Academic Integrity Best Practices To Discourage Dishonesty and Encourage Professional Behavior

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Abstract

This is a work in progress. As with many institutions, West Virginia University has experienced a recent uptick in academic dishonesty cases. In the fall of 2017 a sub-team within the Fundamentals of Engineering Program was tasked with identifying best practices for encouraging academic integrity while discouraging and identifying dishonesty. Initial findings were that the amount of available literature on the subject is disproportionate to the perceived size of the problem. For example, a search of one data base of a very large educational association with some 15 years of conference proceedings resulted in only about a dozen papers that discussed the topic. Much of the material that is available are the products of surveys seeking to identify attitudes of students and instructors about academic dishonesty. While these are of interest, few offer specific methods to prevent or discourage the behaviors. This work conducted a review of available literature from various sources to determine best practices surrounding academic integrity. The goal was to find and implement best practices for encouraging academic integrity, preventing dishonest behaviors, and detecting when such behaviors have occurred. A second goal was to determine which academic dishonesty practices were more common in students enrolled in our Fundamentals of Engineering Program. This paper also discusses practices implemented in the First Year Engineering Program to promote professional behavior and to discourage student misconduct. Some preliminary results and observations based on experience with these methods are presented.

Introduction

This is a work in progress. As with many institutions, West Virginia University has experienced a recent uptick in academic dishonesty cases. In the fall of 2017 a sub-team within the Fundamentals of Engineering Program was tasked with identifying best practices for encouraging academic integrity while discouraging and identifying dishonesty. The purpose of this sub-team was to identify how widespread the problem is, to identify how other institutions and experts suggest combating the problem and how to modify these solutions to fit our needs in the Fundamentals of Engineering Program. A second goal of the study was to determine which academic dishonesty practices were common among students enrolled in a Fundamentals of Engineering Program. While the amount of available literature on the subject is disproportionate to the perceived size of the problem, an attempt to collate and summarize it was made. Of particular interest were works that provided specific methods shown to prevent or discourage the behaviors. Some of these were implemented by the program starting in the spring of 2018, and preliminary findings are presented.

Literature Review

Defining cheating and examples of behavior that constitutes academic dishonesty.

In general terms, cheating is defined as being dishonest or deceitful. Table 1 provides examples of behaviors that are considered academic cheating. Such behaviors include copying from another student during a test or quiz, taking an exam for another student, and paying someone else to take an exam or to write a paper for you.

Table 1. Examples of behaviors that are considered cheating[1]

Copying from another student during a test or quiz
Permitting another student to look at your answer during a quiz or exam
Copying from an unapproved reference sheet during a closed-book test or quiz
Taking an exam for another student
Claiming to have handed in an assignment or exam when you did not
Copying an old term paper or lab-report from a previous year
Copying another student's homework when it is not permitted by the instructor
Submitting or copying homework assignments from previous terms
Paying someone else to take an exam/write a paper for you
Storing answers to a test in a calculator or Personal Digital Assistant (PDA)
Working in groups on Web-based quizzes

One issue with academic dishonesty is that students and instructors have different definitions of cheating. Therefore, it is important for institutions to define what constitutes cheating to students. In general, it is believed that students who cheat in college are more likely to shoplift, cheat in income taxes, abuse harmful substances, and engage in un-ethical behavior in the workspace. Students that cheat in high school also do it in college [1].

Among the different disciplines, Business and Engineering students are among the most likely to cheat, with cheating being more prevalent among business majors[1, 2]. Business promotes a result-oriented mindset focused on effectiveness, efficiency, and meeting goals in the short term. Students in business majors care more about getting the results achieved, and not on how they were achieved. This mindset appears to contribute to their willingness to engage in academic dishonesty. In general, students believe that it is the instructors' and institutions' responsibility to prevent cheating[1].

Understanding why students cheat

Researchers conducting work on academic dishonesty have divided the reasons for cheating into three main categories: demographic, situational, and psychological[1]. Demographics seem to plays a less important role in cheating[1]. Researchers have found no relationship between cheating and ethnicity[1]. A study on college level business students indicated that gender is not a predictor of academic dishonesty[3].

Situational factors are influences that are external to the student such as environment and people around. Several studies have found that the environment in the classroom seems to influence academic dishonesty. Some students blame instructors and poor instructional quality for cheating[1]. Another reason for cheating involves the lack of understanding or comprehension of the work[4]. Poor teaching style and dissatisfying classrooms led to cheating[5]. Students cheated less frequently when they were more free to express their opinions[5]. A different study showed that students seems to cheat when faculty members make little or no effort to prevent or avoid cheating[2]. Faculty response to cheating and sanction threats seems to influence cheating behavior[6].

