

FIFTEEN YEARS IN THE TRENCHES: AN UPDATED SUITE OF SCENARIO-BASED ACADEMIC INTEGRITY VIDEOS

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INTRODUCTION

Academic integrity issues are among the most stressful that faculty face, and the statistics on student cheating rates and attitudes about cheating are troubling.^[1-3] Addressing academic integrity violations can be time consuming and emotionally stressful for both faculty and students. To avoid the issue, some faculty (including colleagues at the authors' institutions) have chosen to either eliminate homework or to count it as a very small percentage of the course grade. Other faculty avoid confronting students or simply issue vague warnings, thereby implicitly endorsing a culture of cheating. An even more troubling trend is faculty who attempt to address the academic integrity issues "under the table" without following the university's student conduct process, which violates students' rights.

None of these approaches creates a healthy learning climate for students and instead sends the message that shortcuts will be tolerated, ironically providing an incentive for otherwise honest students to feel that they must cheat to compete. Moreover, with the advent of new smart technology, students have an entirely new set of tools to assist them in sharing information during exams, including smart watches and miniature earpieces to allow for direct communication during exams. The recent move to online teaching for many institutions during COVID-19 amplified concerns about cheating on remotely administered quizzes and exams.^[4,5] Reports of "contract cheating," where students submit a question to a for-pay website like <https://www.chegg.com> and get a worked out solution within the hour, have exploded since many classes went online in spring 2020.^[5] In small classes these violations are easier to police, but as enrollment and class sizes grow, it becomes an increasing challenge to monitor this behavior.

Bretag^[8] calls attention to the need for discipline-specific education about academic integrity – in other words, helping students understand, within the context of their own discipline, why it is important and relevant for them to act ethically both

now and in the future as engineers.^[9] Paul et al. state, "Acting with integrity goes beyond rule compliance and safety to broader considerations about ethical conduct, sustainability, environment and climate considerations and human rights. When we consider academic integrity as it is connected to ethical conduct in these broader social and professional contexts, it can be more meaningful to students."^[9]

While there are many factors that may contribute to academic misconduct,^[7] an important one is a lack of student understanding about what constitutes cheating, since different instructors (even within the same department) may have different expectations about what behaviors are allowed. Simply including boilerplate language in the syllabus with a link to



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the university's Code of Student Conduct is not sufficient (since most students don't read the syllabus). In the authors' experience the best way to prevent academic integrity violations is to be clear upfront about expectations for individual assignments, lab reports, projects, and exams, providing specific examples of what behaviors are encouraged and what behaviors constitute a violation of academic integrity. This approach of clearly specifying expectations to prevent cheating is supported by the literature.^[9-12] Further, students may not be aware of the potential consequences of cheating, so sharing this information ensures that they are fully informed. Ensuring that students know the instructor's expectations and the potential consequences has three potential benefits: (1) students are aware of which resources and behaviors are allowable and which are not; (2) student cheating may decrease because inappropriate behavior and potential consequences are clearly identified; and (3) students who do commit a violation may be more likely to acknowledge that their behavior violated the clearly defined expectations. This paper will address evaluation of the first benefit – student awareness of allowable resources and behaviors. While each author has anecdotal evidence to support the second and third benefits, the authors have not quantified these due to the presence of multiple confounding factors that influence the incidence of cheating over time, making it difficult to identify which intervention among several may have resulted in a decrease in cheating cases. Obtaining IRB approval for such a study is also problematic given student privacy around data related to academic integrity violations.

In response to two semesters in 2004 and 2005 with multiple cheating cases in the Material and Energy Balances (MEB) course at North Carolina State University (NC State), the authors initially developed a live skit performed during class to illustrate expectations around academic integrity. This was effective but limited to a single exposure, and students who missed the class missed the message. Subsequently, the authors took advantage of on-campus video resources within the NC State Communications Department and student actors to convert the skit into a 15-minute video, which was used starting in 2007 in the MEB course at NC State and starting in 2015 in the MEB course at Louisiana State University (LSU).^[13] The original videos consisted of six sections specifically designed for an MEB course, including definitions of cheating, cheating on individual assignments, cheating on computer assignments, and cheating in common study areas. The videos were successful in educating students about appropriate versus inappropriate behavior. One major finding during the first four years of the video was that students no longer used the excuse of lack of knowledge or unclear expectations as a defense when confronted about an academic integrity violation.^[13]

Since the premiere of the video, one of the authors at NC State has developed additional resources in the area of

academic integrity, including suggested syllabus language, a reflection assignment, prompts for a discussion of ethical behavior, an assignment cover sheet, and a form to prohibit students from sharing copyrighted course content.^[14] As a result of all of these changes to the MEB course at NC State, the number of cheating incidents has decreased dramatically compared to pre-intervention numbers, and almost all students who are confronted with evidence of their violation choose to accept responsibility without additional hearings being required.

