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Teaching international students how to avoid plagiarism: librarians and faculty in collaboration

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This paper presents how a plagiarism component has been integrated in a Research Methodology course for Engineering Master students at Blekinge Institute of Technology, Sweden. The plagiarism issue was approached from an educational perspective, rather than a punitive. The course director and librarians developed this part of the course in close collaboration. One part of the course is dedicated to how to cite, paraphrase and reference, while another part stresses the legal and ethical aspects of research. Currently, the majority of the students are international, which means there are intercultural and language aspects to consider. In order to evaluate our approach to teaching about plagiarism, we conducted a survey. The results of the survey indicate a need for education on how to cite and reference properly in order to avoid plagiarism, a result which is also supported by students' assignment results. Some suggestions are given for future development of the course.

Keywords: Academic honesty; Academic libraries; Engineering education; Plagiarism; Faculty-librarian collaboration; Curriculum integration

Introduction

Plagiarism has become a worldwide problem, of which one of the most important contributing factors is the easy access to Internet resources, where the majority of all scientific papers and reports are published today. However, there are additional reasons for this increasing problem, for instance a lack of ethical awareness and related lack of maturity to take into consideration the long-term consequences of the act (Colnerud & Rosander, 2009; Liddell, 2003; Sisti, 2007). Insufficient language skills, a lack of skills for using information (e.g. citing, paraphrasing and referencing) (Hendricks & Quinn, 2000; Jackson, 2006), unfamiliarity with Western scholarly traditions and pressure to achieve study results are cited to be causes of plagiarism (Duff, Rogers, & Harris, 2006). In her review of literature on international students and textual borrowing practices, Amsberry (2009) shows that reasons for plagiarism are complex and multifaceted, with many aspects to consider when addressing this issue. Amsberry focuses on reasons that can be attributed to the students' cultural, linguistic and educational background. An important concern for many academic teachers is the question of which pedagogy is most suitable for preventing plagiarism. The approach adopted by the authors aligns with McCuen's (2008) supposition that most cases of plagiarism are unintentional, and that the issue should be approached from an

educational perspective, rather than punitive. In this paper we present how we have implemented our approach to plagiarism education into a Research Methodology course. International Master students' understanding of plagiarism is also described, as shown in class exercises, a mandatory quiz on plagiarism, and a survey we conducted in order to evaluate our teaching method.

Background

The course in Research Methodology, RM, for Master students in Electrical Engineering was developed at University of Kalmar (now Linnaeus University) and Blekinge Institute of Technology in Sweden. It was later extended to include Master programs in Mechanical and Computer Engineering, all of which are dominated by international students. About 80% of the students have come from Asia, mainly from India, Pakistan, Iran and China. Of the remaining 20% most students have come from Africa and Europe. Only a few Swedish students have attended the course.

From the inception of the course, how to properly use citations and referencing in a research paper has been a central issue discussed in the course. Since the majority of the Master students in the course are young people from various countries, plagiarism education has to be related to their diversity of cultures and habits. By learning how to use sources correctly, the students will avoid being suspected of plagiarism. Therefore the focus in this part of the course has not been how to avoid plagiarism, but on learning how to use information sources correctly.

The plagiarism content in the course was developed by librarians in collaboration with the course director. The librarians had previously taught similar classes, but those classes had not been fully integrated into any engineering course. The outcome of this component of the course is directly used by the students in other parts of the course, for instance to form a research question and hypothesis, and to report scientific results.

The course teachers have focused on integrating the different elements of the course for a comprehensive approach. As a complementary part of teaching the use of information resources, the course director discusses work ethics together with the students. The discussion is based on codes of ethics, according to the students' educational profile, such as the National Society of Professional Engineers (NSPE) ("NSPE Code of Ethics for Engineers," 2013), the Institute of Electrical and Electronics Engineers (IEEE) ("IEEE Code of Ethics," 2013), or the American Society of Mechanical Engineering (ASME) ("Code of Ethics - ASME Colorado Section, American Society of Mechanical Engineers," 2013).

