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Strengths and Weaknesses of Plagiarism Detection Software

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Abstract

With increased accessibility to electronic text, plagiarism by university students is increasing. Turnitin is a software detection service that can assist faculty in the identification of incidences of plagiarism; however, not all faculty members have adopted the service. This study identifies the strengths and weakness of the service which impact the adoption of the software on a university campus. Suggestions are provided to support faculty in better utilization of the TurnItIn from an educational perspective and as a method of preventing plagiarism.

Introduction

Because of the recent budget cuts at universities, concerns have been raised as to whether money spent on plagiarism software was well spent. Less than 10% of faculty members were found to be using the service. Low adoption rates could be attributed to the lack of knowledge about the availability of the software or how to use the technology. The use of plagiarism detection software also raised concerns by faculty members which may contribute to the level of adoption. The purpose of this study was to determine the factors contributing to lack of willingness by faculty members to use a plagiarism detection service and to identify how those who had adopted the software were using it.

What is Plagarism?

Plagiarism is considered by many to be copying or borrowing another person's work or original ideas. According to Standler (2000), terms like "copying" and "borrowing" disguise the seriousness of the offense. Plagiarism is defined as:

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> "In minor cases, it can be the quotation of a sentence or two, without quotation marks and without a citation (e.g., footnote) to the true author. In the most serious cases, a significant fraction of the entire work was written by someone else: the plagiarist removed the true author(s) names(s) and substituted the plagiarist's name, perhaps did some re-formatting of the text, then submitted the work for credit in a class (e.g., term paper or essay) or as part of the requirements for a degree (e.g., thesis or dissertation)" Standler, R. B. (2000, p. 2).

Based on the definition above, one can assert that when plagiarism is committed, it can be considered as an act of fraud which involves stealing someone else's work and lying about it. According to the United States law, the expression of original ideas is considered intellectual property, and is protected by copyright laws, just like original inventions. Almost all forms of expression fall under copyright protection as long as they are recorded in some way (such as a book or a computer file) (Turnitin, 2008). Students can plagiarize a range of sources including paragraphs from magazines, scholarly journals, books, or newspaper articles. They can also purchase papers from commercial or academic research services.

Why do Students Plagiarize?

Cheating by students has occurred as long as institutions of learning have been in existence. Widespread student plagiarism predates the internet but electronic sources have made the practice easier (Baird, 1980). Several studies revealed that competitive achievement striving

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and self-esteem can significantly influence the prevalence of cheating (e.g., Baird, 1980; Eisenberger & Shank, 1985; Perry, Kane, Bernesser, & Spicker, 1990; Ward, 1986; Ward & Beck, 1990). Other contextual factors that influence college cheating behavior include faculty responses to cheating, sanctioned threats, social learning, and honor codes (Canning, 1956; Jendrek, 1989; Michaels & Miethe, 1989; Tittle & Rowe, 1973). Students often blame cheating on college faculty for using irrelevant course material and not connecting assignments to course material (McCabe, Treviño & Butterfield, 1999). The academic climate of the institution a student attends may also be an important situational factor. Some researchers believe that the climate at many educational institutions has eroded to the point that cheaters face trivial penalties, if any, and faculty members pay so little attention to academic dishonesty that students conclude it is foolish not to cheat (McCabe & Drinan, 1999).

A meta-analysis on academic dishonesty research by McCabe and Drinan (1999) found widespread cheating on academic campuses across the United States. In one study, as many as 72% of students admitted to one or more instances of serious cheating on a test or examination (Kraus, 2002), up from 39% on the same campuses in 1963 (Bowers, 1964).

Approaches for Addressing Plagiarism

Plagiarism has increasingly become a problem educational institutions and many have decided that the best approach to preventing cheating is the to use plagiarism detection tools such as Turnitin. The use of this tool has come under scrutiny from both the students and the professors. Due to concerns about plagiarism, many universities have developed rationales for using plagiarism detection tools/software: deterring and detecting cheating; fostering learning of

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proper acknowledgement practice; building institutional reputation; and treating students fairly (Martin, 2004).