The other author implemented the original videos when he started teaching the MEB course at LSU. Prior to the start of the author's teaching the MEB course in 2015, students were assigned homework that was graded only on effort (and not completeness or technical competence) and contributed a small amount to the final course grade (5%). During the author's first semester teaching the course, the videos were incorporated along with more rigorously graded homework assignments that consisted a substantial component of the final grade (20%). That semester there were 45 instances of academic integrity violations out of 103 students enrolled in the course. Of the 45 instances, most of the violations were for cheating on homework assignments (~80% of violations) while the rest were cheating on exams (~20% of violations), the latter being a new development for the author. That semester had 11 homework assignments where instances of violations of the Code of Student Conduct occurred on homework sets 1 (n = 7), 2 (n = 1), 4 (n = 8), 5 (n = 9), and 7 (n = 12). Of these, only homework set 7 was completed as a team suggesting that transitioning the students into teams helped to solidify the message that academic integrity violations would not be tolerated. This can lead to speculation that putting the students into teams gave them additional resources for help so that the students did not need to access unauthorized resources. In terms of how the violations were detected, these were all found by the TAs assigned to the course who were responsible for grading the homework sets. The majority of these violations were the instances where the students directly copied out of the solution manual. The course instructor notified the class after an academic integrity violation occurred. This was done to let the class know that the graders were carefully inspecting the assignments and to further convey instructor expectations. The instructor did not give specifics (e.g. we caught 7 people using Chegg), but rather informed the class that an instance occurred.

Informal interviews with the students mirror initial findings by the authors that students knew they were violating the Code of Student Conduct and hoped they would not get caught.^[13] In subsequent semesters the number of violations at LSU decreased significantly. This could be attributed to the reputation of the instructor for strictness with respect to academic integrity or the students taking the message from the videos more seriously. Nevertheless, the authors determined it was

time to update the videos to better address student knowledge and expectations related to academic integrity violations. This paper will review the process that the authors used to update the videos, describe the videos' content, and assess the effectiveness of the updated videos to clearly communicate expectations around acceptable and unacceptable behaviors.

A preliminary version of this work in progress was presented at the 2017 ASEE Annual Conference.^[15]

DESIGN, ORGANIZATION, AND SELECTION OF VIDEO CONTENT

In the thirteen years since the videos premiered, changes in technology and the instructors' experience necessitated an update. Prior to Fall 2008, almost all the incidents of academic integrity violations were students working together too closely or copying Excel files. Beginning in Fall 2008, an increased percentage of the cases were students who accessed unauthorized copies of the solution key online and duplicated the solution key for part or all of their solution.^[13] The proliferation of "information sharing sites" such as www.chegg.com and www.coursehero.com has changed the preferred means of cheating from copying a friend's homework to copying something online. In addition, the use of cell phones, smart watches, and wireless capability was not common in the mid 2000's. The original videos included a scenario involving a copy machine, which led a recent student to comment, "What is that? Why don't they just use their phone?"

To update the videos, one of the authors assembled a panel of ~30 undergraduate students at LSU ranging from sophomores to seniors and gathered feedback on what worked well in the videos and what needed to be updated. All these students were volunteers who had previously taken the MEB course instructed by the LSU author. Student feedback was combined with recent observations by the authors to refine and update video content. The authors developed new scenarios to encompass a broader range of behaviors, including cheating in laboratory courses, cheating in project-based courses, and cheating on exams. One comment from viewers of the video was that the script was one-dimensional in

nature – meaning that it only referenced chemical engineering majors and, more specifically, one class in the chemical engineering curriculum. Thus, we identified a need to make the video more broadly applicable to academic integrity issues across STEM courses and disciplines by developing examples rooted in calculus, physics, and chemistry courses, which are prerequisites for all engineering undergraduates. In response to this, new scenarios were outlined by the authors and then written by undergraduate students at LSU. A summary of the six different sections of the updated videos is shown in Figure 1. Specific additions to the updated suite of videos included an emphasis on using online resources for homework, instructor resources for help/feedback, and broad expectations for allowable behavior on exams, projects, and reports. All the students in the panel agreed that the initial set of videos was too "homework centric" and that they all would like more information on these three important areas of assessment.