Literature Review

The results of several studies confirm that plagiarism has to be approached not only as a moral problem, but also as an educational issue. A study carried out at San José State University (Jackson, 2006) showed that students lacked the ability to apply the concept of paraphrasing in practice; they consequently need more opportunities to practice paraphrasing in order to develop a better understanding of the concept and to be

able to apply it in their own texts. In her literature review, Jackson points to previous research which shows that students do not understand the concept of plagiarism and lack the knowledge and skills to avoid it. In 2007 librarians at University at Albany created workshops on the research process and plagiarism. The students who took part in the workshops also took pre- and post-tests. The results of these tests showed that the students' knowledge about plagiarism had improved after having attended the workshops (Chen & Ullen, 2011).

In her study, Broeckelman-Post (2008) shows that teaching explicitly what is expected from students with regard to the use of sources, is an effective approach for deterring plagiarism. In those cases where the teacher had talked about citing and referencing, the students were clearly less inclined to plagiarize. Liles and Rozalski (2004) describe how teaching the students to use style manuals helps them not to plagiarize.

Being explicit is especially important when teaching students who come from a different academic tradition, as the problem of plagiarism is not only closely related to ethical, but also to cultural aspects. According to Amsberry (2009), in some cultures, texts are seen as common property, and belonging to the whole society, not to one individual person. It may also be seen as a sign of respect or flattery to copy another author's text. However, as views of the concept of plagiarism and the practical application of the concept may vary greatly among students from one country, there may also be reasons to be cautious about making assumptions based on students' cultural background. Handa and Power (2005) argue "that students coming from different educational cultures require proper and explicit introduction into the principles and philosophy behind many western academic conventions as different conventions of scholarship...can create unique difficulties for them".

Similar observations were made by Duff, Rogers and Harris (2006), who found that the students' ideas of the concepts of academic integrity and plagiarism are founded on their historical and cultural assumptions. In their paper, Duff, Rogers and Harris (2006) assert that "notions of plagiarism are constructed culturally and the remedy for plagiarism is not necessarily punitive, but lies in making Western expectations of scholarship clear". Liu and Winn (2009) who studied international graduate students in Canada also argue that, apart from teaching skills on how to correctly use information, ethical and cultural contexts must also be considered.

As the course language is often not the students' first language, this is also a consideration when teaching international students. Unfamiliarity with conventions and practices of academic writing, as well as difficulties associated with writing in a language which is not the students' native language, may result in inappropriate use of sources. For example, students may copy the original text because they feel they are not able to express themselves well enough in English, or because they doubt their ability to convey the meaning of the original text (Amsberry, 2009). A research project in South Africa also points to students' difficulties in using their own words, especially when the course language is not their first language (Hendricks & Quinn, 2000).

McCuen argues that a time deadline can be a reason to plagiarize and that mentors therefore have “an obligation to identify situations that students face and that lead to significant pressure” (2008, p. 155). Anti-plagiarism-detection software is widely used in higher education as a response to students’ plagiarism. Although the tool is undoubtedly useful, it does not solve the problem, and can be applied just as a support for educational efforts aimed at reducing the problem (Youmans, 2011). According to McCuen (2008), it is common to include ethics education programs as a response to incidents of unethical behavior, but in the case of this RM course, ethics education was integrated into the course to prevent the occurrence.

From our own experience, and from literature on individual differences and unethical behavior, with an emphasis on the subjects of plagiarism and integrity (Martin, Rao, & Sloan, 2009; Wood, 2004), we believe that students can demonstrate contextual understanding of academic integrity. Handa and Power (2005, p. 74) proved that “the concept of plagiarism...elicited a wide range of responses and was not aligned with the concept of academic integrity in...practical application”. This suggests that it could be valuable to integrate plagiarism and academic integrity in courses. According to Handa and Power (2005), in engineering education, it is common that the issue of plagiarism is included as part of a separate course on information literacy. Such courses are typically taught by librarians, usually at the beginning of the program, for both under-graduate and post-graduate students.

