

Perceptions of Plagiarism by STEM Graduate Students: A Case Study

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Received: 5 June 2014 / Accepted: 17 October 2014 / Published online: 7 November 2014
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Abstract Issues of academic integrity, specifically knowledge of, perceptions and attitudes toward plagiarism, are well documented in post-secondary settings using case studies for specific courses, recording discourse with focus groups, analyzing cross-cultural education philosophies, and reviewing the current literature. In this paper, the authors examine the perceptions of graduate students in science, technology, engineering, and mathematics (STEM) disciplines at the University of Florida regarding misconduct and integrity issues. Results revealed students' perceptions of the definition and seriousness of potential academic misconduct, knowledge of institutional procedures, and views on faculty actions, all with a focus on divergences between US and internationally-educated students. The open-ended questions provide anecdotal evidence to highlight personal experiences, positive and negative, aimed at the faculty, international students and undergraduates. Combined, these findings outline an important part of the campus academic integrity culture at a major American university. Recommendations for local actions also are discussed.

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Keywords Plagiarism · STEM · Honor codes · Research misconduct · Academic integrity · Graduate students

Introduction

Student academic misconduct is a persistent problem in colleges and universities. The reported incidence of cheating is high but varies widely across disciplines. Indeed, evidence suggests that some forms of cheating are becoming more prevalent (McCabe 2005). Most research studies take an institutional perspective, and identify a number of key institutional elements that affect cheating, including faculty actions, peer attitudes, and institutional procedures, often arranged around a campus honor code.

Like many higher education institutions, the University of Florida (UF) has been affected by this trend. According to the UF Dean of Students Office (DSO), the number of campus plagiarism incidents rose sharply over the last 5 years, from 88 reported incidents in 2008 to 150 in 2013, with a peak of 203 incidents in 2010. Overall, the DSO attributes the increase of incidents to capturing better data, and the faculty's willingness to report violations (University of Florida, AITF 2011).

This paper reports the results of a recent survey administered to UF science, technology, engineering, and mathematics (STEM) graduate students regarding their perceptions of plagiarism. In the fall of 2010, three science librarians from the University of Florida (UF) were awarded a \$298,000 grant from the National Science Foundation to develop a series of online games entitled "Gaming Against Plagiarism (GAP)." The grant project concluded with the creation of three online mini-games designed to engage STEM students with complex issues surrounding data fabrication, data falsification, and plagiarism (FFP). The GAP project is innovative by taking an experiential games-based learning approach to an important component of ethics education, and it explores an interactive online model that is adaptable to various learning environments (Leonard et al. 2010).

To inform development of the GAP project, the authors conducted an environmental scan to establish a base-line of student perceptions in an existing academic integrity culture. Designed in consultation with McCabe, the resulting survey is an adaptation of his previous work (2001, 2005) and has been incorporated into his larger pool of data. The predominant finding of this comparison was that more students at UF reported perceiving plagiarism to be a serious issue when compared to the national sample compiled between 2002 and 2011 by McCabe (2011), 36 and 28 % respectively. The UF survey provides a snapshot of the student academic integrity culture at a major land-, sea- and space-grant institution with a large and diverse group of STEM graduate students. The survey results also indicate a strong need for instructors, advisers, and mentors to incorporate aspects of academic integrity into graduate students' activities.

Literature Review

Research relating to academic integrity is vast. The literature places plagiarism and cheating under the broader umbrella of academic dishonesty, and touches every

discipline (STEM, SBE, Medicine, Arts, Humanities), every demographic. Broadly, the literature in every discipline features qualitative or quantitative surveys, focus group analysis, and in-depth interviews on the issues of honor codes, academic dishonesty, cheating, and plagiarism. A few noteworthy surveys have been conducted on a national and international scale in all disciplines at the undergraduate and graduate levels (McCabe 1997, McCabe et al. 2001), within disciplines at the undergraduate and graduate levels (Ryan et al. 2009), at the undergraduate level (Power 2009), or at the graduate level (Wajda-Johnson et al. 2001). Common themes include prevalence, perceptions, behavior, and educational/institutional knowledge comprising components of academic integrity. Although our study concentrates on the graduate level in STEM, it is important not to discount the perceptions of academic integrity by undergraduates should their attitudes carry over in graduate school.

Over the past two decades, many anecdotes, limited case studies, and small course-based surveys have described various aspects of academic integrity in higher education, with a focus on STEM disciplines. However, few large-scale survey-based studies have been conducted. The most insightful research has been led by McCabe (1997), (2005); McCabe et al. 2001. His surveys of over 63,000 undergraduate students and 9,000 graduate students reveal that 62 % of undergraduates, and 59 % of graduate students had engaged in “cut and paste” plagiarism from either print or electronic sources at least once in the last 3 years. Carpenter et al. (2006) conducted a survey on the perceptions of why students cheat, how often it occurs, and are there methods to curb academic dishonesty. They administered a survey to ~640 undergraduate and pre-undergraduate engineering students from 11 institutions ranging in size, including community colleges and large research institutions. Survey questions included the definition of cheating, psychological factors, values and ethical decision making, and the effectiveness of various ways to deter cheating. One of the outcomes is quite significant in that the frequency of student cheating is defined by their attitude toward the behavior. Their research also suggests that the students hold the instructor responsible for trying to prevent cheating, in other words the students will offer excuses and blame the instructor to rationalize unethical behavior. Other research demonstrates that faculty may be reluctant to accuse students of plagiarism. The burden of proof may be too high (McCabe 2001), or that instructor confidence relies on the institution’s policies on academic honesty and honor code (Bennett et al. 2011). Broeckelman-Post (2008) argues that students are more influenced by their peers than by activity in the classroom. In sum results suggest that the academic community as a whole, including students, faculty and the institution, is responsible for defining the importance of academic integrity.