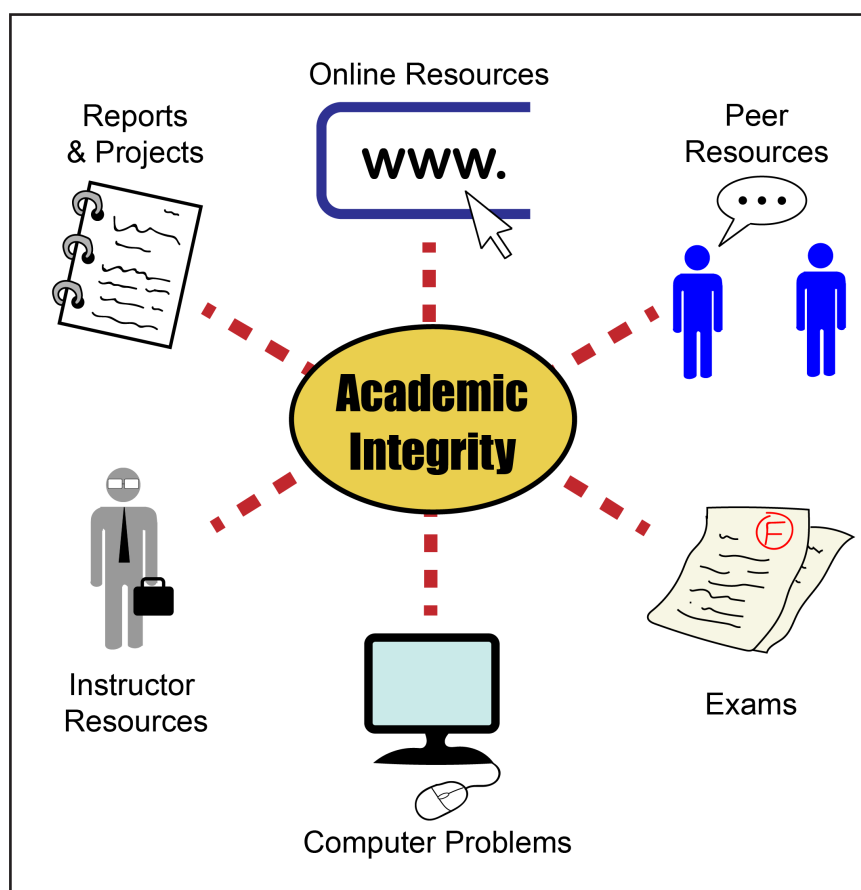


Figure 1. Organization schematic of the academic integrity videos. The videos were designed to address and educate students about multiple areas related to their academic career and highlight allowable and non-allowable behaviors related to the Code of Student Conduct. The set of videos was organized into six scenes: (1) cheating on homework (online resources), (2) cheating on homework (peer resources), (3) cheating on homework (instructor resources), (4) cheating on computer problems, (5) cheating on reports and projects, and (6) cheating on exams.

The input and design by current undergraduate students helped ground the message in both examples and language utilized by current students. Student Conduct professionals from both universities further offered suggestions on the commentary provided by the video's narrator to establish context for the scenarios. Responding to student input, several scenarios offer a version of "what to do" contrasting with "what not to do" to provide an increased focus on appropriate and encouraged use of resources. This also addresses concerns that faculty might have regarding a potentially negative/fearful climate created by the videos that might discourage appropriate student interaction. One message that emerged from informal discussions with students is that academic integrity violations often result from student procrastination, so this was also specifically addressed in the new suite of videos.

Once the authors identified the specific areas for focus, the next step was writing the script for each of the sections. We separated each of the six components into six acts, where each act would be a standalone video. The authors assembled a second panel of volunteer undergraduate students from both LSU and NC State to identify specific scenes relating to either examples of an academic integrity violation or a positive resource to help students. The undergraduate students were quite insightful on specific examples and had excellent feedback on what scenes to keep/update from the original set of videos in addition to what new scenes needed to be included. We then designed and wrote narration sections as a transition between the example scenes to provide additional context and instruction for the various scenes (Table 1). A major strength of the content in the example scenes is that they were all written by nine volunteer undergraduate students (eight from LSU and one from NC State) to make them as relatable as possible. The authors wrote the transition narration scenes with input from both NC State and LSU Student Conduct offices to make sure the language aligned with university policies. The script was completed in the fall of 2017.

STUDENT-LED FILMING AND PRODUCTION

The first set of academic integrity videos was filmed, produced, and edited by a communications senior design team at NC State. We felt that having students film the videos was a major strength as it made the videos relatable. To reproduce this, the author at LSU reached out to the Chevron Center for Engineering Education housed in the LSU College of Engineering. This unique educational resource is aligned with the LSU Communication Across the Curriculum (CXC) program, a focused program to educate students about effective methods of communication. We collaborated with the staff advisor of the CXC program and student leaders to organize a film crew of five undergraduate students in the College of Engineering (COE). This production team was responsible for all aspects of the filming process (Figure 2).

These students storyboarded every scene based on the script to identify filming locations in the engineering building and the necessary camera angles that needed to be obtained (Figure 2B). Next, we recruited 21 volunteer chemical engineering undergraduate students at LSU to serve as actors for the scenes, with one of the authors serving as the narrator. All 53 scenes were filmed on four consecutive Tuesday evenings in November and December of 2017. After filming was complete, the production team edited and cut all the raw footage into the six separate videos for each of the acts. The production team also worked with the author to incorporate all the voiceover narration.