Students that are associated with cheaters were more likely to cheat[5]. Students participating in students' organizations also tend to cheat more. Students are less likely to cheat if they feel that they could get caught[5]. In general, situational factors such as external work commitments, heavy course loads, financial aid or scholarship requirements seems to have little effect in cheating[1, 4].

Psychological factors seem to play the biggest role in academic dishonesty. For instance, a strong correlation has been found between students' values and cheating[1]. Engineering students appears not to be motivated to cheat due to excessive peer pressure or a competitive environment in engineering [1, 4]. However, for business students, to desire or need to get better grades, procrastination, and not enough time to complete work appears to contribute to cheating [4]. For high school students that value grades, those students seems to cheat with the purpose of getting higher grades[7].

In a study by Finn and Frone, the authors found that low achievers cheat when they do not identify with school, whereas high achievers with low levels of self-efficacy cheat[7]. Students that perceive a low ability to succeed in school, students that are not doing well in school, and those that have not identified with their school are most likely to cheat[7]. Studies indicate that students with low school achievement, low grades, or low intelligence tend to cheat more frequently[5]. There is an inverse relationship between GPA and cheating, with students with lower GPA found to be cheating more. Adolescents that feel alienated from school and those that are extrinsically oriented tend to cheat[8].

Fostering Academic Integrity

Whitley and Keith-Spiegel [9] suggest that by establishing a supportive classroom climate in which all students perceive to be fair, discussing academic integrity in the classroom along with expectations, facilitating student learning by providing clear reasoning in the classroom,

reducing pressure on students by introducing low risk assessment and implementing honor codes that the likelihood that students will engage in academically dishonest behaviors will decline.

Assignments

According to Whitley and Keith-Spiegel [9], one of the clearest ways to prevent academic dishonesty is to regularly change questions or exercises each time you teach a course to the best of the instructor's ability. By removing repeat assignments, students will not be able to find assignments from previous semesters. Therefore, instances of cheating will become more pronounced and hopefully easier to detect in your classroom.

Exams

Keep all exams secure by locking them up. Students have been known to try to attain copies of exams before they are administered. If digital copies of exams are kept, it's best to keep them in a secure location (on a USB drive locked in a desk drawer) and not kept on office computers. Paper copies of exams should be kept secure as well. When the exam is over, all additional copies should be shredded and disposed.

During exams, Hollinger and Lanza-Kaduce [10] suggest that by simply having an exam proctored, students view proctoring as an effective deterrent. Computer based exams may be proctored by having an extra set of eyes in the classroom or by utilizing an online proctor. There are quite a few options available with different functionality. Some of those functions are: limiting internet access to only the test window, having real time monitoring from the instructor's station, using the student's webcam to monitor testing conditions remotely, etc.

Term Papers

Term papers and written work can be checked for plagiarism with varying degrees of success through online plagiarism detectors. To name a few: plagiarismdetector.net, Grammarly.com and turnitin.com. Many of these websites will search internet sources, but some will search both cached papers and internet sources for evidence of plagiarism.

Unfortunately, there's no one method that prevents academic dishonesty. Instructors may need to mix and match methods for best results in their own learning environments.

Courses under consideration in this study

The engineering college at this university utilizes in a common first year program. In order to move to major, students must complete several typical first year requirements including maintaining a minimum GPA and completing with a C or better Calculus 1, General Chemistry, Introductory Composition & Rhetoric, First-Year Seminar, and two introductory engineering courses. Most students complete these in the first year, but some take the maximum time of two years to complete the requirements. The Fundamentals of Engineering Program teaches the First-Year Seminar course and the two introductory courses, named Engineering Problem Solving 1 and 2 respectively. Class sizes can vary from 40 to 70 students, with a total cohort of around 900 students annually. Both introductory courses are taught using project-based learning.

Engineering Problem Solving 1 is a two-credit, broad ranging course of primarily professional skills. Students learn teamwork, project management, report writing, oral presentations, ethics, inclusivity and diversity, data collection, data reduction using Excel, graphing, and Computer aided design (CAD) with Autodesk Inventor. Assignments are varied including written technical reports, short written essays, quizzes, exams, oral presentations, and on line assignments. Some assignments are completed as a team and submitted, but most are concluded individually.