For a comprehensive literature review on plagiarism, Klein (2011) delves into the theories of why students plagiarize, including the traditional ethical and moral philosophies, such as cultural relativism, utilitarian and Kantian. Perceptions of why and how students cheat from a societal perspective are also discussed, and include academic dishonesty both online and in the classroom, and whether electronic detection tools play a role in deterring plagiarism. The goal of a limited study (solicited via selected teaching listservs) on instructor perceptions of plagiarism was

to determine if there is a common definition of what constitutes plagiarism. The results reveal that instructors define plagiarism behaviors as “probably” or “definitely.” Roig (2006) writes extensively on plagiarism and writing practices. His guide on ethical writing and avoiding plagiarism should be required reading at any academic institution.

Brown and Howell (2001) deconstruct plagiarism definitions, and argue that more positive outcomes are attained when students understand the terminology used and the impact of offenses. (McCabe et al. (2001) review 10 years of research on academic dishonesty—specifically cheating and the importance of understanding why cheating occurs—focusing on students perceptions and the behaviors associated with academic dishonesty. The key findings show that cheating can be managed in the classroom if the instructor outlines the expectations and the consequences of dishonest actions. An Australian study by Gullifer and Tyson (2010) conducted focus groups where six perceptual themes of plagiarism emerged: confusion, fear, perceived sanctions, perceived seriousness, academic consequences, and resentment. In their most recent research (2014), Gullifer and Tyson hypothesize that the knowledge of the honor code lowers the rate of academic dishonesty, but their results showed the opposite.

A substantial body of literature has shown that academic conduct standards can vary cross-nationally (Handa and Power 2005; Leask 2001; Ramburuth and McCormick 2001). In particular, these studies show that definitions of cheating vary and that some behaviors prohibited under some cultures’ standards are deemed acceptable or even desirable in others. Walker (2010) research reveals that international students have a higher rate of plagiarism than domestic students. Walker (1998) suggests that students whose native language is not English may be susceptible to plagiarizing for multiple reasons, including academic pressures, cultural reasons, such as living/studying in a new environment. Sowden (2005) explored values and practices among non-Western cultures and identified some basic differences. He argues that international students may define plagiarism differently than their Western counterparts, as part of cultural conditioning. Counter-arguments are found in the literature as well. Employing a largely personal perspective, Lui (2005) dismisses the theory of cultural conditioning (Sowden 2005) as the leading culprit of plagiarism incidents among TESOL programs, specifically among Chinese students, stating that Chinese students are taught that plagiarism is not an acceptable practice. He further states that students who are caught plagiarizing do not understand their actions or use it as an excuse. Considered overall, then, definitive conclusions on cross-cultural differences, which are highly controversial, have yet to be reached.

The emerging theme from the literature on the perceptions of plagiarism within the academic institution is perspective (East 2006). All of the literature points toward the accountability of students, faculty, and administration. Students need to develop an awareness of academic integrity and follow the guidelines of ethical scholarship, faculty need to be vigilant and hold the students accountable, and administration must set policies and guidelines that are practical and enforced.

Methodology

The survey was administered to 4,500 graduate students in STEM disciplines UF. The instrument, accompanied by an explanatory letter, was distributed via email by the department chairs of the relevant STEM-related departments; chairs were asked to encourage their graduate students to participate. Ultimately, this yielded 647 completed surveys (roughly an 18 % response rate) with 188 respondents (29 %) making further comments on one or both open-ended questions.

The survey contained several major blocks of questions. The largest was a 14-item battery asking respondents to rate presumed academic dishonesty behaviors (e.g. paraphrasing without attribution, appropriating others' work) on a four point scale: "Serious" "Moderate" "Trivial" or "Not Plagiarism." These questions allowed us to assess two related aspects of attitudes: whether a given behavior was perceived as constituting academic dishonesty and, if so, the seriousness of the offense.

A second question block focused on the university's Honor Code. An introductory question assessed familiarity with the code, and then a set of follow-up questions asked respondents how much they had learned about the Code from six sources, including professors, advisors, and peers. The results thus provide a rough measure of knowledge.

The third block focused on communication of academic integrity information by professors. These questions assessed students' perceptions of the amount of faculty effort devoted to discussing and educating students about policies on matters such as plagiarism, group work, and citations.

The fourth block assessed respondents' views of the broader academic integrity environment at the university. Factors assessed included the perceived degree of academic misconduct on campus, faculty anti-plagiarism efforts, and the fairness of the campus investigation process.

Additional questions addressed other concerns, including whether the respondent had been the victim of academic dishonesty perpetrated by another student, and whether they had ever reported another student for dishonesty. Demographic information also was collected regarding primary academic department and country where respondents completed their undergraduate degree. The survey instrument is available in the Appendix, and the responses are available in the UF Institutional Repository, <http://ufdc.ufl.edu/l/IR00003940/00001>.