The videos were then sent to the LSU College of Engineering Communications Department to make them ADA compliant and to build an open-access webpage so that any instructor can access them. The videos are currently available at <https://www.lsu.edu/eng/chevron/resourcesandoutreach/academicintegrity.php>, which launched in May 2018 (Figure 3).

Act	Number of Scenes with Examples	Number of Narration Segments
Cheating on Homework: Online Resources	7	3
Cheating on Homework: Peer Resources	8	3
Cheating on Homework: Instructor Resources	6	2
Cheating on Computer Problems	6	2
Cheating on Reports and Projects	6	2
Cheating on Exams	5	2

ASSESSMENT

We began incorporating the videos into the MEB courses at both LSU and NC State starting in the Fall 2018 semester and collected assessment data during the Fall 2018, Spring 2019, and Fall 2019 semesters. IRB approval was obtained at both institutions for this study. The videos' implementation varied between the two institutions as a function of the course structure. At LSU the videos were shown during the first week of class during a three-hour required recitation section. The LSU author led an open discussion section

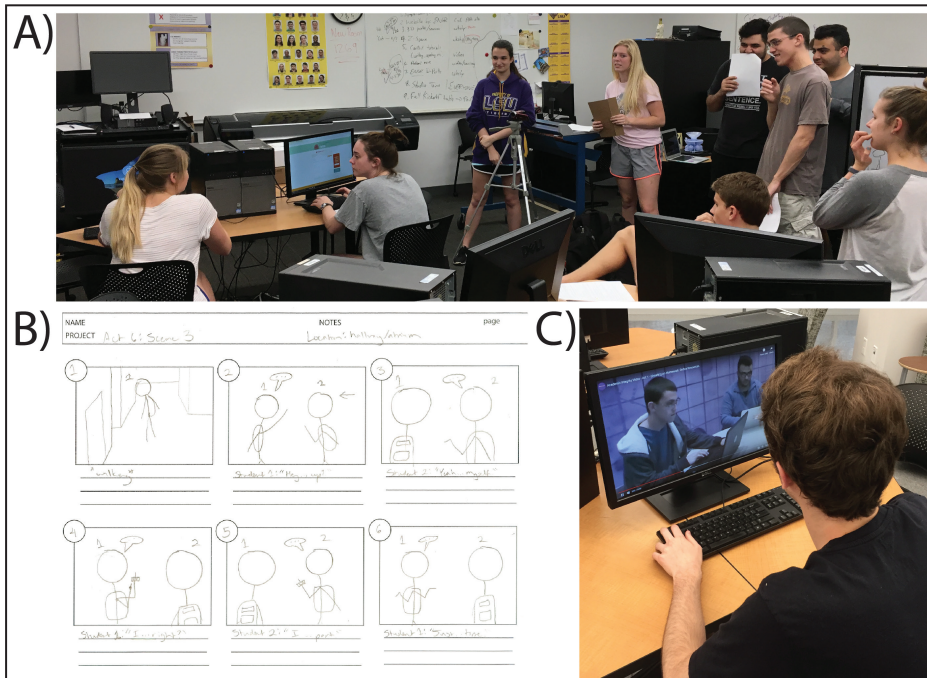


Figure 2. Representative images of the entire filming process. (A) Student-led directing, producing, and acting teams filming one of the computer-based scenes. (B) Example storyboard utilized by the production team to map out the filming angles to capture each of the scenes. (C) Student editing the raw video footage to compile the final videos including voice capture for narration scenes.

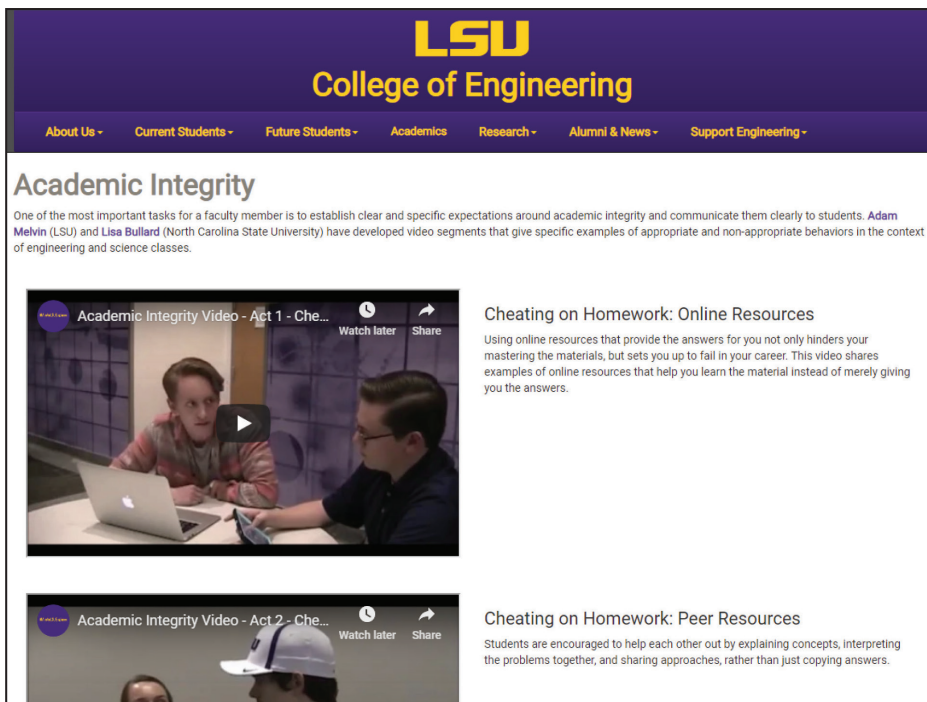


Figure 3. Image capture of the homepage for the academic integrity videos. The webpage can be accessed at <https://www.lsu.edu/eng/chevron/resourcesandoutreach/academicintegrity.php>. The website and all videos were uploaded to allow for ease of access while following all ADA guidelines.

where students could watch the videos and then discuss the concepts and implications of each of the scenes in small groups. After each of the videos, the LSU author would pose additional follow-up questions related to the videos and answer student questions clarifying content. At NC State the video viewing was given as a required out-of-class homework assignment where students watched the videos and answered a series of questions in a worksheet provided by the authors. This worksheet required the students to identify which section of the Code of Student Conduct was violated by specific listed behaviors. The LSU students completed the same worksheet in class while watching the videos. The NC State students additionally completed a reflection assignment developed by Bullard that asks students to connect specific behaviors to the university's Code of Student Conduct, prompts them to reflect on the adverse consequences of cheating, and encourages them to proactively plan on how they will avoid putting themselves in a position to be tempted to cheat.

To assess the impact of the videos on students' perceptions of academic integrity, we performed pre- and post-assessment in the form of a survey. The survey consisted of 19 questions addressing varying student behaviors for which the students had to respond with either agree, not sure, or disagree whether the behavior was allowable under the academic integrity expectations of the course. We elected to use a three-point scale instead of a five-point scale (including strongly agree and strongly disagree) because the survey was designed for yes/no answers instead of a confidence associated with their response. The number of students who watched the videos and completed the pre- and post-assessment

surveys was: 113 (LSU pre F2018), 128 (NCSU pre F2018), 81 (LSU pre S2019), 35 (NCSU pre S2019), 96 (LSU pre F2019), 115 (LSU post F2018), 144 (NCSU post F2018), 79 (LSU post S2019), 33 (NCSU post S2019), and 94 (LSU post F2019). The result was a total of 290 pre-survey and 288 post-surveys for the LSU cohort and 163 pre-surveys and 177 post-surveys for the NC State cohort.

We found that viewing the videos led to a substantial shift in student perception in four key areas: (1) the use of online resources to check final homework answers, (2) the use of peers to check final homework answers, (3) the use of online resources to help get a problem started, and (4) the ability to identify *allowable* online resources to help students master course concepts (Figure 4). We observed a substantial shift from “agree” to “disagree” in all four of these categories dur-

ing all three semesters where data was collected at both institutions. In all cases ~40-60% of students initially responded that online and peer resources were allowable (or *were not sure* they were allowable) sources of aid on homework before viewing the video. However, after watching the videos and completing the assignment, ~80-100% of students identified that these were *not* allowable resources (Figure 4). The context of allowable versus unallowable resources is fleshed out in greater detail in the videos with unallowable resources including www.chegg.com, www.coursehero.com, and other websites where students can access solution manuals or pay someone to do their homework for them. We observed an interesting trend in the data when comparing the outcomes between the LSU and NC State students. In all cases the LSU students tended to have a higher “disagree” response

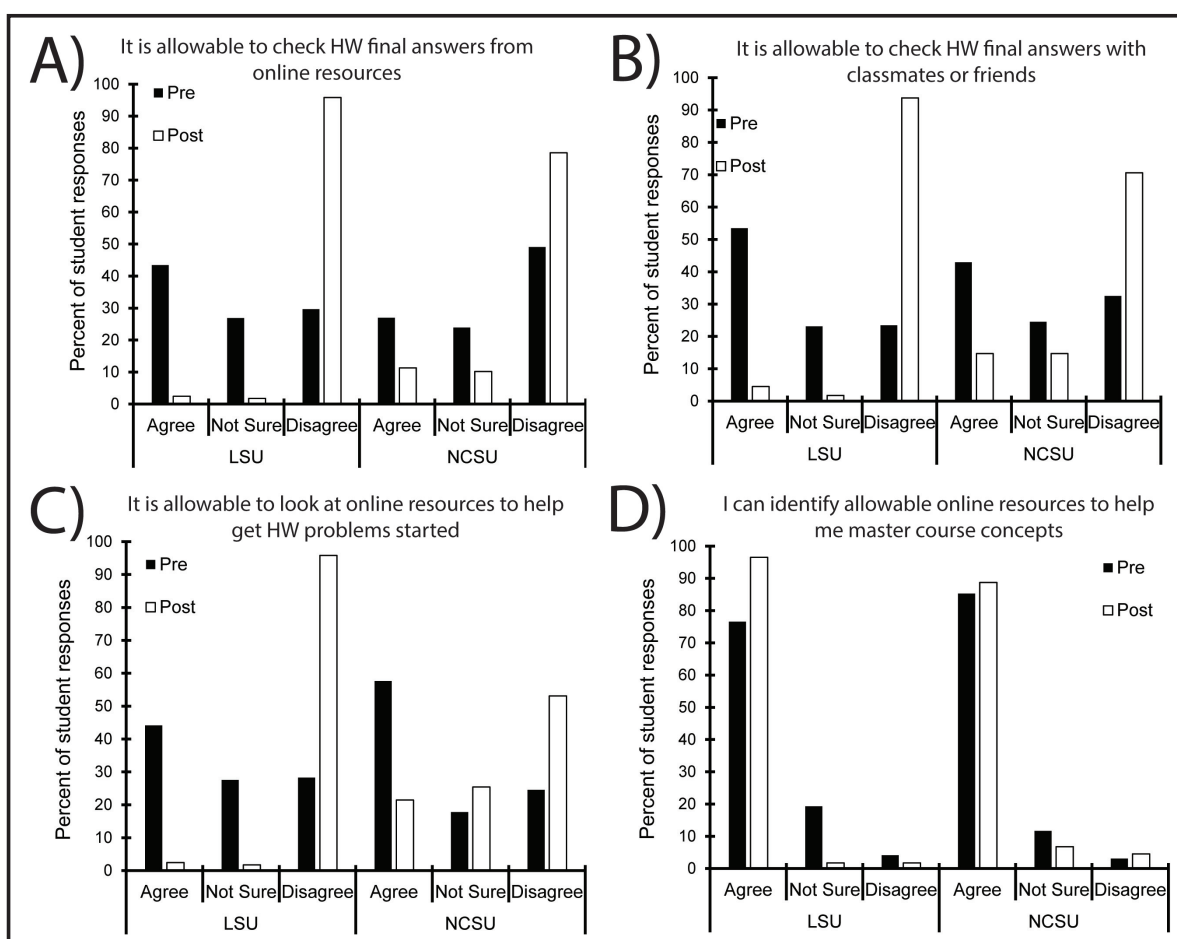


Figure 4. Four instances of how the videos shifted student perception of allowable behavior. The representative questions where the greatest degree of change was observed before and after the students watched the videos: (A) it is allowable to check homework final answers from online resource; (B) it is allowable to check homework final answers with classmates or friends; (C) it is allowable to look at online resources to help get homework problems started; and (D) I can identify allowable online resources to help me master course concepts. These four questions were selected because they showed the greatest change due to video viewing. All responses were reported as percentages from the combined responses across the three LSU cohorts ($n = 290$ for pre and $n = 288$ for post) and two NC State cohorts ($n = 163$ for pre and $n = 177$ for post).

to these four questions (in the post-survey) when compared to the NC State students. Of the LSU students, only ~ 10-20 out of 290 students answered with “agree” or “not sure” after the videos. At NC State, we found 40-75 students out of 177 students answer with “agree” or “not sure” after the videos. We believe this trend is due to the instructional method where LSU students received additional feedback/discussion directly from the author while the NC State students did not have this opportunity for clarification in completing their assignment. This finding supports the idea that a question and answer supplement to the videos can help to solidify student perception with respect to academic integrity. Additionally, there was a larger discrepancy between the pre- and post- responses at NC State, with 14 students *only* completing the post-survey compared to LSU where there were only two students who only completed the pre-survey. This 7% difference could potentially skew the findings from NC State since no pre-video data were collected for these surveys.

