

Perceptions of Academic Integrity of Students in a First-Year Engineering Program

Irene B. Mena, University of Pittsburgh

Irene B. Mena has a B.S. and M.S. in industrial engineering, and a Ph.D. in engineering education. Her research interests include first-year engineering and graduate student professional development.

Dr. David V.P. Sanchez, University of Pittsburgh

David Sanchez is an Assistant Professor in the Department of Civil & Environmental Engineering and the Assistant Director for the Mascaro Center for Sustainable Innovation. He directs the Sustainable Design Labs that is currently focused on fusing sustainability principles and design thinking to address the Water and Energy grand challenges in the natural and built environment. Current projects include: Renewable electrode materials for Microbial Fuel Cells and the Electro-Fenton process, Recirculating Aquaponic Systems, Environmental Quality wireless sensor networks, and incorporating Sustainable Design/Innovation into engineering curricula.

He serves as a director for Pitt's Design EXPO and a variety of the Mascaro Center's Sustainability Outreach and Education programs including the Manchester Academic Charter School "Green week" and the Teach the Teacher program, impacting thousands of students each year. Dr. Sanchez teaches Introduction to Sustainable Water Technology and Design, classes in the Civil & Environmental Engineering Department and the Swanson School of Engineering First-Year program. He works directly with K-12 initiatives and outreach programs including Constellation Energy Inventor Labs, ReMake Learning Network, and INVESTING Now.

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Abstract

Given the increasing efficiency and expanding functionality of communications technology, and the degree to which students use these technologies to connect and/or access course materials, it is important to update our understanding of students' perceptions and habits with regard to academic integrity.

The purpose of this study is to learn about engineering students' perceptions of and experiences with academic integrity at the start of their undergraduate experience (post K-12). It answers the following research questions: (1) How do students define academic dishonesty? (2) What is the frequency with which they witness and participate in academically dishonest behaviors?, and (3) What are the motivations for engaging in these behaviors?

A survey was administered to all first-year engineering students enrolled in the University's required first-year engineering course (ENGR 0011) in the Fall 2016 semester. The survey was administered at the beginning of the semester to capture their K-12 perceptions and experiences. 113 of the 526 enrolled students completed the survey, for a response rate of 21.5%. The survey consisted of both qualitative and quantitative items.

Qualitative items included two open-ended questions: "How would you define academic dishonesty?" and "Please share your thoughts and experiences with academic dishonesty." The second question included additional prompts to guide student responses. Qualitative responses were analyzed using open coding to identify themes from the students' responses. The results indicated that a majority of students define academic dishonesty as cheating and wrongdoing, getting an unfair advantage, disobeying instructions or policies, or inaccurately representing their knowledge. The main motivations for engaging in academically dishonest behaviors included: pressure to get good grades, laziness, workload and stress.

Quantitative items asked students to select which behaviors, from a given list, they considered to be academically dishonest. Students were then asked to identify the frequency with which they have witnessed and/or personally engaged in those behaviors. Quantitative items were analyzed using descriptive statistics. Main behaviors students witnessed include: copying assignments from peers and asking another student questions about a test or quiz they have not yet taken. These are also the main behaviors students personally engage in (according to the self-reported data).

This study presents the initial findings of a study looking at the perceptions of and experiences with academic integrity that students bring with them post K-12, at the start of their undergraduate engineering careers. It also provides a foundation to help track the evolution of students' perceptions of academic dishonesty as they progress through their studies.

Introduction

Engineering work is performed within the context of a code of ethics. Codes of ethics are shared by the different engineering professional societies, such as the American Society of Civil Engineers¹, the Institute of Electrical and Electronics Engineers², and the National Society of Professional Engineers³, among others. It is therefore important to ensure that engineering students are being prepared to act within the ethical requirements of the engineering field.

Research has focused on looking at different approaches for helping students learn about ethics in engineering. For example, the literature describes topics/modules related to ethics that have been incorporated into existing courses (such as Bielefeldt⁴ and Vigeant et al.⁵); the creation and implementation of engineering ethics courses (such as Brown & Pfile⁶, and Trice⁷); and the use of innovative techniques, such as learning about ethics through “virtual worlds”⁸ or through an ethics challenge game⁹. In addition, the impact of “out-of-classroom experiences” on ethical development has been discussed¹⁰.

It would appear that engineering education is being proactive about preparing students to become engineers of 2020 – engineers who, as described by the National Academy of Engineering (NAE), should “possess a working framework upon which high ethical standards and a strong sense of professionalism can be developed”¹¹, among other attributes. Yet, students in engineering engage in high levels of cheating – surpassed only by business students¹². This is significant, as research has shown correlations between academic dishonesty and certain forms of “deviance”¹³. As stated by Harding et al.¹⁴: the data from prior research “...suggest the apparent conclusion that disciplines with higher self-reported levels of academic dishonesty are producing professionals with seriously compromised morals who are more likely to participate in professional dishonesty.” It is important to learn about students’ perceptions of academic dishonesty, as well as how to best prevent and address it, so that students’ behaviors and attitudes towards cheating do not undermine, but rather enhance, existing efforts to prepare them to become ethical professionals.

Context of the Study and Research Questions

This study is part of a larger study at the University of Pittsburgh that aims to explore and understand engineering students’ perceptions of academic dishonesty, and how these perceptions evolve throughout their engineering education at the University. This first stage of the study had the goal of getting baseline data about incoming students. Therefore, the purpose of this study is to learn about engineering students’ perceptions of and experiences with academic integrity post K-12 (at the start of their undergraduate experience). It answers the following research questions: (1) How do students define academic dishonesty? (2) What is the frequency with which they witness and participate in academically dishonest behaviors?, and (3) What are the motivations for engaging in these behaviors?

Because the data were gathered at the start of students’ freshman year, the results reflect the perceptions and attitudes about academic integrity that were the result of students’ K-12 experience. The results indicate the perceptions and attitudes that students bring with them to the

University, the lens through which their college experience will be seen and which their college experience should transform to be that of an ethical engineer.

Data Collection and Data Analysis Methods

A survey was administered to all first-year engineering students enrolled in the University's required first-year engineering course (ENGR 0011) in the Fall 2016 semester. The survey was administered at the beginning of the semester to capture their K-12 perceptions and experiences. 113 of the 526 enrolled students completed the anonymous, online survey, for a response rate of 21.5%. The survey consisted of both qualitative and quantitative items.

Qualitative Items

Qualitative items included two open-ended questions:

1. "How would you define academic dishonesty?" and
2. "Please share your thoughts and experiences with academic dishonesty."

The second question included some additional prompts to guide student responses, as follows: "Perhaps some points to help organize your thoughts: Where and when does academic dishonesty occur (i.e. tests, quizzes, hws)? In your opinion, what % of students has participated at some point? In your opinion, why do students choose to cheat?"

Qualitative responses were analyzed using open coding to see what themes emerged from the students' responses. Specifically, codes were assigned to the data, and then similar codes were grouped into themes or categories¹⁵. No predetermined themes were used; the data was analyzed with the goal of letting the themes emerge on their own. The themes are described in the Results section.

Quantitative Items

Quantitative items asked students to select which behaviors, from a given list, they considered to be academically dishonest. Following the survey structure used by Carpenter and his fellow researchers¹⁶, in addition to asking students to indicate what they considered to be academically dishonest, the survey also asked them to provide information about the frequency they have participated in or witnessed the specified behaviors.

While the items listed in Carpenter et al.¹⁶ served as a model, the authors, who are both instructors for the first-year courses at the University, developed the list of behaviors based on what they considered to be relevant to the freshman engineering-specific courses, which consist of programming and considerable group assignments. As the different course sections share a common syllabus and common assessments, there is also the possibility of communicating with students from other sections and previous years to access additional material or information, so behaviors were included to address this. The list of behaviors included in the survey can be seen in Table 1.

Table 1: List of behaviors included in the survey

<ol style="list-style-type: none"> 1. Copying an assignment from a peer(s) 2. Not contributing to a team assignment that you receive credit for 3. Submitting or copying assignments from previous terms 4. Copying from another student during a test/quiz 5. Sharing your answer during a test/quiz 6. Asking another student for information about a test/quiz that you have not taken 7. Using a false excuse to get an extension on assignments or test/quiz 8. Using an old test/quiz that is unavailable to other students 9. Cheating when a high % of peers are cheating
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For each of these behaviors, students were asked the questions in Table 2 below.

Table 2: Questions students responded to for each of the behaviors in Table 1

Question	Possible Responses
Is [the behavior] academically dishonest?	Yes/No
Please indicate the frequency you've witnessed [the behavior] amongst peers	0 / 1-3 / 4+
Please indicate the frequency you have participated in [the behavior]	0 / 1-3 / 4+

Quantitative items were analyzed using descriptive statistics, and these can be found in the Results section.

Results

Results will be shared in terms of how they address each of the research questions.

Research question 1: How do students define academic dishonesty?

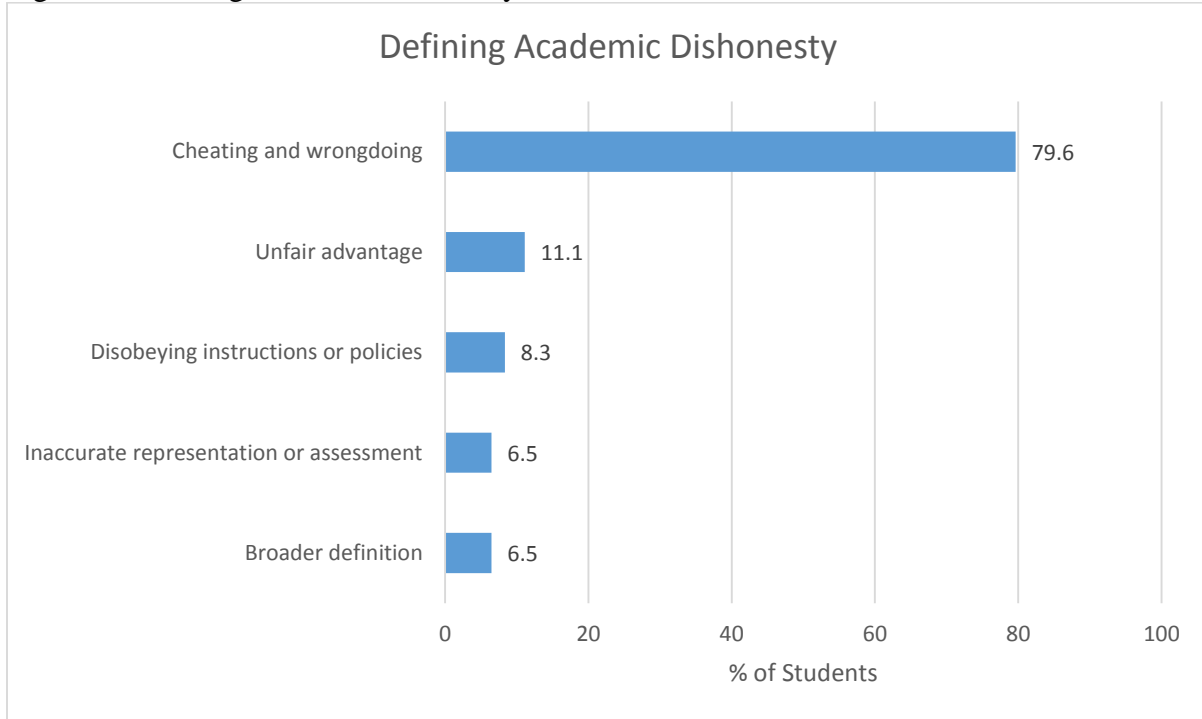
The qualitative open-ended question “How would you define academic dishonesty?” provides an initial response to this first research question. The five main themes that emerged from students’ comments were:

1. *Cheating and wrongdoing.* The large majority (79.6%) of students defined academic dishonesty as cheating, submitting work that is not your own, taking credit for something you didn’t do, and in general getting or doing something unrightfully. Some sample responses are:
 - “Cheating, knowingly turning in work that isn’t one’s own.”
 - “I would define academic dishonesty as any actions and [behaviors] which result in work that is not the sole ‘property’ of the student himself/herself. In other words, when students steal, give, or receive information to and from others which do not belong to them, and which they did not work for.”

2. *Unfair advantage.* 11.1% of students included comments that academic dishonesty was related to getting an unfair advantage over others, such as by using resources, help, or information that is not available to others. For example:
 - “Anything that gives an unfair advantage is academic dishonesty.”
 - “I define academic dishonesty as using some sort of means that provide you or someone else with an unfair advantage over other students on any sort of academic material like [an] assignment, quiz, exam, project or paper. Everyone should be on the same level, so if you use something or do something that gives you an unfair advantage then you have been academically dishonest.”
3. *Disobeying instructions or policies.* 8.3% of the students described academic dishonesty as disobeying instructions or policies, as follows:
 - “Doing anything that goes against a school's academic policies.”
 - “... academic [dishonesty] is breaking the rules of an assignment in an attempt to improve your performance on it...”
4. *Inaccurate representation or assessment.* 6.5% of students defined academic dishonesty as occurring when they are misrepresenting their knowledge, and getting an inaccurate assessment of their knowledge. For example:
 - “Receiving, by any means, a score on a graded assignment that does not represent your true knowledge of the subject.”
 - “[Academic dishonesty] results [when] tests and homework do not match the student's actual academic capabilities.”
5. *Broader definition.* While the majority of the students described academic dishonesty strictly from the student perspective, 6.5% of the students discussed the concept more broadly, such as by including other groups. For example:
 - “If faculty or students do not keep to their allotted appointment/class times, teachers forget to make a syllabus, ...academic advisors make academic records public knowledge, or anyone violates the policies for academics instated by the University...”

Figure 1 below summarizes the main ways students defined academic dishonesty.

Figure 1: Defining academic dishonesty



The quantitative items in the survey provide additional information about the specific behaviors students consider to be academically dishonest. The results are summarized in Table 3.

Table 3: Student responses to whether each behavior is academically dishonest

	Yes	No	<i>n</i>
Copying an assignment from a peer(s)	95.83%	4.17%	96
Not contributing to a team assignment that you receive credit for	84.38%	15.63%	96
Submitting or copying assignments from previous terms	73.96%	26.04%	96
Copying from another student during a test/quiz	100%	0%	96
Sharing your answer during a test/quiz	98.96%	1.04%	96
Asking another student for information about a test/quiz that you have not taken	72.92%	27.08%	96
Using a false excuse to get an extension on assignments or test/quiz	88.54%	11.46%	96
Using an old test/quiz that is unavailable to other students	78.95%	21.05%	95
Cheating when a high % of peers are cheating	100%	0%	96

Overall, the majority of students agree that the listed behaviors are academically dishonest, but they do so to varying degrees. According to the responses, all students agree that copying from someone on a quiz or test, and cheating even when a high percentage of their peers are cheating, are academically dishonest behaviors. 98.96% and 95.83% of the students agree, respectively, that sharing an answer during a quiz or test, and copying an assignment from a peer(s) are academically dishonest. Regarding asking others about information about a test or quiz they have not taken and submitting or copying assignments from previous terms, however, there is less agreement, with 72.92% and 73.96%, respectively, considering these behaviors to be academically dishonest.

Research question 2: What is the frequency with which they witness and participate in academically dishonest behaviors?

The quantitative items in the survey provided information on the frequency with which students witness and participate in academically dishonest behaviors. These results are summarized in Tables 4 and 5. Responses with 50% or more of the students are highlighted.

Table 4: Frequency with which students witness academically dishonest behaviors amongst peers

	Witnessed others			
	0	1-3	4+	<i>n</i>
Copying an assignment from a peer(s)	7.37%	25.26%	67.37%	95
Not contributing to a team assignment that you receive credit for	14.89%	58.51%	26.60%	94
Submitting or copying assignments from previous terms	41.05%	41.05%	17.89%	95
Copying from another student during a test/quiz	23.16%	41.05%	35.79%	95
Sharing your answer during a test/quiz	31.58%	40%	28.42%	95
Asking another student for information about a test/quiz that you have not taken	7.37%	22.11%	70.53%	95
Using a false excuse to get an extension on assignments or test/quiz	31.58%	40%	28.42%	95
Using an old test/quiz that is unavailable to other students	50.53%	38.95%	10.53%	95
Cheating when a high % of peers are cheating	18.09%	53.19%	28.72%	94

Table 5: Frequency with which students have participated in academically dishonest behaviors

	Participated			
	0	1-3	4+	<i>n</i>
Copying an assignment from a peer(s)	34.04%	48.94%	17.02%	94
Not contributing to a team assignment that you receive credit for	87.23%	11.7%	1.06%	94
Submitting or copying assignments from previous terms	84.04%	10.64%	5.32%	94
Copying from another student during a test/quiz	69.15%	27.66%	3.19%	94
Sharing your answer during a test/quiz	65.96%	28.72%	5.32%	94
Asking another student for information about a test/quiz that you have not taken	28.72%	38.3%	32.98%	94
Using a false excuse to get an extension on assignments or test/quiz	88.3%	8.51%	3.19%	94
Using an old test/quiz that is unavailable to other students	86.17%	12.77%	1.06%	94
Cheating when a high % of peers are cheating	69.15%	25.53%	5.32%	94

According to students' responses, copying assignments from peers, not contributing to team assignments, and asking others about a quiz or test they have not yet taken are academically dishonest behaviors that over 50% of the students have witnessed at least once, and often more than four times. 50.53% have never witnessed others using an old test or quiz that is unavailable to other students.

Although students report witnessing academically dishonest behaviors in others, for the most part, they do not report participating in these behaviors themselves. In fact, as seen in Table 6, the majority of the students report that they have never participated in most of the listed behaviors. 48.94%, however, did admit to copying an assignment from a peer between 1-3 times, and 38.3% asked others about a test or quiz they had not yet taken, also between 1-3 times.

Research question 3: What are the motivations for engaging in these behaviors?

The second open-ended question asked students to share their thoughts and experiences with academic dishonesty. Many of the responses focused on the reasons why students decide to cheat, and the main themes that emerged were:

1. *Grades and fear of failure.* 47.3% of the students shared that students often decide to cheat because they feel pressured to get good grades, are afraid of failing, and either they or the system value getting good grades over learning the material. Some sample responses are:

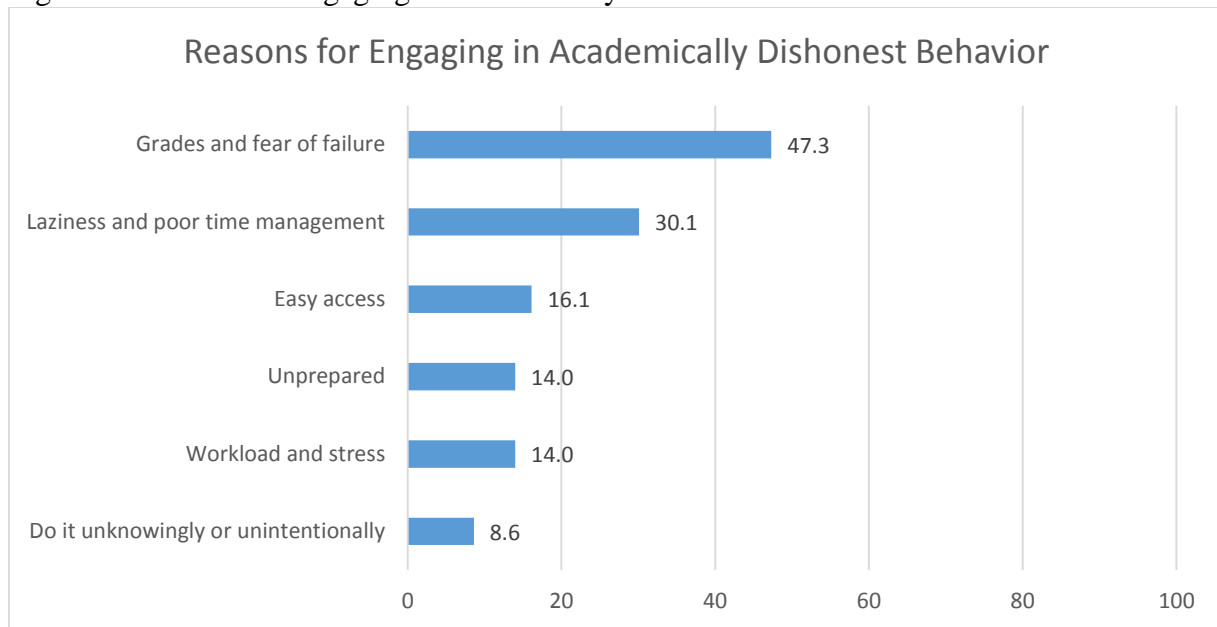
- "...I believe cheating stems from the fear that one will do poorly in the class, so they try to take other's work until they believe they have caught up in the class."

- “Students choose to cheat because our education system values the grades that they receive on assignments more than whether or not the students actually learn the material.”
2. *Laziness and poor time management skills.* Approximately one third of the students indicated that students choose to cheat because they are lazy, don’t want to put in any work or effort, or have poor time management skills. For example:
 - “...Students cheat because they are too lazy to do the work themselves...”
 - “...I think students do it for different reasons, sometimes because they are lazy and sometimes because they think they are too smart to bother putting real effort in.”
 3. *Easy access.* 16.1% of the students said cheating occurred because it was so easy to do: students could easily get the resources they needed, they felt that everyone else was doing it, and it was unlikely they would get caught, and therefore worth the risk. For example:
 - “It occurs everywhere that students can get away with it... Students cheat because it is an easy way out...”
 - “...because if it is easy to cheat and answers to the test are readily available, why not save some sleep and study time.”
 4. *Unprepared.* 14% of the students agree that sometimes students cheat because they don’t understand the material or are unprepared for the assignment or quiz/test:
 - “Students cheat... because they legitimately don’t understand a topic and don’t want to ask the teacher.”
 - “In my opinion, students cheat because they haven’t prepared enough for an assignment.”
 5. *Workload and stress.* Some students (14%) decide to cheat because they are under a lot of stress, have too much work, and are struggling to keep up with all their responsibilities. As written by some of them:
 - “...When 3 other assignments have to get done as well, priority leads to doing a topic until you think you know it, copying the rest, and moving on.”
 - “Students choose to cheat because... they are too stressed to be able to handle all the coursework...”
 6. *Do it unknowingly or unintentionally.* 8.6% of the students responded that while many students do engage in academically dishonest behaviors, they do so unintentionally or unknowingly. For example:
 - “Most academic dishonesty occurs over homework, usually without either party knowing it is academic dishonesty.”

- “I believe that some students do choose to cheat but many times it happens on accident when students are told to do homework and decide to work in groups together.”

Figure 2 below summarizes the main reasons students choose to engage in academic dishonesty.

Figure 2: Reasons for engaging in academically dishonest behavior



Discussion and Conclusions

The purpose of this study was to learn about engineering students’ perceptions of and experiences with academic dishonesty post K-12 (at the start of their undergraduate experience). It focused on the following research questions: (1) How do students define academic dishonesty? (2) What is the frequency with which they witness and participate in academically dishonest behaviors?, and (3) What are the motivations for engaging in these behaviors?

Regarding the first research question, the results indicated that the majority of the students in the sample think of academic dishonesty as cheating or as being engaged in some kind of wrongdoing. This indicates that students overall do begin their undergraduate experience with the knowledge that academic dishonesty is wrong. However, although they define academic dishonesty as cheating, it seems that there isn’t complete agreement on what behaviors constitute cheating. For example, while 100% of the respondents agreed that copying from someone during a test or quiz is cheating, 26.04% of the respondents don’t consider submitting or copying assignments from a previous term to be cheating. As Ozment et al.¹⁷ stated, “the first difficulty in studying cheating is defining it.” As part of their study, faculty, teaching assistants, and students completed a survey about what constitutes cheating. They found that “[n]ot only were there wide discrepancies between the three groups, there was also wide deviation within the

groups”¹⁷. A similar lack of consensus about what behaviors constitute cheating can be seen in Carpenter et al.’s study¹⁶.

The lack of consensus in our particular group may stem from the fact that they are expressing their opinions of academic dishonesty based on their diverse K-12 experiences (they completed the survey at the start of their freshman year, before experiencing academic dishonesty at the university level). Perhaps the start of their undergraduate careers is a good time for universities to provide explicit definitions of what constitutes academic dishonesty, and these should be definitions that instructors continue to reinforce throughout students’ engineering education, in this way minimizing the differences of opinion regarding what behaviors are and are not appropriate.

Regarding the second research question, the results indicate that students seem to witness certain academically dishonest behaviors more frequently than others. Copying assignments from peers and asking another student about a test or quiz they have not taken seem to occur with the highest frequency. These two behaviors were also the ones students mostly admitted to participating in themselves. Students may be witnessing or participating in these behaviors the most because they don’t believe it likely that they will experience any consequences, such as “shame, embarrassment, or sanctions”, in this context¹⁸. Alternatively, these behaviors could also be the result of students attempting to manage their time, or of instructors not clearly defining them as cheating¹⁹.

Although students report witnessing most behaviors, they mostly do not report engaging in these behaviors themselves. The majority of the students report never participating in seven out of the nine listed behaviors. While it may be possible that the level of integrity of this particular generation of first-year students exceeds that of previous generations, this could simply be the result of the self-reporting and self-selecting nature of this survey. Students completed the anonymous survey on a voluntary basis, so perhaps a majority of the students who decided to complete the survey were those who had not engaged in these behaviors themselves, though they had witnessed others in their high schools engage in these behaviors. Also, the self-reporting nature of this survey means that there is a possibility that students were not entirely honest in their reporting.

Regarding the third research question, the reasons why students engage in academically dishonest behaviors, the results are not surprising. Students are concerned about their grades, and feel the pressure to get good grades. They feel the need to get good grades even when they are not willing to put in the work, when they are unprepared, or struggling with workload and stress. These are similar results to those shared by Khalid et al.²⁰.

The purpose of this study was to get baseline data about incoming first-year engineering students and their perceptions of and experiences with academic dishonesty. As such, the results reflect their K-12 experiences. When it comes to academic dishonesty, research has shown connections between high school cheating and cheating in college^{14,21}, so this baseline data could be a predictor of how students will perceive and engage in academic dishonesty during their time at the University – something our future research will be looking at.

This study is part of a larger study that will seek to understand how these perceptions evolve throughout students' undergraduate education, and how students can be better prepared to be ethical professionals.

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