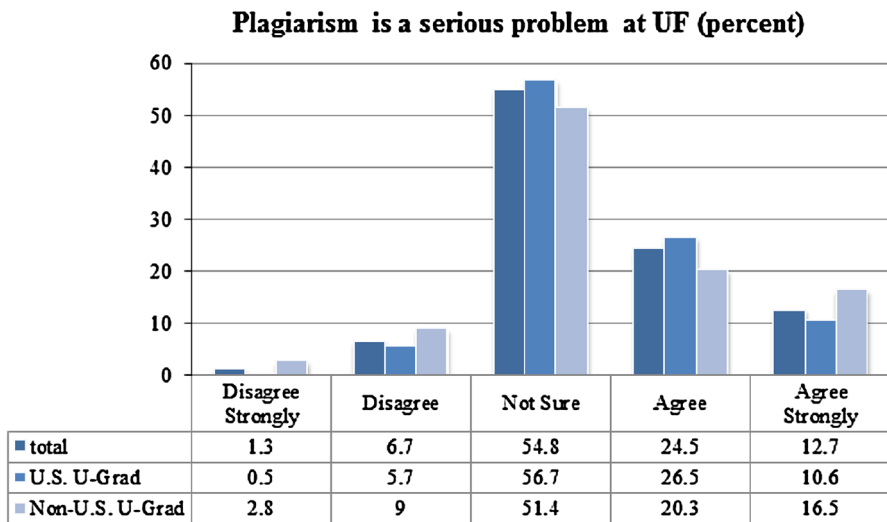
Results

Respondent Portrait: Academic Affiliation and Country of Origin

Respondents were asked to identify their primary academic department, and responses from non-STEM students are excluded from the analysis. Respondents were also asked whether they completed their undergraduate degree outside the United States. Distribution is shown in Table 1. Non-US responses have been aggregated throughout the paper.

Table 1 Country/Region of undergraduate degree

Country	(%)
United States	65.8
India	7.7
China	6.3
Latin America	6.5
Europe	2.6
Other or Unknown	11.1

**Fig. 1** Severity of plagiarism by country of undergraduate

Academic Dishonesty on Campus

One of the most basic concerns in the literature involves the increased frequency of plagiarism. We assessed student perceptions on how much plagiarism they think is occurring on the UF campus.

More than half chose “Not Sure,” which may simply indicate a lack of awareness of others’ behavior. Over one-third of respondents believe that academic dishonesty is a serious problem. Students who received undergraduate degrees outside the US were more likely to choose the extreme (“strongly”) options in each direction (Fig. 1).

Seriousness of Academic Dishonesty

Respondents were asked to rate 14 types of presumed academic dishonesty (Table 2). Respondents generally seem to have internalized prevailing academic

Table 2 Seriousness of Academic Dishonesty (Percentages)

	Not plagiarism	Trivial	Moderately serious	Serious	Mean Score (1–4 Scale)	SD
1. Turning in another students' paper	.8	.2	1.4	97.6	3.96	.30
2. Copying from a written source	.6	.2	3.9	95.3	3.94	.31
3. Incorporating research data as own	.6	.3	5.5	93.5	3.92	.34
4. Turning in someone else's work	.9	.5	3.9	94.6	3.92	.37
5. Copying Someone Else's Comp Program	1.1	1.9	13.1	83.9	3.80	.52
6. Incorporating lab data as own	.9	2.5	20.0	76.5	3.73	.55
7. Copying different sources into paragraph	1.7	3.9	17.7	76.6	3.69	.63
8. Paraphrase/copy from e-source w/o cite	1.3	6.0	28.4	64.4	3.56	.67
9. Paraphrase/copy from print source w/o cite	1.6	4.1	30.1	64.3	3.57	.66
10. Adding/deleting/changing a cited quote	4.7	14.1	41.5	39.7	3.16	.84
11. Quoting another author w/o cite	1.1	3.1	23.3	72.4	3.67	.59
12. Collaborating with others (in person)	4.7	16.2	44.0	35.1	3.09	.83
13. Collaborating with others (via email)	5.4	19.4	42.4	32.9	3.03	.86
14. Turning in same paper for another class	14.4	20.5	34.4	30.8	2.82	1.03

norms, since only a small percentage of students viewed these behaviors as not constituting plagiarism. These offenses were generally characterized as serious; mean scores for all but one behavior were at or above 3.0 (Moderately Serious).

Comparing Domestic and International Students

Despite claims about differing cultural conditioning of international students (Sowden 2005), or the research conducted by Walker (2010) that shows international students have a higher rate of plagiarism instances and may plagiarize due to academic or cultural reasons, our findings showed no consistent pattern of differences between those whose undergraduate degree was earned in or outside the US. While seven of 14 “seriousness” measures showed a statistically significant difference between the two groups (Table 3; independent samples *t* test, .05 level), only items 7 and 14 showed a substantively meaningful difference. In fact, UF’s international students took a stricter interpretation of academic misconduct on two items: (6) incorporating others’ lab data, and (14) turning in the same paper.