Universities have embraced the use of services such as TurnItIn to deal with rising numbers of plagiarism incidents on campuses. Advocates of argue that increasing incidents of plagiarism should be addressed by pedagogical change focusing on how assessment is conducted. One method suggested is to use authentic assessment, which involves the students in the learning process and includes personal reflection (Bassendowski & Salgado, 2005). Another method is to create a unique assignment that would not be available from "paper mills", and by including unique requirements and changing those requirements each semester (Bassendowski & Salgado). In addition, faculty can enhance the course with tools such as: wikis, blogs, discussion threads, emails, and chats which provide a variety of writing samples and a sense of each student's writing style can also reduce plagiarism (Baron & Cook, 2005). Faculty can also provide cognitive scaffolding for online research (Howard & Davies, 2009). Additonally, students should be taught values, how to handle pressure, and the customs of authors as part of their course of studies so they understand why it is important to use their own words (Howard & Davies; Williams, 2008)

Barriers to Using Plagiarism Detection Services

Turnitin is a plagiarism detection service that has created a database of more than 10 million student papers. Even though courts have ruled that Turnitin's plagiarism detection process is not a violation of students' property rights, some faculty believe this type of service is a way of using the use of another's intellectual property rights for profit (Walsh & McNally, 2007). Having student papers warehoused outside of the control of the university has created

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concerns because of the potential to abuse of this central repository of student writing (Cochrane, 2006). Some faculty members have expressed concern over the use of the service because they maintain that it breaches the student-teacher relationship.

Other barriers to adoption of plagiarism detection services include lack of knowledge about the availability of the technology, how to use the technology, and how to incorporate the technology (Hall & Hord, 2001). Other barriers included limited availability of time, not understanding the relevance of why the technology, poor usability design, access to technology, and time to redesign curriculum were barriers to learning the technology (Butler & Sellbom, 2002; Amburgey, 2007).

Methodology

The purpose of the study was to identify why faculty members use Turnitin, how the faculty members use the results from the program, and to determine barriers to adoption by faculty members.

Participants

The participants for this study were faculty members from a midsize university consisting of nine colleges. The university has a variety of program offerings at the undergraduate and graduate levels including masters and doctoral degrees. Of the 807 faculty, 44% are female and 56% are males. The faculty has 71% of the its members in the tenure track with 26% full professors, 25% associate professors, 20% assistant professors and 29% of the faculty are core instructors, instructors, adjunct faculty, or assistants.

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Procedure

A survey instrument was developed by a cross-disciplinary team of faculty members and technology support personnel to explore the use of Turnitin by the faculty members at the University. The survey was developed to collect two types of data: (1) demographic information about age, gender, and college and (2) issues surrounding plagiarism to determine professor's level of concern about plagiarism and what actions were taken when plagiarism was identified. The survey collected information both from participants, who had used or not use Turnitin. For those participates who used Turnitin, the questions focused upon frequency usage, course types, assignment types, and plagiarism identification frequency. For those participants, who did not use the software, the Likert-scale questions identified their reasons for not using the service. Finally, a series of open-ended questions provided the faculty an opportunity to expand upon their feelings about why they use or did not use the service.

The University has multiple campuses so an online survey tool was used. This method also allowed the faculty to express their opinions freely since the research team was unable to trace who had participated in the survey. Because all faculty members were required to use university email for all university related correspondence, the message inviting faculty to participate was sent by email. The invitation to participate in the study contained the informed consent letter and the link to the survey. Follow-up reminders were sent twice a week through the university announcements for six weeks. After the sixth week, the survey was closed.

Analysis of Data

The survey collected of two types of data. To obtain quantitative data, participants responded to a three point Likert-scale questions: very important, important, and not important.

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The original survey designed for the study was modified by the university to reduce the number of questions and decreased the five-point scale option to the three-point Likert-Scale. The modifications reduced the amount of time faculty spent in answering the questions; however, it also decreased the depth of information obtained by the researchers. The Likert data was converted into mean and percentage scores to observe broad patterns within the responses.

The open-ended questions allowed the research team to understand why the faculty selected their rating on the Likert-scale. Content analysis was used to identify patterns within the data collected from the open-ended question. One of the researchers did the content analysis and placed the data into broad groupings as to the reasons why people used Turnitin, when the tool was used, how it was being used as a teaching tool, and challenges in using it as a teaching tool. The research team then met to analyze the results developed within the broad categories. During the data-analysis process, the data was compared across the groups for similarities and differences.

Results

Demographic Data

Of the 807 member faculty, 165 participated in the survey for a response rate of 20%. The participants were closely divided between users (86 faculty) and non-users (80 faculty members). The College of Education and College of Nursing had the highest percentage of responses at 29% with College of Arts and Letters following at 26% and the College of Business at 24%. These four colleges would most likely use Turnitin because the course content involves writing. The three colleges with the highest rates of non-use were College of Engineering and Computer Science with a response rate of 10%, College of Science at 23%, and College of

Architecture at 14%. In the opened ended question responses, members of these three Colleges indicated they were not using the service because the curriculum is mathematically based, hands-on programming, or design work. Of the different age groups, faculty members between the ages of 31 to 40 were more likely to use the software (63%). Of the other age groups 46% to 48% indicated they used the software. By a narrow margin, females were more likely to use Turnitin at 56% than males at 51% (see Table 1).

