

A COMPARISON OF THE ROLE OF ACADEMIC DISHONESTY POLICIES OF SEVERAL COLLEGES ON THE CHEATING BEHAVIOR OF ENGINEERING AND PRE-ENGINEERING STUDENTS

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Abstract— *While universities take a variety of approaches in dealing with academic dishonesty, current evidence suggests that institutions with honor codes have a significantly lower level of self-reported cheating as compared to non-honor code institutions. This paper focuses on five institutions and their effectiveness in dealing with cheating, specifically among engineering or pre-engineering students. Our goal is to provide greater understanding of what institutional approaches appear to be most effective in minimizing cheating among this specific sub-group. The paper presents a predictive model of the extent of cheating among engineering students at these institutions using a variety of variables, including the nature of the academic policies at the study institutions, student perceptions toward cheating on their campuses and other contextual variables. Results appear to indicate that the strongest predictor of increased cheating among this sample of engineering students was the sense that cheating was necessary to succeed. Other variables that made a significant impact were the presence of an honor code and membership in a fraternity or sorority.*

Index Terms ¾ Academic Dishonesty, Cheating, Honor Codes

INTRODUCTION

Academic dishonesty on college campuses has been a well known problem for some time. It seems that every few years it receives renewed attention when a particularly serious case arises in the national media, as evidenced recently by the cheating scandal at the University of Virginia [1]. Cheating in college is, in its own right, very serious, but it becomes even more so should that behavior extend into the workplace, particularly among the professions. While there has been considerable research on the issue of academic dishonesty, there is a paucity of data specific to engineering students, for whom it has been shown that rates of cheating are higher than almost all other disciplines [2,3].

Of particular interest to administrators is the impact of a controllable variable, such as their institution's academic dishonesty policy, on the frequency of cheating. This study seeks to examine students' perceptions of the academic

dishonesty policies of their institution to uncover those efforts that might be the most fruitful for administrators to focus on.

Honor codes have existed at many institutions as a primary means of reducing cheating for more than a century. Though available data is limited, formal honor code systems have been shown to reduce the extent of cheating [4]. For example, in a recently published study, 45% of students at non-honor code schools admitted to cheating on an exam, compared to only 25% at honor code institutions [5]. Therefore, we might suspect that institutions with formal honor code systems would be associated with decreased levels of cheating (Hypothesis #1).

It has also been established that effective communication of the institution's values to both students and faculty is an essential element to a successful academic integrity program [6]. In a study by McCabe and Trevino [7], it was found that ". . . [the] ability to promote a mutual understanding of the purpose of academic dishonesty policies was the strongest deterrent to cheating". Therefore, we suspect that academic dishonesty will be negatively related to students' perceived understanding of academic dishonesty policies by students and faculty (Hypothesis #2).

Faculty support of academic dishonesty policies also plays an important role. Research has suggested that the extent to which the values of students and faculty agree as they relate to cheating is a strong predictor of reduced cheating [4], and that the reinforcement of ethical behavior by faculty was an important component of successful honor codes [6]. Academic dishonesty should, therefore, be negatively related to students' perception of faculty support for the academic dishonesty policies of their institution (Hypothesis #3).

Formal sanctions for cheating imposed by the university are a traditional part of almost all academic dishonesty policies, often for the sole purpose of punishing the offender. However, recent work by Cochran [8] has shown that consistent, institutional sanctions actually validate social pressure against academic dishonesty, leading to less cheating. This would suggest that academic dishonesty will be negatively related to the perceived effectiveness of academic policies to deter cheating (Hypothesis #4).

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Furthermore, we might hypothesize that academic dishonesty would be negatively related to the likelihood of punishment if caught cheating (Hypothesis #5).

Honor codes usually include some form of student involvement in the establishment of policies and the adjudication of cheating cases [5]. In fact, at institutions with exclusive student responsibility for the honor code, cheating levels were found to be lowest [7]. This would suggest that academic dishonesty will be negatively related to perceived personal responsibility for the prevention of cheating (Hypothesis #6).