Engineering Problem Solving 2 is a three-credit course focused on MATLAB programming. It also covers technical report writing, oral presentations, teamwork, project management, inclusivity and diversity, and using high level programming as an engineering tool. Assignments include coding problems as homework, quizzes, exams, project code, and technical reports. Most assignments are completed individually but some are done as a team in conjunction with the project.

Interventions to minimize academic dishonesty

Based on the literature review, the following list strategies for preventing and catching cheating was developed by the First Year Programs teaching team. [1-10]

- Create environment of integrity with integrated ethics
- Clearly define cheating in syllabus and on assignments
- Use recommended problems with quizzes
- Use case studies
- Use Blackboard or other Learning Management System (LMS) for question pools, randomizing, time stamps, IP address comparison, antiplagiarism tools (Turn It In), time limits
- Proctored exams only
- Use short answer questions
- Have students create questions
- Require explanations of solutions
- Require specific solution methods

In order to undertake and complete any task, whether nefarious or not, the person needs to have the motive, the means, and the opportunity. Although usually associated with crime fighting, these principles can also be applied to combatting academic integrity occurrences. Methods for controlling and preventing occurrences generally address one of these three categories.

While academic integrity has always been important at this university, the areas of motive, means and opportunity were specifically addressed starting in the spring of 2018. The teaching team strove to address enforcement and consequence uniformity across sections, and set of guidelines was created. This helped faculty to better communicate with students and to handle any occurrences. The following list of strategies was identified based on the literature:

Addressing Motive

A common method for addressing motive is the make any gain unworthy of the risk, because when consequences are severe, students are more likely to conclude that it’s not worth the risk to

cheat. The syllabus of the first semester engineering course was modified. The Academic Integrity section of the syllabus originally had a standard one-paragraph university-wide statement with a link to that part of the university academic catalog. This was maintained in the updated version, but supplementary information was added to the Classroom Conduct section which clarified what constitutes acceptable and unacceptable collaboration among students in regards to graded homework and project work. It also specified how exam and quiz procedure would be enforced, and behaviors that would be deemed unacceptable. This material was communicated at the beginning of the semester and throughout the course so that students were informed of their responsibilities. Coordinators of the Engineering Problem Solving 2 class decreased the weighting of the homework portion of the grade so as to reduce the desire for students to cheat on homework assignments. Faculty also promoted an environment of integrity by implementing the university's "WVU Core Values" of Service, Curiosity, Respect, Accountability, and Appreciation.

Addressing Means

Means for cheating were reduced by strengthening exams in several ways. Exams were given using the university's LMS system (Blackboard), which allowed for increased randomizing of questions and for drawing of questions from pools, so that all exams were of the same level of difficulty but contained different versions of questions and were in different order. More short answer and essay questions were added to the exams that required explanations and specific solution methods. Plagiarism-finding tools (Turn-it-in) were already in use by most instructors, and were implemented across all sections. A subscription to a common "homework help" web site was purchased so that instructors could better detect plagiarism and contract cheating.

Addressing Opportunity

Opportunities to cheat were reduced by eliminating some of the assignments where cheating was more common. In some classes, graded homework was nearly eliminated while implementing more frequent in-class assessments such as quizzes and graded activities. New projects were created so that project materials could not be re-cycled by students. At least two proctors were placed in each room during exams, cell phones were required to be placed in plastic containers on desks with their student IDs, and seating of students was randomized by the instructor for exam days.

Results and Conclusion

Data of reported incidences of academic dishonesty cases was collected by the registrar's office. These were cases that were reported by instructors to the registrar's office at the university level, and do not include some cases that were handled by instructors or by departments without higher level reporting. Data collection methods changed during 2016, so comparison of cases prior to 2017 with those after was difficult. All of the cases were those where academic dishonesty did occur and some type of sanction was made, but did not differentiate between severities of the infractions. The cases are aggregated over all of the courses taught by the Fundamentals of Engineering program. Total enrollment is about 900 per regular semester, and about 425 in the summer. There were 33 total academic dishonesty cases reported in 2017 and 39 in 2018, both

including summer sessions. The distribution among the semesters was inconsistent. The summer 2018 session had a considerably larger number of reported cases than any other session. Due to the fact that there are many factors that influence the numbers of cases reported in a given semester, review of the total numbers of cases was inconclusive. Figure 1 shows the number of cases by session. The large number in the summer of 2018 was considered to be an outlier due more to reporting of cases than a reflection of actual increase in cases. The increase of reported cases in the summer of 2018 could also be attributed to the fact that students that are taking summer session courses are usually trying to shorten their time to graduation. Students that are taking courses in this session could arguably have a higher motive to succeed in these classes.