Table 3 Mean scores by country of undergraduate degree

Survey item	US mean	SD	Non-US mean	SD	df	t stat	Effect size (cohen's d)
2. Copying from a written source	3.96	.23	3.89	.43	631	2.80	.20
4. Turning in someone else's Work	3.95	.30	3.87	.48	631	2.75	.20
6. Incorporating course lab data as own	3.67	.57	3.84	.47	629	3.89	.33
7. Copying and pasting from several sources	3.78	.53	3.51	.76	629	5.12	.41
9. Paraphrase/copy from print source w/o cite	3.62	.60	3.48	.73	631	2.58	.21
11. quoting another author w/o cite	3.71	.54	3.59	.67	631	2.53	.20
14. Turning in the same paper for another class	2.67	1.05	3.09	.91	630	4.97	.43

Statistically significant survey items only

Dimensions of Student Perceptions of Academic Dishonesty

Along with measuring student perceptions on academic dishonesty, these survey questions also allowed us to analyze the structure of these perceptions. To explore this, we conducted a principal components analysis (PCA) of the fourteen academic dishonesty items in Table 2. PCA is a statistical technique which can identify clusters of related survey items (Dunteman 1989). For example, PCA analysis of a survey on political issue opinions might reveal that these opinions cluster into two general scales or dimensions, with opinions on social issue forming one cluster, and opinions on economic issues forming another.

Our PCA analysis with Varimax rotation sorted respondents' survey answers into three interpretable clusters, or dimensions, using a 1.0 eigenvalue cutoff criterion and reporting component loadings over .5, which suggests that students perceive three basic types of academic dishonesty. While labeling dimensions is not an exact science, the following names seem to capture the central thrust of each category.

Misappropriation of Others' Work

The first scale involved misappropriation; each of the six survey items loading on this component (or cluster) involved taking another person's work (generally from peers) and representing it as one's own.

- Submitting a paper written by another student
- Copying from a written source and submitting it as one's own work
- Turning in someone else's work
- Incorporating another students' research data
- Copying another students' computer program
- Incorporating another students' lab data

Improper or Inadequate Citation and Paraphrasing

The second cluster contained five items, each of which involved some type of improper or inadequate citation or paraphrasing of presumably published work.

- Copying and pasting from several different sources to create a paragraph
- Copying or paraphrasing a few sentences from an electronic source without citation
- Copying or paraphrasing a few sentences from a print source without citation
- Purposely adding, deleting or changing words in a quotation
- Quoting another author without citation.

Unauthorized Collaboration

The third and final cluster had two survey items. Both involved working in groups despite an instructor's explicit instruction to do individual work.

- Working on an assignment with others, in person, when the professor asked for individual work
- Working on an assignment with others, via email or chat, when the professor asked for individual work;

These three components, or clusters, enable us to determine the relative seriousness that students assign to different types of academic dishonesty. Calculated using a 1–4 scale, with higher numbers again indicating greater perceived seriousness, the cluster means were 3.88, 3.53, and 3.06, respectively. Thus misappropriating others' work was generally viewed as most serious offense, followed by improper citation or paraphrasing, with unauthorized collaboration seen as the least serious (A final survey item “Turning in Same Paper for Another Class,” was essentially an outlier as it does not fit into one of the three major scales. Thus it is not included in the component mean calculation).

University Honor Code

Honor codes “can play a powerful role in reducing dishonest behavior...” (McCabe et al. 2001). A more recent study by Gullifer and Tyson (2014) revealed that only half of the students read the honor code and most were confused by the definitions. They ascertain that an educational approach is the best method for avoiding plagiarism, not necessarily relying on the honor code. At UF, the complete honor code is far too long to include on each syllabus, and thus it is likely that most students are familiar only or primarily with the Honor Pledge, which is brief and is limited in scope to assignments. The complete Honor Code (University of Florida 2008) specifies and defines violations of (a) Plagiarism; (b) Unauthorized Use of Materials or Resources (“Cheating”); and (c) Prohibited Collaboration or Consultation.

Table 4 Learning about Honor Code by source (%)

	Little or nothing	Some	A lot	Mean score (1–3 Scale)	SD
Graduate Student Orientation Program	32.0	52.9	15.1	1.83	.67
University website	51.0	38.9	10.1	1.59	.67
Program director or advisor	44.2	39.4	16.4	1.72	.73
Faculty (via course instruction)	10.6	48.9	40.5	2.30	.65
University library	82.2	12.8	5.0	1.23	.53
Other students	67.9	24.4	7.7	1.40	.63

Table 5 Knowledge of UF honor code by country of undergraduate degree

	Low HC knowledge	Moderate HC knowledge	High HC knowledge
US	11.1	75.3	13.6
Non-US	21.2	51.4	27.4

The vast majority of respondents—93.4 %—reported familiarity with the UF Honor Code. While the distinction between the Code and the Pledge is somewhat ambiguous, an affirmative answer on this survey item likely indicates a general exposure to academic integrity principles.

Students were asked to indicate how much they had learned from six campus sources that might be expected to provide information about the Honor Code (Summary in Table 4).

All six sources show some impact, though their contribution to student learning varies widely. As anticipated—since instructors are asked to include the Honor Code in course syllabi—course instruction appears to be the greatest source of information about the Honor Code at UF.