Finally, we examine two further hypotheses. Academic dishonesty will be positively related to the perception that cheating is a necessary part of life (Hypothesis #7), and that academic dishonesty will be positively related to the behavior of one's peers (Hypothesis #8).

METHODOLOGY

Sample

The study was conducted using a sample of approximately 350 engineering and pre-engineering students from five different U.S. institutions. These institutions include a public university (23.3% of sample), a private technological university (40.1% of sample), a private commuter university (24.4% of sample) and two community colleges (12.2% of sample). The average age of the students in the sample was 21.1 years (S.D.=4.34); however, it should be noted that the average age of students attending community colleges, 26.0 years, was significantly different from that of students attending the 4-year universities, 20.4 years ($t=8.491$, $p<0.001$). The sample consisted of 78.5% male students and 17.2% female students (4.3% of respondents did not indicate their gender). Ethnicity data was not collected for reasons of protecting student identities within small sample subsets. The sample had a mean G.P.A of 3.25 (S.D.=0.51) which was fairly consistent across all institutions. From past research we have noticed a significant effect of membership in fraternities or sororities on the level of academic dishonesty among engineering students [9]. For this reason, we included this information in the sample descriptives. Overall, 25.3% of the male students in the sample were members of a fraternity and 18.3% of female students were members of a sorority. However, the private technological university had a significantly higher percentage of students from the sample in greek organizations (43.3% of males, 33.3% of females) than did the other institutions included in the study ($\chi^2=43.64$, $p<0.001$).

Data Collection

Surveys were provided to specific faculty who volunteered to administer them during a class period in the 2001 calendar year. This approach ensured a very high response rate, however, we are aware that the sample likely does not

accurately reflect the entire student population at each institution. Respondents completed the surveys anonymously and returned them to their instructors, who in turn mailed them to the authors. A total of 349 surveys were returned for a total response rate of 92.5%. Thirty-five percent of respondents were freshmen, 14.7% were sophomores, 24.6% were juniors, 16.8% were fourth-year seniors and the remainder had been in school for more than four years.

Measures

A variety of measures, or variables, were assessed to determine the relationship between levels of cheating, the presence of honor codes and student perceptions of the social context within which cheating occurs at their institution. These measures are described here:

Cheating Index – The cheating index is a composite measure of the 18 types of self-reported academic dishonesty identified in the survey. These scenarios are listed in Table I. Respondents were asked to identify the frequency with which they had been involved in each of these scenarios using a scale of 1 = 0 times, 2 = 1-2 times and 3 = 3 or more times while in college. The composite score was generated by adding the responses for all scenarios, resulting in a measure with a range of 18 to 54, meaning never cheated in any of these ways to cheating frequently in all scenarios described. The scores for this variable ranged from 18 to 52 with a mean of 26.62 and a standard deviation of 6.50.

TABLE I
CHEATING SCENARIOS USED FOR CREATING CHEATING INDEX

Scenario
1. Copying from another student during a test or quiz
2. Permitting another student to look at your answers during a test
3. Asking about questions on a test that you have not taken
4. Delaying taking an exam with a false excuse
5. Improper use of a reference sheet during a closed-book exam
6. Claiming to have handed in an exam or assignment falsely
7. Taking an exam for another student
8. Adding false references to term papers to expand the bibliography
9. Copying an old term paper or lab-report from another student
10. Copying another student's homework when it is not permitted
11. Copying a passage from the textbook to complete an assignment
12. Submitting or copying homework assignments from previous terms
13. Witnessing a case of cheating in a class and not reporting it
14. Storing answers to a test on a calculator or PDA
15. Changing answers on a test and claiming it was incorrectly graded
16. Paying someone else to take an exam for you
17. Working in groups on web-based quizzes
18. Working in groups on take-home exams

However, examination of the residuals from subsequent regression analysis showed that the distribution was negatively skewed. Therefore, a natural log transformation of the cheating index variable was used. The distribution of the residuals of this variable is shown in Figure. 1. Also

shown is the probability plot of the residuals showing the high degree of normality in the distribution of residuals from the regression analysis. This transformed variable had a range of 2.89 to 3.95, a mean of 3.25 and a standard deviation of 0.23.

