

8-23-2022

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Measuring Academic Integrity Perceptions and the Correlation with Ethical Reasoning

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Measuring Academic Integrity Perceptions and the Correlation with Ethical Reasoning

Abstract

Here we share findings of student and faculty perceptions of academic integrity practices at two institutions, gaps between these perceptions, and how these perceptions may correlate with markers of ethical engineering identity formation. We hypothesize that a climate of informed ethical practices surrounding academic integrity supports higher levels of student outcomes on an ethical reasoning assessment. As part of this mixed methods study, engineering students indicated their perceptions via a confidential survey of how well faculty fulfill several best practices for supporting academic integrity: articulating clear policies, preventing cheating, and promoting the value of integrity in class. Students also self-reported their perceived achievement of ethical reasoning and what value they place on it. Student responses are compared with performance on an objective ethical-reasoning exam which involves applying a code of ethics to multiple-choice problems that are modeled after licensing exam ethics questions.

Engineering faculty indicated via an anonymized survey and individual interviews their perceptions of how well they fulfill the same best practices for supporting academic integrity as referenced above. Faculty also shared perceptions of the achievement level of student ethical reasoning and what value students place upon it. The gap of student vs. faculty perceptions is compared with student performance on the objective ethical-reasoning exam at one institution. We expected larger perception gaps would correlate to lower ethical reasoning performance. Although our data is not sufficient to support the hypothesis, the results contribute significantly to further investigation and future academic integrity work. Future work beyond the scope of this paper will seek to lower the perception gap by identifying and motivating better faculty support for student academic integrity, which is hoped to lead to higher student outcomes. The work reported in this paper is designed to assess needs and serve as the background to launch future changes in academic integrity education and practices within the two Engineering Schools studied.

Introduction

The National Academy of Engineers, in its seminal document “The Engineer of 2020” [1], establishes that engineers of the future must possess “high ethical standards and a strong sense of professionalism.” One potential indicator of future professional ethical behavior among college students is their approach to academic integrity during their education. If a relationship between academic integrity and future professional ethics exists, then there is a strong motivation to reexamine how academic integrity is taught and enforced in engineering programs.

It is extremely difficult to get an accurate estimate of the extent of academic dishonesty in undergraduate engineering programs. This is in part due to the likelihood that students are not entirely honest when self-reporting academic misconducts, even in anonymous formats [2]. Studies have shown, however, that engineering students are among the most likely student populations to cheat in their courses, second only to business students [3]. Some reasons for this high rate of cheating may include the difficulty of the subject matter, the high workloads, and an increased presence of competition in their courses, but not all research supports these

conclusions [4], [5], [6]. Across all studies, however, it appears that the quantity of engineering students who participate in at least some form of academic dishonesty while in college may be as high as around 95% [7], [8], [9].

Factors in Cheating Behavior

Besides the program of study, other demographic, situational, and psychological factors have been examined to assess their correlation with cheating behaviors. In most studies, it does not appear that demographics, such as gender or ethnicity, play an important role [3], [6]. As one possible exception, however, international students may be five to six times more likely to be reported for academic integrity issues [10]. This issue is likely due to international schools possessing a different set of rules regarding academic integrity, leaving international students to start at a different place in their understanding of integrity issues than their non-international peers [10]. This is supported by the finding that most students in a first-year engineering program understood academic dishonesty as morally wrong, suggesting high school experiences play a major role in shaping student attitudes towards academic integrity [2].

For the most part, situational factors also do not have a major impact on cheating, with a few exceptions. The quality of instruction in the classroom seems to possess a strong correlation with cheating, as many students experienced reduced inhibitions toward academic dishonesty when they perceived their instructors to be unfair or unskilled [9], [11], [3], [6]. Also, students who are heavily involved in student organizations, such as social fraternities and sororities or athletics, have shown a tendency to cheat more regularly [7], [3], [6].

Psychological factors, such as students' value systems, are generally the most closely correlated factors with students' likelihood of cheating [6]. However, while students' attitudes toward cheating behaviors are related to their willingness to demonstrate that behavior, there is also sufficient evidence to suggest that students will at least occasionally knowingly choose dishonest actions even though they consider them to be wrong [9]. Students' values related to cheating also seem to be less restrictive for assessments that take place through technology or outside of the classroom [3].

Addressing Academic Integrity Issues

Academic integrity can be addressed at an institutional or individual faculty level. For example, at an institutional level, implementation and clear communication of a strong institutional honor code has been shown to be related to reduced cases of academic dishonesty [7], [9], [3]. Even in the absence of a clear honor code, a cultural commitment to academic integrity at the institutional, faculty, and peer levels, has been shown to reduce instances of cheating [7], [4], [12]. At most institutions, the approach to maintaining academic integrity is based in deterrence theory, to varying levels of success. For deterrence to be effective, there must be reasonable certainty (likelihood of getting caught), celerity (a quick imposition of the penalty), and severity (a harsh enough penalty) [13]. One different perspective on addressing academic integrity involves implementing crime-fighting principles to focus on addressing students' motives, means, and opportunities for cheating by policy and curricular design [6].

There is an even greater opportunity for improving academic integrity at the individual faculty level. Carpenter et al. [9] suggest that “the greatest reduction in cheating may come from faculty who promote and nurture the highest levels of integrity both from the students and themselves in their classrooms.” While there is a high potential for improvement in academic integrity at the individual faculty level, there are also some critical challenges. One of the biggest hurdles for improving academic integrity appears to be the difference in how students and faculty view academic integrity and cheating [9], [4], [12]. This pervades all the way down to their differing definitions of cheating, with faculty typically perceiving unethical behavior to be inherently a part of cheating, while students see cheating and acting unethically as separate issues [4], [11], [3].

This is a particularly concerning outcome, given that at least some students report that faculty are their primary source of information regarding topics related to academic integrity (an introductory engineering course that addressed academic integrity issues was shown to be nearly as important as faculty communications, with the university website, student handbook, and peers all reported as being significantly less influential sources) [14]. If faculty possess a particular definition of academic integrity and are the primary conveyors of academic integrity topics, yet students do not share the same definitions, then the most logical conclusion is that faculty are not effectively communicating their expectations. Despite faculty being a critical part of the development and enforcement of academic integrity, faculty members may also prefer not to invest their time in attempting to detect cheating or in taking confrontational, consistent, and formal actions when they do [9], [13]. Some faculty members view communicating principles of academic integrity through their actions as role models to be sufficient integrity instruction, but Holsapple et al. [5] found that students instead often view faculty as either ethically neutral or unethical in their behaviors, and regardless did not consider the role-modeling of faculty as contributing to their ethics education.

Students hold the belief that the responsibility for limiting cheating ultimately lies with the faculty and broader institution, not the students themselves [9], [3]. When students perceive that their peers are dishonest, they will be more likely to cheat themselves [7], [9], [4], [6]. It has been demonstrated that students tend to believe that their peers are cheating as much, if not more, than they do [9], [3]. Students are also unlikely to report the cheating of other students [9]. These findings, taken together, reinforce the importance of the established institutional culture on students’ academic integrity practices. Students believe that faculty carry the responsibility to dissuade cheating - for example, by not reusing exams and assignments – and faculty members who fail to do so are perceived as permitting cheating behaviors [3]. While this may not be the way faculty members would wish for students to approach their courses, it does reinforce the fact that the opportunity exists for an individual faculty member to minimize students’ cheating through the way they design and run their courses [3].

Importance of Addressing Academic Integrity, and Relationships to Professional Ethics

A major risk in letting professional students commit acts of academic dishonesty is the broader implications for the profession itself [8], [13]. This could manifest itself through graduates not possessing the necessary knowledge to support professional practice [13]. This could also create an increased likelihood of students exhibiting dishonest behaviors and practices in the

professional workplace [8], [9], [13]. Cheating is habit forming; it becomes a way to cope with feeling unable or unwilling to earn something one wants or needs, and there is no reason to think such a habit would be restricted to the academic setting [15]. Harding et al. [8] found that engineering professionals who committed unethical acts in the workplace typically did so due to the themes of “wanting or needing something” or perceiving that the activity “seemed harmless”; both are examples of motivations that students would similarly experience during their college educations. Researchers have found that a strong relationship exists between students’ past behaviors (cheating in high school) and later unethical behaviors (cheating in college or acting dishonestly in the workplace) [8], [3].

Besides the indirect relationship to habits of academic integrity, numerous studies have also identified concerns that ethical education at the undergraduate level has not prepared graduates well to address social and ethical concerns in their practice as professional engineers [5]. Instructors and students seem to disagree about not only the relevance, but also the content of the undergraduate ethics education that is being provided [5]. What faculty view as complex and nuanced ethics instruction, students tend to perceive as a simplistic, black-and-white approach [5]. An unbalanced focus on academic integrity with the purpose of establishing and enforcing rules related to cheating produces this overly simplistic ethics experience for students and may interfere with their more nuanced understanding of ethics in their professional fields [5].

The relationship between academic integrity and professional ethics is therefore an important and complex one. This study aims to further explore the differences that exist between student and faculty perceptions of these topics.

Methods

Setting

This study involves two private teaching-focused universities with 450-600 engineering students each, and approximately 25 engineering faculty each. The school cultures both include a large amount of interaction between students and faculty, including individual and small-group mentorship. This study was created and conducted primarily by one professor at each institution. In this paper we use the names “South University” and “North University” to refer to LeTourneau University and Cedarville University, respectively.

Data Collection

A mixed methods approach was selected for this study which includes the integration of data collected through both quantitative and qualitative methods [16]. This approach was deemed a good fit due to the opportunity it presents to collect detailed information from a few individuals and generalized information from a much larger population [17]. The surveys all include Likert-scale questions and open-ended text comments, and a small number of interviews were also conducted. Table 1 below summarizes the data collection methods used in this study.

Table 1: Data Collection Methods in this Study

Population	Method	South U.	North U.	Data Type
Students	Survey	n=79 (paper)	n=186 (online)	Likert + Comments
	Interview	n=0	n/a	Comments
	Ethical-Reasoning Exam	n=78	n/a	Objective Score
Faculty	Survey	n=18 (paper)	n=17 (online)	Likert + Comments
	Interview	n=4	n/a	Comments

South University Students – Paper Survey, Ethical-Reasoning Exam, and Interviews

We created and deployed a hardcopy academic integrity survey in a Sophomore Engineering Seminar which includes all second-year engineering students at South University. The seminar class meets one hour a week for pass/fail credit based on attendance. We created the academic integrity survey (Appendix A) with 15 Likert-scale questions and two open-ended text comments. Of the 103 students, 79 voluntarily completed the survey. Most completed the survey in class and four later submitted it electronically (some students participate in the seminar via asynchronous videos rather than in-person attendance). Almost all students are in their fourth semester of various engineering majors. Students were assured of the strict confidentiality of their identity. They were asked to provide their identity to allow correlating survey results with scores on an in-class objective ethical-reasoning exam. The ethical-reasoning exam involves applying a code of ethics to multiple-choice problems that are modeled after licensing exam ethics questions. The ethical-reasoning exam was developed by the authors earlier for internal program assessment as part of continuous improvement efforts linked to ABET accreditation.

We sent an interview invitation via email to students in the South University seminar a few days after the survey was completed. The confidential interview protocol consists entirely of the invitation to make open-ended comments on each of the survey questions. However, no students chose to participate in the interview, possibly due to time constraints and reluctance to discuss academic integrity face-to-face with a faculty member. The only incentive offered to participate in the interviews was the future benefit to students and faculty, and the opportunity to be heard.

South University Faculty – Paper Survey and Interviews

In a school of engineering faculty meeting, the faculty survey was passed out and faculty were invited to voluntarily complete the survey. We also emailed the survey and some faculty completed it a few days later, bringing the participation rate to 18 out of 27 invitations. The school meeting included a talk of approximately 7 minutes on Academic Integrity to raise awareness and motivate attention to this important topic. The faculty survey is anonymous but does ask faculty to list their department. Approximately half of faculty did not indicate their department, which may have been due to a desire for increased confidentiality or the question

could have been mistaken for introductory text. The lack of department indication in the data prevented meaningful investigation of department-level comparisons between faculty and students.

Faculty were invited to an in-person interview both verbally during the school meeting and via email after the surveys were completed. Four South University faculty volunteered to participate in individual interviews. Again, the confidential interview protocol consists entirely of the invitation to make open-ended comments on any of the survey questions.

North University Students – On-line Surveys

All North University students in engineering and computer science were sent an online version of the student survey. In addition, NU students were asked their class year. These surveys are anonymous and individual responses are confidential. The response rate was 186 out of approximately 600 students. The ethical-reasoning exam and in-person interviews were not offered at North University.

North University Faculty – On-line Surveys

All North University faculty in engineering and computer science were sent an online version of the faculty survey. In addition, NU faculty were asked their years of faculty experience, which was not included on the SU survey. These surveys are anonymous and individual responses are confidential. The response rate was 17 out of 25 faculty. In-person interviews were not offered at North University.

Limitations

This study has several limitations. All participants are self-selected, with a response rate of approximately 70% of the faculty population of interest, 77% of Sophomore students at South University, and 30% of all students of interest at North University. Although these participation rates are significant, it is possible that students with dissenting views on academic integrity disproportionately opted-out of participation. As is the nature of studying perceptions, this study uses self-reporting in many answers, although some can be cross-checked (for example, if faculty think they adequately clarify cheating, do students agree?) We also note the survey Likert-scale questions likely influenced the open-ended comments; for example, the question “I take sufficient steps to prevent cheating ...” was likely considered when faculty were writing open-ended comments. The objective ethical-reasoning exam is a useful although limited measure of ethical-reasoning ability, with confounding factors such as student reading comprehension. Finally, the ability to generalize findings to other types of institutions is limited by the number and type of institutions in this study.

Analysis and Results

Data Analysis – Student Survey Ratings

Table 2 below shows the student survey average ratings for both Universities. The rating scale is [-2=strongly disagree, -1=disagree, 0=neutral, +1=agree, +2=strongly agree]. The average rating for each item is strikingly similar at each university (none differ by more than 0.2). The standard deviations for the responses to most items are in the range from 0.7 - 1.0. Some noteworthy results are:

On *average*, students:

- 1) **Agree** teachers sufficiently clarify cheating in engineering classes.
 - 2) Are **neutral** as to whether some banned behaviors would actually help their learning (however, 35-40% of students agree or strongly agree with this prompt, which is reflected in numerous free-response comments requesting for increased allowances).
 - 3) **Agree** most other students are aware of the definition of cheating (although note the calls for clearer definitions in the free-response comments, even though only 6-10% of students disagreed with this statement).
 - 4) **Agree** teachers sufficiently de-motivate cheating (“encourage students not to cheat”).
 - 5) Are **neutral** regarding wishes for more cheating prevention.
 - 6) **Disagree** non-cheaters are disadvantaged.
 - 7) Are **neutral** that most cheaters are caught.
 - 8) **Agree** they know what to do when a classmate is cheating.
 - 9) **Agree** (strongly) that being able to handle difficult ethical job situations is very important.
 - 10) **Agree** they can spot ethical risks and figure out what to do.
- 11-13) **Agree** most students believe cheating in school is unethical, cheating on the job is more serious, and cheating in school leads to unethical job behavior.
- 14-15) **Agree** (strongly) they have the ability to do well in classes, internships, and jobs.

Table 2: Student Survey - Average Ratings (South U. n=79, North U. n=186)

Item	Student Survey Prompt (-2=strongly disagree, -1=disagree, 0=neutral, +1=agree, +2=strongly agree)	SU AVG	NU AVG
1	Teachers sufficiently clarify what is considered cheating in my engineering ¹ classes.	1.1	1.2
2	Some things my teachers consider cheating would actually help my learning if allowed.	0.1	0.1
3	Most students are aware what is and is not cheating in my engineering classes.	0.9	1.1
4	Teachers sufficiently encourage students not to cheat in my engineering classes.	1.4	1.4
5	I wish teachers did more to prevent cheating in my engineering classes.	0.0	-0.2
6	Students who don't cheat are at a disadvantage for grades.	-0.8	-0.7
7	Most students who cheat in my classes are eventually caught.	-0.2	-0.2
8	I know what to do if I find out a classmate is cheating.	0.5	0.4
9	Being able to handle difficult ethical situations on the job is very important to me.	1.5	1.4
10	I am able to tell when an engineering decision could be unethical and figure out what to do.	1.1	1.0
11	Most students believe cheating in school is unethical (morally wrong).	0.9	1.1
12	Most students think cheating on the job is more serious than cheating in school.	1.0	0.9
13	A student who cheats in school is more likely to be unethical on the job.	0.9	1.1
14	I believe I have the ability to do well overall in my engineering classes.	1.6	1.5
15	I believe I have the ability to do well in future internships and jobs.	1.6	1.6

¹ For NU “engineering and computer science classes” was used in all prompts.

Table 3 below shows the same student survey average ratings as above, now separated by student classification year and for North University only. For comparison, the South University survey population above was almost entirely second-year students. Some of the noteworthy results are that in student item #2 there is a large difference between years (up to 0.9), and item #10 may indicate a steady increase in agreement in their ability to discern an ethical decision as students progress from first to fourth year.

Table 3: Student Survey - Average Ratings by Student Year (North U. n=186)

#	Student Survey Prompt (-2=strongly disagree, 0=neutral, +2=strongly agree)	North University				
		Student year	1	2	3	4
	n	44	42	46	46	186
1	Teachers sufficiently clarify what is considered cheating in my engineering ³ classes.	1.5	1.0	1.2	1.4	1.2
2	Some things my teachers consider cheating would actually help my learning if allowed.	-0.4	0.0	0.5	0.2	0.1
3	Most students are aware what is and is not cheating in my engineering classes.	1.1	1.2	1.0	1.1	1.1
4	Teachers sufficiently encourage students not to cheat in my engineering classes.	1.5	1.4	1.4	1.4	1.4
5	I wish teachers did more to prevent cheating in my engineering classes.	-0.4	-0.4	0.1	-0.4	-0.2
6	Students who don't cheat are at a disadvantage for grades.	-1.0	-1.1	-0.5	-0.5	-0.7
7	Most students who cheat in my classes are eventually caught.	-0.1	-0.3	-0.2	-0.2	-0.2
8	I know what to do if I find out a classmate is cheating.	0.3	0.4	0.4	0.4	0.4
9	Being able to handle difficult ethical situations on the job is very important to me.	1.5	1.3	1.4	1.4	1.4
10	I am able to tell when an engineering decision could be unethical and figure out what to do.	0.8	0.9	1.0	1.3	1.0
11	Most students believe cheating in school is unethical (morally wrong).	1.1	1.2	1.0	1.0	1.1
12	Most students think cheating on the job is more serious than cheating in school.	0.9	0.9	0.9	1.0	0.9
13	A student who cheats in school is more likely to be unethical on the job.	1.3	1.4	1.1	0.8	1.1
14	I believe I have the ability to do well overall in my engineering classes.	1.7	1.6	1.5	1.4	1.5
15	I believe I have the ability to do well in future internships and jobs.	1.6	1.6	1.6	1.5	1.6

² Total includes an additional 8 students who did not report a year classification.

³ For NU “engineering and computer science classes” was used in all prompts.

Data Analysis – Faculty Survey Ratings

Table 4 below shows the faculty survey average ratings for both Universities. The rating scale is [-2=strongly disagree, -1=disagree, 0=neutral, +1=agree, +2=strongly agree]. The average rating for each prompt varies between universities most notably on prompt #1 and #5, but are quite similar for other items. The standard deviations for most items are in the range from 0.6 - 1.0. Some of the noteworthy results are:

On *average*, faculty:

- 1) **Agree** they sufficiently clarify cheating in their classes.
- 2) **Agree** most students are aware of what is cheating.
- 3) **Agree** they de-motivate cheating (“encourage students to not cheat”).
- 4) **Agree** they sufficiently prevent cheating.
- 5) **Differ** on wanting more guidance on preventing cheating. (61% of SU faculty agree vs. 29% of NU faculty agree. This may be explained by a difference in years of faculty experience as discussed below.)
- 6) **Disagree** honest students are at a grade disadvantage.
- 7) Are **neutral** in the belief cheaters in their classes are eventually caught.
- 8) **Agree** they know what to do if a student is cheating.
- 9) **Agree** most students believe cheating in school is unethical.
- 10) **Agree** or are **neutral** that students think cheating on the job is more serious than in school.
- 11) **Agree** students cheating in school are more likely to be unethical on the job.

Table 4: Faculty Survey - Average Ratings, (South U. n=18, North U. n=17)

Item	Faculty Survey Prompt (-2=strongly disagree, 0=neutral, +2=strongly agree)	SU AVG	NU AVG
1	I sufficiently clarify what is considered cheating in classes I teach.	0.8	1.4
2	Most students are aware what is and is not cheating in my classes.	0.9	1.1
3	I encourage students to not cheat in my classes.	1.3	1.6
4	I take sufficient steps to prevent cheating in my classes.	0.9	0.8
5	I wish I had more guidance on how to prevent cheating.	0.5	-0.1
6	Students who don't cheat are at a disadvantage for grades.	-0.4	-0.8
7	Most students who cheat in my classes are eventually caught.	0.2	0.0
8	I know what to do if I find out a student is cheating.	1.2	1.4
9	Most students believe cheating in school is unethical (morally wrong).	0.7	1.1
10	Most students think cheating on the job is more serious than cheating in school.	0.6	0.2
11	A student who cheats in school is more likely to be unethical on the job.	1.3	1.3

Table 5 below shows the same faculty average ratings as above, now separated by faculty years of experience, and for North University only. Relatively large bins of 20 years are used to avoid having too few faculty in one bin. For comparison, the South University survey population above was heavily weighted towards faculty with 0-10 years of faculty experience, whereas the North University faculty are evenly distributed between below and above 20 years of experience. Some of the noteworthy differences are in faculty survey items #5, #6, and #8. As might be expected, this seems to indicate newer faculty are significantly more likely to (#5) want guidance on preventing cheating, and (#8) feel less confident in handling cheating.

Table 5: Faculty Survey - Average Ratings by Faculty Years of Experience (North U. n=17)

#	Faculty Survey Prompt (-2=strongly disagree, 0=neutral, +2=strongly agree)	North University		
		Faculty years 0-20	21+	ALL
	n	8	9	17
1	I sufficiently clarify what is considered cheating in classes I teach.	1.3	1.4	1.4
2	Most students are aware what is and is not cheating in my classes.	0.9	1.2	1.1
3	I encourage students to not cheat in my classes.	1.5	1.8	1.6
4	I take sufficient steps to prevent cheating in my classes.	1.0	0.6	0.8
5	I wish I had more guidance on how to prevent cheating.	0.4	-0.4	-0.1
6	Students who don't cheat are at a disadvantage for grades.	-0.4	-1.1	-0.8
7	Most students who cheat in my classes are eventually caught.	0.1	-0.1	0.0
8	I know what to do if I find out a student is cheating.	1.0	1.8	1.4
9	Most students believe cheating in school is unethical (morally wrong).	1.4	0.8	1.1
10	Most students think cheating on the job is more serious than cheating in school.	0.4	0.0	0.2
11	A student who cheats in school is more likely to be unethical on the job.	1.4	1.2	1.3

Data Analysis – Perception Gaps (Faculty vs. Student Survey Average)

Table 6 below shows the average perception gaps between faculty and students at each University. A negative gap indicates student agree more than faculty with the prompt, whereas a positive gap indicates faculty agree more strongly. For example, the negative gap on student survey item #5 (faculty survey item #4) indicates student agree more than faculty with the statement that faculty should do more to prevent cheating. Student item #8 shows faculty are more confident in how to handle a cheating incident than students are. Student item #12 shows students agree more strongly than faculty that students think cheating on the job is more serious than cheating in school.

Table 6: Survey Average Perception Gaps (Gap = Faculty – Student average)
 [negative numbers indicate students agree more than faculty with the item]

Student Item	Faculty Item	Student Survey Prompt (-2=strongly disagree, 0=neutral, +2=strongly agree)	SU GAP	NU GAP
1	1	Teachers sufficiently clarify what is considered cheating in my engineering classes.	-0.3	0.1
3	2	Most students are aware what is and is not cheating in my engineering classes.	0.0	0.0
4	3	Teachers sufficiently encourage students not to cheat in my engineering classes.	-0.2	0.2
5	4 ⁴	I wish teachers did more to prevent cheating in my engineering classes.	-0.9	-0.5
6	6	Students who don't cheat are at a disadvantage for grades.	0.3	0.0
7	7	Most students who cheat in my classes are eventually caught.	0.4	0.2
8	8	I know what to do if I find out a [student] is cheating.	0.8	1.0
11	9	Most students believe cheating in school is unethical (morally wrong).	-0.2	0.0
12	10	Most students think cheating on the job is more serious than cheating in school.	-0.4	-0.7
13	11	A student who cheats in school is more likely to be unethical on the job.	0.4	0.2

Data Analysis – Ethical-Reasoning Exam Correlation with Selected Survey Responses

Figure 1 below shows student scores on the objective ethical-reasoning exam plotted against answers to student survey item #10, which self-reports ethical reasoning ability (“I am able to tell when an engineering decision could be unethical and figure out what to do.”). There is no significant correlation, and there is also no correlation with the other survey questions of interest.

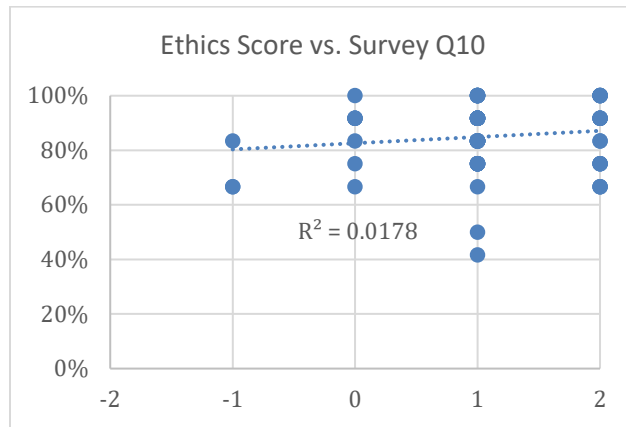


Figure 1: Ethical-Reasoning Exam Scores vs. Student Survey Question #10 – No correlation (North U. n=78)

Data Analysis – Student Survey Text Comment Theme Analysis (SU n=79, NU n=186)

Student participants gave free-form comments in response to the survey prompts, “I wish teachers would do this to clarify and/or prevent cheating:” and “Do you have any other comments?” We identified seven major themes in student free-form comments. We then counted the frequency of each theme, including where multiple themes occur within one survey

⁴ For gap comparison on this question, the faculty survey item is multiplied by -1 to align with the student survey.

comment. The frequencies of the seven student comment themes are shown in Table 7 and Table 8 below, followed by example text comments for the two most frequent themes.

Table 7: Student Survey Comment Themes (43 comment parts on 79 surveys, South U.)

- 1) **Define Cheating (10)**
- 2) De-motivate cheating (3)
- 3) Prevent cheating (7)
- 4) Improve teaching (4)
- 5) Facilitate reporting (5)
- 6) **Allow solutions/collaboration (7)**
- 7) Misc. (7)

Table 8: Student Survey Comment Themes (81 comment parts on 186 surveys, North U.)

- 1) **Define cheating (30)**
- 2) De-motivate cheating (8)
- 3) Prevent cheating (4)
- 4) Improve teaching (3)
- 5) Facilitate reporting (3)
- 6) **Allow solutions/collaboration (18)**
- 7) Misc. (14)

Student Survey Comment Theme #1: Define Cheating

The most frequent theme in student free-form comments is the request for faculty to clearly define cheating. This includes clarifying expectations on the use of solutions, old exams, and peer collaboration.

Example comments⁵ from both universities include:

- Clarify if finding HW answers is cheating or not.
- Communicate on a consistent basis what is and is not cheating (for tests, HW, assignments).
- Clarify to what extent working in groups is allowed.
- If a teacher is giving a take-home exam, they should be very clear about what activities are expected to take the test.
- Is it cheating to look at old exams from previous years? Some professors say it is cheating, but others don't.
- Show examples of what's been labelled cheating and not cheating in the past.
- Mention specific programs that we should not use (Chegg, Slader, etc.).
- More clearly specify practices that are or are not allowed (what level of collaboration or using online resources, back of book, old exams, etc.).

Student Survey Comment Theme #6: Allow Solutions/Collaboration

The second most prominent theme in student free-form comments is the request for faculty to authorize utilizing problem solutions and/or peer collaboration.

⁵ Some survey comments are lightly edited for brevity, taking care to maintain the original intent and tone.

Example comments⁵ from both universities include:

- Being able to check your work online greatly helps understanding how to solve problems, especially when they aren't covered in class.
- I wish that teachers would allow online help for partial credit.
- Some of us need to see the answers to reverse engineer the problem.
- We are going to be using google, the internet, and others for plenty of things in our careers. Knowing how to find answers is more useful than hoping to know everything ...
- Using Chegg/similar online resources are considered cheating on homework assignments but can be useful and should be allowed.
- Some teachers have allowed us to use old exams ... to build familiarity with the concept that lectures and textbooks sometimes can't give. Teachers forget that students have no familiarity with working through problems ...
- Encourage students to work together to help each other solve problems, because students tend to resort to cheating because we don't know how to work with others without thinking it's cheating.

Data Analysis – Faculty Survey Text Comment Theme Analysis (South U. n=18, North U. n=17)

Faculty participants gave free-form comments responding to the prompts, “*I wish someone would do _____ to support me in clarifying and/or reducing student cheating:*” and “*Do you have any other comments?*” Although we identified the same themes across both universities in student comments, a different set of themes for each of the faculty data sets emerged. We then counted the frequency of each theme, including when multiple themes occur within one survey comment. The frequency of themes in the faculty comments are shown below in Table 9 and Table 10, followed by example text comments for the most common theme.

Table 9: Faculty Survey Comment Themes (28 comment parts on 18 surveys, South U.)

- 1) Faculty education (15)**
- 2) De-motivate cheating (1)
- 3) Prevent cheating (1)
- 4) Facilitate reporting (1)
- 5) Allow solutions/collaboration (2)
- 6) Misc. (8)

Table 10: Faculty Survey Comment Themes (17 comment parts on 17 surveys, North U.)

- 1) Faculty education (6)**
- 2) De-motivate cheating (2)
- 3) Prevent cheating (2)
- 4) Improve teaching/grading (1)
- 5) Define cheating (1)
- 6) Misc. (5)

Faculty Survey Comment Theme #1: Faculty Education

The most frequent theme in faculty free-form comments are requests for faculty education. This includes suggestions of faculty workshops and discussions surrounding: best practices, case

studies, help defining cheating, understanding student thinking, help de-motivating cheating, help preventing cheating, how to respond when students cheat, and understanding honor system functioning.

Example comments⁶ from both universities include:

- Help all faculty be more consistent in clarifying expectations ... maybe a uniform checklist used school-wide.
- I am eager to learn how to make it easier for students to know and do the right thing.
- Publish examples without student name; "Students were caught cheating by doing ____."
- Clarify best practices.
- Give us better insight to student thinking and student justification of cheating.
- Offer practical ways to recognize the subtle aspects of cheating that go unnoticed by the instructor.
- Find out what course materials have been uploaded to Chegg by our students.

Data Analysis – Faculty Interview Transcripts Analysis (South U. n=4)

Rather than conducting a second thematic analysis, the four South University faculty interview transcripts were analyzed to add context to the written survey comments.

Faculty Interview Comments Related to “Define Cheating”

Example comments⁷ include:

- Students believe cheating is wrong, but define cheating very differently than most faculty, for example "Of course cheating is wrong, but copying solutions off the internet is not cheating."
- When I clarify what is cheating, students are glassy-eyed, I don't think they hear it.
- I like the idea of a standard checklist faculty use to specify what is allowed in a class.

Faculty Interview Comments Related to “Faculty Education”

The most frequent theme in faculty interview comments are requests for faculty education (all four faculty interviewees emphasized this). The interviews helped clarify that the dynamic of faculty discussions meets a significant part of this request by maintaining awareness.

Example comments⁷ include:

- Faculty discussing academic integrity is important ... if it's in our collective thought we can help and guide instead of doing nothing (which is the worst response).
- Publicly share what types of cheating are caught (without student names).
- I don't need more training, but keeping it in discussion will instill a better culture of how to combat it.
- It would support all faculty to have an academic integrity dashboard to see improvement over time as we instill a better culture and use best practices.
- I appreciate this being discussed because it brings up thoughts of how I can improve.
- A reminder and discussion on academic integrity every semester would help.

⁶ Some survey comments are lightly edited for brevity, taking care to maintain the original intent and tone.

⁷ Interview comments are lightly edited for brevity, taking care to maintain the original intent.

- Faculty from other cultures find the situation more difficult to understand and must feel supported in order to confront cheating.

Conclusions

A common theme that arose in a review of literature and through both the student and faculty surveys was a desire for cheating behaviors to be more clearly defined (tagged as “define cheating” in the survey analysis). Significant progress toward improving academic integrity at undergraduate engineering programs may be achievable simply through having expectations clearly communicated from faculty to students. These expectations should also take into careful consideration allowing students to make use of appropriate collaboration and online resources on assignments (“allow solutions/collaboration”) – cases in which these approaches are not permitted need to be clearly defined, but there may be opportunities available for students to learn more effectively by also selectively permitting them. Achieving this progress will require additional faculty training and support (tagged “faculty education” in prior sections).

Despite the unclear results from comparing survey responses to ethical-reasoning exam scores, the survey responses alone highlight the relationship between academic integrity and ethical professional behavior. Students at both universities agreed cheating at work would be a more serious issue than cheating in school, as well as that students who cheat in school are more likely to act unethically as a professional. Faculty at both universities were much more neutral about whether students would consider cheating at work more serious than in school, but believed more strongly that students who cheat in school are more likely to act unethically as a professional. The differences between how students and faculty perceive the relationship between academic integrity and ethical professional behavior suggest an important opportunity: by communicating openly about these issues, students may be able to better express their desires to behave ethically as future professionals, and faculty may be able to help students better understand the importance of approaching academic studies with integrity to build ethical skills for the workplace.

Improved communication among faculty, students, and between both populations about academic integrity is likely to help address several of the improvement opportunities this study identified. While students and faculty at both universities generally agree that most students understand how to approach their academic endeavors with honesty, normalizing the discussion of these topics will help develop cultures of academic integrity that will support the development of positive, ethical habits for current and future students.

Future Work

This study is designed to assess needs and serve as the background to launch future changes in academic integrity education and practices within the two Engineering Schools studied. We envision next steps potentially include:

- Sharing a selected summary of the findings here with students, faculty, and department chairs to raise awareness and motivate positive change.
- Facilitating faculty workshops and discussions surrounding academic integrity best practices and case studies. This includes help defining, de-motivating, and preventing

cheating; understanding student thinking; and integrity violation reporting procedures.

- Creating an *academic* code of ethics modeled after an engineering code of ethics, as described below.

Based on the literature review and study results, we would like to explore creating and promoting an academic code of ethics stylistically similar to the American Society of Civil Engineers' professional code of ethics [18]. A preamble would define the academic integrity relationship between the institution, faculty, and students and then expected behaviors could be categorized by relevant stakeholder. This code of ethics could clearly communicate to both faculty and students the definitions of cheating and ethical academic behaviors and also prepare students to enter professions governed by similar codes of ethics. These documents would serve a similar purpose to institutional honor codes (and will fully align with existing institutional policies) but would have the advantage of being more clearly related to the opportunities and challenges associated with engineering education. Student and faculty perceptions of these new codes of ethics will be assessed and reported.

Additionally, given the similar nature of the two universities included in this preliminary study, further research in this area could be expanded to include different types of institutions with more varied contexts.

Acknowledgments

Any opinions, findings, and conclusions or recommendations expressed in this paper are those of the author(s) and do not necessarily reflect the views of their institutions. The authors thank the students and faculty who voluntarily participated in this study. We are also grateful for the information sharing of the International Center for Academic Integrity⁸.

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Appendix A: Student Survey (hardcopy version)

Student Survey on Academic Integrity

Name or ID: _____

Hello, this survey is **confidential** and only I will know your name. This survey is **voluntary** so not doing it will not cause any problems or hard feelings. **Your opinions are very valuable to us** and will help your faculty serve you better. Also, average results (without names) may be shared in **research**¹ to help other faculty. Thank you for taking a few minutes to complete this – *your response is greatly appreciated!*

What is Cheating? It includes taking unfair advantage, such as looking at someone else’s test or buying an essay online. Our student handbook indicates that using unauthorized tests, problems, or reports other than allowed by the instructor is cheating.

Please share your thoughts by marking in columns to the right →

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		-2	-1	0	+1	+2
1	Teachers sufficiently clarify what is considered cheating in my engineering classes.					
2	Some things my teachers consider cheating would actually help my learning if allowed.					
3	Most students are aware what is and is not cheating in my engineering classes.					
4	Teachers sufficiently encourage students not to cheat in my engineering classes.					
5	I wish teachers did more to prevent cheating in my engineering classes.					
6	Students who don't cheat are at a disadvantage for grades.					
7	Most students who cheat in my classes are eventually caught.					
8	I know what to do if I find out a classmate is cheating.					
9	Being able to handle difficult ethical situations on the job is very important to me.					
10	I am able to tell when an engineering decision could be unethical and figure out what to do.					
11	Most students believe cheating in school is unethical (morally wrong).					
12	Most students think cheating on the job is more serious than cheating in school.					
13	A student who cheats in school is more likely to be unethical on the job.					
14	I believe I have the ability to do well overall in my engineering classes.					
15	I believe I have the ability to do well in future internships and jobs.					

1. What is your current degree concentration (please circle)?
2. I wish teachers would do this to clarify and/or prevent cheating:
3. Do you have any other comments?

¹ If you have questions or concerns about this research, please contact: [redacted] or the research review board administrator [redacted].