Anti-Plagiarism Strategies for Environment Engineering Students

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Abstract: - Plagiarism, as defined in the 1995 *Random House Compact Unabridged Dictionary*, is the "use or close imitation of the language and thoughts of another author and the representation of them as one's own original work." Within academia, plagiarism by students, professors, or researchers is considered academic dishonesty/fraud and offenders are subject to academic censure, up to, and including, expulsion. It is a breach of ethics, and the ones caught plagiarizing face disciplinary measures ranging from suspension to termination of employment. Some individuals may claim that they plagiarized unintentionally, by failing to give the appropriate citation. While plagiarism in scholarship and journalism has a long history, the development of the Internet, where articles appear as electronic text, has made the physical act of copying the work of others much easier. Plagiarism is not the same as copyright infringement. While both terms may apply to a particular act, they are different transgressions. The former means reputation dishonestly earned, whereas the latter is a violation of a copyright holder's rights, when material protected by copyright is used without consent.

Key-Words: anti-plagiarism strategies, education in engineering, prevention methods, cultural perspectives

1 Introduction

There are many reasons why students plagiarize: close deadlines, overwhelming assignments, unclear boundaries between plagiarism & research. Learning to identify the factors that make plagiarism attractive as an alternative to students' original work is the best way to stop it before it starts.

Here are some statistics on plagiarism that worry the academic world, students and professors alike, posing serious questions to the potential employers as well. According to 2008 surveys by *U.S. News* and *World Report*, posted on www.academicintegrity.org

- 80% of high-achieving high schoolstudents admit to cheating.
- 51% of high school students did not consider cheating to be wrong.
- 95% of cheating high school students said that they had not been detected.
- 75% of college students admitted to cheating, and 90% of college students did not believe cheaters would be caught.
- Almost 85% of college students said cheating was necessary to get ahead.

Professor Donald McCabe, leading expert in academic integrity, as early as May 2001, in a study on 4500 high school students, found the following:

- 72% of students reported one or more instances of serious cheating on written work.
- 15% had submitted a paper obtained in large part from a term paper mill or website.

- 52% had copied a few sentences from a website without citing the source.
- 45% admitted to collaborating inappropriately with others on assignments

In a further sample of 1,800 students at nine state universities, the same author found that:

- 70% of the students admitted to exam cheating.
- 84% admitted to cheating on written assignments.
- 52% had copied a few sentences from a website without citing the source

2 Problem Formulation

Anyone who has written/graded papers knows that plagiarism is not always a black&white issue. The line between plagiarism and research is often unclear.Learning to recognize the various forms of plagiarism, especially the more ambiguous ones,is an important step towards effective prevention. Here follow the most widely spread types:

2.1 Sources not cited

- The writer claiming to be the author is not the real one. The text or the homework was entirely written by somebody else.
- Copying significant text portions from a single source, unaltered,and passing them as original.
- Copying from different sources, combining sentences together in order to disguise plagiarism, but keeping the original sentence patterns.

- Retaining key content in the source, slightly altering the text appearance by changing certain words and phrases.
- Using previous personal work, disregarding the expectation of originality in most institutions.
- Taking time to paraphrase most content from other sources and fitting in the pieces, instead of spending the same effort on original work.

2.2 Sources cited, and still plagiarized

- Mentioning the author's name without including specific information on referenced material location.
- Providing inaccurate information on the sources, making it impossible to find them.
- Adequately citing a source, but neglecting to insert quotation marks, thus falsely claiming original presentation and interpretation of the information.
- Properly citing all sources, paraphrasing&using quotations appropriately, but including no original work. It is difficult to spot this form of plagiarism, as it resembles any other well-researched document.
- Properly quoting and citing sources in some paragraphs, but continuing to paraphrase arguments from those sources without citation.