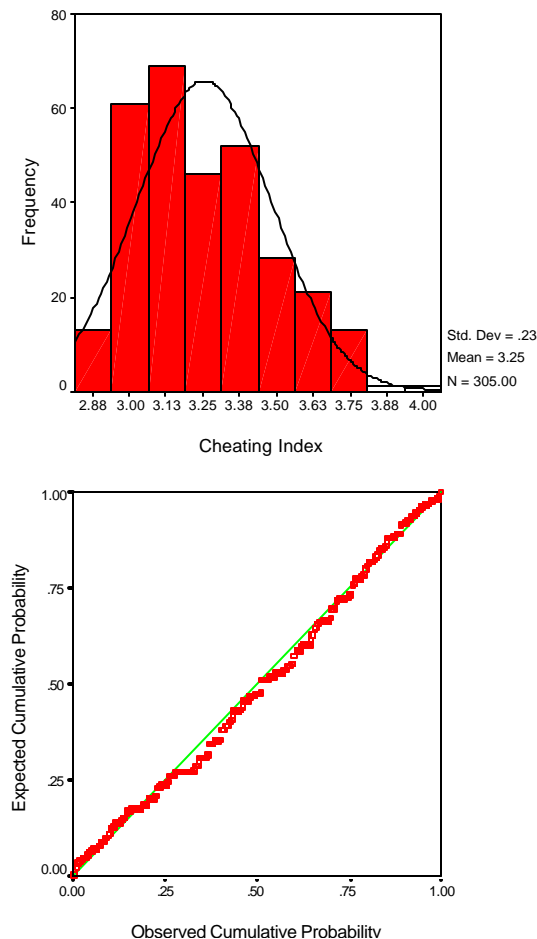


FIGURE 1

- A) DISTRIBUTION OF THE LOG TRANSFORMED CHEATING INDEX
- B) PROBABILITY PLOT OF THE RESIDUALS FOR THE LOG TRANSFORMED CHEATING INDEX

Honor Code – The academic dishonesty policies of each of the study institutions was examined and identified as either a non-honor code or an honor code school. The elements of an honor code, first described by Melendez [10], and later by McCabe and Trevino [7] are: unproctored exams, an honor pledge, student reportage and the existence of a peer judiciary (i.e. students directly involved in adjudication). Based on a review of the available academic policy documentation for each institution, it was determined that only the 4-year public university qualified as an honor code school under these criteria. For this dummy variable, a response of 1 = non-honor code, 2 = honor code was used.

Understanding of Policies – This variable was measured with a single question on the survey: “Do students and faculty understand the academic dishonesty policies of your institution?” Responses ranged from “not at all” to “a lot” on a three-point Likert scale.

Faculty Support– The extent to which students believe that their faculty support the academic dishonesty policies was measured with a three-point Likert scale from “not at all” to “a lot” that asked, “Do faculty support the academic dishonesty policies of your institution?”

Deterrent Effect – Student perceptions of whether the academic dishonesty policies of their institution actually deter cheating were measured with a single three-point Likert scale question that asked “Do the academic dishonesty policies at your institution deter cheating?” Responses ranged from “not at all” to “a lot.”

Likelihood of Punishment – The perception that students would be punished for cheating, if caught, was measured using a three point Likert scale question that asked “How likely is it that you would be punished if caught cheating?” Responses ranged from “not at all” to “a lot”.

Personal Responsibility – Students were asked to indicate whether they agreed with the statement “It is my responsibility to prevent cheating” on a five point Likert scale ranging from strongly disagree to strongly agree.

Cheating as Necessary – As a measure of the perception among students that cheating is necessary to succeed, students were asked whether they agreed with the statement “Cheating is a necessary part of life” on a five point Likert scale ranging from strongly disagree to strongly agree.