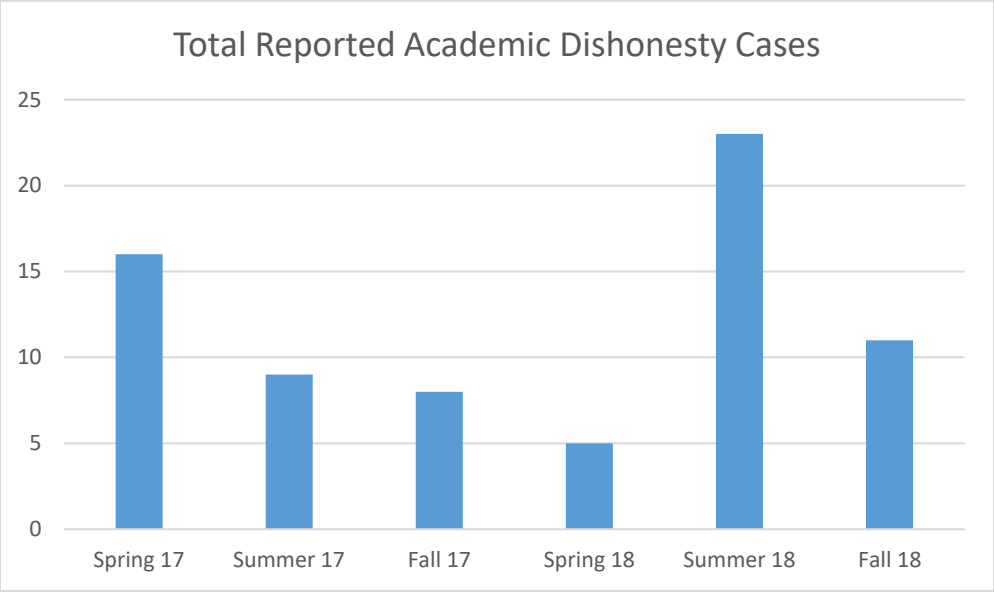

Figure 1: Total number of reported cases of academic dishonesty in the Fundamentals of Engineering Program at a large mid-Atlantic university

A review of the types of assignments and types of cheating in the reported cases was more informative. Exams were particularly improved. In 2017, eleven of 33 total reported cases were related to exams as opposed to 2018 where only one of 39 total cases was exam related. The methods for strengthening exams seems to have made an impact.

While the number of exam related cases decreased, there was an increase in the number of plagiarism cases reported. The total number of reported cases for the semester was similar even though there was growth in plagiarism reports on homework and written project reports. It is likely that the acceleration in reported cases was related to the increase in use of the plagiarism detection software and the faculty utilization of the “homework help” web site. This was particularly true in the summer of 2018, when many (11 of 23) plagiarism cases were reported on homework. Figures 2 and 3 show the differences in the types of incidents reported in 2017 and

2018. The proportion, as well as the number of plagiarism cases increased, but cheating on exams was greatly reduced due to the changes made to procedures.

