Curing the Cheating Epidemic? A Multi-site International Comparison of Perspectives on Academic Integrity and the Way We ”Cure” by Teaching

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Abstract

Plagiarism became an issue in both the scientific and political communities in Germany at the beginning of the decade. The former German Minister of Defense and the Minister of Education and Science lost their Ph.D. titles due to plagiarism and subsequently resigned. In response, a German internet community worked as a group of “plagiarism hunters” screening the dissertations of high profile individuals. The situation prompted an intense discussion about academic integrity, largely focusing on plagiarism. A number of newly published books have surfaced in Germany about the correct way to proceed with academic work. In contrast, other cases of cheating are not discussed widely by German academics. Obviously different traditions and organizational arrangements in various countries or in different institutions in the same country will lead to varying degrees of scrutiny. The research question for this work is: whether schooling is unavoidably connected to cheating? The answer to this question is probably yes. The specific question to be addressed is whether different university traditions and organizational arrangements are more or less successful in preventing cheating, or at least instilling a consistent view of what is acceptable and what is not? This paper will present data from East Carolina University in Greenville, North Carolina, and the University of Applied Sciences (Hochschule) in Darmstadt, asking students about their attitudes towards cheating. The participating institutions of higher education offer obligatory courses which inform the students about academic integrity and the faculty try to support students to apply the rules correctly. The university systems of the countries are very different, leading to differing modes of supervision and to different student expectations of how they have to be guided.

1 Introduction

Examination of literature in the English and the German speaking world about cheating by university students reveals a remarkable difference. In the English language literature, there exists an extensive body of research looking back over many decades. A comprehensive national study by Bowers in 1964 and, four decades later, a thorough overview by McCabe et al. provide a
good entry point to the many hundreds of individual studies. Citation indices from Google Scholar, for example, indicate that more than a few of these pivotal works have been referenced 300, 500, or even 900 times at the time of this publication. Clearly, the topic has been widely discussed across the English-speaking landscape. The German situation is quite different. The same simple search engine test does not retrieve a comparable number of publications. Furthermore, only a few cross references between German scientific articles can be found. The topic garnered more interest in Germany with the state-wide discussion of cases of plagiarism connected with the names of Annette Schavan and Karl-Theodor zu Guttenberg. Ms. Schavan is the former German Federal Minister of Education and Science and Mr. zu Guttenberg is the former German Federal Minister of Defense. While completely different in the degree of cheating and plagiarizing, both cases had the same result. The doctoral degrees of both were rescinded, and both subsequently lost their governmental position (Zu Guttenberg in 2011 and Schavan in 2013). Both incidents were discussed nationwide in the German media and garnered the status of breaking news in the mainstream press. A similar incident has recently occurred in the United States. A potential communications director for the US National Security Council, Monica Crowley, withdrew from consideration after plagiarism in her Ph.D. dissertation and other subsequent works was brought to light. The two German affairs are presented in more detail in Section 3 to provide context and more background information about the German discussion. Since the beginning of the decade, a number of German publications have touched the topics of academic integrity with a heavy focus on plagiarism. In daily German academic life, the situation can still be described as an occasional detective lecturer looking for delinquent plagiarizing students. Until now, the student behavior (or misbehavior) is at the center of most of the German publications. The aspects of the teaching situation and the lecturers’ attitudes which make it more likely that cheating occurs, has not reached the broad debate that is evident in the English-speaking literature. An exception is a detailed and differentiated discussion presented in the text by Althaus.

This work will present data from one institution in the United States and from a German duplication of the research carried out at the Hochschule Darmstadt. Both data sets are from engineering students and focus on their attitudes towards various types of cheating which are presented in a questionnaire in 19 different scenarios. The US and the German university system are quite different and these differences may be part of the situational factors influencing student’s willingness to accept either written or implied honor codes. These system differences are briefly discussed in Section 2. Section 3 gives an overview of the two main German affairs on plagiarism to provide historical context. Section 4 presents the methodology of the two studies and discusses differences between the two approaches. Results from the two administrations of the instrument and the international comparison of these results are presented and discussed in Section 5, leading to some concluding remarks in Section 6. The 19 scenarios which constitute the main body of the questionnaire are shown in Appendix A.

2 Comparison of US and German University Systems

Higher education in the two countries share a number of similarities, but there are important differences as well. One of the most striking differences is that of cost. Historically, the cost of
higher education in Germany was entirely funded by the state governments. In the mid 2000s, some German states began charging tuition, typically on the order of 1000€ per year. The move was broadly unpopular and many states have since abandoned the tuition charges. The states compensated for the financial loss by paying more funding drawn from taxes. Those funds are specifically intended to improve the quality of teaching in the universities. Therefore, that allocation can only be spent for certain purposes. Generally today, administrative fees are several hundred Euro per year, which is in stark contrast to tuition costs in the United States. The most inexpensive public universities range from a low of several thousand dollars per year to the top end of many tens of thousands of dollars. A 2014 report notes that 50 US institutions have an annual cost (tuition and fees) of more than $60,000 per year for the 2014-2015 academic year.

Many of the other aspects of each of the education system discussed here are too varied to be widely attributable as a contextual difference with regards to academic integrity behaviors. Class sizes in either country may range from the massive impersonal lecture halls with hundreds of students to highly personalized small group instruction. Such variation is true between institutions and can even vary widely between programs at the same institution. Both systems have mechanisms in place for students to evaluate teaching, but weak teaching evaluations often have little meaningful consequence for the professors. Particularly in the case of professors who have been conferred permanent tenure, there is often little external leverage to influence teaching behaviors. The incentives for professors to engage in teaching are rare. The opportunities to negotiate salaries or to earn additional money (and even then usually only a disproportionately small percentage of annual salary) for teaching are limited. On the other hand, a significant amount of additional salary is possible through research contracts negotiated with external firms. In both Germany and the United States, accolades for faculty are generally earned through research productivity rather than teaching effectiveness, particularly at larger, more prestigious institutions.

The working contracts of the teaching staff have similar variability as well. Tenured professors in the US are typically expected to teach between 3-9 credit hours per semester, which usually corresponds to at least roughly the same number of hours of lecture time per week, and represents 1 to 3 individual courses. Other full time faculty positions, which may be called fixed term, limited term, contract, or clinical, are not eligible for tenure, and typically have a heavier course load of up to 15 credit hours. In both countries, graduate students may teach one or two courses per semester while completing their Ph.D. In the German system, professors at the classic universities are expected to teach 4 courses, typically delivered in 8 45-minute periods per week, while professors at Universities of Applied Sciences typically teach 9 courses in 18 periods per week. German lecturers (graduate students) have three to four year employments and will teach one or two courses per term.

Another key difference is the relative importance of examinations. In the German system, there is a tendency to have fewer formal examinations. It is not uncommon to have a series of lectures and only a single final examination to earn the ultimate credit points for the course. Formative assessments such as graded homework during the term are not widely used in Germany. By contrast, it is the exception for the undergraduate student in an American university to have only one exam per semester to earn credit for the course. More typical is one or even two midterm
examinations and a cumulative final exam, along with some proportion of the course grade originating from homework, smaller quizzes, and other formative assessment tools.

Anecdotally, the German system leaves the student with less support and on the whole, the typical German professor does not feel a sense of responsibility for whether students pass or fail. The burden of initiative for learning is squarely on the German student. That fact is supported by the relative lack of formative assessment, which also means less student work to evaluate for the German professors. The notion of keeping routine office hours, designated time for students to be able to ask questions and seek clarification, is a standard fixture of the American professor’s week, but is not commonly observed in Germany. Often, a high failure rate in a German course is not seen as an indicator of a pedagogical “disaster” but rather an indicator of upholding a good or appropriate standard. By contrast, there has been a proliferation of student support mechanisms on American campuses to retain students through the precarious first semesters of study. While there have been similar initiatives in German universities, they have mostly not been very successful yet.

3 German Plagiarism Cases

The zu Guttenberg affair was a remarkable case of cheating done by a well-known public personality in Germany. It is presented here in some detail because it marked a significant milestone in the German discussion about plagiarism and cheating at the university level. Such discussion or acknowledgement was more or less non-existent in the years prior to these incidents.

Karl-Theodor zu Guttenberg became everybody’s darling during his short but remarkably successful political career, courting the media and the general public alike. From 2008 to 2010 six leading print media outlets covered zu Guttenberg and his family in nearly 600 articles. Zu Guttenberg became Federal Minister of Economy in February 2009. After the resigning of his predecessor in office, he became Federal Minister of Defense. Good manners, a noble family background, and an engaging presence made him popular, fueling speculations about a possible future chancellor candidate. From December 2009, shortly after rising to the Minister of Defense position, to February 2011, the month of the plagiarism affair, leading print and broadcast news media published more than 16,500 stories.

The stone that initiated an avalanche started to roll when an assistant professor prepared a university seminar and came across the Ph.D. thesis of zu Guttenberg. The thesis appeared heterogeneous in style and argumentation. A few checks revealed plagiarism and going into detail revealed even more. After contacting the Süddeutsche Zeitung (SZ), one of the important German daily newspapers, the SZ published the story asking zu Guttenberg to comment the accusation. His statement, which was a full denial, was part of the article which started the affair. A few days later the online platform Guttenplag Wiki was published, inviting the community to participate via swarm intelligence to search for more instances of plagiarism. The results of 45 days of searching is given in the two following pictures (see timestamp of 03 April 2011). Figure 1 shows the more than 450 total pages of text indicating different degrees of plagiarism per page.
Figure 1: A snapshot from the German Guttenplag Wiki site that was established to “crowd-search” through the dissertation of then Federal Minister of Defense Karl-Theodor zu Guttenberg. From: http://de.guttenplag.wikia.com/wiki/GuttenPlag Wiki.

Figure 2 shows a compilation of the single pages indicating the sources (colored bar on the right) zu Guttenberg used on the different pages. The ambition of the crowd was remarkable. After four days the online platform published an intermediate report mentioning 271 pages which were written in a fashion using various types of plagiarism. On March 1, 2011 zu Guttenberg resigned his position as Federal Minister of Defense. The affair finally culminated with the granting university withdrawing zu Guttenberg’s doctorate.

However, zu Guttenberg’s resignation was just the start of the avalanche. After March 2011, a second online platform, vroniplag.wikia, published the results of 178 additional targeted plagiarism searches. A second very prominent victim of the crowd was Annette Schavan, former Secretary of Science and Education. The case of Ms. Schavan is not so severe. As shown in Figure 3, as compared to Figure 1, the differences are obvious. While the case of zu Guttenberg took two weeks for the university to make a decision, the case of Schavan was widely reviewed and discussed by the University of Düsseldorf. It was a question in the end whether the academic council was able to act independently or it was too heavily influenced by a public prejudgement. In the end, the responsible examination board rescinded her Ph.D. title. More details and background information is given by Deborah Weber Wulff in her book.

The history of these two cases have been presented here in some detail because they are representing points in time when academic integrity garnered more interest in German universities. Many universities bought new software to check for plagiarism or set up writing
Figure 2: This picture shows all pages of the Ph.D. dissertation of Karl-Theodor zu Guttenberg. The bar on the right displays with varying colors the 135 sources which have been plagiarized. Colors in the bar represent the sources plagiarized on the pages.\(^{18}\)

courses after these cases came to light. The public discussion in Germany mainly focused on plagiarism. The Deutsche Forschungs Gemeinschaft (German Research Foundation) and German Rectors’ Conference published an updated honor code. These two institutions are the most
Figure 3: This picture shows the dissertation of Annette Schavan. This case shows a substantially smaller percentage of plagiarized work, as compared to Figure 1. This image from http://de.vroniplag.wikia.com/wiki/Übersicht

important bodies relating to research in higher education in Germany. The general problem of cheating of all forms, which is in the focus of this work, was not addressed in the watershed of these high-profile events. A joint initiative was not visible and any measures were taken only at the level of the individual university.

4 Methods

This section describes the study population and survey instrument. The study protocol was reviewed and approved as per appropriate regulation at each local study site. No personally identifiable information is collected and waiver of documentation of consent ensures anonymity of responses.

This work compares survey results administered to students at two postsecondary institutions. At East Carolina University, the instrument was administered by way of an anonymous online survey platform. At Hochschule Darmstadt, the original English instrument was translated to German and administered as a paper-based anonymous survey. A total of 274 responses were gathered. The instrument consisted of four main parts and a fifth designed to mimic earlier work by McCabe and Bowers. Incomplete or incomprehensible responses for individual questions were excluded, resulting in different numbers of responses for some of the individual questions.

Study Population

The survey population consisted of undergraduate engineering students at East Carolina University in the United States and both undergraduate and master’s students majoring in engineering at Hochschule Darmstadt in Germany.

Survey Instrument

The main survey instrument consists of five parts, each described in subsections that follow. Four of the parts ask for responses that involve the same set of 19 behaviors or scenarios that represent different degrees of academic dishonesty. The behaviors are listed below as well as in Appendix Table A1. The original research at the East Carolina University in the US included 20 scenarios.
For the German study, the last scenario (the use of online solution manuals or solution services such as chegg.com) was dropped as analogous resources are not known to exist in German language sources. It should also be noted that the translation was conducted without additional oversight or verification of validity. Two of the instrument items are not dishonest actions and were included as a kind of negative control on the pooled responses: Scenario 3: Writing-quoted with citation and Scenario 14: YouTube to study. The remainder are designed to present gradations of similar situations. This list includes shortened descriptor phrases to facilitate the presentation and discussion of results. In the instrument, only the full descriptions are presented to the respondent. The nominative person of the descriptions are adjusted as appropriate for each part (“You”, “I”, or “a student”).

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.
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)

The first question asks the respondent to rank and rate all 19 behaviors in a comparative way. The zero end of the scale is described as “not an academic integrity violation” while the other end is valued at 100 and is labeled “severe academic integrity violation”. For this part, the scenarios are presented in generic third person: “A student copies...”

The second question uses the same list of behaviors but presents a new evaluation scale designed to elicit an indication of the ease with which a student decides to participate in a given behavior. This question attempts to get at the guilt factor or “moral compass” component of decision-making. This is a complex question, and a simple two-dimensional slider ranging from “very easily” to “never” is insufficient to capture an important aspect of this issue. A student may choose to act in a given way easily even though they consider the action to be dishonest, or they may simply not consider the action dishonest. In addition to the described slider, a “not applicable” box is provided as an option if the respondent does not consider the action to be wrong or unethical. This checkbox differentiates between the important cases of easily deciding to act in a particular way despite feeling that the action is unethical, and easily acting in that way because there is nothing unacceptable or unethical about the action. For this part, the scenarios are presented in second person: “You copy...”

The third question uses the same 19 behaviors and the identical slider configuration, but asks the students to rate how easily they believe their peers would decide to participate in the behaviors. This distinction is intended to illustrate another aspect of the perception of academic integrity issues. The scenarios, as in question 1, are phrased in third person.

The fourth question asks for the number of times the respondent has acted as described in the most recent two semesters (three or more times, twice, once, or zero). This question is again worded in second person.

The remaining question is similar to the fourth question, but is in the spirit of the McCabe and Bowers work. The categories and question style should allow for direct comparison to previous results. The question presents a four point Likert scale ranging from “Never” to “Many Times”, and polls for frequency of having acting in any of the following nine dishonest ways during their college career. The specific questions are listed under the associated results in Figure 4.

5 **Results and Observations**

A total of 274 German and 46 US Engineering students responded to the survey request. Results and observations for each part of the instrument will be presented in turn, followed by a general discussion and concluding remarks in the next section.

**Bowers and McCabe follow-on**

The Bowers-McCabe follow on questions correspond by number to the scenario numbers in Figure 4:
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

Figure 4 presents the frequency results for the nine behaviors meant to compare to prior literature. The left column of each pair represents the US respondents and the right column of each pair represents the students at the German institution. The first four of the nine behaviors relate to dishonesty in a testing environment, and in all cases, the German students report significantly more incidence of cheating. The reverse is true for item 6, turning in copied work, with the US students reporting substantially more activity. That higher percentage may be attributable to the fact that such interim work is often of no significance to the course grade for a German student, but may represent a significant portion of the US students’ marks. To the authors’ knowledge, there is also not a German analog to chegg.com, so widespread access to solutions may not be as

Figure 4: Results of the survey item intended to be comparable to the earlier work of Bowers and McCabe.25
prevalent. (It should be noted that the German author informally polled a number of the engineering students as to whether they knew of an analog to chegg.com. None did, and after some checking reported that they could not find anything of that nature)

**Comparison of relative severity**

![Box plot of reported severity](image)

Figure 5: Reported severity of 19 academic integrity scenarios. The median value is represented by the filled square. The interquartile range is represented by the filled bar. The whisker line extends to the 2.5 and 97.5 percentile. The x markers indicate the 95% confidence interval of the medians. The study groups are represented according to color. The scenarios are listed in Table A1.

![Difference in medians](image)

Figure 6: Difference in medians of reported academic integrity severity for 19 scenarios. This plot reports the difference between the German and US Engineering students. The behaviors are listed in Table A1.

In this survey section, the respondents were asked to rank and rate the severity of each of 19 behaviors. Figure 5 is a box plot presentation of the responses. The median response for each of
Figure 7: Reported severity of 19 academic integrity scenarios. The median value is represented by the filled square. The interquartile range is represented by the filled bar. The whisker line extends to the 2.5 and 97.5 percentile. The x markers indicate the 95% confidence interval of the medians. The two study groups are represented according to color. The scenarios are listed in Table A1.

the scenarios for each of the two study populations is indicated with a filled square. The extent of the colored bar represents the interquartile range (IQR), while the whisker lines extend from the 2.5 to the 97.5 percentiles. In all of these box plot representations (Figures 5, 7, 8, 9, and 10), if the median (square marker) of a given group’s response is outside the 95% confidence interval (x markers) for another group’s response, that indicates significant difference in response between groups.

Figure 6 shows a simple difference between the median values of the sub-groups to illustrate the degree to which perceptions differ. Markers above zero indicate that the German students perceive the scenario as more severe, while markers below zero indicate that the US group rated the scenario as more severe. This analysis is purely graphical and does not consider whether the differences meet the criteria for significance. Figure 6 indicates that the German students have a greater respect for copying of drawings (Scenarios 7: Figure-adapt, no citation and 8: Figure-copy, no citation) as well as copyright (Scenario 9: Download book). The German students rarely write documents requiring formal citation literature, but do write laboratory reports that undergo scrutiny for having copied figures from a textbook without proper references.

When considering results as presented in both Figures 5 and 6, both of the control scenarios (3: Writing-quoted with citation and 14: Youtube to study) are the two lowest responses. The differences in medians are significant (by lack of overlap in the 95% intervals) for Scenarios
7-12, 16, and 18. As stated above, Germans rated those related to figure plagiarism and copyright as more serious, while the remainder, 10-12, 16, and 18, were rated as more serious by the US students. Of interest is the stark difference in the German ratings between 12: Exam-ask earlier section, 18: Exam-peek and change, and 19: Exam-mobile device. The German students do not feel that asking students who have already taken a particular exam for details is wrong at all (a median of 1 compared to a median of 32), are much more comfortable with the idea of changing an answer during an exam based on a neighbor’s paper (medians of 78.5 and 100), but are in agreement (both medians 100) regarding the very grave nature of using a mobile device to cheat during an exam. As with the US students, Germans were more lenient with the idea of giving a friend who had been ill assistance (Scenario 11) as compared with getting work for themselves in the event of illness (Scenario 10) and rated both scenarios milder than the US students.

Comparison of self and peers: Ease-to-act

This portion of the study presents the same 19 scenarios with a different research question. These two questions sets (Parts Three and Four) are designed to get at how easily a student chooses to act in a manner he or she considers wrong or unethical. In Part Three, the student is asked to rate the scenarios based on personal perception (their own actions), and in Part Four, the student is asked to answer how their peers would act. For each item, the student may respond instead to indicate that the scenario is not wrong or unethical.
Figure 9: Reported severity of 19 academic integrity scenarios. The median value is represented by the filled square. The interquartile range is represented by the filled bar. The whisker line extends to the 2.5 and 97.5 percentile. The x markers indicate the 95% confidence interval of the medians. The two study groups are represented according to color. The scenarios are listed in Table A1.

Figure 7 and Figure 8 present box plot representations of the ease-to-act responses comparing the US self and peer ratings on one plot and the German self and peer ratings on the second plot. The median ease-to-act value is noted by the square. The box represents interquartile range. The 95% confidence notch interval is indicated on both data sets with an x marker.

The difference between the self and peer ratings are not nearly as striking in the German comparison (Figure 7) as in the US comparison (Figure 8). Fourteen of the 19 are statistically different for the German respondents. The typical German respondent places their own ethical compass much nearer to their peers than the US respondents, who report that their peers are far less ethical than they are. The overall higher ratings for the German responses regarding ease-to-act are consistent with the higher reported incidence rates seen in Figures 4 and 11.

Figure 9 compares the reported ease-to-act ratings for self with German and US responses on the same plot, while Figure 10 displays the German and US ratings for the peer ease-to-act responses. Both highlight the increase German willingness to participate in most of these dishonest behaviors, as well as the large disconnect between the self and peer ratings evident in the US responses. The use of mobile devices on an exam (19:Exam-mobile device) is the one exception. German and US students agree in Figure 9, with both reporting a zero median.
Figure 10: Reported severity of 19 academic integrity scenarios. The median value is represented by the filled square. The interquartile range is represented by the filled bar. The whisker line extends to the 2.5 and 97.5 percentile. The x markers indicate the 95% confidence interval of the medians. The two study groups are represented according to color. The scenarios are listed in Table A1.

Recent self-reported behavior count

The final section of the survey instrument asks students to indicate how many times in the last two semesters they engaged in the 19 behaviors. This is a more restricted time period than the results from the nine scenario question discussed previously. Figure 11 summarizes these results in a paired stacked bar format. