

Interim Results of a Longitudinal, Multi-site Survey of Perceptions of Academic Integrity

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Abstract

Cheating is a perennial issue in education from early grades all the way through graduate study. A spate of back to back academic integrity issues in the authors' home department spurred a number of conversations among faculty. A recurring theme of the conversations was, "How can these students think this is acceptable?" The authors decided to try to answer the related question of how differently DO faculty and students regard the same cheating behavior in terms of severity. During the 2015-2016 academic year, a survey was developed and administered. One section is meant to duplicate the spirit of McCabe and Bowers' pivotal study. Other sections of the instrument are intended to elucidate a severity rating for 20 various scenarios that represent a range of academic integrity violations from trivial to most severe. The results from the first year were sufficiently compelling to warrant recruitment of additional respondent institutions during year two. This work reports on results from the third administration at the original institution, and the first or first and second administrations at additional institutions. In all cases, previous work has pointed to the existence of a disparity in perception between students and faculty, freshmen and upper-class students, and students at different institutions. The authors have termed this disparity an ethical gray area. Understanding these differences enables the opportunity to better engage in dialogue with the ultimate goal of reducing academic integrity violations.

Introduction

This paper first will summarize key background literature, then describe the design of this study. The survey instrument and brief descriptions of the institutions participating in the study are included in Methods. Detailed results and discussion are presented for various populations and comparisons. The paper closes with a broader discussion of the implication for practice.

Background

The foundation study for the current work was a survey of faculty and students in the Department of Engineering at East Carolina University. The survey presented student and faculty participants with different scenarios and asked respondents to rate each scenario on a scale ranging from "serious violation" to "no violation". Each scenario was meant to present varying shades of ethical gray area among what behaviors are considered academic violations. The first year's results generally indicated that faculty members perceived academic integrity violations as more severe than students did. Among the students, freshmen rated the academic integrity violations as somewhat more severe than upperclassmen, indicating a shift in student perception from the first year of college to the last year of college [1]. The goals of the second year of research were to compare the results of three institutions: one public university and two religious private institutions, one of which has a formal honor code. The expectation based on multiple other works was that institutions with an honor code would have the best handle on academic integrity issues [2],[3]. The results were that Benedictine College and East Carolina University's

results were most like previous studies of colleges that have honor codes in place, while The Catholic University of America (the institution without a formal honor code) was most similar to previous studies of colleges without honor codes in place [4]. A 1994 study by Graham concluded there were no statistically significant differences between religious institutions or community college students' attitude toward cheating and perceived amount of cheating [5]. One aim of this ongoing project is to capture a sufficient cross section of institution types to enable similar observations.

The pivotal Bowers study that spanned 99 institutions found that half of the students admitted to committing some sort of academic integrity violation while attending college, but only a small percent of cheaters was caught and punished. Bowers argued that most students morally disapproved of cheating and believed their peers to disapprove as well, but they continued to cheat due to academic survival outweighing moral decision-making [6]. Thirty years after Bowers' article, in 1994, McCabe and Bowers compared the results of McCabe's research in 1991 to the results of Bowers' study in 1964 [7]. A portion of the survey instrument used in the current work asks students to self-report the number of times they have engaged in specific cheating behaviors which are drawn from the work of Bowers and McCabe. Inclusion of this question in the ongoing survey allows not only for comparison within the years administered at any given institution but also with the responses from decades ago.

From a practical standpoint, the responsibility for enforcing academic integrity infractions must start with the faculty, but doing so requires participation and buy-in from many parties. Another study involving McCabe argued that beyond adopting an honor code, students and faculty who care about ethics are willing to work to address dishonesty at their institutions, so institutional administration must properly address the issue as well. That study also suggested that institutions should support their faculty members through the allegation process so that faculty will not be more lenient on students because of the burdensome prosecution process [8]. Research by Miguel Roig focused even more in depth about college professors' perception of plagiarism and paraphrasing, concluding that professors have a broad range of what is considered to be plagiarism, and even suggests that some professors might be stricter than the generally accepted definition of plagiarism [9]. Another aim of this work is to more fully understand the nature of the discrepancies in interpretation of academic integrity concerns such that faculty can be more mindful in architecting proactive policies and education. The overall approach a faculty member employs can reduce both the number of and onerous nature of contending with academic integrity violations while promoting highly ethical behavior instead of simply turning a blind eye.

Method

This section describes the study populations across the years, the survey instrument, and the institutions that participated in each year of the study. The East Carolina University Institutional Review Board approved the study protocol per local, state, and federal requirements. The instrument was administered through the survey platform Qualtrics through East Carolina University computing resources. The study recruited participants through email, announcements during faculty department meetings, and announcements from faculty to students in relevant

courses. The instrument did not collect any personal information on the survey participants, and anonymity was ensured through a waiver of documentation of consent.

Method: Study Population

The study aimed to enroll both students and faculty members involved in engineering at the participating institutions. In 2016, the first year of the study, only students and faculty from the Department of Engineering at East Carolina University were involved. A total of 72 student and 18 faculty responses were collected. In 2017, participants were recruited from East Carolina University, Benedictine College, and The Catholic University of America. During this second administration, there were 36 students and 10 faculty from East Carolina University, 46 students and 4 faculty from Benedictine College and 33 students and 4 faculty from The Catholic University of America. In 2018, this paper reports on the 96 responses gathered to date: 59 students and 6 faculty responded from East Carolina University, and 25 students responded from Benedictine College. (Note that administrative delays have impacted distribution of the instrument at all planned locations for the 2017-2018 academic year.)

Method: Participating Institutions

East Carolina University is a public institution with a population of 29,000 students and has no formal university or department honor code. This university is in a city of about 100,000 residents. The facility offers an undergraduate degree in general engineering, and the engineering program has a faculty of 30 and student population of about 600.

Benedictine College is small, religious institution with approximately 1900 total undergraduate students, 180 engineering students and 8 engineering faculty. Benedictine College students pursue degrees in Mechanical, Civil, Electrical and Chemical Engineering. Benedictine College is the only participating institution with a formal honor code. The Benedictine College honor code is not campus wide, but has been implemented for all engineering students. Benedictine College is located in a town of approximately 11,000 residents which is approximately an hour from a moderately populous city (500,000 residents).

The Catholic University of America is another small, religious institution with approximately 3000 undergraduate students, 2800 graduate students, and just under 500 undergraduate engineering majors served by 29 faculty with teaching responsibilities. The Catholic University of America also has no formal honor code. It is an urban campus situated in a metropolitan area with a population of several million residents.

Method: Survey Instrument

The survey instrument consists of three main portions. This work will refer to them as Part One, Part Two, Part Three. Parts One, Two, and Three are multi-response questions presented to student respondents. Faculty are presented a version of Part Two with alternate wording as described below.

Method: Survey Instrument: Part One, Student Survey

This portion of the student instrument presents nine broad groups of dishonest academic behavior. These categories are listed below. The categories were drawn from the work of McCabe and Bowers [5]. The wording was adapted to keep the survey instrument inclusive of current trends and technology, in particular, the ubiquitous nature of mobile devices and internet-based repositories of academic work such as Chegg.com. Part One prompts students to indicate how many times they have engaged in each of the following behaviors during their college career, using a four-point Likert scale that ranges from 1 representing Never to 4 representing Many Times.

1. Using unauthorized material (cheat sheet/mobile device) during a test
2. Copying from another student during a test
3. Helping someone else to cheat on a test
4. Copying from another student during a test without their knowledge
5. Fabricating or falsifying a bibliography entry
6. Turning in copied material as own work (*i.e.* Chegg, solution manual)
7. Turning in work done by someone else (*i.e.* copying homework from a classmate or receiving work from a previous semester)
8. Collaborating on an assignment when the instructor asked for individual work
9. Copying a few sentences of material from a published source without footnoting it or including a citation

Method: Survey Instrument: Part Two, Student Survey

This section of the student survey uses a list of 20 detailed cheating behavior scenarios. The 20 behaviors are listed directly below. Two of the scenarios were included to act as negative controls: Scenario 3 (*Writing: quoted with citation*), and Scenario 14, (*Using YouTube to study*). Neither item is meant to be considered a violation or act of academic dishonesty, while the rest of the scenarios were designed to present gradations of situational severity. The survey instrument in this section has the respondent use a slider scale of zero to 100 to rank the severity of all 20 scenarios in comparison to each other. The zero end is labeled “not an academic integrity violation” while the 100 end of the scale was labeled “severe academic integrity violation”. This list has shortened phrases in bold used as descriptors for plots. Only the full descriptions are presented to respondents in the survey instrument. The survey instrument allowed scenarios to be rated at an equal value.

1. **Writing: verbatim no citation** You copy a passage from a website word for word without including a citation/footnote.
2. **Writing: verbatim with citation** You copy a passage word for word, but include a citation/footnote.
3. **Writing: quoted with citation** You copy a passage word for word, but include a citation/footnote and put the passage in quotations
4. **Writing: patchwork plagiarism** You copy a passage, but change a few words and include a citation/footnote.
5. **Lab: recreate data** You have lost the data collected during a lab. You try to remember/recreate the data.

6. **Lab: borrow data** You have lost the data collected during a lab. You ask a friend in another section for his/her data.
7. **Figure: adapt, no citation** You draw a figure based on but not identical to a figure from a textbook, but do not cite the textbook.
8. **Figure: copy, no citation** You draw a figure virtually identical to a figure from a textbook, but do not cite the textbook.
9. **Download book** You search for and download a .pdf of a copyrighted textbook.
10. **HW: get when sick** You have been sick and ask a friend to provide their homework which you copy and submit.
11. **HW: give to sick friend** A friend has been sick, and asks you to copy your homework and you provide the homework.
12. **Exam: ask earlier section** You are in the 11 AM section of a course. You ask your friend in the 9 AM section for details about an exam before you walk in to take it.
13. **Multiple submission** You submit an essay you wrote for your history class last semester to your English class this semester.
14. **YouTube to study** You use YouTube videos on a topic to study for an exam.
15. **Take-home: internet help** Your instructor assigns a take home test with explicit instructions to use only your text or course notes as resources. You search for material on the internet.
16. **Take-home: peer help** Your instructor assigns a take home test with explicit instructions to use only your text or course notes as resources. You and two classmates work collaboratively through the entire exam.
17. **Exam: peek but do not change** You purposely look over a peer's shoulder to see exam answers and realize some of your answers differ, but you do not change your answers.
18. **Exam: peek and change** You purposely look over a peer's shoulder to see exam answers and change your answers to match.
19. **Exam: mobile device** You use a mobile device during an exam to get help (either via internet or communicating with a peer)
20. **HW: online solutions** You use Chegg or similar online solution sources to complete homework.

Method: Survey Instrument: Part Three, Student Survey

This final section of the student survey prompts the respondent to state whether they have been informed of the academic integrity policies of their institution, and what source they gathered that information from. This section has student respond using another four-point Likert scale, which is labeled with "N/A", "Learned a Little", "Learned a Bit but Not a Lot", and "Learned A Lot", for each of these six sources: introduction to engineering course, faculty (either in class or from syllabus), institution's website, student handbook, other students, or other (with a prompt to elaborate). Once this section is completed, the survey closes.

Method: Survey Instrument: Modified Part Two, Faculty Survey

When a respondent enters that they are a faculty member the instrument directs the respondent to this single portion of the survey. It is the faculty version of Part Two, and the instrument presents the same 20 scenarios to be ranked. The one difference is that for this faculty version, the

behaviors are presented in third person, describing a student rather than in second person: “A student uses a mobile device...” instead of “You use a mobile device...”

Results

A total of 90 students and 7 faculty responded to the survey request from all institutions to date in 2018. In 2017, 103 students and 14 faculty responded. In 2016, 49 students and 17 faculty responded. In any case, incomplete responses to a given part of the instrument were eliminated from analysis of only that part. Such piecewise exclusions explain differences in number of respondents for different survey parts.

Results: Part One: Self-Reported Behavior Frequency

Part One of the instrument is the self-reported number of times a student engages in a given behavior. Figure 1 gives three years of responses at East Carolina University, while Figure 2 gives two years of responses at Benedictine College. Response groupings are evaluated by one-way ANOVA at a 95% confidence interval. The only change in reported prevalence reaching statistical significance is question 6 (turning in work from Chegg.com or a solution manual) and it is a significant increase in reported prevalence for both East Carolina and Benedictine. This result is alarming and warrants vigilance as an instructor. The substantial increase in responses of 3 and 4 (Many Times) also adds additional impetus to maintain the annual administration of this instrument to determine if there is indeed a sudden trend or simply a response anomaly.

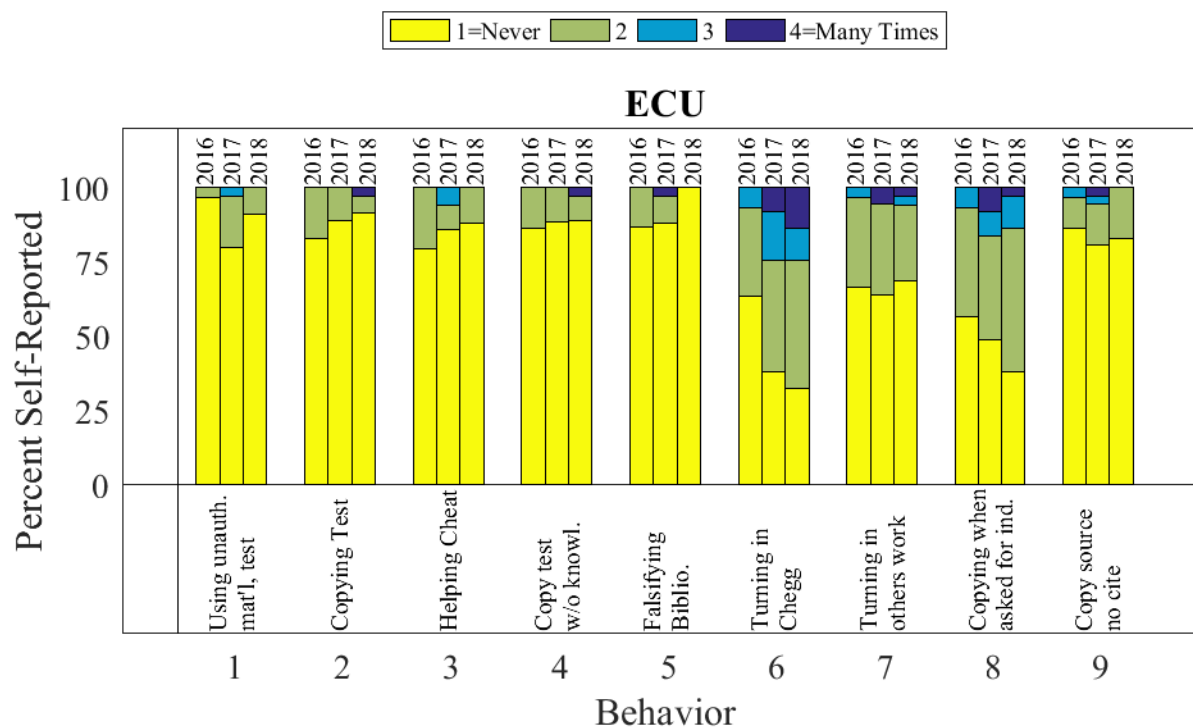


Figure 1 Self-reported incidence of nine broad types of cheating for three years at East Carolina University. ($n=49, 36, 41$ for 2016, 2017, 2018)

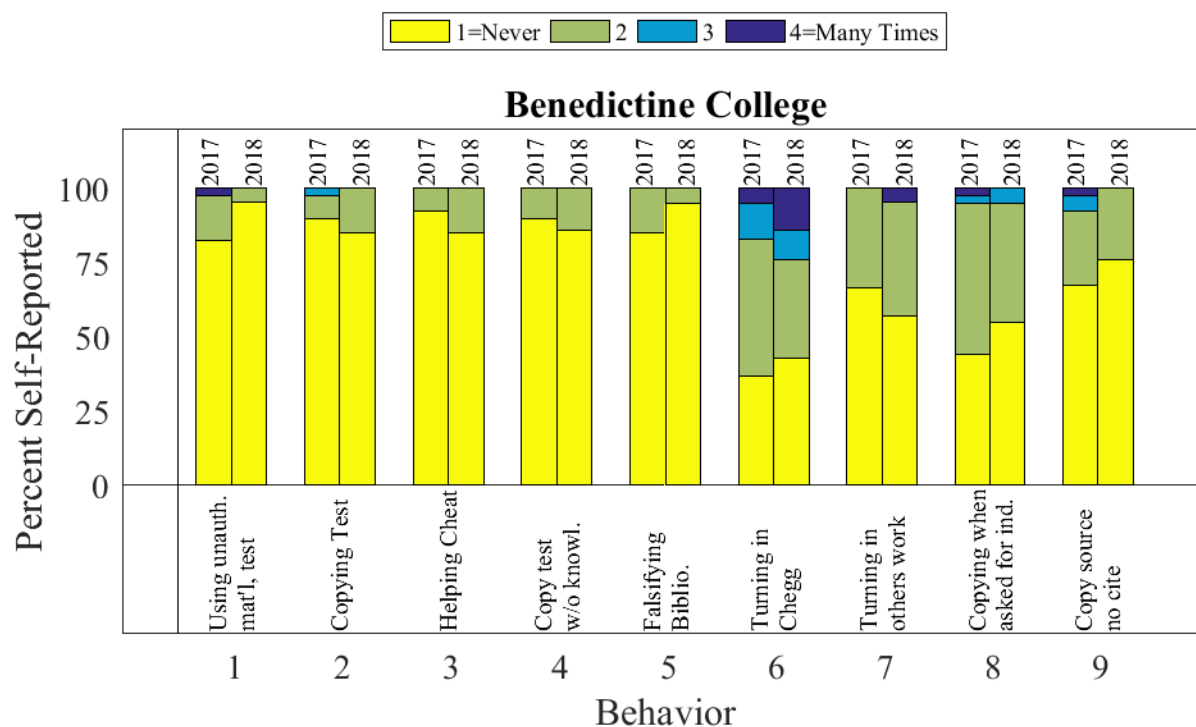


Figure 2 Self-reported incidence of nine broad types of cheating for two years at Benedictine College. ($n=42$, 20 for 2017, 2018)

Results: The 20 Scenarios

The next section presents results of the severity ratings for the 20 scenarios for both student and faculty respondents grouped in several different ways. In Figures 3-9, the responses are presented in a box plot format. The median response for the specified group is indicated with the filled square, while the 95% confidence interval of the median is indicated by the \times markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile.

Results: The 20 Scenarios, Analysis 1: Comparison of ECU responses by year

Figures 3 and 4 present all the data for Part Two for students and faculty for each year of responses for East Carolina University in a box plot format described above. Detailed comparative analysis will be presented in subsequent sections, but even a cursory inspection of Figure 4 (faculty) as compared to Figure 3 (students) shows a glaring disconnect between students and faculty on at least several of the scenarios presented in this instrument (*e.g.* Scenarios 10, 15, and 16) and strong consensus on others (*e.g.* Scenarios 3, 14, 19). (Note that larger landscape format copies of Figures 3, 4, and 6 are included in the Appendix.)

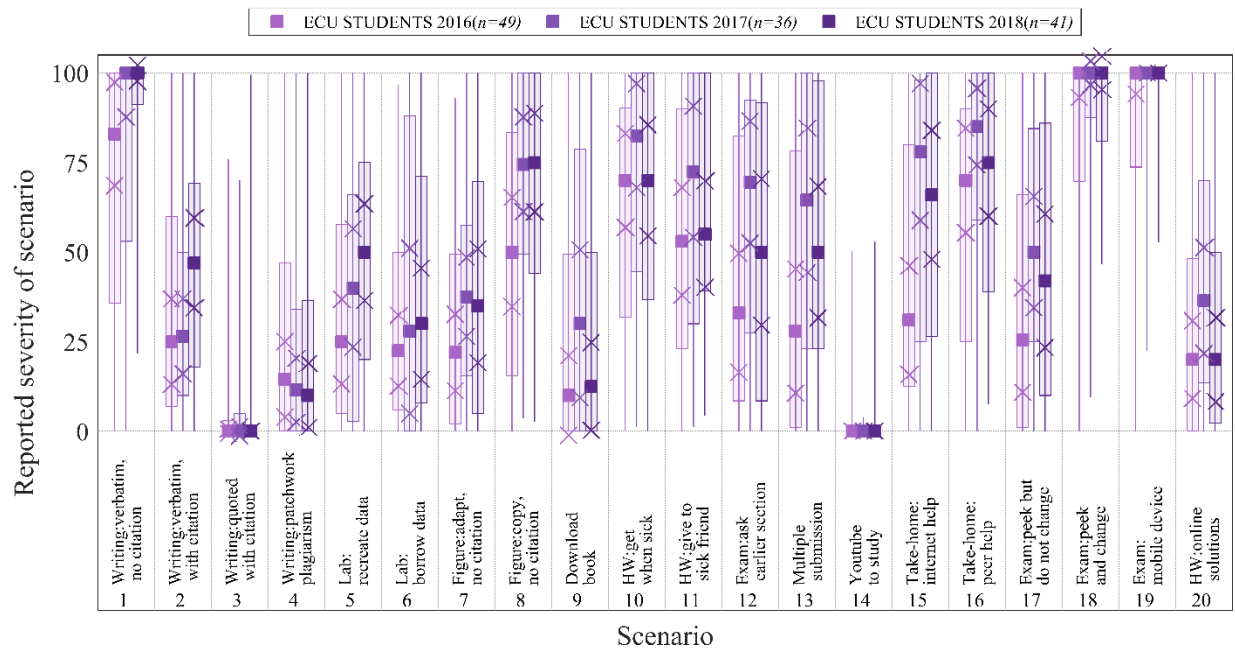


Figure 3 Student responses for Analysis 1 of 20 academic integrity scenario severity ratings for three years at ECU. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the × markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile.

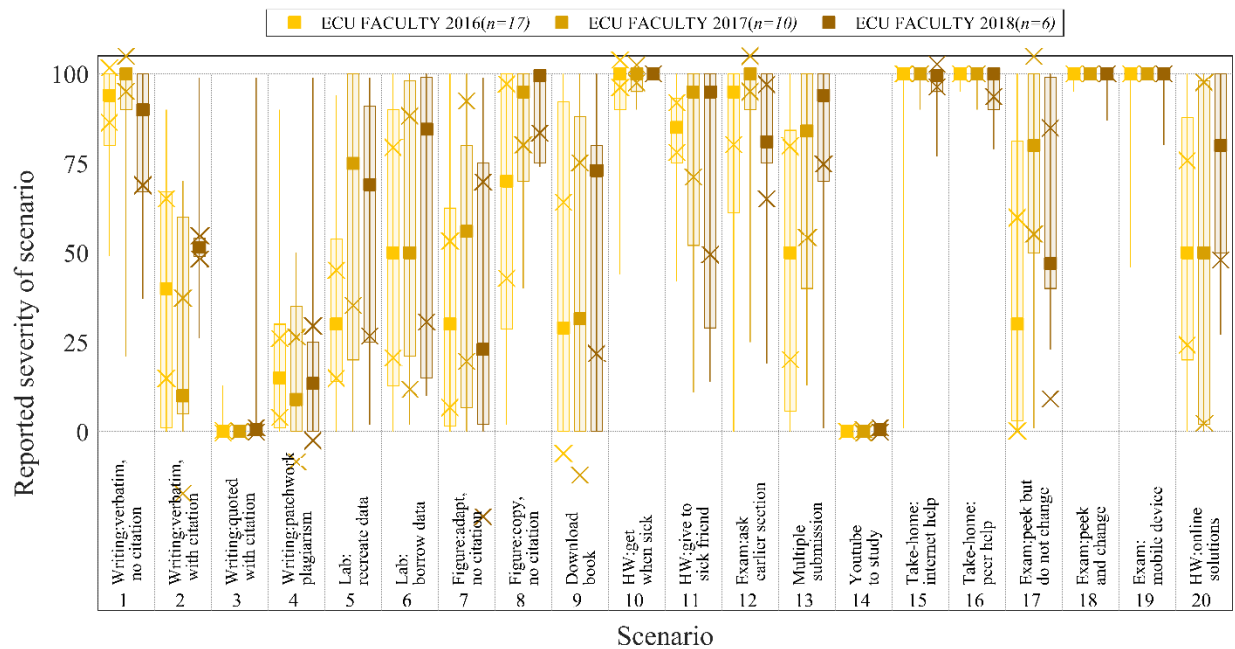


Figure 4 Faculty responses for Analysis 1 of 20 academic integrity scenario severity ratings for three years at ECU. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the × markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile.

One-way ANOVA and Tukey-Kramer post-hoc analysis at 95% confidence interval (CI) reveals a few significant differences between student responses from year to year. The 2018 student response differs significantly from the 2016 student response for Scenario 1 (*Writing:verbatim, no citation*), Scenario 8 (*Figure:copy, no citation*) and Scenario 19 (*Exam:mobile device*). See Figure 3. The 2017 student responses for those three scenarios were intermediate, with Tukey-Kramer connecting letter assignments in common with both 2016 and 2018. During the years the instrument has been administered at East Carolina University, there has been a concerted effort on the part of the faculty who teach three key courses with significant writing demands to bolster the education about and policing of proper citations, plagiarism, and academic integrity in general. These shifts in student responses for Scenarios 1 (*Writing:verbatim, no citation*) and 8 (*Figure: copy, no citation*) may reflect effectiveness of the faculty efforts. Initial analysis of faculty responses for East Carolina University over the three years (Figure 4) include only one significant difference at the 95% CI for Scenario 16, though examination of the individual responses reveals a single outlier that appears to be a likely response error, in that it is incongruent with that respondents' other ratings. Smaller sample sizes for faculty responses contribute to the lack of ascribing significance to these findings.

Results: The 20 Scenarios, Analysis 2: Students and faculty by institution and by year

A one-way ANOVA was performed for the 20 scenarios for nine population groups. The nine groups are as follows:

1. STUDENTS East Carolina University 2016
2. STUDENTS East Carolina University 2017
3. STUDENTS East Carolina University 2018
4. STUDENTS Benedictine College 2017
5. STUDENTS Benedictine College 2018
6. STUDENTS The Catholic University of America 2017
7. FACULTY East Carolina University 2016
8. FACULTY East Carolina University 2017
9. FACULTY East Carolina University 2018

The analysis showed that for 11 of the 20 scenarios, there was no significant difference between the population groups via post-hoc Tukey-Kramer at 95% CI. These 11 scenarios are shown in box plot format in Figure 5. For clarity in the box plot presentation, the faculty responses for ANOVA groups 7-9 (ECU Faculty) were pooled in the figure. There are two mechanisms at play. In some cases, which are highlighted in Figure 5 with yellow circles on the plot labels, there is little variation in the 95% CI on the medians (as represented by the smaller vertical spread between the × markers) indicating a strong consensus across the groups. Those cases for which consensus is strong are Scenarios 3 (*Writing: quoted with citation*), 4 (*Writing: patchwork plagiarism*), and 14 (*YouTube to study*). In other cases, the lack of significant difference in the Tukey-Kramer results is due to poor consensus both within a group (as indicated by a larger 95% CI on a given median) and between the groups (as indicated by differences in the median values).

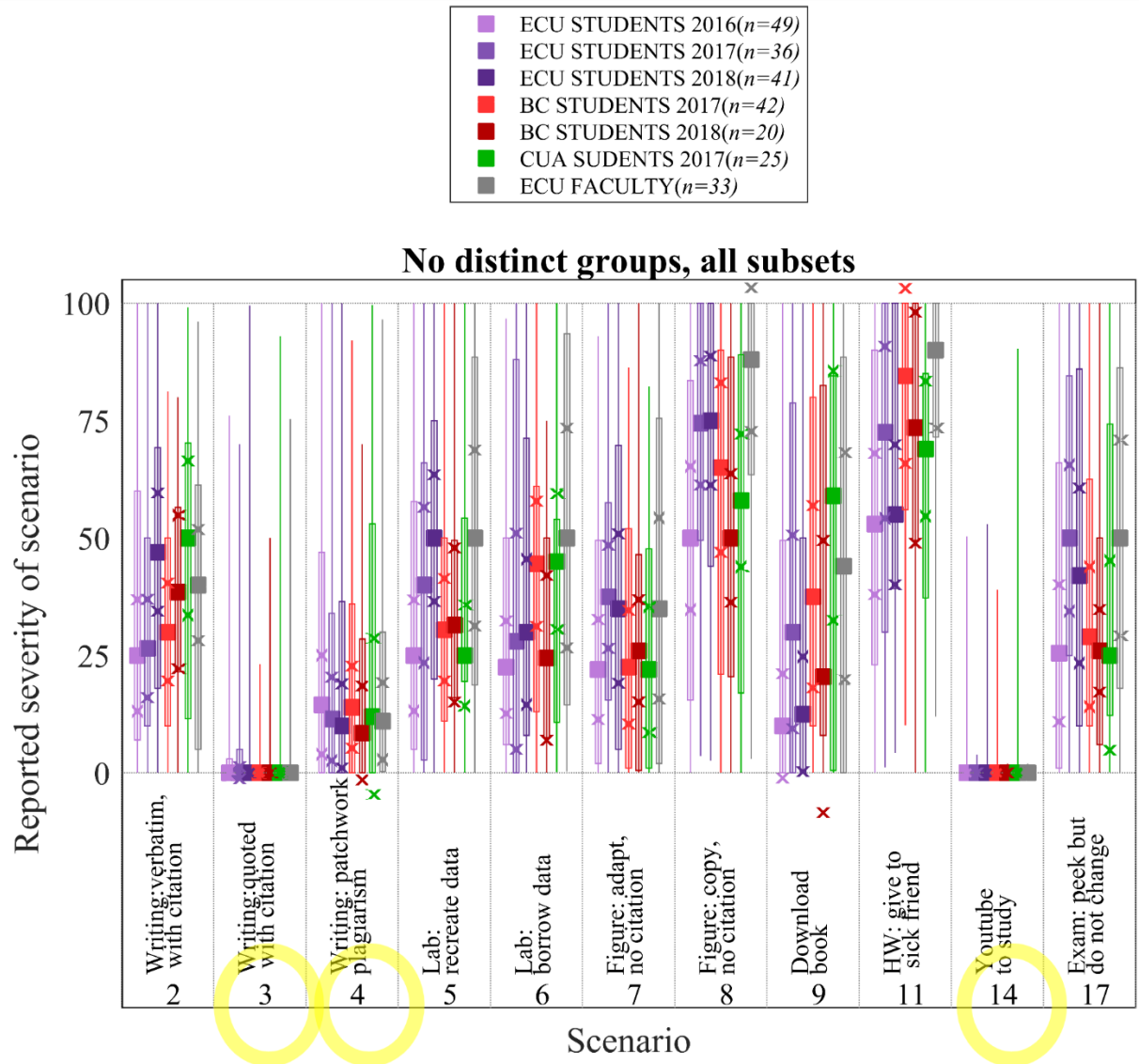


Figure 5. In Analysis 2, 11 of the academic integrity scenarios are deemed not significantly different for nine population groups by post-hoc Tukey-Kramer at 95% CI. Those circled in yellow indicate a strong consensus. See also Figure A1 in the Appendix for the Tukey-Kramer plot for Scenario 11 (*HW: give to sick friend*).

Results: The 20 Scenarios Analysis 3: Students by institution and all faculty

Using the same data with different pooled groupings, another post-hoc Tukey-Kramer analysis was performed. In this test, the 9 groups described in Analysis 2 above were instead pooled into three larger groups as follows:

1. STUDENTS East Carolina University 2016, 2017, 2018
2. STUDENTS Benedictine College 2017, 2018
3. ALL FACULTY 2016, 2017, 2018

Note that The Catholic University of America was excluded from this pooled analysis due to having only one year of data at this time. The results for Analysis 3 are given in box plot format in Figure 6.

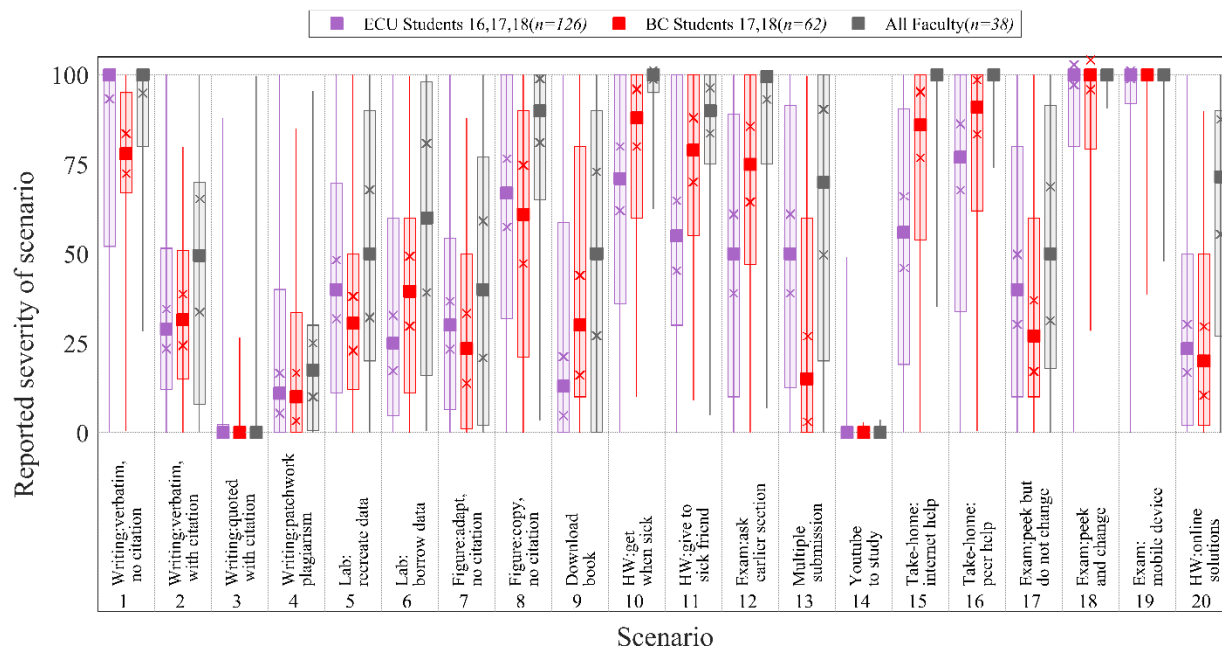


Figure 6. Severity ratings for Analysis 3 of the 20 academic integrity scenarios. Responses are pooled for all available response years for the following groups: (1) students at East Carolina University, (2) students at Benedictine College, and (3) all respondent faculty. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the \times markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile. See also Figures A2-A4 in the Appendix for select Tukey-Kramer results.

For these pooled results, only eight of the 20 scenarios were reported with only a single connecting letter, as compared to 11 scenarios reported as as having no significant difference between groups for Analysis 2. Figure 7 presents the box plot representation of those eight scenarios reported as having no difference using the groupings of Analysis 2. It should be noted that the pooled groupings (shown in Figure 6, where all years for a given institution are considered together) are used for the Tukey-Kramer test, but the more granular results (each year plotted with its own bar with color designating the institution) are shown in Figure 7. The implication of this difference in the number of scenarios with no significant difference between groups (11 scenarios in Analysis 2 and eight scenarios in Analysis 3) likely derives primarily from greater discerning power derived from the larger samples sizes when data is pooled. The general conclusion drawn from Analysis 3 is the same: there are some areas of consensus between students and faculty and some areas that variation contributes to the lack of difference between groups. In Analysis 3, the strongest consensus (shared connecting letter and smallest 95% CI on medians) are for Scenarios 3 (*Writing: quoted with citation*), 14 (*YouTube to study*), and 19 (*Exam: mobile device*). These represent the least severe and most severe items included in the list of 20 scenarios, so there is consensus at the ends of the severity spectrum.

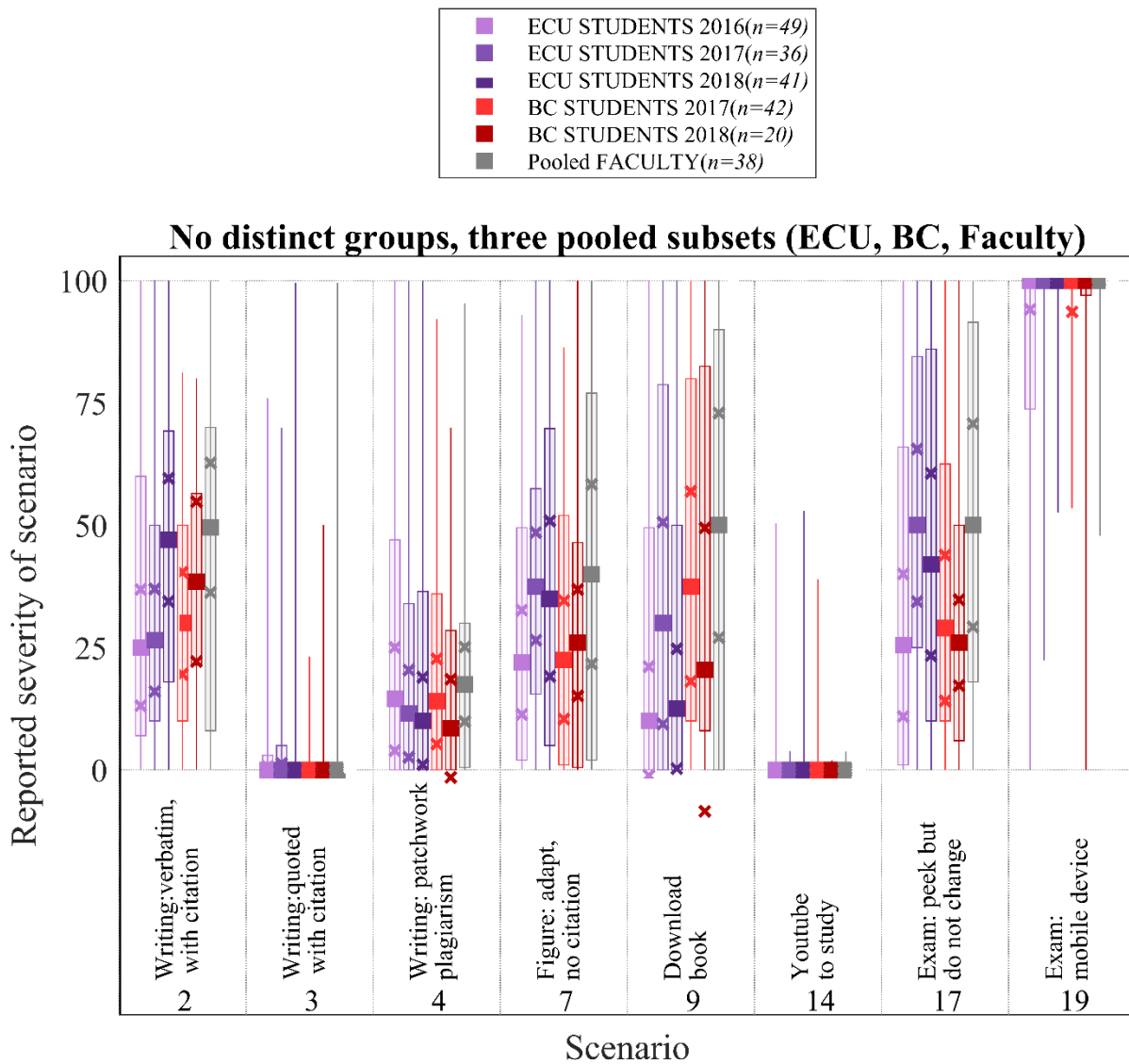


Figure 7. Academic integrity scenarios that are not significantly different when evaluated as pooled groups in Analysis 3 (All ECU student responses, all BC student responses, and all faculty responses) by post-hoc Tukey-Kramer at 95% CI. See also Figure A2 in the Appendix for the Tukey-Kramer plot for Scenario 2 (*Writing: verbatim with citation*).

The consensus illustrated with Analysis 2 and 3 above provide a point of commonality to begin additional efforts in educating students about academic integrity issues. The situations that cause concern from a practical standpoint in the classroom, however, are those where there is a difference of opinion on cheating behaviors. For Analysis 3, the reported perception of the severity of an issue differs between students as a single group and faculty for three scenarios. The Tukey-Kramer results (see Figure A3 in the Appendix) indicate two connecting letter groups: one with students from ECU and BC as indistinguishable and one for faculty. The box plot formats for these three scenarios are included in Figure 8.

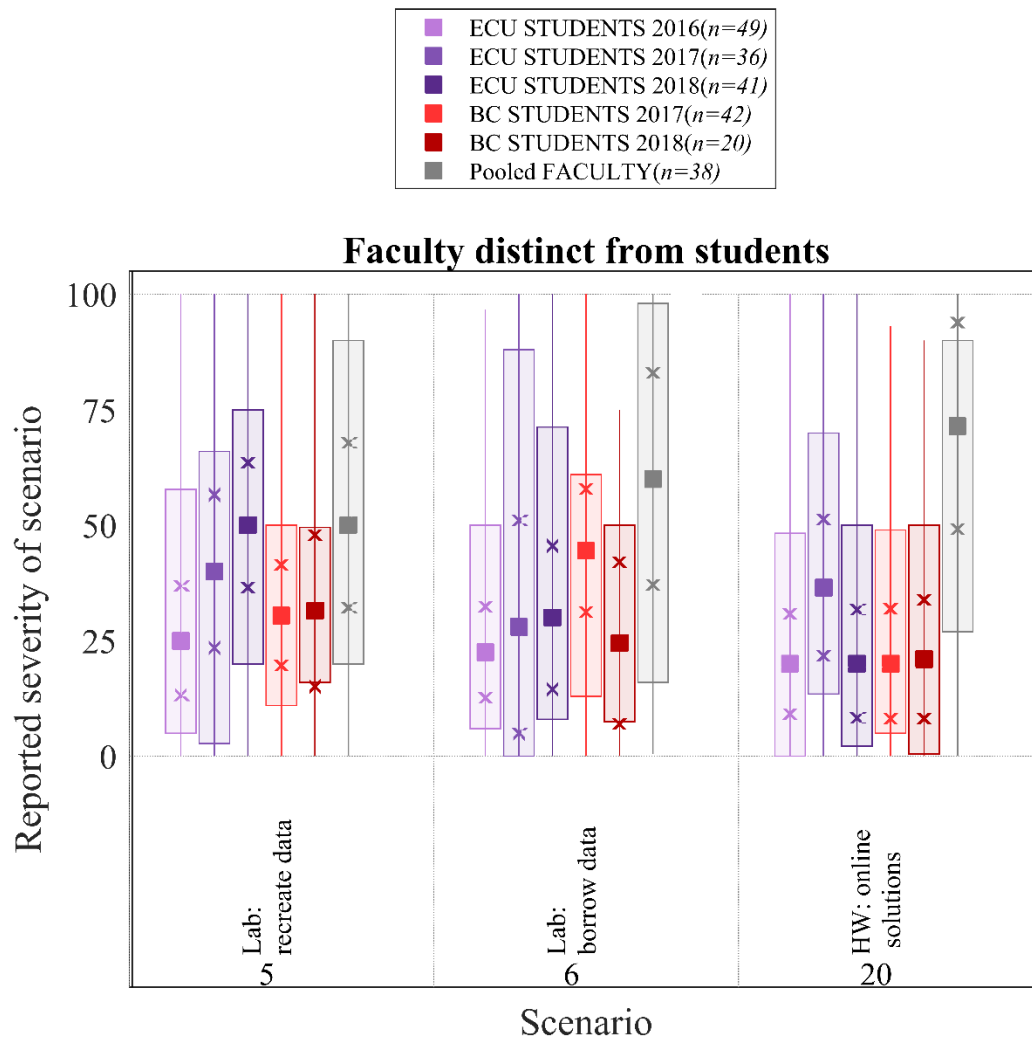


Figure 8. Select academic integrity scenarios for which faculty differs from students in Analysis 3. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the \times markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile. See also Figure A3 in the Appendix.

The groupings of Analysis 3 also produced some scenarios with three distinct connecting letter groups in the Tukey-Kramer result (See Figure 9 for box plot and Figure A4 in the Appendix for Tukey-Kramer plot). The three groups are students at East Carolina University, students at Benedictine College, and pooled faculty. This result poses the question of what institutional differences in practice may have resulted in this disparity between the institutions. East Carolina University is a moderate sized engineering program at a large, public university that does not have a formalized honor code while Benedictine College is a small engineering program at a small religious college with a formalized honor code. Any number of plausible explanations could be offered to justify the fact that Benedictine College's responses are higher than East Carolina University's. It might be that one particular professor at Benedictine relies heavily on

take-home exams and polices the administration of those take-home exams in a particularly effective way while take-home exams are not a commonplace experience at East Carolina University. It might also be one or more of the institutional characteristics. As yet, the limited number and type of respondent institutions do not afford a statistical answer to the question.

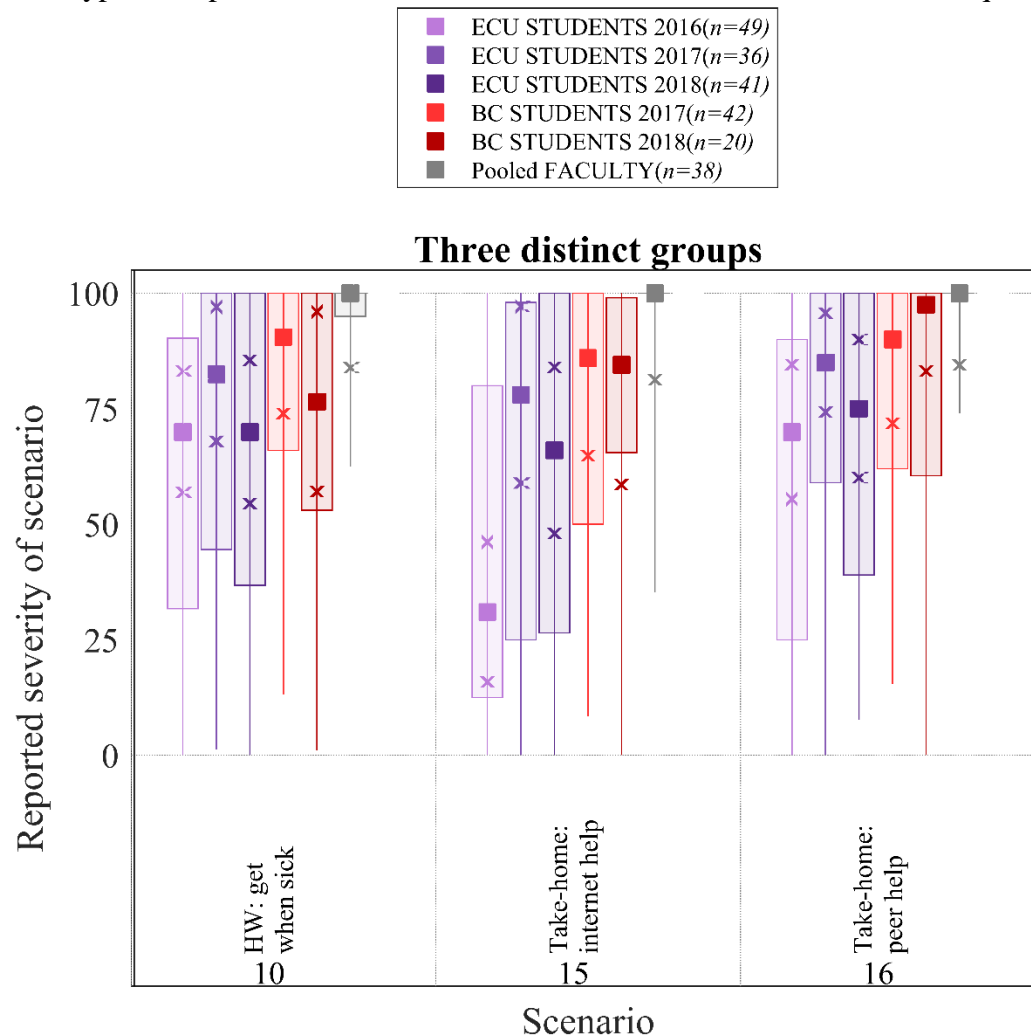


Figure 9. The three academic integrity scenarios for which faculty differ from students at both institutions in Analysis 3. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the \times markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile. See also Figure A4 in the Appendix.

Results: The 20 Scenarios Analysis 4: First-year to upperclass students

A variety of additional groupings were examined using ANOVA to determine the degree of difference between first-year and more experienced students. For Benedictine College and The Catholic University of America, the instrument divides students into those in their first or second semester or those in their third semester and beyond. For East Carolina University respondents, the instrument adds a level of granularity by asking whether the student has completed ENGR

3024 Mechanics of Materials. In the ECU Engineering curriculum, that course is a writing-intensive course requiring several independently authored formal laboratory reports and also incorporates significant plagiarism and academic integrity education components. For clarity, non-ECU students are divided into two groups (freshmen and upperclassmen), while East Carolina students are subdivided into three groups: (1) first or second semester, (2) third semester or later but NOT completed ENGR 3024, and (3) third semester or later and has completed ENGR 3024. When comparing all institutions, groups 2 and 3 described above for East Carolina are collapsed to a single group of upperclassmen.

When pooling all years and all institutions such that there are only two groups, freshmen and upperclassmen, there is no significant difference at a 95% CI. When pooling all response years within each institution, there are no differences between freshmen and upperclassmen at East Carolina University or The Catholic University. Three scenarios differ at Benedictine College: Scenario 4 (*Writing: patchwork plagiarism*), Scenario 14 (*YouTube to study*), and Scenario 20 (*HW: online solutions*). Freshmen rated these three as more severe than their upperclass counterparts. This result is consistent with the observations noted in [1], and may be explained by an increased tolerance of supposed wrongdoing as students progress through college. The difference for Scenario 14 may be an anomalous result or a misunderstanding by freshman that using YouTube as a learning resource is an entirely acceptable practice.

An examination of the finer granularity available for the ECU responses for the three years of responses yields an interesting result. Comparing ECU freshmen for 2016, 2017, and 2018 shows a difference at a 95% CI from 2016 to 2017 for Scenario 15 (*Take-home: internet help*). For ECU upperclass students who have not yet completed the ENGR 3024 course, only Scenario 5 (*Lab: recreate data*) was rated as more severe in 2018 at a 95% CI. When comparing upperclass students who have completed ENGR 3024, a total of five scenarios are different between 2016 and 2018 at a 95% CI: Scenarios 1 (*Writing: verbatim no citation*), 5 (*Lab: recreate data*), 6 (*Lab: borrow data*), 8 (*Figure: copy, no citation*), and 19 (*Exam: mobile device*). In each case, the 2017 responses were statistically in common with 2016 and 2018 with 2016 responses lower than 2017 which were lower than 2018. It is of note that ENGR 3024 is a writing intensive course and four of the five scenarios with differences in ratings are related to writing.

In the last ANOVA permutation, ECU freshmen, those not completing ENGR 3024, and those completing ENGR3024 were pooled for all years, and there are no differences at 95% CI. Taken together, these results indicate that having completed the ENGR 3024 course has had *more* of an effect on student perception in the most recent year. Refinements in instructor approach, the number of relatively severe academic integrity issues discovered and processed, and general student awareness of the degree to which the faculty are committed to address academic integrity issues may all be factors in this noted increase in ratings.

Results: Part Three: Source of Academic Integrity Information

Figure 10 summarizes the results of the instrument item asking students for the source of their knowledge about academic integrity. Faculty influence is the primary source of information at both institutions, while the introduction to engineering course is a close second at both. At East

Carolina University, the response for faculty and the introduction to engineering course are approximately equivalent. This result indicates that the curriculum of the introductory course at East Carolina University is effective in presenting academic integrity information to the students. Of note is the fact that the most common write-in response for the “Other, please explain” prompt is “common sense”.

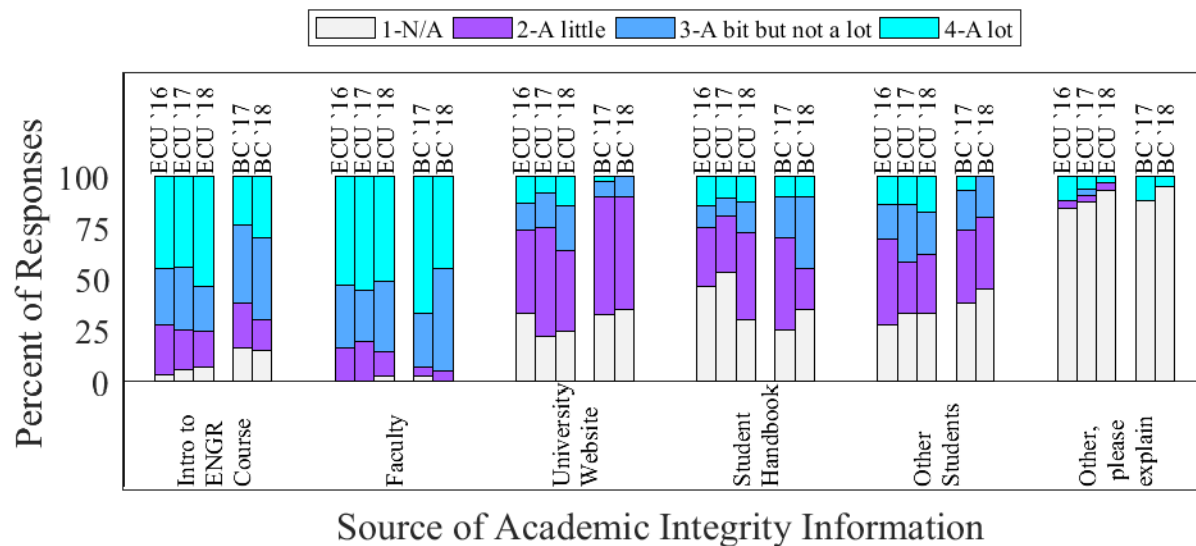


Figure 10. Self-reported source of academic integrity knowledge for two institutions over the study period.

Conclusions

The first conclusion is that results are mixed. Generally, faculty and student consensus exists at either end of the severity spectrum. It stands to reason that it is a simpler matter to agree on what is *clearly* acceptable and what is *clearly* unacceptable behavior. These results bear out that assertion that the scenarios in the middle of the spectrum are the ones for which this ethical gray area or lack of consensus exists. These survey results indicate that there are some significant differences between student and faculty perception of academic integrity issues and even some differences between students at two of the respondent institutions. The results also indicate that the multi-year effort of increased education and diligence with writing-related academic integrity concerns in the ENGR 3024 course at ECU may be effecting a change in student responses.

These results merit continued investigation but already provide opportunity to develop strategies to get students and faculty to better understand expectations and avoid misunderstandings in the classroom. In particular, the use of unauthorized resources (solutions manuals or online), plagiarism and citation concerns, and data ethics in a lab setting are three of the key areas for focus and diligence based on the existence of differences in severity ratings.

The fact that faculty are identified as the source for “a lot” of the respondent student’s academic integrity knowledge underscores the collective responsibility as faculty members. The sphere of influence of faculty extends far beyond just subject matter. When the responsibility and influence are stewarded effectively, instruction imparts not only the notions of ethics and ethical

responsibility, which are key to engineering education as a whole, but also a clear understanding of educational and ethical expectations, which are key to a reduction in academic integrity issues.

Implications for practice and further study

The clearest implication for practice is to focus educational efforts and increase student awareness of policies and acceptable practices for areas with noted differences in severity ratings. One such area is the practice of obtaining unauthorized homework solutions from the internet. The fact that students report that so much of their knowledge of academic integrity issues is sourced from faculty underscores our responsibility. Continuing to administer the instrument for many years at existing sites and expanding to additional sites will allow for additional insight and statistical confidence that results from additional samples. Learning more about how respondent departments handle academic integrity concerns will also inform the interpretation of the growing body of study results.

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Appendix

Larger size duplicates of Figures 3, 4 and 6 and select Tukey-Kramer results are included.