Peer’s Behavior – Respondents’ perceptions of their peers’ behavior was measured by asking students whether they agreed with the statement “Other students cheat more frequently than I do” on a five point Likert scale ranging from strongly disagree to strongly agree.

Other Contextual Variables – Students were also asked to indicate their age, gender and whether they belonged to a fraternity or sorority.

RESULTS

Variable Descriptives

Some rather interesting observations can be made by examining the frequency distributions of the various variables. For example, only 35% of the sample felt that the academic policies of their institutions were well understood by faculty and students. And only 49% felt that the faculty at their institutions fully supported these policies. In terms

of the effectiveness of academic policies, only 38% felt their institution's academic policies were very effective in deterring cheating, while 12% felt they were not at all effective. When asked whether they believed they had any personal responsibility for preventing cheating, only 20.3% of the sample agreed or strongly agreed with this statement. On the positive side, over 67% disagreed with the statement that cheating was a necessary part of life. However, as will be shown later, this variable plays a very significant role in the extent of cheating within this sample. Finally, we observed that only 3.9% of the respondents were willing to admit that they cheated more frequently than their peers did, as compared to 65.3% who believed that their peer's cheat more frequently than they do.

A comparison of the extent of cheating at the honor code institution and the non-honor code institutions was accomplished using a t-test of the log transformed cheating index variable. Overall, students at the honor code institution reported a significantly lower level of cheating compared to the remainder of the sample ($t=3.60$, $df=298$, $p<0.001$). The mean cheating index value for the honor code school was 3.17 compared to 3.28 for the non-honor code institutions (23.8 vs. 26.6).

A comparison was made between the honor code variable and all other variables to identify differences between student responses at the one honor code institution and those at the non-honor code institutions. Using Chi-square, we found only two such variables with significantly different responses: faculty support of academic policies and the deterrent effect of academic policies. For both of these variables, respondents from the honor code institution were more likely to respond "a lot" than those from other institutions in the sample.

A more detailed comparison of each institution was made using a one-way ANOVA of the transformed cheating index, which found that there was a significant difference between the various schools ($F(3,296)=4.917$, $p<0.01$). Post-hoc analysis showed that these differences were primarily between the one honor code school and the other two 4-year institutions in the study (there was no significant difference

in the cheating index scores of these two schools). The lack of a significant difference between the community colleges and the one honor code institution is attributed to a small sample size for the community colleges.

Correlations

Correlations among the variables were measured using Spearman's correlation coefficient. These correlations are presented in

Table II. Significant correlations are shown in bold. These results indicate that higher values of the transformed cheating index variable are significantly correlated ($p<0.01$) with 1) the lack of an honor code, 2) a perceived lack of faculty support for the institution's policies, 3) the perception that cheating is a necessary part of life and 4) membership in a fraternity or sorority. Academic dishonesty is negatively correlated, though less significantly, with 1) the extent to which faculty and students understand the academic policies of their institution, 2) the likelihood of punishment if caught and 3) a sense of personal responsibility for preventing cheating. In addition, older students were more likely to cheat ($r = 0.12$, $p<0.05$).

Further there appear to be significant intercorrelations between understanding, faculty support, and the deterrent effect of an institution's academic policies, as well as the likelihood of being punished if caught. In addition, in those situations where students take greater personal responsibility for preventing cheating, they perceive a stronger deterrent effect of their academic policies and a greater likelihood of being punished for cheating.

Among the other contextual variables, age does not appear to have strong correlations with any variable except for the lack of an honor code, which is likely due to the significantly higher age of students attending the community colleges. A weak positive correlation is seen between age and the extent of cheating.