3. Problem solutions

Just as tempting as hacking into websites, plagiarizing papers can be viewed as a thrill and a question of ingenuity for many students. Distinctions between search and research must be clearly defined in the context of today's learners who quickly realize that finding & manipulating data on the Internet constitute a valuable skill; considering the wealth of information available online, it is considerably easier to find web sources than produce original analyses/interpretations. Therefore, engineering students should be taught that the real skills they need to master are interpretation and analysis: how to process the information they find, as almost anyone can get data from the net, but it is what they do with such data that counts. In other words, the solutions to this problem lie in informing, motivating and monitoring students in their efforts to actively build their professional skills without illegal data copying and style imitation.

3.1 Educational strategies for prevention

The key issue in preventing plagiarism is to address its causes. Here are some guiding strategies:
1. become aware of the reasons plagiarism occurs
2. identify the different forms of plagiarism
3. integrate plagiarism prevention into lectures

Certain students may find better vocabulary and communication elements in the references,thus being discouraged to produce original text. Intimidated by the quality of online work, they think that personal efforts cannot lead to comparable results.The foreign language teacher should let them know that practice makes perfect and improvement is commensurate with the amount of work and dedication. Professors are interested in seeing how learners understand the assigned topic, and how they develop their own style and voice.Still, it is not enough for making them feel more comfortable with writing, but explaining the connection between writing and learning processes might increase the quality of their results and, more importantly, spur self confidence. Setting standards is also very important, as learners are not expected to be as brilliant as the experts who have devoted years to the subject. Additionally, students' experience in class context gives them a unique perspective with a far more interesting and relevant angle on the issues, and they should become aware of it.

Pressured by family / peers / instructors, learners compete for scholarships, certificates and jobs, often seeing education as a step on the ladder to success, and not as an active process valuable in itself. Due to this fact, students tend to focus on the end results of their research, rather than on the skills they learn in the process. It is too late when they realize they may be able to hide ignorance of particular facts/theories, but their research&writing skills betray them in front of evaluators/future employers.In other words,grades are irrelevant if skills do not back them up. In this context, language professors may wish to emphasize improvement as a key factor in grading,to encourage students in developing personal abilities.

Plagiarism is often justified by pointing out that peers plagiarize as well, so the same must be done to keep up. Investing several hours of work and risking a mediocre grade,with less time to other subjects,has as an alternative copying better web texts for an easy mark,with time to spare.Sanctioning cheaters creates fair competition,eliminating fears of falling behind.

Students do not estimate assignment effort and length in realistic parameters,being often unaware of the extent of the work involved in a research paper. Sometimes learners are simply overwhelmed by the task, postponing it until the last minute, with no time for original work.The language professor must there-fore set progress stages on student papers and have them submit bibliography,outlines,thesis statements or drafts on specified dates before the final version is due. This will give them a clear idea on the amount of work involved and will help with organizing time, making the task seem less complicated.

However, unintentional plagiarism exists, and may be generated by the following:
- Citation confusion: ignoring proper citation forms

• Plagiarism vs. Paraphrasing: many students have difficulties in separating the contexts where they paraphrase from the ones where they plagiarize. In an effort to make personal work seem more original by formulating ideas in their own words, they may often inadvertently plagiarize either by changing the original too much or not enough. Doing exercises in class,with the language professor handing out paraphrased&plagiarized passages in order to discuss the differences,might prove very helpful for engineering students. Didactic explanations focus on retaining key ideas from the original, significantly changing the style and the grammatical structures, so as to fit in the context of the learner's argument.

• In carelessly taken notes, learners mix their ideas with those in the sources,being unable to sort out the confusion when writing the paper. Foreign language professors consider it worth revising note-taking methods, teaching future engineers how to document sources so as to save time and keep references clear.

• Students note incomplete bibliographic data on their sources, becoming unable to properly attribute information in the assignment. The language teacher should explain the importance of keeping careful track of references throughout the note-taking stage. Learners eager to focus exclusively on the content of their research need to be reminded that proper handling of reference material is a key stage in scientific approaches. Having them turn in bibliographies prior to submitting the final form of the paper will lead to increased attention paid to the sources.