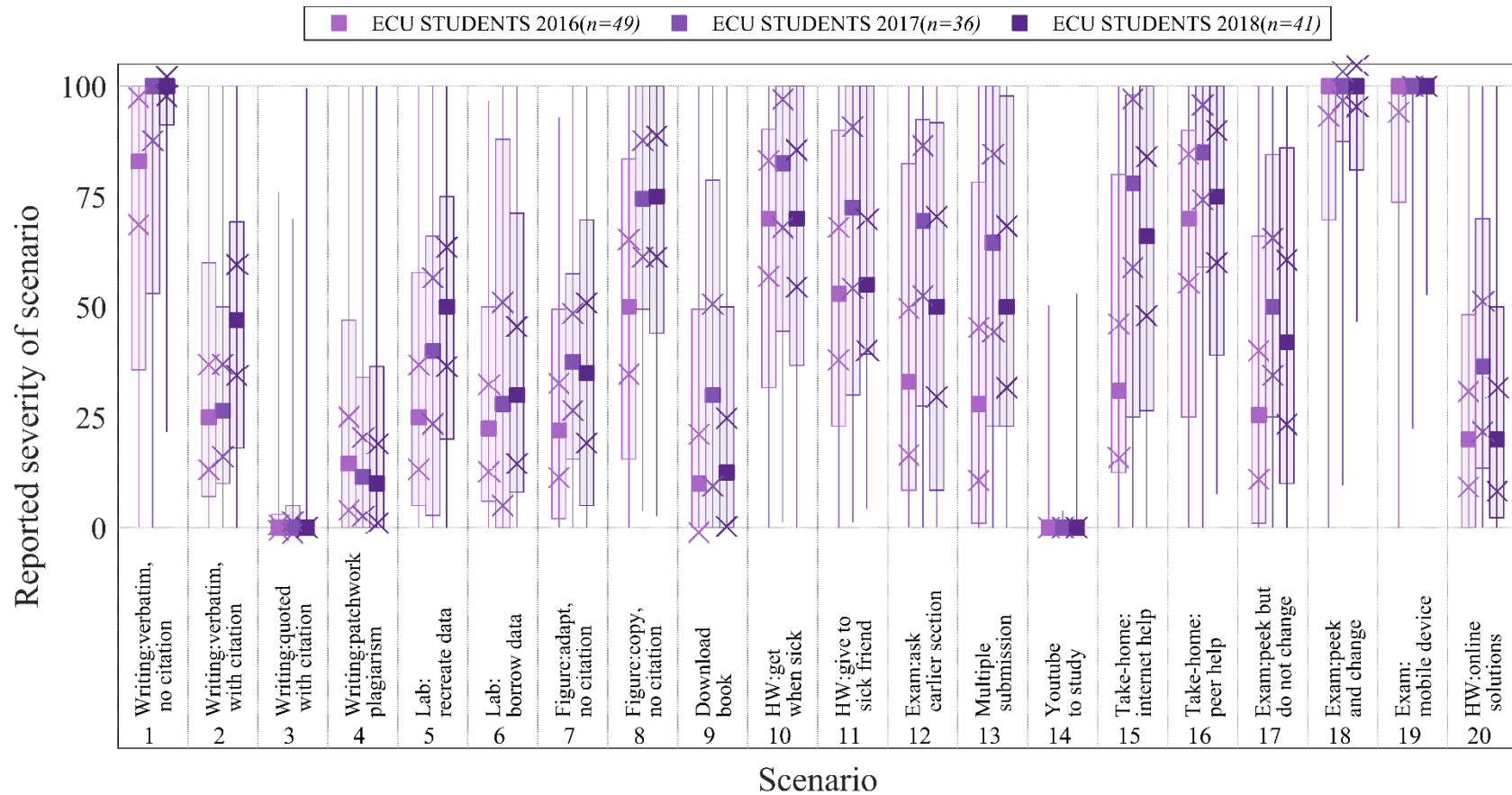


Figure 3 Student responses for 20 academic integrity scenario severity ratings for three years at East Carolina University. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the × markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile.

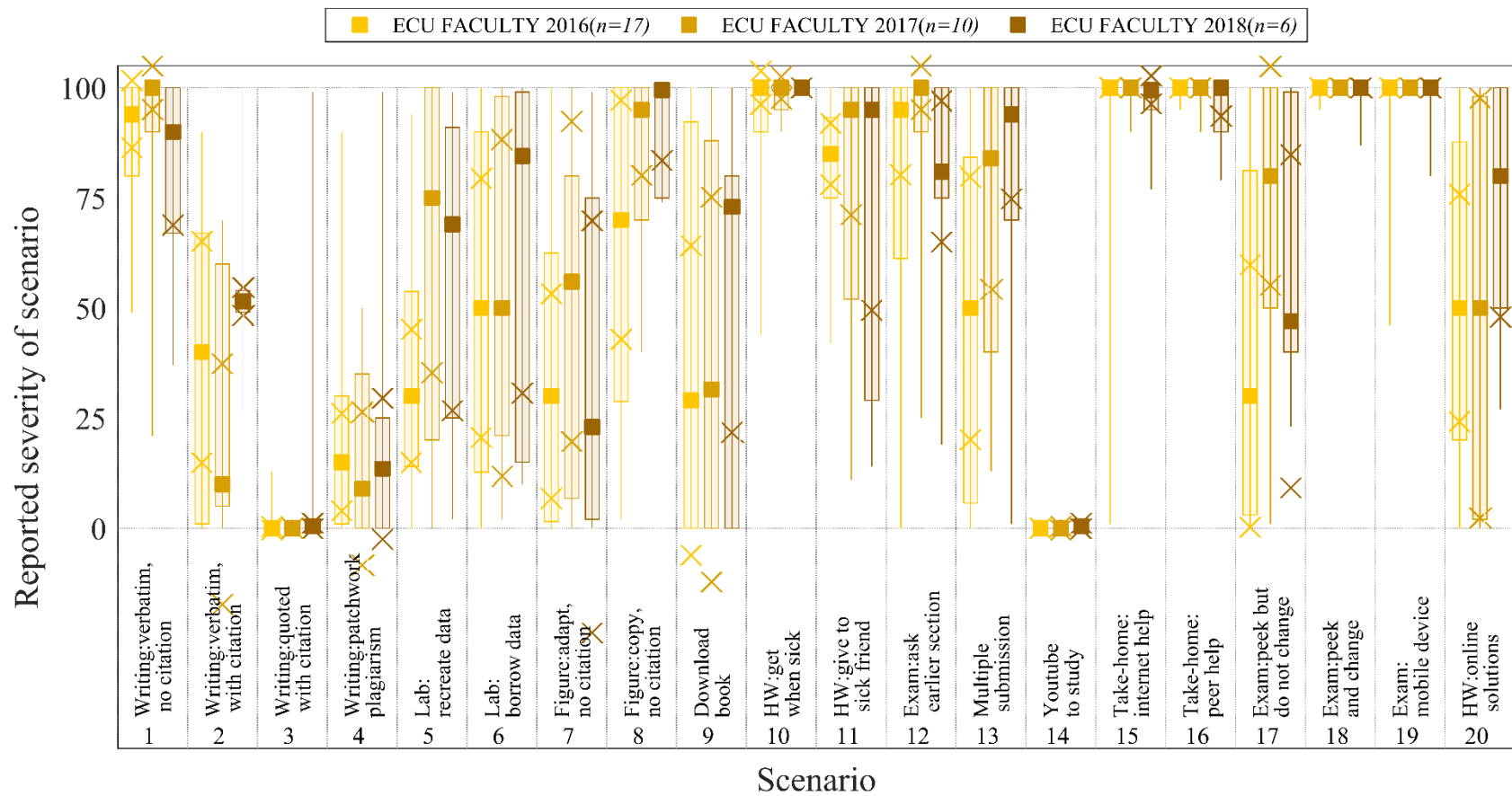


Figure 4 Faculty responses for 20 academic integrity scenario severity ratings for three years at East Carolina University. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the × markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile.

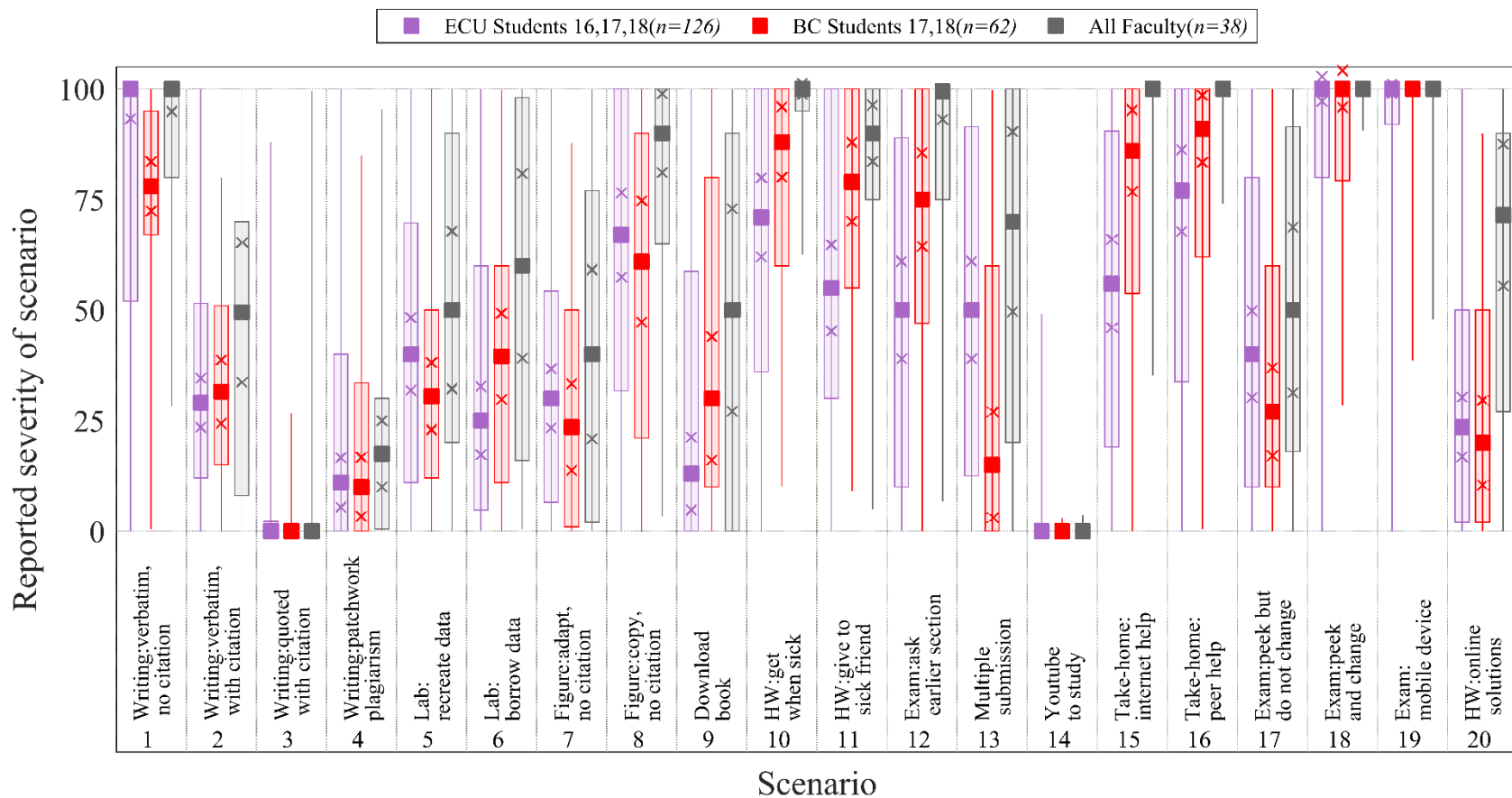


Figure 6. Severity ratings for 20 academic integrity scenarios. Responses are pooled for all available response years for the following groups: (1) students at East Carolina University, (2) students at Benedictine College, and (3) all respondent faculty. The median response is indicated with the filled square, while the 95% confidence interval of the median is indicated by the \times markers. The filled vertical bar represents the interquartile range and the whisker lines extend to the 2.5 and 97.5 percentile.