TABLE II
CORRELATIONS OF STUDY VARIABLES (SIGNIFICANT CORRELATIONS SHOWN IN BOLD)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Honor Code	-											
2. Understanding of Policies	.05	-										
3. Faculty Support	.04	.35[‡]	-									
4. Deterrent Effect	.15[‡]	.30[‡]	.31[‡]	-								
5. Likelihood of Punishment	.12[*]	.26[‡]	.31[‡]	.27[‡]	-							
6. Personal Responsibility	.04	.03	.07	.15[‡]	.15[‡]	-						
7. Cheating as Necessary	-.02	-.14[*]	-.08	.06	-.11[*]	-.14[*]	-					
8. Peer's Behavior	-.11	-.10	-.04	-.14[*]	-.13[*]	-.09	-.12[*]	-				
9. Age	-.36[‡]	-.06	-.05	-.07	-.08	.01	-.06	.02	-			
10. Gender	-.10	.02	.02	.05	-.07	-.11[*]	.04	.15[‡]	.01	-		
11. Fraternity/Sorority Membership	-.17[‡]	-.04	-.07	-.01	-.02	.02	.15[‡]	-.12[*]	-.01	.06	-	
12. Log Cheating Index	-.21[‡]	-.14[*]	-.18[‡]	-.02	-.14[*]	-.14[*]	.35[‡]	-.10	.12[*]	-.05	.18[‡]	-

Note: * - Significant to $p<0.05$, ‡ - Significant to $p<0.01$

Gender also lacks many significant correlations with the other variables, except that women are somewhat more

likely to take personal responsibility to prevent cheating and view others as cheating more than they do.

Membership in a fraternity or sorority is significantly correlated with the perception that cheating is necessary and negatively correlated with the view that their peers cheat more frequently.

Regression Analysis

To examine the relative impact of each variable on the self-reported frequency of cheating among the sample, a multiple regression analysis was conducted with the log transformed cheating index as the dependent variable and the others as the independent variables. A stepwise method was employed with an acceptance criterion of $p < 0.05$.

The model was significant; however, only three of the study variables made significant contributions to the final model. These included perceiving cheating as necessary, the presence of an honor code and membership in a fraternity or sorority, as seen in Table III. By far, the view that cheating was a necessary part of life had the greatest impact on the values for the cheating index. Membership in a fraternity or sorority has a significant positive relationship with academic dishonesty, while the existence of an honor code appears to have a negative effect on the extent of cheating.

TABLE III

REGRESSION OF STUDY VARIABLES WITH LOG TRANSFORMED CHEATING INDEX AS THE DEPENDENT VARIABLE (INCLUDED VARIABLES IN BOLD)

Variable	B	β	p
Constant	3.131		
Honor Code	-.093	-.166	.003
Understanding of Policies		-.094	.094
Faculty Support		-.108	.052
Deterrent Effect		.019	.732
Likelihood of Punishment		-.051	.370
Personal Responsibility		-.078	.161
Cheating as Necessary	.070	.329	.001
Peer's Behavior		-.081	.152
Age		.005	.924
Gender		-.097	.080
Fraternity/Sorority Membership	.064	.122	.024

NOTE: N = 280, $R^2 = .169$, Adjusted $R^2 = .160$, $F(11,269) = 18.75$, $p < 0.001$

Since the variable cheating as a necessary part of life appears to play such an important part in the measured extent of student cheating, we conducted a post-hoc regression of this as the dependent variable and all remaining variables as the independent variables. The results of this regression are shown in Table IV, with only the included variables shown.

DISCUSSION

The positive effect of formal honor codes in this study is evident by using a simple t-test, which indicated a significantly lower frequency of cheating, based on the cheating index used here, at the one honor code institution, as compared to the non-honor code institutions.