• The web makes data quickly and readily available, constantly keeping in step with the latest science and technology developments. As a result, engineering students may find it difficult to tell the difference between the *common knowledge* they are free to use and the original ideas in others' intellectual property. Teachers should advise students to cite sources.

• Confusion about expectations: students may not be aware of what proper research requires, thinking that simply reporting critical comments or borrowing from a number of sources would be sufficient for homework. One of the most common sources of confusion is the ambiguity of terms such as *analyze* and *discuss*, that have specific connotations in the academic discourse, requiring original thought that goes beyond mere reporting. Emphasizing teachers' interest in students' ideas will help learners to understand what is expected from them.

• Cultural perspectives on plagiarism vary around the world as not all cultures have the same outlook on this phenomenon. The western notion that ideas can be the property of individuals may seem absurd to those with different views on what constitutes shared information&public discourse. Students from cultures with a more collective sense of identity may have difficulties in understanding the distinctions other cultures draw between individual and public property. Foreign language teachers could encourage cross-cultural debates on this issue during seminars.

3.2 Sample of student's learning log for first year students,implemented in the Polytechnic University of Bucharest, Faculty of Power Engineering, Environment Protection Studies

1. In a research paper, come up with personal original ideas, but refer to work that has already been done by others.
2. Plan your paper
    • prioritize the ideas
    • write an outline
    • draw up a thesis statement
    • devise a balance between ideas you take from other sources and your own
    • anticipate ways to include other information sources in your paper
3. Consult with your instructor
4. Check the guidelines for citing sources.
5. Take effective notes from all your sources, so as to have much of the information organized before you begin writing.
6. To avoid confusion about your sources, try using different colored fonts or pens for each one, and clearly distinguish your own ideas from those you found in the references. Mark page numbers and record bibliographic information or web addresses for every source immediately (finding them again later is too time-consuming)
7. When in doubt, cite the sources. Instead of weakening your paper, it will actually strengthen your achievement by:
    • showing more than copying ideas: processing and adding to them.
    • lending support to your own ideas.
    • highlighting the originality of your ideas by making clear distinctions between them and ideas in the sources
8. Clearly state who said what: ambiguity in phrasing disguises the real source of given ideas, causing inadvertent plagiarism.
9. Beware of confusing pronouns.
10. Practise paraphrasing (restate the author's ideas in your own words. In a legitimate paraphrase modify the words&the sentence structure of the original, without changing the content. Paraphrased passages still require citation as the ideas came from another source, even though the formulation is yours.Paraphrasing is not used for

reducing the number of quotations in your paper, but for making the ideas of the original source fit smoothly into your paper, emphasizing the most relevant points and leaving out unrelated data.

11. Quote as infrequently as possible, very concisely, and only when you believe the way the original author expresses an idea is the most effective means of communicating the point you want to make. If you want to borrow an idea without the exact words, paraphrase. Your essay cannot be a series of quotations. Paraphrasing and summarizing your sources is sufficient, and for every line you quote, have at least two lines analyzing it.When inserting a quotation, be careful, as you could accidentally alter the meaning and falsely claim that the author said something he did not. Mention the author and work in a sentence that introduces your citation. However when citing the source to make a minor point, use parenthetical references/foot-notes/endnotes. Describe the authors and state their profession if they are not famous, or if you have reason to believe the reader does not know them. State where you found the source and why you think it is credible and worth citing.

12. Evaluate your sources: not all web sources are worth citing and some are wrong. Check the information,where it came from and when it was written. Determine source credibility: effective support of ideas, writing quality, data accuracy.

13. Include bibliography; it is a list of all of the sources you used in the process of researching your work. In general, it should include:

- authors' names
- titles of the works
- names and locations of the companies that published your copies of the sources
- the dates your copies were published
- page numbers of your sources (if they are part of multi-source volumes)

An annotated bibliography is the same as a bibliography with one important difference: in it bibliographic information is followed by a brief description of the content, quality, and usefulness of the source.