Select Tukey-Kramer results

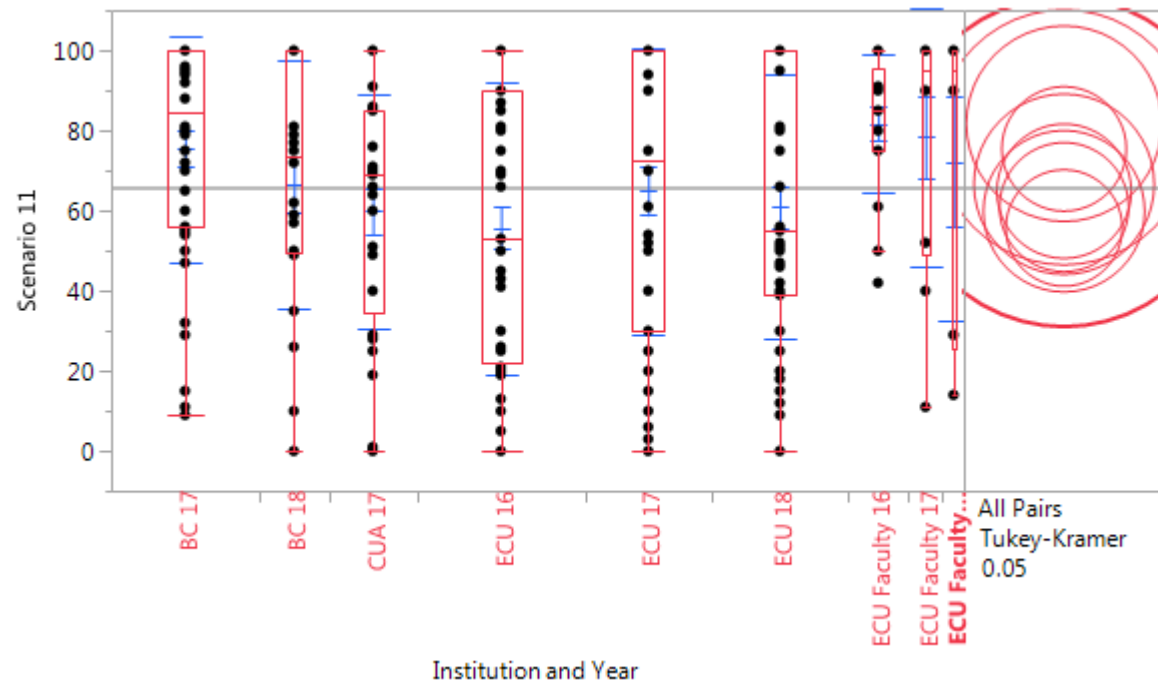


Figure A1. Tukey-Kramer test at 95% CI for Scenario 11 (*HW: give to sick friend*) for 9 groups. This corresponds to Scenario 11 (*HW: give to sick friend*) in Figure 5 (scenarios with one connecting letter group). This result indicates no difference between response groups.

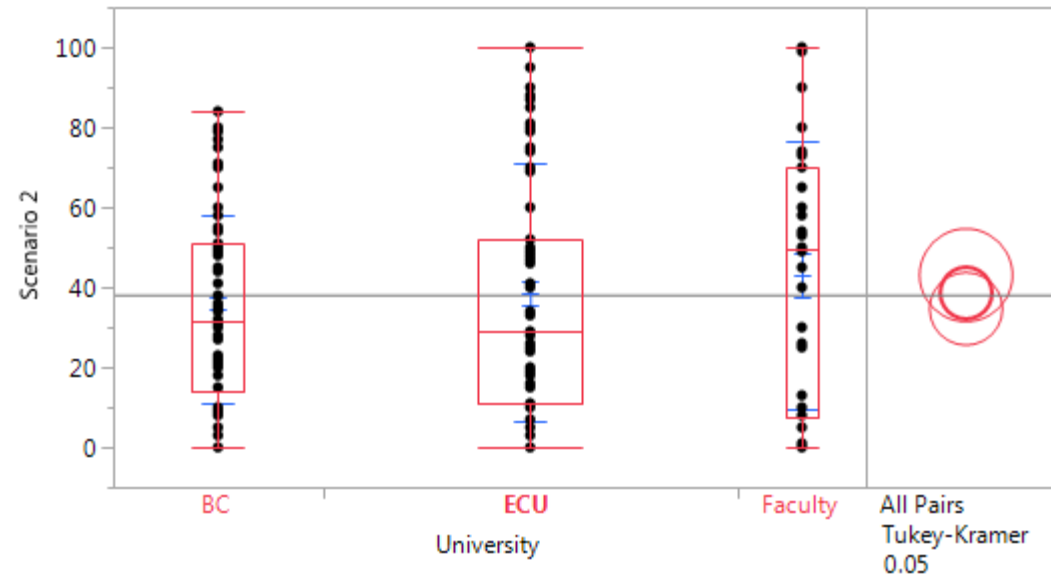


Figure A2. Tukey-Kramer test at 95% CI for Scenario 2 (*Writing: verbatim with citation*) for the three pooled groups. See Figure 6 (all scenarios, pooled responses) and Figure 7 (scenarios with one connecting letter group). This result indicates no difference in response groups.

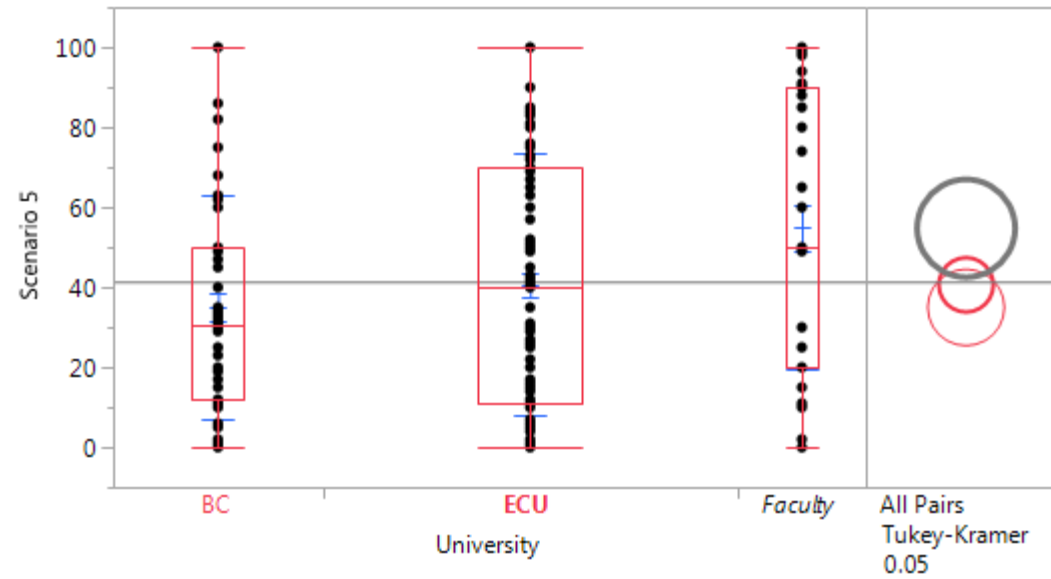


Figure A3. Tukey-Kramer test at 95% CI for Scenario 5 (*Lab: recreate data*) for the three pooled groups. See Figures 6 (all scenarios, pooled responses) and Figure 8 (scenarios with two connecting letter groups). This result indicates that students and faculty differ.

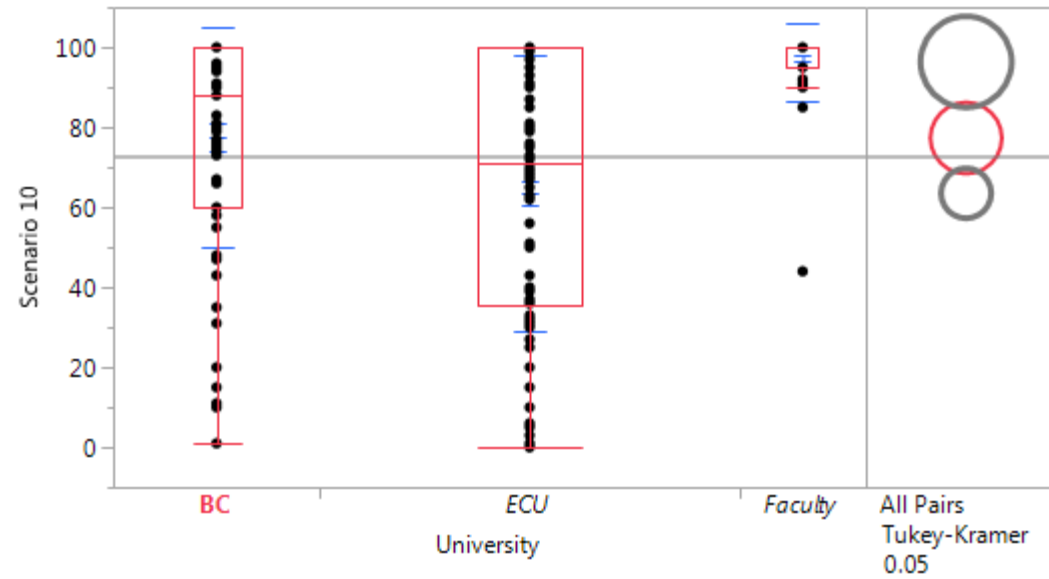


Figure A4. Tukey-Kramer test at 95% CI for Scenario 10 (*HW: get when sick*) for the three pooled groups. See Figure 6 (all scenarios, pooled responses) and Figure 9 (scenarios with three connecting letter groups). This result indicates the three groups are distinct.