Interestingly, however, students who received their undergraduate degrees outside the US did differ from their US -educated counterparts (Table 5, which aggregates learning across the six information sources in Table 5 into “low” “moderate” and “high” categories). While mean knowledge of the Honor Code was virtually identical for the two groups, the variance was higher among the non-US educated, with more respondents in the low and high categories.

There are several possible interpretations for this polarization among international students. But the survey did not enable us to extract the motivations for this difference.

Faculty Academic Integrity Efforts

The data also allow for a broader look at faculty contributions to academic integrity efforts. Another block of questions delved into greater detail about faculty members’

academic integrity communications with students. Moving beyond the UF Honor Code to academic policies on various forms of academic integrity, a battery of questions asked our graduate student respondents how often their professors had discussed any of six integrity-related policies over the past year (Table 6).

The “seldom” and “often” responses were most common, suggesting a moderate level of faculty emphasis. The pattern across policies shows that non-US students report having received somewhat more information from professors than their US counterparts. The differences are not substantively large, but they are consistent (all mean differences were significant at the .05 level via *t* test, Table 6).

This block of questions also allowed us to compare perceived faculty emphasis on academic integrity policies with student perceptions of the seriousness of academic misconduct. Interestingly, there is little correlation: as the Pearson’s *r* correlation coefficients in Table 7 indicate, there is no substantively significant relationship between professors’ emphasis and the perceived seriousness of these behaviors.

Finally, our last major block of questions assessed other contextual factors that might shape or affect the academic integrity culture at the university. These questions, involving factors that other authors have identified as important, clustered into four main groups.

Difficulty and Appropriateness of Course Work

Since overly demanding course requirements may be an inducement to cheat (Love and Simmons 1998; McCabe 2011), respondents were asked two related questions on the amount and difficulty of their academic assignments. While some dissatisfaction is evident, approximately two-thirds of respondents agree that the amount and difficulty of course work are appropriate. Therefore, the results do not indicate that either of these factors provides a strong inducement to cheating at UF.

Faculty Vigilance and Anti-Cheating Efforts

Whatever preventative measures are taken, however, some academic dishonesty temptation will likely still exist. Another element of instilling an academic integrity culture involves curbing opportunities to follow this urge, and further research on how instructors respond to plagiarism violations based on institutional policies is warranted (Bennett et al. 2011). Respondents were asked two questions about faculty efforts to prevent academic dishonesty. The modal category for each indicates students are “not sure.” This lack of certainty suggests that this is not a significant factor; however the open-ended comments introduce some anecdotal evidence of dissatisfaction with faculty and administrative oversight.

University Procedures

Each institution must develop effective procedures for handling any academic dishonesty cases that do arise. As with the previous pair of questions, approximately two-thirds of respondents reported they were not sure whether investigations were

Table 6 Professors' emphasis on academic integrity policies (frequency of mention in percentages)

	Never	Very seldom	Seldom	Often	Very often	Mean score (1–5 scale)	SD	df	t stat	Effect size (Cohen's d)
<i>Plagiarism</i>										
US	13.7	23.0	28.9	29.6	4.7	2.89	1.12	630	3.11	.26
Non-US	11.0	14.8	27.1	39.5	7.6	3.18	1.12			
<i>Group work or collaboration</i>										
US	13.5	16.6	28.7	35.5	5.7	3.03	1.14	628	1.97	.17
Non-US	13.9	9.1	29.3	35.6	12.0	3.23	1.20			
<i>Proper citation of print sources</i>										
US	13.8	16.9	27.3	30.4	11.6	3.09	1.22	626	2.75	.24
Non-US	11.1	12.1	21.3	39.1	16.4	3.38	1.22			
<i>Proper citation of internet sources</i>										
US	19.6	19.8	30.0	22.5	8.2	2.80	1.22	617	3.28	.28
Non-US	13.2	14.6	30.2	28.8	13.2	3.14	1.21			
<i>Incorporating others' lab data</i>										
US	42.5	20.0	22.4	13.1	1.9	2.12	1.16	622	5.65	.47
Non-US	25.9	16.1	29.3	20.0	8.8	2.70	1.29			
<i>Incorporating others' research data</i>										
US	34.3	19.8	25.0	16.4	4.5	2.37	1.23	625	3.63	.30
Non-US	26.1	14.5	27.5	20.8	11.1	2.76	1.34			

Table 7 Professors' emphasis on academic integrity topics by perceived academic misconduct seriousness (mean scores with Pearson r correlation)

	Never	Very seldom	Seldom	Often	Very often	Correlation (r)
Plagiarism	3.53	3.58	3.60	3.64	3.74	.112
Group work or collaboration	3.01	3.00	3.00	3.13	3.12	.063
Proper citation of print sources	3.82	3.64	3.75	3.77	3.78	.029
Proper citation of internet sources	3.67	3.32	3.53	3.60	3.73	.057
Incorporating others' lab data	3.68	3.65	3.75	3.86	3.85	.118
Incorporating others' research data	3.93	3.96	3.87	3.95	3.86	-.042

Table 8 Use of citation tool by perception of plagiarism seriousness (%)

Use citation tool	Plagiarism not or somewhat serious	Plagiarism moderately serious	Plagiarism very or extremely serious
Yes	32.3	10.5	57.1
No	43.9	12.9	43.3

managed fairly. Many students have likely not had any exposure to adjudicated cases, or may not have been aware of the final outcome.

Citation Management Tools

Another survey question asked about use of citation management tools. Among all respondents, 47.4 % reported use of a tool such as RefWorks, EndNote, Zotero, ProCite, or Mendeley, with slightly greater use by those who received undergraduate degrees in the US (49.3 vs. 44.3 %).

Interestingly, as Table 8 indicates, there was a slight tendency for those who use such tools to view plagiarism offenses as more serious than those who do not use such tools (Contingency coefficient = .14, $p < .05$).

It may be the case that they use citation tools because they understand the seriousness of plagiarism, or, alternatively, their use of a tool has led them to appreciate the value in crediting others. While a majority of librarians in US academic institutions conduct workshops on citation tools (Gibson and Chester-Fangman 2010), librarians must accept the challenge to work with faculty on addressing plagiarism issues by offering courses across campus, although a debate between librarians of who is responsible for teaching citation styles and appropriation to avoid plagiarism continues with some arguing that it is the responsibility of the campus writing centers (Park et al. 2010). Amsberry (2010) reveals studies about plagiarism from cross-cultural, educational, and linguistic perspectives from a variety of disciplines. She discusses the definitions of plagiarism and how each is perceived by international students. She concludes by offering recommendations for teaching plagiarism workshops in an academic library setting. Leonard and Bennett (2013) argue that librarians can find a niche in

Table 9 Frequency of open-ended comments by category

Open-ended comments (clustered)	Total	Open-ended comments (clustered)	Total
Instructors could prevent/punish	60	Participated in FFP	8
Witnessed peer or above	45	Collaboration issues	20
Witnessed as TA	42	Confusion about double dipping	6
Witnessed researchers/practitioners	13	Communication/education needed	36
Not witnessed any	30	Differences across cultures	16
Had been victim	25	Honor code comments	6

promoting avoiding plagiarism to students by working with faculty and administrators, developing seminars and symposia, and creating online guides.

Open-Ended Responses

Two open-ended questions were included, intended to gather respondents' personal experiences encountering plagiarism and their general views on plagiarism and academic dishonesty. Over a quarter (29 %) of the respondents answered one or both of these open-ended items, providing explanations that augment the numeric data. The quantity and thoughtfulness of the comments surprised the authors. A clustering of topics discussed in the comments emerged from reading them; see Table 9 for their natural grouping.¹

Sixty (32 %) commenters stated that instructors and administrators could or should do more to prevent plagiarism and cheating. Many graduate students, their peers, and their faculty are dissuaded from reporting incidents because the process requires time and energy and usually results in no punishment. Thirty-six commenters note that communication, education, and training might help them and all students reduce the incidents of academic dishonesty.

- *“I think there is a great range of seriousness of offenses, and the punishment for each should vary accordingly. ... if the honesty code were simplified and made less severe and more enforced, I think you could actually deal with dishonesty much more effectively.”*
- *“If the rules were explained clearly, students might follow them better.”*
- *“I get the impression that academic dishonesty is something that professors at UF try to deal with at their own level, and very few cases get reported to the university. While plagiarism might be easier to prove than say cheating on exam, I think professors don't often think it is worth their time and effort (or even risks to them) when an incident of academic dishonesty occurs.”*

¹ One respondent reported a state of mind over a plagiarism offense that led the authors immediately to contact an appropriate university office out of concern for the respondent's mental health. The reporting action also required completing an “adverse effects” form with IRB. The authors don't know how many corrective avenues the respondent had attempted, but the survey afforded an opportunity. The respondent's comment has been stricken from the dataset.

In their role as teaching assistants, graders and proctors, forty-two graduate students noted that they have become aware of an unexpectedly high amount of plagiarism or cheating by undergraduates. A number of these students also lamented that their instructors were unwilling to pursue violators. Forty-five commenters had witnessed cheating or plagiarism at the peer level or above. Thirteen of the students related anecdotes of researchers or practitioners plagiarizing, stealing, or condoning such behaviors.

- *“Plagiarism is not the only issue, academic honesty is too. I’ve witnessed blatant collaboration during test taking in graduate school that I never saw during my undergraduate career but did not report it because I did not want to become involved with a lengthy judicial process early in my graduate career and I did not believe the ‘cheating’ would affect my overall grade in the course.”*

Twenty-five respondents reported that they themselves had been victims of copying, cheating, or plagiarizing. Seven noted the fine lines between teaching versus giving answers or problems with helping others until they realized their beneficiaries were simply copying.

Thirty noted that they had not witnessed or participated in cheating or plagiarism. Among them, one carefully replied “not in my department,” three “not at <institution>” and one said “in my professional career, not as far as I know in school.” A much greater percentage of non-US undergraduate comments clustered into the “none” category than US undergraduates’ comments: (11/49 commenters, 22.4 % versus 19/138 commenters, 13.7 %).

Eight reported having copied, cheated, or plagiarized, with varying degrees of deliberate or inadvertent action.