3.2 Plagiarism and the Internet

Plagiarism has never been easier than it is today. Before the Internet, cheating was labor-intensive and obvious. Potential plagiarists had to find appropriate works from a limited pool of resources, usually a nearby library, and copy them by hand. Since these resources were almost always professionally written, the risk of detection was very high.

The Internet makes it easy to find thousands of relevant sources in seconds, and in the space of a few minutes plagiarists can find, copy and paste together an entire term paper or essay. As much of the material online is produced by other students, it is often difficult/impossible for educators to identify plagiarism based on expectations of student-level work. Even when an instructor suspects plagiarism, the sheer size of the internet seems to work in the plagiarist's favor. Search engines can be useful for tracking down suspect passages, but even they have their limitations, given the number, variety, and password-protected nature of many websites. Even where search engines do prove useful, manually searching the internet for matches of hundreds of student papers can be an impossible task.

Additionally, the seemingly public nature of online content blurs the distinction between publicly & privately owned information.Electronic resources, by nature easily reproducible, are not perceived as intellectual property in the same way that their material counterparts are. Just as file transfer programs make it easy to trade copyrighted music files most people would never think to steal in physical form, the internet makes plagiarism easy for students who might have thought twice about copying from a book or published article.

Perhaps the greatest resources for would-be plagiarists are the numerous online paper-mills that exist solely for the purpose of providing students with quick homework and term-paper solutions. Many such services contain thousands of papers on a wide variety of topics, and some offer customized work for an additional fee. The fact that many of these sites have become profitable ventures (with paid advertising) only confirms the unfortunate truth that plagiarism has become a successful industry.

Many students feel pressured to complete papers well and quickly, and, with the accessibility of new technologies,they can plagiarize by copying&pasting information from other sources. Plagiarism detection is favoured by the following:

- students' choice of sources is unoriginal.
- instructors receive the same passage copied from a popular source from several students.
- it is easy to tell if a student used his own *voice*
- students choose inappropriate sources, which are off-topic or contain incorrect information.
- professors may insist that student work should be first submitted to online plagiarism detectors.

3.3 Sanctions for plagiarism

In the academic world, plagiarism by students is a very serious offense that can result in punishments

such as a failing grade on the particular assignment (typically at the high school level) or for the course (typically at college or university level). For cases of repeated plagiarism, or for cases in which a student commits severe plagiarism (giving a copied piece of writing as original work), the student is suspended or expelled. In many universities, academic degrees or awards may be revoked as a penalty for plagiarism.

4   Conclusion

Unfortunately, plagiarism is quickly becoming part of our educational culture. Increasing numbers of students are turning to the internet for shortcuts around the rewarding but time-consuming work of writing research papers. A large part of the problem is awareness of the issues. Often, students do not even know that they are plagiarizing, and those who do know are often unaware of the seriousness of the offense and its possible consequences. Another part of the problem lies in the factors that make students likely to plagiarize: poor research skills, attitudes toward grades and schoolwork, poor time-management skills, the perception that peers are cheating, and unrealistic risk-reward assessments.

Plagiarism is almost always a symptom of other educational problems. The students who perceive their instructors as concerned and actively involved in the learning process are less likely to engage in dishonest acts, but if the professor seems indifferent or if the subject seems unimportant or uninteresting, students feel less moral obligation to avoid cheating.

Plagiarism hurts everyone involved:
1.   plagiarists do not acquire the skills legitimate work would teach them, risking failure & expulsion.
2.   classmates working hard for their grades have to compete with plagiarists for jobs and admissions.
3.   teachers have to take time out of the education process to deal with plagiarism.
4.   administrators find the principles on which their institutions are founded undermined by plagiarism, and must devote resources to combating it.

It is a common misconception among students that they need to hide their reliance on other sources. Actually it is advantageous to highlight how other sources support the engineering student's own ideas, and using quality sources to prove such ideas makes them seem stronger and more valid.

Preemptive education is the most effective way to prevent plagiarism. However, professors know that there are students who will plagiarize despite their best efforts and despite any measures they might implement. For such students, automated plagiarism detection is a very effective deterrent.

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