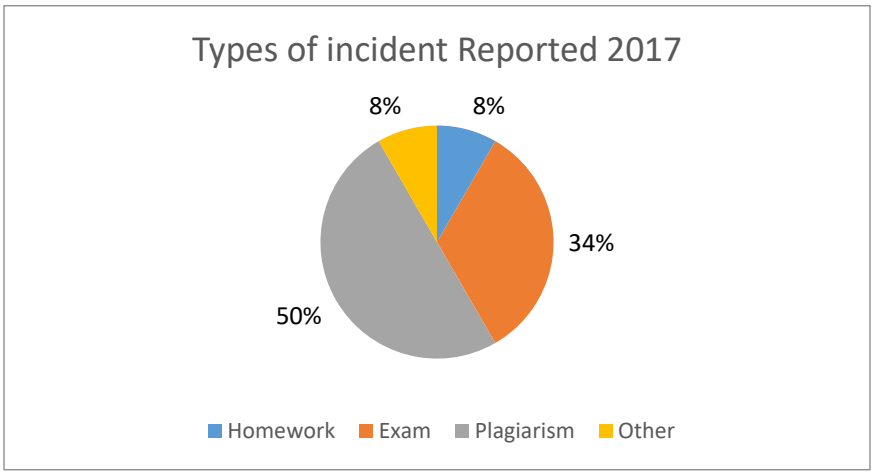

Figure 2: Types of Academic Dishonesty incidents reported in 2017

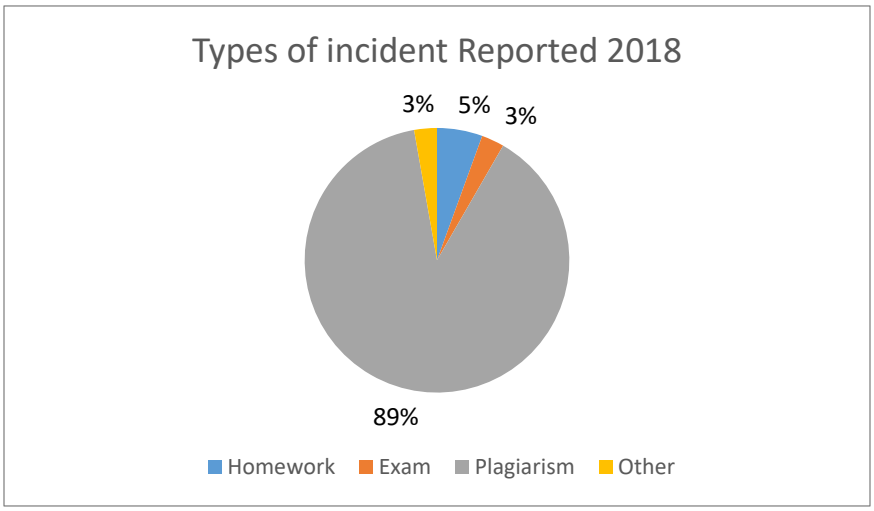

Figure 3: Types of Academic Dishonesty incidents reported in 2018

University-wide intervention against academic dishonesty

An institutional framework has been implemented at our academic institution in which cases of academic dishonesty are evaluated at the institutional level. Since the institution is recording and keeping track of all cases of dishonesty, repeated offenders are identified and sanctioned depending on the offence and the number of offenses. Repeated offenders are being suspended or expelled from the institution. An institutional approach to deal with academic dishonesty brings consistency, fairness and transparency to the process.

Future Work

The teaching team in the First Year Program are continuing to pursue avenues to reduce the motive, means and opportunity for academic dishonesty. Strategies include reducing the amount

and type of graded homework, especially in Engineering Problem Solving 2 course. Work will continue on exams and term papers to encourage academic integrity, and the methods that have been found to be successful will be enhanced. Since plagiarism was found in this study to be the most abundant type of academic dishonesty among first year engineering students, the First Year Program is educating students on what constitutes plagiarism and the consequences of it.

Eventually data will need to be collected from students about their motivators for engaging in academically dishonest behavior. Future work include conducting semi-structured interviews of offenders, especially of repeated offenders, to further understand what triggers academic dishonesty. Only then will there be insight into why students are cheating in these courses at this institution.

References

[1] D. D. Carpenter, T. S. Harding, C. J. Finelli, S. M. Montgomery, and H. J. Passow, "Engineering students' perceptions of and attitudes towards cheating," *Journal of Engineering Education*, vol. 95, pp. 181-194, 2006.

[2] D. L. McCabe, "Cheating among college and university students: A North American perspective," *International Journal for Educational Integrity*, vol. 1, 2005.

[3] D. E. Allmon, D. Page, and R. Rpberts, "Determinants of perceptions of cheating: Ethical orientation, personality and demographics," *Journal of Business Ethics*, vol. 23, pp. 411-422, 2000.

[4] D. L. Jones, "Academic dishonesty: Are more students cheating?," *Business Communication Quarterly*, vol. 74, pp. 141-150, 2011.

[5] A. Bushway and W. R. Nash, "School cheating behavior," *Review of Educational Research*, vol. 47, pp. 623-632, 1977.

[6] D. L. McCabe, L. K. Treviño, and K. D. Butterfield, "Cheating in academic institutions: A decade of research," *Ethics &Behavior*, vol. 11, pp. 219-232, 2001.

[7] K. V. Finn and M. R. Frone, "Academic performance and cheating: Moderating role of school identification and self-efficacy," *The Journal of Educational Research*, vol. 97, pp. 115-121, 2004.

[8] E. M. Anderman, T. Griesinger, and G. Westerfield, "Motivation and cheating during early adolescence," *Journal of Educational Psychology*, vol. 90, p. 84, 1998.

[9] B. E. Whitley and P. Keith-Spiegel. *Academic Dishonesty: An Educator's Guide. Psychology Press*, 2002.

[10] R. C. Hollinger & L. Lanza-Kaduce. *Academic dishonesty and the perceived effectiveness of countermeasures: An empirical survey of cheating at a major public university.* NASPA Journal, vol. 46, no. 4, 2009, 587–602.