Table 1: *Participation in Survey by Colleges*

College	# Faculty	# Participants	% Participating
Arts and Letters	189	50	25%
Business	122	29	24%
Biomedial Science	46	5	11%
Education	112	32	29%
Engineering and Computer Science	70	7	10%
Honors College	35	6	17%
Nursing	34	10	29%
Science	148	18	12%
Architecture, Urban and Public Affairs	56	8	14%

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Using Turnitin to Detect Plagiarism

Turnitin can be used in three ways to identify incidents of plagiarism. A majority of faculty members (64%) automatically submit papers for an originality score. The percentage of originality scored used to identify potential plagiarized material ranged from 20% to 40%. The factor that seemed to affect this variability was the amount of expected material that was to be cited or quoted within the assignment. Ten percent of faculty members used Turnitin if they suspected the student had plagiarized the paper and used the originality report to confirm their suspicions. Finally, four percent of the faculty members had the students submit their own papers.

For most faculty members, the originality report alone was not enough to support allegations of plagiarism. In the qualitative data, faculty indicated that once the paper was identified as having plagiarized content, they conducted their own investigations to confirm the report before they conferred with the student. The need for these confirmations seemed to be prompted by the high number of false positives that can be reported by the program. The number of high false positives appeared to occur because the program frequently used content-related phrases as non-original and website content changing from the time of submission to the verification of plagiarism by the faculty member.

Knowledge about the faculty willingness to submit papers to the service to identify plagiarism can deter copying by students. Only 5% of the user participants reported they use the program as a deterrent in the Likert-scale question. However, 13 faculty members mentioned deterrent as a reason for using the software in their classes in the open-ended question response. The effectiveness of the program in deterring plagiarism was questioned by one faculty member

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who noted that even with a "big song and dance" about using the software; he still catches someone every semester. Others found the program to be effective as a deterrent. One professor noted that before using Turnitin, she would have several plagiarism cases every semester, now plagiarism had been reduced to zero. Finally, another professor noted, "It is the best counter-plagiarism tool since students discovered online papers."

Using Turnitin to Support Teaching

One purpose for using Turnitin is to teach students how to be responsible digital citizens by using proper citations and quotations within the paper. Approximately a third of the professors (32%) reported using the program as a tool to teach students the difference between original thought and plagiarism. Thirty percent of the professors use Turnitin to teach how to properly cite. As one instructor observed, "As for Turnitin, I think it is VERY valuable as a tool for educating students on the role of putting attention into the thoughts and work of others. It helps them re-think their citation methods and also encourages them to learn a citation format (i.e., APA style). Additionally, when students have a high level of not-really-paraphrased thoughts, I am able to use it as a coaching tool." However, another professor reported the opposite experience and questioned what the students are actually learning, "I have found that rather than learning what plagiarism entails, students learn how to change enough words to beat the software detection tools." Finally, others had not considered using the service as a teaching tool. "I hadn't ever thought of using it as a teaching device and am not sure how I'd go about using it as such." This indicates a common problem in training how to use the technology tool without focusing on the instructional value of the tools.

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Turnitin's Strengths

Turnitin users seem to like using the program as evidenced by their comments. They stated: “I think it is wonderful”, “Turnitin has definitely reduced plagiarism in our courses”, “best counter-plagiarism tool”, “very effective”, and “invaluable tool”. Reasons for the positive impressions of Turnitin vary. The strengths of the program included identifying material published on the internet and papers submitted to another class. The service also saves time for faculty who used Google searches for finding plagiarized content.

Non-Users Reasons for Not Adopting the Program

Among non-users of the software, the most frequent reason cited for not using Turnitin (53%), was the belief that the professor was able to identify plagiarism without using Turnitin. Eleven of the survey participants indicated they prefer to use assignment design to prevent plagiarism. A common approach mentioned was to have the students work on one writing project throughout the class which required the professor's input for improvement. Another approach suggested was to have students write papers on unique topics so they are unable to find already published material on that subject or the topic. Some courses have content that supports a uniquely individualized project within the class such as changing the behavior of a subject in a psychology class. Finally, some faculty felt they had adequate knowledge of the writings in their fields of study to identify plagiarism in their class without the service.