While the four categories presented in Figure 4 show a dramatic response to video viewing, we did observe changes in student perception in several other categories. To provide a quantitative assessment of the effectiveness of the videos, we calculated a metric called the percent difference, as shown in Equation 1.

$$\text{Percent Difference} = \frac{(\text{Post-Survey}) - (\text{Pre-Survey})}{\text{Total Number of Responses}} \quad (1)$$

The percent difference was calculated based on the desired response. For example, students should respond with “disagree” to the question “it is allowable to check homework final answers from online resources.” In the instance of LSU, we found a shift of 190 students who switched from “agree” or “not sure” to “disagree,” resulting in percent difference of 66% (Figure 5). As expected, we found the largest percent difference in the four questions related to online and peer resources used to complete a homework assignment (Figure 4), with values ranging from ~ 20-60% (Figure 5A). We also found a smaller percent difference value for the NC State cohort when compared to the LSU cohort, which supports the conclusions described above. One interesting comparison was the percent difference in students who thought it was acceptable to copy homework solutions from online or peer resources. There was almost no change for the LSU students while there was a 10% difference with the NC State students. This could potentially be explained by the difference in students who completed the pre/post survey. Another explanation could be the internal reputation of the course instructor at LSU; based on informal discussions with students, the LSU author had a reputation for being extremely strict on copying, such that junior/senior students warned sophomore students to avoid these behaviors. This suggests that clear and consistent guidelines and expectations for students can be a helpful supplement to the academic integrity videos to reduce instances of cheating, thus helping to create a departmental culture of integrity.

The three other categories (cheating with computers, cheating on reports/projects, and cheating on exams) also showed a percent difference between 5-20% in several categories. Both institutions found a shift in student attitude, with the unauthorized sharing of computer files and their ability to identify appropriate methods to help their peers (Figure 5B). The LSU cohort did not have a substantial shift in student perception with respect to lab reports and projects except in the case of omitting or modifying data points. However, the NC State cohort had a more pronounced shift (10-20%) in all three categories with respect to data stewardship and reporting. We found a similar trend in the students’ perception with sharing information about exam content (Figure 5B) Finally, we observed a percent difference of 8% (LSU) and 13% (NC State) in the students’ response to the prompt “*I understand the expectations for academic integrity for this course*” and a percent difference of 2% (LSU) and 9% (NC State) for the prompt “*I believe academic integrity is important.*” This supports the use of the videos as a means of clearly communicating instructor expectations with respect to academic integrity.

Finally, we attribute the lower percent difference with several of the prompts to the fact that there were relatively small numbers of the “undesired” response to many of these questions. This is an encouraging finding – the students already understood that certain instances are clear academic integrity violations. This also matches the outcome from the authors’ previous work that students could identify most instances of academic integrity and that they just hoped they would not get caught.^[13] Another interesting takeaway from the assessment was the importance of clearly stating course objectives and policies with respect to online resources. During video instruction, the authors clearly stated the course policy that students were not allowed to access/use online or peer resources to check answers or get started on problems. This expectation is important because these are resources that the students will not have access to on the exam. The purpose of homework is to provide students practice in problem solving, and using unauthorized resources “just to get the problem started” does not allow students to develop critical thinking and problem-solving skills that they will need to successfully solve future real-world problems (whose answers are not published online). We believe this clarification was an important component of the videos because the students were made aware of the policies up front.

RECOMMENDATIONS AND CONCLUSIONS

This paper highlights the authors’ efforts to update a suite of academic integrity educational videos as a resource to provide students with examples of allowable versus unallowable behavior in both the classroom and the lab setting. The landscape has changed in the thirteen years since the first