Although librarians can contribute a general approach to the problem of plagiarism, in our experience students also need to learn the nuances of plagiarism within their discipline. For example, traditions regarding citing and referencing can vary between subject fields. This is also true for issues regarding a field’s common knowledge and paraphrasing. With this in mind, it is necessary for librarians and subject faculty to collaborate so that they may provide the students with specialized knowledge within the field.

In her article, Grafstein (2002) proposes such a discipline-based approach to teaching the components of information literacy, with a shared responsibility between teachers and librarians. Glassman et al. (2011, p. 346) also advocate a joint effort: “University faculty and administrators are unable to manage all plagiarism issues on their own. Librarians are a natural step into this necessary role.” Carroll and Zetterling (2009) recommend a holistic or integrated approach for preventing plagiarism. They suggest using various methods of instruction to encapsulate the issue. Such an approach makes use of lectures, discussions, written assignments, course literature, and interactive exercises which expose students to different perspectives on plagiarism.

Findings from previous research, as well as our teaching and research experience and feedback from students, have influenced the design of the course. Among the most important aspects of our approach to plagiarism education have been the close collaboration of librarians and faculty, having an educational perspective, rather than punitive, and also the integration of plagiarism education into students’ subject studies in engineering, for example by aligning plagiarism to professional codes of ethics. Together with reasons for plagiarism that can be related to the students’

cultural, linguistic and educational background, this has led us to implement an explicit, articulated, and integrated approach to plagiarism education. We also present findings on international master students' understanding of plagiarism as shown in class exercises, a plagiarism quiz, and our survey.

Methods

The Research Methodology course was mainly designed for Engineering Master students, in order to prepare them for writing their thesis proposal and thesis. The main part of the course is a research project, a *mini-final thesis* consisting of all the elements required for the thesis. It can also function as a pre-study for their final thesis. At this stage in their education, the students have a fairly long educational experience and understanding of their subject.

The primary objective of the Research Methodology course is to learn how to start and carry out a research project and how to write scientific texts, which are properly related to previous research and other people's texts. It is also included in the aims and learning outcomes of the course syllabus, that on completion of the course the student will be able to “use search tools and sources to base the research on scientific content” (“Course Syllabus,” 2013). The course syllabus also states that the theoretical part of the course among other things deals with legal and ethical aspects of research, where the plagiarism problem is approached from a more general perspective of academic integrity.

One teacher, the course director, and two librarians from the BTH university library collaborate in this course. Before teaching the course, the librarians and course director always meet and discuss updates of contents and method. The RM course is also a venue where both librarians and subject faculty can share their experiences and knowhow with the students. For example, the issue of preventing plagiarism is approached in several different course moments. Firstly, it is introduced theoretically and practically by the librarians in the information retrieval part of the course, in lectures, interactive exercises, and the course literature. Then, it is discussed during a seminar related to the relevant engineering association's code of ethics with the course director. Students demonstrate their skills in their reports; in particular, students are asked to survey related works and demonstrate their ability to reference/cite and paraphrase. A plagiarism detection service is also used.

The skills and knowledge which are taught are not limited to instruction on how to approach a scientific problem, or how to write a paper, but also to how to consciously apply a suitable method to prove a scientific hypothesis. For this reason, apart from the project, students read about philosophy of science, which helps students to understand scientific methods. The textbook which is used leads to the conclusion that new experimentalism is a suitable approach to an engineering problem (Chalmers, 1999). Such knowledge develops the students' research vocabulary and increases their confidence, and in turn, can reduce the improper usage of information sources.

To benefit from the intercultural environment in the class, students are divided into project groups with members from at least two different countries, more when

possible. Furthermore, at the beginning of the course an icebreaking exercise is carried out, where students discuss how they show respect toward parents, teachers and fellow students in their home countries.

After establishing project groups with defined projects, the groups deliver Excel based project plans, consisting of project tasks for each of the students and also clearly distinguished milestones and deliveries. The project progress is monitored by weekly project reports which each group gives to the teacher. This helps the students to work systematically and not leave all the work until the end of the course. It reduces stress and the deadline as a motivation factor for plagiarism. Students' stress was also further managed by teachers' availability and quick response to students' requests. This was reflected in the course evaluation.

To directly bind the two concepts of plagiarism and academic integrity together it is advisable to apply the code of ethics suitable for the student group. We believe that it is an honor for students to be a member of ASME or IEEE which are large professional associations of broad engineering disciplines. Students' attitude toward the associations enhances the codes' authority and helps validate their importance. Specific issues of the codes of ethics are discussed and analyzed during a workshop. In an open discussion the students discuss why it is important from a professional point of view to follow the code. They quickly conclude that engineers' professional integrity is of their own interest "and agree: . . . to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others" ("IEEE Code of Ethics," 2013). This aspect of the code is directly related to proper use of information sources, and as such, is emphasized in the course. The main argument to be committed to "highest ethical and professional conduct" is to preserve the prestige of engineers, which should be reflected in suitable appreciation of their work.

In the part of the course which is taught by librarians, the focus is on scientific information retrieval and use of information in a scientific context, in particular citing/referencing, copyright and avoiding plagiarism. Lectures, workshops and assignments are taught on the theme. An interactive exercise is included in the lecture, where students discuss cases in groups, and try to determine whether they are cases of plagiarism, or if they are examples of correct use/behavior. The cases are then discussed in the whole group with the librarians. The course director occasionally takes part in the discussions. This helps librarians and students understand the engineering point of view.

A web based tutorial, Refero – an Anti-plagiarism Tutorial (Andersson, Larsson, & Löfkvist, 2008) is used in the course. It was developed by the libraries of Blekinge Institute of Technology and Linnaeus University to help students in higher education understand what plagiarism is and give them advice on how to avoid it. From Refero, students learn reasons why they should cite their sources, and also when they do not need to add a reference. How to quote and paraphrase is described and exemplified, both with general examples and subject specific examples within humanities and social sciences, science and medicine, and engineering. In the subject specific examples there are both correct and incorrect examples of citing and paraphrasing.

Although the emphasis in Refero is on preventing plagiarism by learning correct citing and referencing, there are also sections on plagiarism detection services, and about the consequences if you plagiarize, for example disciplinary measures. As an obligatory assignment the students take a quiz with questions that are related to the Refero tutorial. The quiz results and their possible implications are described later in this article.

Another mandatory assignment is to find project references and write them according to a style manual of a professional publication. By learning to write correct references, the students may be able to avoid unintentional plagiarism.

Education about plagiarism detection services is also included in this part of the course. A plagiarism detection service is used to check the students' reports for plagiarism. The students are always warned by the teachers whenever their assignment is going to be controlled by the plagiarism detection service. They are also informed about missing quotations marks, or if the paraphrasing is not good enough. Furthermore, in students' peer reviews of other students' reports, they have been asked to check manually if the resources are used correctly.

Results

After going through Refero (Andersson et al., 2008), students take a quiz with questions that are related to the tutorial. Students' quiz results show that there is a high percentage of correct answers on most questions, but that they find the questions related to correct paraphrasing most challenging. In those questions they are given examples of original text passages and paraphrases and are asked to identify what, if anything is wrong with the paraphrase.