Technology Challenges Led to Non-use

Of the non-users of Turnitin, 36% had explored the program. These individuals reported several challenges in using it. One of the most frequently reported concerns was the inaccurate

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reporting of the originality reports. Several factors contributed to inaccurate reporting including commonly used phrases being reported as unoriginal which raised the originality score leading to a false positive identification of plagiarism. Another concern raised was the method in identifying plagiarism incidents. At the heart of the software application is a database of paper submitted by students each semester papers but not scientifically-based journal resources. This design flaw results in the program catching plagiarism from secondary sources, but not from primary sources; thus making Turnitin ineffective for science classes or higher level courses that require journal citations in the writing.

The inaccuracy of the originality reports the service produces resulted in high levels of frustration. As one professor expressed, “I have seen many discrepancies on the Turnitin’s reports. The website referenced in the originality report did not exist.” Turnitin’s defense was that the website changed after the report was created, but faculty members found this reason to be unsatisfactory. They maintain the discrepancy happens too often. As one professor stated, "Much as I support the idea of the software, I have serious reservations about how reliable Turnitin is. Since I will fail a student for plagiarizing, I need to know that the software used to determine plagiarism is robust and acute. Right now, Turnintin does not meet those criteria.”

The final concern voiced by the faculty was difficultly in using the program. Thirty-eight percent of those not using Turnitin reported the lack of knowledge about how to use the program as "very important" and another 20% rated their lack of knowledge as "important" in their non-use of the program. Lack of time was also another factor with 16% rating this reason as "very important" and another 23% as "important". In the open-ended question, some professors noted they did not have time to learn how to use the program or knowledge of where to go to learn how to use the program. Another factor contributing to non-use was the need to request a Blackboard

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course shell, which was another technology tool they did not know how to use. Finally, the papers had to be turned in electronically and for different reasons, professors did not want papers in electronic format for grading.

Another concern noted by many professors was how quickly students acquire the ability to trick the program. Students with savvy technology skills are able to circumvent the service way of evaluating for plagiarism changing the originality scores. Websites are now available that teach students how to fool the service. Students also learn techniques on their own after submitting their papers several times.

Results

With impeding budget shortfalls, the university was questioning the expenditure on Turnitin, a plagiarism detection service, citing adoption by less than 10% of the faculty. The survey created for this study explored how faculty members were using Turnitin and questioned why they were not using the program. Patterns emerged as to how faculty members were utilizing the software and flaws within the program, which were contributing to the program not being used. The survey also revealed misunderstandings about the capabilities of the software and suggestions arose for how to utilize the software as a teaching tool. These patterns can be used for planning for faculty training in the use of the software and targeting faculty who are more likely to use the program such as: professors in the fields of education, nursing, business and humanities. Increasing the number of user creates a better justification for continual expense incurred by the service. Because of ethical concerns, faculty may not feel uncomfortable using the service for their classes.

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Faculty members, who used the software, felt strongly that the software was helpful to them in detecting plagiarism. For this group, the Turnitin originality reports produced a result that addressed their needs. First, the service compared papers to content available on the Internet the source material for many identified incidents of plagiarism. Second, Turnitin compared papers to those submitted by other educational institutions allowing faculty to identify papers purchased from other institutions. Third, the service created an institutional database of papers submitted from previous semesters, which prevents selling or sharing of those papers to current students. Fourth, Turnitin reduced the time faculty of large classes spent in checking for plagiarism. Finally, the service provided an originality report that identified the content that had been copied and the original source of that content. This allowed the faculty members to verify if the content had been copied before conferencing with the student.

The process used by Turnitin to detect plagiarism is not an all inclusive process so it does not identify all cases of plagiarism. The service did not compare the student papers to certain primary sources or restricted material. As a result, science classes, upper division courses, and graduate level courses were not using the service as often. Some faculty members felt the originality report itself cannot support allegations of plagiarism due to the rate of high false positives. The high false positives were attributed to the identification of frequently used common phrases from a specific content area and internet content changing between the time of identification and verification of the copied material.

Turnitin may not be necessary for all classes; in particular, classes in which faculty can design unique assignments. In addition, classes that require papers to be submitted multiple times were less likely to use the service. In graduate level courses, the content may be so specific that

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the faculty member was aware of the publications in that area allowing him/her to quickly identified copied material.