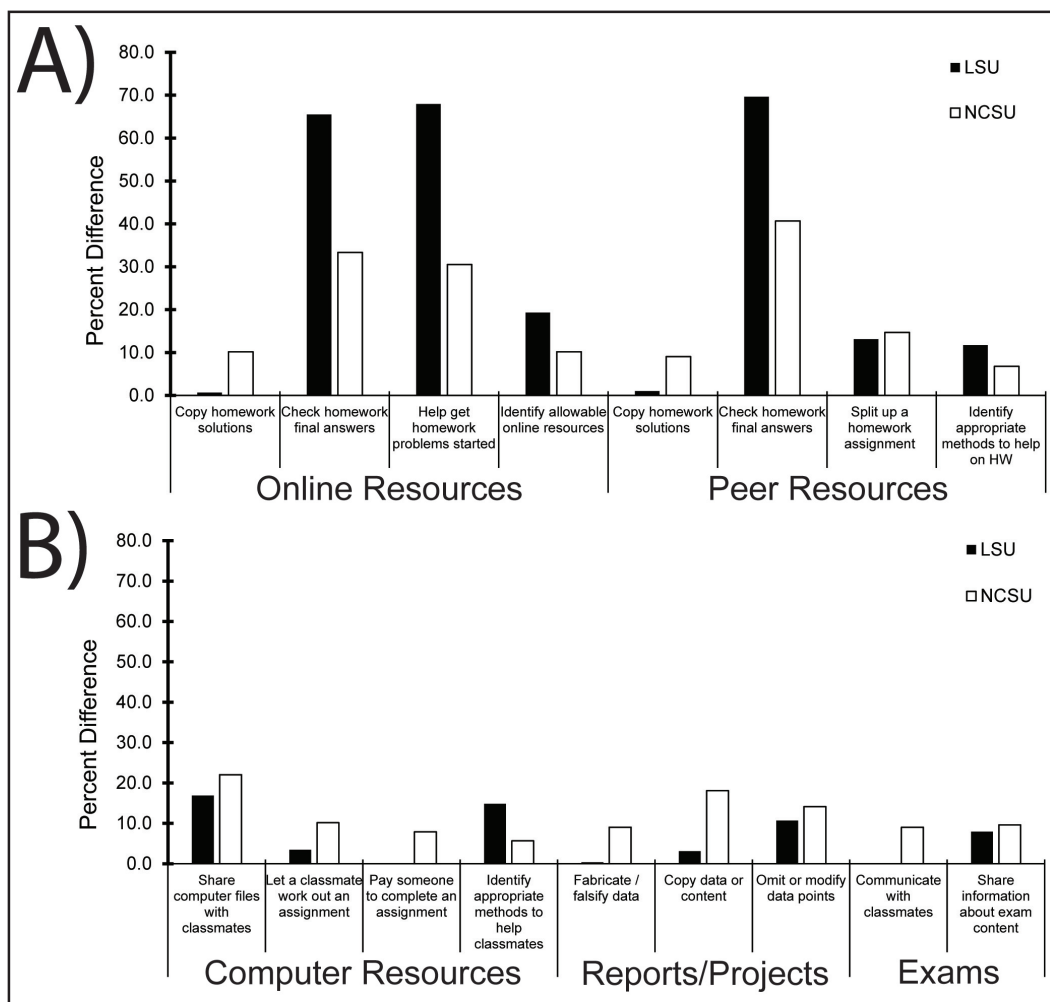


Figure 5. Assessment of the effectiveness of the academic integrity videos. The percent difference was computed based on the desired student response from the pre- and post-surveys (e.g. copy homeworking solutions would have a desired response of 'no'). (A) Percent difference in student responses for four questions related to online resources and four questions related to peer resources). (B) Percent difference in student responses for four questions related to computer resources, three questions related to lab reports and design projects, and two questions related to exams. Every question started with the prompt "It is allowable to." The exception are the three questions that started with "I can." All responses were combined across the three LSU cohorts ($n = 290$ for pre and $n = 288$ for post) and two NC State cohorts ($n = 163$ for pre and $n = 177$ for post).

set of videos was released, with an emphasis on technology and a greater number of online resources for the students. We found the videos were substantially helpful in clarifying instructor expectations around homework; in addition, the authors also found increases in the desired outcome in nearly all categories of the assessment survey. We conclude that the videos are an effective resource to help educate students about academic integrity expectations and importance. This is why we have made the videos publicly available to any instructor who chooses to use them. We also strongly encourage our colleagues to share their feedback and data on the effectiveness of the videos in their courses with us.

Since the video script references calculus, chemistry, and physics, the videos are appropriate for use across STEM disciplines. Faculty may choose to have students watch all the videos or choose specific videos that relate to their specific course. The videos are split up by the different acts, each of which focuses on a specific topic (e.g. cheating on exams). They were designed this way so that faculty could pick and choose which videos to utilize for their courses. We recommend that faculty view the videos themselves to confirm that the expectations set forth are consistent with their own. The authors (and the videos) do clearly state that the students should check with their own instructors on whether specific

resources are allowed, as some instructors do not have specific guidelines on allowed versus unallowed resources. Many new instructors realize too late that they should have had clear policies in place after they catch students cheating on homework assignments, reports, and exams. As such, any instructor planning on using these videos should communicate specific guidelines and expectations for the students to avoid potential confusion for their students.

Finally, we acknowledge that these videos, while newly released, are already out of date with respect to newer technologies. For example, in the time between the script writing and data collection, the use of GroupMe on smart phones to cheat has dramatically increased. This app is available on all platforms, and students will often create class-wide groups to share information. While this may be a helpful communication tool, some students will also use it inappropriately to ask for help or share answers during an exam or quiz. This is even easier when the quiz or exam is administered virtually in online courses. This is just one example of how instructors need to continue to adapt and evolve to new technologies. While instructors cannot provide an exhaustive list of unauthorized behavior in their syllabus language, they can communicate guidelines and principles to help student make ethical decisions. Our hope is that the videos are a good starting point to educate students about instructor expectations and policies. Additionally, we encourage instructors to review other resources that can also be used to complement the video, in particular the reflection assignment, which can be modified to fit faculty needs at different institutions.^[14] The authors welcome any faculty input or suggestions regarding the content of the videos and how they choose to use them at their institution.

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