Sixteen students noted differences in behavior across cultures. Most used a neutral tone, observing that differences exist or stating that non-US students do not know the guidelines practiced in the US. Selected culture-related comments (with emphasis added) include:

- *“In my country, college students plagiarise **usually because tutors do not supply them with enough materials and tools to handle their assignments alone.** No one want to steal someone else’ property if he has a better choice, though I disagree strongly against it myself.”*
- *“I went to an undergrad institution where honor code was strictly implemented, and comparatively UF does not seem to have an honor code. I have seen students copy solution manuals, or other people’s homeworks all the time, and professors didn’t seem to notice, or care. Being Latina myself, this is definitely common among the Hispanic community, where under the name of “teamwork” people just copy each other’s’ work, even on exams....”*
- *“I wish we have the same approach regarding plagiarism in my home country.”*
- *“As a US citizen I was taught all along in school how serious plagiarism is. I don’t do it ever. But people from other cultures don’t have the same kind of view of it, and I know that because most grad students I work with are international. I know they will from time to time use writing that someone else wrote and change*

it. They will work together when the professor asked them not to. But that doesn't mean that they are dishonest people. They have a standard 99 % of them will not do something that is truly wrong. They just don't agree with the American definition...."

- *"As a graduate student, I can say that there is a serious gap in understanding what plagiarism is between international and domestic students. I think **more could be done in collaboration with the international student center** to really emphasize that plagiarism is taken seriously in the US and what it means to plagiarize."*

Twenty noted collaboration issues, such as confusion over situations where collaboration is encouraged versus when (and why) it is discouraged. Some opined that since collaboration is required in the workplace, it should be acceptable in all tasks relating to education, while others display insight into the differences between the learning process and demonstrating that knowledge. Many of the commenters expressed the view that instructors need to clearly delineate when and where collaboration is permitted or prohibited. The full University of Florida Honor Code (2008) includes an extensive section on "Prohibited Collaboration or Consultation" so the confusion expressed in the comments belies the high familiarity (93.2 %) assessed in the objective query.

Selected quotes that resonated with the authors include:

- *"I'm not having original thoughts at this point so almost everything I write is paraphrasing other's work."*
- *"... people are careful not to mention current plagiarism while it is occurring."*
- *"No one cheats when they want to learn something."*
- *"I think it would be helpful for there to be a workshop for grad students on the different citation methods and examples of how to cite books, journals, magazines, personal communication, etc."*

Discussion

Foundationally, our results show that over half of our student respondents were "not sure" about the level of academic dishonesty at UF. Over one-third indicated that this was a serious problem, with the remainder viewing it as a minor or non-existent concern. But this raises a question; how do students define academic dishonesty? UF students largely embrace conventional definitions; of the fourteen types of academic dishonesty we asked about, only one—turning in one's own paper to more than one class—was judged as less than moderately serious. Our statistical analysis further revealed that students sorted these individual behaviors into three basic categories; misappropriating others' work, inadequate or improper citation, and engaging in prohibited group work, with this order indicating decreasing levels of seriousness.

Turning to results on institutional anti-dishonesty efforts, findings showed a high but probably diffuse knowledge of the UF campus Honor Code. However, this familiarity may be limited to the briefer Honor Pledge, which is the only text required for display on syllabi, since the open-ended comments indicate that the Code is weak, poorly understood, and not detailed. Comments regarding collaboration and turning in one's own previously-submitted paper indicate a lack of awareness of the full Code. Examining students' familiarity with the complete Code might provide insight into the true depth of their knowledge. Ensuring exposure to the full Code would only improve academic integrity within the institution. Only 15.1 % reported learning "a lot" about the Honor Code in the Graduate Orientation program. Much content is stuffed into the orientation week, in general as well as departmental sessions. But the low percentage indicates an opportunity for the Graduate School and the departments to emphasize both the Honor Code and other expectations of academic integrity as students begin their graduate programs. Formalizing such training across the university would ensure a strong foundation of awareness. Even fewer (7.7 %) report learning from fellow students. To the extent that many beginning graduate students work under the direction of more experienced colleagues, departments also have an opportunity to encourage advanced level graduate students to incorporate aspects of academic integrity into everyday lab activities.

Professors were seen as making a moderate effort to promote academic integrity through their academic policies. Instructors can communicate academic integrity standards to students. As our surveyed students perceive this, faculty did reasonably well, at least cumulatively. However, only 16.4 % learned "a lot" about the Honor Code from their advisers. While the orientation sessions should emphasize academic integrity in the classroom, the data indicate an opportunity for advisers to not only reinforce the concepts, but also stress academic integrity in the research and publishing environment.

Direct comparisons can be drawn between UF survey responses and McCabe's compiled national sample of Science and Engineering students (2011). First, and perhaps most interesting, more students at UF reported perceiving plagiarism to be a serious issue when compared to this sample (36 and 28 % respectively). UF students' were also more likely to characterize the seriousness of an academic integrity offense higher than McCabe's sample. When it comes to faculty academic integrity efforts, only one-third of UF graduate students (compared to 45 % in the national sample) thought that faculty changed assignments regularly and therefore facilitating a culture of academic integrity. Further, only 34 % of UF students reported professors discussing citation of internet sources (compared to 42 % in the national sample). These ideas are further supported by the open-ended responses in which many expressed both the need for more academic integrity education/communication and increased faculty attention to this issue. Faculty may assume that graduate students learned about plagiarism and proper citation at an earlier stage of their academic careers, but perceptions detailed here indicate a need for faculty to be proactive and to err on the side of repeating rather than assuming.