Barriers to adoption of the TurnItIn service identified in this study were similar to barriers found in the literature. The most frequent reason cited for not using the program was the lack of awareness of how the software worked. To address that concern, the technology team believed that integrating Turnitin with Blackboard would simplify the steps required by the faculty members to use the software. However, this approach was not a complete success. The survey revealed that faculty members were not using the service because they did not use Blackboard. Thus, some faculty members were unaware that Turnitin could be used without the course management system. Additionally, some confusion existed about training for Turnitin with many faculty members unaware that an online web tutorial was available for their convenience. Finally, faculty noted high false positives based upon common phrases within the content area indentified as plagiarized phrases. With proper training on the program, faculty would learn how to exclude those phrases from the originality report increasing the usability of the program.

Ultimately, using the Turnitin service had mixed reviews. Faculty indicated they use the originality reports to identify the incidents of plagiarism and then use the opportunity to teach proper citation and quoting techniques. Other faculty members indicated a desire to re-submit a paper a second time after it has been edited. However, without excluding the first set of results, the reports showed lower than 10% originality because the paper was compared to the previously submitted paper. Faculty would benefit from on instructional strategies for the using Turnitin in the classroom.

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Even with proper training, some faculty members reported that they continue to feel uncomfortable in using detection services like Turnitin. Those faculty members, who used the program, felt responsible for promoting student's ethical behavior; which could lead to improving the quality of the educational programs the university is offering. Other faculty believed that using Turnitin on every paper inhibited the development of professor-student trust and others felt the service created ethical concerns regarding use of student's intellectual property. Faculty members expressed concern using an originality report that could falsely identify plagiarism as proof to expel students from a class, program, or university.

Limitations

The survey itself posed a limitation. The original survey developed by the team was scientifically based with redundancy built in to validate the questions. The assessment coordinator at the University decided that the survey had to be completed within a 15 minute time frame which limited the data collection possibilities. The survey was revised to be a program evaluation format rather than a research format. As a result, the study yielded less information and did not allow for measuring the validity of the survey. However, the research team was able gather enough information to share.

This study had other limitations including being limited to one university meaning that it is cannot be generalized to other institutions. Second, the participants may have been those that strongly felt positively or negatively about Turnitin. The other faculty members may not have participated in the study because they do not feel using plagiarism software was important in their classrooms or that plagiarism was occurring in the courses. As a result, faculty members that participated in the study had strong feeling for or against the use of Turnitin.

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Future Studies

Demographic variables seem to have little influence in the faculty's decision to use or not use the program except for the 31 to 40 age group who are slightly more likely to use the program than the other age groups. Faculty members in this age range are open to learning and using technology while younger faculty members may be open to using technology but could hold similar views as their students regarding plagiarism. Younger faculty may not view the copy and pasting of text from a website unethical. A study could clarify if younger faculty have this view does this view gradually changes as faculty members gain knowledge and experience in writing professionally.

Implications of the Study

Understanding the strengths and weaknesses of plagiarism detection services, the usage patterns, and the concerns of faculty, post-secondary institutions can provide insight into expenditure of funds for such services. Plagiarism detection services are not a good match for all content areas or academic levels. Regardless of availability and training, some faculty members will continue to have pedagogical and ethical concerns about using the service.

Within a large organization, it is difficult to communicate to everyone the types of technology and computer software available. As the study found, a lack of knowledge about the software prevented faculty from using it. Increased accessibility to training can be achieved by providing just-in-time training online and subsequently increase the number of faculty using the program making the expenditure for the services more cost effective. Training should be linked within the courseware management program near the plagiarism detection software program. For clarity, this training should demonstrate the keystroke movements on the computer screen.

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Additionally, training packages should include several features: (1) how to establish assignments that can be batch loaded into the system, (2) how to eliminate the common phrases used in a discipline, (3) how to submit a draft as opposed to a final copy, (4) how to read the reports generated by the program and (5) how to prevent high false positive within the reports. Finally, at least one training session should be available on how to use plagiarism detection software to support the instructional objectives of a class.

Each plagiarism detection software package has different strengths and weaknesses. Our study revealed that programs that create databases of student work create ethical dilemmas for faculty in deciding whether or not to use the program. Regardless of the service chosen, preventing plagiarism should not be dependent upon the software alone. Assignment design is also useful in preventing plagiarism.

The study conducted and subsequent data-analysis can assist in making policy decisions related to the use of the plagiarism detection services at educational institutions that require the use of such software. It was discovered that not all university majors or programs will benefit from use of the application. Courses with hands-on activities, dominated by mathematical processes, or artistic content cited little need for the program. Classes that require the use of primary sources that come from books or items not in digital format may also not benefit from detection software. Finally, the program does identify text plagiarized from specialized journals. The study concluded that the combination of the program's weaknesses and ethical concerns will continue to impact the level of adoption of plagiarism detection services by some faculty members.

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