Table IV

POST-HOC REGRESSION OF STUDY VARIABLES WITH CHEATING AS A NECESSARY PART OF LIFE AS THE DEPENDENT VARIABLE

Variable	B	β	p
Constant	4.623		
Likelihood of Punishment	-.326	-.163	.005
Peer's Behavior	-.226	-.182	.001
Understanding of Policies	-.354	-.172	.003
Personal Responsibility	-.143	-.147	.008

NOTE: N = 317, $R^2 = .108$, Adjusted $R^2 = .094$, $F(5,317) = 7.545$, $p < 0.001$

The correlational data indicated that the strongest relationships between academic dishonesty levels and other variables were 1) the lack of an honor code and 2) membership in a fraternity or sorority. The former supports our first hypothesis that honor codes have a mitigating effect on levels of cheating, which is further supported by the literature [4],[5],[7]. The latter finding confirms earlier observations from our data that fraternity or sorority membership does appear to be related to increased cheating. This effect has been observed by other researchers as well [2],[11],[12],[13]. However, caution should be taken as our sample contained one school with significantly higher numbers of fraternity and sorority members than the other institutions. More data is needed to confirm this relationship.

The correlational data also supported the hypotheses that academic dishonesty is negatively associated with understanding of academic policies, faculty support for these policies, the likelihood of punishment for cheating and a sense of personal responsibility for preventing cheating. And it was positively related to the sense among students that cheating was a necessary part of life. This analysis did not, however, support the hypothesis that a perceived deterrent effect would be related to decreased cheating and that perceived high levels of peer cheating would result in increased levels of cheating among respondents.

We might also point out that gender was not significantly correlated with academic dishonesty. Earlier research has indicated higher levels of cheating among male students [4],[15],[16],[17], but more recent research finds that cheating among women has increased while that of men has remained flat [13],[18],[19]. We find no significant difference in the rates of cheating between men and women in this study ($t = 0.64$, $p = 0.53$), suggesting that for this sample, women are cheating at equal rates to men.

Multivariate regression was used to determine the magnitude of the effect of each of the study variables on the level of cheating. This analysis found that the perception that cheating was a necessary part of life was the most important variable, suggesting a strong influence from values and social norms. Post-hoc analysis indicated that the strongest influence on whether students viewed cheating as necessary was their peer's behavior. However, this was an inverse relationship, suggesting a contradiction with social

learning theory that argues that cheating behavior would be learned from one's peers. Instead we find that perhaps those students who recognize they cheat more frequently than their peers also would see it as necessary, perhaps to compete. This suggests a strong influence of values developed prior to entering the university setting. In fact, we find a strong correlation between the perception of cheating as necessary and the frequency with which students cheated in high school ($R^2=.213$, $p<.001$). Furthermore, there is a significant relationship between viewing cheating as necessary and membership in fraternities and sororities ($R^2=0.15$, $p<0.01$), which is also a significant variable in the regression analysis of the frequency of cheating. This may indicate that in some social circles cheating may be so endemic that the social setting is normative rather than a deterrent. From the administrative point of view, significant efforts may be needed to address values and ethics early in the engineering curriculum and to convince the leaders of certain social groups, such as fraternities and sororities, to be more supportive of these efforts.

The post-hoc regression analysis also found that the perception that cheating is necessary is negatively influenced by better understanding of the academic policies, an increased likelihood of punishment, and a sense of personal responsibility. The influence of these variables may yet provide opportunities for practical approaches to reducing cheating among students. An institution's ability to effectively communicate and support a mutual understanding of its academic policies between faculty and students may help to reduce the sense that cheating is necessary. Also important will be the sense that the school takes instances of cheating very seriously and that faculty will initiate formal sanctions against students they catch cheating. This may be difficult considering the ample evidence that faculty are reluctant to punish, much less report, cheaters. Finally, involving students directly in any efforts to reduce cheating through both policy development and adjudication is critical. At most honor code institutions this is accomplished through student-run judiciary panels, honor pledges, reportage and unproctored examinations. And in fact we see in the regression analysis that the lack of a formal honor code system, such as that described here, is a significant influence on the level of cheating at the institutions in this study.

Thus we see that a positive first step may be the development of a formal honor code system that is supported by the entire university community and that places greater emphasis on the act of learning. However, it would be incorrect to assume that this is the only step needed to reverse recent trends in academic dishonesty. Careful attention must be paid to addressing issues of values and ethics with our students, not only in the professional sense, but also as members of an academic learning community.

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