To investigate our approach to teaching about plagiarism we formed eight questions and asked students of spring semester 2011. 34 students of 35 registered to the course responded to the survey. At the time all the students in the course were international, mainly from Asia and Africa. For this reason, no comparisons were made between the Swedish and international students' understanding of plagiarism as shown in exercises, quiz results and the survey. The concept of plagiarism presented in the course was totally new to 18% of the participants, while 82% learned something new about the concept. No one was fully familiar with the idea. Among the things that were new to them, the most common choice was how to write references, 85%, followed by how to paraphrase/cite, 79%. Even when to add a reference was new for 74% and the IEEE Code of Ethics was unfamiliar to 68%. 12% answered that everything was new to them, see Fig. 1.

The students affirmed that it was a good idea or a very good idea to include the plagiarism issue in the course (97%). The same percentage of the students believed that what they learned regarding this issue will be useful for them in the future.

71% answered that plagiarism decreases the value of higher education and that it should be avoided. 65% think that there are ethical reasons involved. Disciplinary measures were marked by 50%, see Fig 2. None of the students answered that plagiarism is acceptable.

(Fig. 1 here.)

In the last open question one of the students wrote: “students should be well educated in the code of ethics in research work”. Another student thinks that “plagiarism is a very serious problem; we need to respect other people's works”.

(Fig. 2 here)

The course evaluation shows that the fact that ethical and cultural contexts are considered is highly appreciated by the students, for example the experience of working in multicultural project groups. The use of project management tools is also highly valued by the students, as it helps students to plan their work and avoid too much stress to build up close to deadline.

Discussion and conclusions

In the RM course for engineering Master students we have approached the matter of plagiarism prevention primarily as an educational issue, rather than punitive. We have found that the results from the survey and the quiz, as well as previous research, support this approach. Our case study shows that international Master students still need basic education on how to cite and reference properly in order to avoid plagiarism. They especially need more opportunities to practice paraphrasing, in order to develop a better understanding of the concept and be able to apply it in their own texts. This result is supported by a larger study carried out at San José State University (Jackson, 2006). It shows that such difficulties could be a cause of possible misuse of information sources.

The survey, individual students’ opinions and also teachers’ observations and experiences confirm that plagiarism as an issue of academic integrity has to be taught in respect to work ethics and educational culture. This is in accordance with previous research on plagiarism among international students, which shows that it is a complex issue with many aspects to consider, for example those that can be related to students’ cultural, linguistic and educational background (Amsberry, 2009). Being explicit about what is expected from students regarding use of information and referencing is one way to address these problems, which is supported by Broeckelman-Post (2008) and Handa and Power (2005)

We have found the continued collaboration between the teacher and the librarians to be rewarding as we can approach the issue of correct use of information from different points of view in the course. We can also contribute to the implementation of these points of view into complementary parts of the course. Due to the integration of the different parts of the course, students can directly apply what they have learned in one part of the course in other parts also. The continuous communication between the teachers also facilitated the application of a holistic approach to plagiarism prevention. Such a holistic, or integrated, teaching approach for preventing plagiarism is recommended by Carroll and Zetterling (2009) among others.

Some other methods are also applied in the course, which may help decrease the risk of students plagiarizing. The study of philosophy of science deepens students understanding of scientific methods, and also develops their research vocabulary, which

in turn facilitates the reporting of scientific results. A stable use of detection services makes students conscious of possible consequences of their actions. The project management tools used help students control their schedule and hence reduce stress, which is one cause for plagiarism.

When the survey was carried out all students in the course were international, therefore it was not possible to make comparisons between Swedish and international students' understanding of plagiarism. However, as the number of Swedish students has increased recently, this would be an interesting topic for future research.

For future development of the course, we would like to focus more on teaching correct paraphrasing in practice, as the results of the survey showed that this is what students found to be most challenging. Also, since unfamiliarity with the practices of academic writing can be one reason for students to plagiarize, introducing and developing web resources about academic writing can be useful for preventing plagiarism. Students survey answers to the question why they think plagiarism is wrong could also be used to develop the course, and to motivate the students' interest in learning about this issue. Finally, cultivating possibilities for the teachers to meet with teachers and students who have their background in different educational cultures could improve our knowledge of the intercultural aspects of the course.

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