Conclusions

These data point to several avenues for expanding future surveys. More deeply assessing the knowledge and behaviors of international students might help inform local activities. The open-ended comments uncovered some potential value in compartmentalizing respondents' awareness of academic misconduct at several levels: among their peers as undergraduate students, among their peers as graduate students, among the undergraduate students in courses where the graduate students serve as teaching assistants, and among higher-level researchers with whom they interact. The authors would like to survey the STEM graduate students at the University of Florida about their perceptions and behavior regarding academic integrity at regular intervals, perhaps every 5 years, to assess changing attitudes and any impact of local actions such as training, publicity, and code enforcement.

The objective of this survey was to inform the content created for the NSF-funded GAP series of mini-games developed at the University of Florida. Exploring the perceptions and in some cases, anecdotes of these students helped create realistic game modules with which students could interact. Survey results and comments also provided developers a lexicon that would be understood by all players, independent of their cultural background. However, the differentiation found in the comparison with the national sample brings to light the need for a holistic approach to improve the culture of academic integrity at UF. The UF Academic Integrity Task Force (2011) accepted this finding and released a white paper with recommended short-term and long-term goals to this end. A few short term goals include the developing training for faculty on the UF Honor Code, emphasizing the adjudication process, and defining clear explanations on behaviors related to academic integrity. Long term goals include the creation of a strong campus culture on academic integrity by launching a campaign on ethical conduct, including a peer-to peer student campaign. When implemented, support from the entire campus community will be needed to ensure success. It is not unlikely that this phenomenon is limited to the UF community and that similar explorations should be conducted at other institutions.

Acknowledgement The authors are deeply grateful for the guidance, mentoring and expertise of Dr. Donald L. McCabe, who not only permitted the adaptation of his survey, but also served as an external consultant on the NSF Grant project, Gaming Against Plagiarism, EESE IIS #1033002.

Appendix: Survey Instrument

Response data available at <http://ufdc.ufl.edu/IR00003940/00001>.

Perceptions of Plagiarism in the Academic Environment

- Q1. [*affirm consent to participate voluntarily*]
Q2. Have you been informed about the University of Florida Honor Code regarding academic honesty?
Yes
No

Q3. If yes to question #2, where and how much have you learned about the UF Honor Code policies?

	Learned little or nothing	Learned some	Learned a lot
Graduate orientation program			
University of Florida website			
Program Director or Advisor			
Faculty (e.g., discussed in class, course syllabi, or course outlines)			
Librarian/Library			
Other students			
Other (please specify)			

Q4. In the past year, how often did any of your professors discuss policies concerning:

	Never	Very seldom	Seldom	Often	Very often
Plagiarism					
Guidelines on group work or collaboration					
Proper citation/referencing of in-print sources					
Proper citation/referencing of internet sources					
Incorporating another's course lab data as your own					
Incorporating another's research data as your own					

Q5. Please mark how serious you think each type of behavior is.

	Not plagiarism	Trivial	Moderate	Serious
Working on an assignment with others (in person) when the professor asked for individual work				
Working on an assignment with others (via e-mail/chat) when the professor asked for individual work				
In a course requiring computer work, copying another student's program rather than writing your own				
Incorporating another's course lab data as your own				
Incorporating another's research data as your own				

continued	Not plagiarism	Trivial	Moderate	Serious
Paraphrasing or copying a few sentences from a book, magazine, or journal (not electronic or Webbased) without citing them in a paper you submitted				
Paraphrasing or copying a few sentences from a book, magazine, or journal (electronic/Internet)				
Without citing them in a paper you submitted				
Turning in a paper written and previously submitted by another student and claiming it as your own work				
Quoting another author in your own work without citing them in a paper you submitted				
Copying material, almost word for word, from any written source and turning it in as your own work				
Turning in work done by someone else				
Turning in the same paper for another class				
Copying and pasting directly from several different sources and combining them to create a paragraph for a paper				
Accidentally or purposely adding/deleting/changing words in a quotation				

Q6. How strongly do you agree or disagree with the following statements?

	Disagree strongly	Disagree	Not Sure	Agree	Agree strongly
Plagiarism is a serious problem at UF					
Investigation of suspected incidents of plagiarism is fair and impartial at UF					
Faculty members are vigilant in discovering and reporting suspected cases of academic dishonesty, specifically plagiarism					
Faculty members change assignments on a regular basis					
The amount of course work I'm expected to complete is reasonable for my year level and program					
The degree of difficulty in my assignments is appropriate for my year level and program					
The types of assessment used in my courses are effective at helping me learn course concepts					

Q7. Has someone ever taken credit for, or plagiarized, your work?

Yes

No

- Q8. Have you ever reported another student for plagiarizing an assignment?
Yes
No
- Q9. Did you complete your undergraduate degree in the United States?
Yes
No. If no, in which country did you complete your undergraduate degree?
- Q10. Please select your primary department [from a drop-down menu].
- Q11. Do you use a bibliography/citation management tool? (e.g. RefWorks, EndNote, Zotero, ProCite, Mendeley)
Yes
No
- Q12. Please share any personal experiences you encountered with plagiarism.
[open-ended response]
- Q13. Do you have any other comments about plagiarism or academic honesty?
[open-ended response]

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