colleges that taught courses involving writing such as Education, Nursing, Arts and Letters, and Business were keen on the software while colleges that offer curricula which were mathematically based, having hands-on programming, or having design work were not keen on using it. The originality report alone was not conclusive in supporting allegations of plagiarism. Faculty members had to follow up with their own investigations before taking disciplinary action against any student. The software acted as a tool for creating awareness among students about the need for using proper citations and acknowledgements in their papers and not as a plagiarism watchdog. The same view was taken by Kirkpatrick (2006), Murray and Rowell (2009), and Todd (2010). Although many anti-plagiarism software services were available, none were reliably capable of detecting plagiarism (Kajjonen & Mozgovoy, 2010). Therefore, there was a need for the instructor to intervene when detecting plagiarism.

While most literature suggests that academics should enforce plagiarism detection, Snyder Gibson and Chester-Fangman (2011) were of the opinion that the university librarian is the main administrator responsible for policing attempts by any student to plagiarise. On the other hand, Wheeler and Anderson (2011) suggested that any action to combat plagiarism should involve *everyone* in a university. Rolfe's (2011) UK study differed from her American counterparts, Brown et al. (2010). The biosciences staff and students were very supportive of Turnitin use. The incidence of plagiarism did not decrease, due to the worsening of the referencing and citation skills of the students. There was a culture among students to "copy and paste" as this is a norm entrenched within the schooling system. On the upside, the initiative improved the students' writing skills. Dee and Jacob (2012) were of the opinion that it was ignorance of citation guidelines that caused students to plagiarise, and not because of the intention to cheat. Some form of training must be given to students to make them aware about the problem of plagiarism.

McCord (2008) theorised that it is the design framework of assignments that cause students to plagiarise. It is easier to plagiarise when assignments do not require synthesis. Educators should design their assignments so that students are very much involved in the learning process. Fact-based background work should be avoided and higher-level work involving synthesis included instead.

However, Patel, Bakhtiyari and Taghavi (2011) cautioned that universities were too deeply engrossed in academic paper and web page plagiarism when using anti-plagiarism services. The suites of anti-plagiarism software were unable to differentiate between patterns and strings of plagiarism and original thought. Some focus must be given to more sophisticated methods of cheating such as ghost-writing, the use of online translators and fake bibliographies when dealing with the whole plagiarism issue.

We noticed that the literature all dealt with whether any anti-plagiarism software should be used. The issue of when the software should be used was not explored at all. We will address this issue here. Secondly, we noticed that researchers either used statistical analysis or the case study method to research the issues mentioned above. We wanted our research to be more expansive. Statistical analysis shows the breadth of the issue of plagiarism while the case study method brings out the details of the issue.

Methodology

As mentioned in the introduction, the management of Wawasan Open University was concerned that its students could copy material from the Internet while doing their assignments. In order to discourage plagiarism, the university made compulsory for students to use Turnitin. Students are now required to scan their assignments using Turnitin before submitting them for grading. In this study, we observed two different programmes in the university. In the first programme, students were assessed on their ability to manipulate numbers while the other was narrative based. The numerical-based courses were from the accounting programme which comprised the second-year course *Business Accounting II (BA 2)* and the final-year course *Auditing and Assurance in Malaysia (A & A)*. The narrative-based courses were from the Management programme: i.e., second year *Human Resource Management (HRM)* and final year *Organisational Behaviour (OB)*. One 2011 cohort class from each of the above courses was studied.

The assignments

BA 2 and A & A (Numerical-based courses)

The BA 2 instructor required students to attempt three case studies concerning the book-keeping and the preparation of the final accounts of three partnerships. The skills of "understanding" and "applying" as suggested by Bloom's taxonomy were required here.

Students needed to apply the steps they learned from their course material in the case studies presented to them. The steps had to be applied rigorously. Marks would not be awarded if students deviated from them.

A & A was designed to test the skills of "remembering", "understanding", "applying" and "analysing" as suggested by Bloom's taxonomy. The assignment consisted of two parts. In part 1, students were required to answer five mini essay questions concerning auditing standards and guidelines. The instructor tested the ability of students to connect the requirements of the question with suitable citations of auditing standards and guidelines. A brief discussion of the citations was encouraged.

Two case studies were presented in part 2. Both case studies had serious issues pertaining to governance. Students had to read the cases and identify all the major issues of governance. They had to identify the issues and solve them while citing relevant auditing guidelines and standards.

HRM and OB (Narrative-based courses)

Both the HRM and OB assignments were designed to test the skills of "remembering", "understanding", "applying" and "analysing" as suggested by Bloom's taxonomy. The assignments consisted of two parts. In part 1, students were required to answer three to five essay-type questions. Students were required to apply management concepts. They were also tested on their critical thinking apart from their ability to regurgitate ideas they studied in the course material. Questions such as *"In your opinion, how can Human Resource Management help an organisation to achieve its competitive advantage?", "Compare and contrast between the Theory X and Theory Y orientation" and "Which orientation you think is better applied in today's 21st-century globalised business environment?"*, tested the ability of students to apply critical thinking within the theoretical framework of HRM and OB. The expression of personal opinion was encouraged here.

The students were presented with two to four questions based on a case study in part 2. They had to read the case study and then identify all the major problems in it. Students were encouraged to identify the underlying causes of the problems and not just their symptoms. They were required to link each identified problem to relevant theory and evidence from the case study.

To show the differences among the assignment questions of these four courses, the weightings (%) for each course according to Bloom's Taxonomy of Learning are stated below.

Bloom's Taxonomy	Remembering	Understanding	Applying	Analysing	Evaluating	Creating
BA 2	0%	50%	50%	0%	0%	0%
HRM	10%	20%	40%	20%	10%	0%
A&A	0%	10%	30%	30%	30%	0%
OB	5%	10%	30%	35%	20%	0%

Table 1 Bloom's taxonomy analysis

The method of analysis

We used both quantitative and qualitative research methodology of analysis in this study. Descriptive statistics comprising mean, median, range, minimum and maximum were used to get a general overview of the situation at hand. Figures cannot describe issues such as writing skills; thus a certain level of qualitative analysis was needed. We analysed every student's similarity index reports from each of the aforesaid courses.

Peculiarities were observed in each similarity index report. We took note of items such as references to Internet sources, journals or articles and from student papers, whether from the same or a different cohort. We cross-checked references to Internet sources and publications to see whether students had properly cited their work. We studied the reports to see if there was copying among students of the same class. Although we were unable to see student papers from other educational institutions, we checked to see whether there were instances where students were referencing from works from selected papers. The findings were then summarised.

Two pairs of observations would be made. First, we would observe the levels of "plagiarism" in the reports from the two disciplines, i.e., accounting and management. Our first hypothesis was:

> *There are differences in the similarity indices of accounting courses as compared to management courses.*

Secondly, we would observe whether there are differences between the levels of "plagiarism" in a lower-level course and an upper-level course. Bloom's taxonomy would be used to separate a lower-level course from an upper-level course. The second hypothesis was worded as follows:

> *There are differences in the similarity indices of lower-level Bloom's taxonomy courses as compared to higher-level courses.*

Findings

In this study, we analysed every student's similarity index reports from each of the stated courses. A total of 30 reports from BA 2 and 24 reports from HRM were looked at. Both were second-year courses. For the final year courses, 35 reports were analysed for OB and 15 for A & A.

As mentioned earlier, quantitative analysis gives a "helicopter" view of the case study. We tabulated the quantitative results from our study in **Table 2**.

	Second year		Final year	
	BA 2	***HRM***	***A&A***	***OB***
Mean	37%	24%	36%	18%
Median	37%	19%	29%	17%
Range	73%	79%	80%	77%
Minimum	0%	0%	0%	0%

Table 2 Descriptive statistics
(%) denotes the percentage of the similarity index

Comparing between the accounting and management courses

We noticed that the similarity indices were higher for the accounting cluster courses (which were considered to be numerical courses) as compared to the management cluster courses (which are narrative). The means from the two accounting courses, i.e., BA 2 and A & A were 37% and 36% respectively, which were higher when compared to the management cluster courses, i.e., HRM and OB, which had means of 24% and 18% respectively. The same pattern was observed for the median. There was a regimented answer scheme for the lower-level accounting course, BA 2, as a student would get marks for having the correct figure and the correct format. The A & A instructor tested some numerical analysis together with some narrative analysis. The A & A instructor required his students to cite certain accounting and auditing standards verbatim while connecting the accounting and auditing framework to the question at hand. Marks might not be awarded if the student rephrased certain terminology from the standards. The rewording of certain terminology would create a different legal implication and thus this is not encouraged in disciplines like auditing.

The HRM and OB instructors required their students to be eloquent. They were required to be creative when suggesting methods to solve issues in the cases presented in the assignments. Although the students needed to use selected management terminology, the usage was not as stringent as in A & A as the students could reword explanations of management terminology.

There were not many differences between all four courses when it came to the spread (or "range" in this case). Turnitin has a certain peculiarity in that it will cite the first student to submit a certain answer either with its narrative or form. The later a student submits an answer the higher the student's similarity index will be, making it appear that the student had "stolen" the answer from the student who had submitted earlier. This was a concern highlighted by Patel et al. (2011).

Comparing between the different levels of difficulty

By comparing between final year and second year Management courses, we found that there were significant differences between the similarity indices of the two courses (Mean HRM = 24% vs. OB = 18%). The means of the two Accounting courses were not very different (BA 2 = 37% vs. A & A = 36%). The A & A instructor required his students to have the ability to "apply, "analyse" and "evaluate" under Bloom's Taxonomy. Apart from that, A & A students were also required to cite verbatim selected accounting and auditing standards. Marks would be deducted if students failed to cite verbatim the relevant standards.

The marking schemes for both management courses were not as tight as the marking schemes of the accounting courses. For the management courses, markers need to exercise a high level of personal judgment, discretion and professionalism when awarding grades.

To sum up, we accept our first hypothesis:

> *There are differences in the similarity indices of accounting courses as compared to management courses.*

The second hypothesis is now reworded as:

> *There are differences in the similarity indices of lower-level narrative courses as compared to higher-level courses. The same does not apply for numerical-based courses, in this case accounting.*

Conclusion

We would like to conclude that whether "policing" assignments using any plagiarism detection software will be useful or not is determined by the learning outcomes of a particular course. While McCord (2008) suggested that instructors should include synthesis in their assignments to avoid the problem of plagiarism, we disagree as it boils down to the learning outcomes of the course. The learning outcomes of the course should not be sacrificed for the sake of having very little "plagiarism".

Any plagiarism detection software will be useful in any course that requires students to demonstrate a strong sense of *originality* in their assignments. The software will be useful in any narrative management course as it is the intention of the instructor to make sure that students demonstrate a high level of creativity. This is in line with the thoughts of Brown et al. (2010) and Kajjonen and Mozgovoy (2010).

Conformity is a word that is important in any anti-plagiarism discussion. Courses that require students to rework pre-set steps should not be subjected to the anti-plagiarism process as this is futile as in the case of numerical and mathematical courses. Courses that require a high level of verbatim citation such as law, assurance, literature and divinity would not work very well with the software due to the limitations of the software in detecting strings and patterns, as reported by Patel et al. (2011). To conclude, the inability of current software to differentiate between patterns and strings of plagiarism and cited work makes this exercise futile.

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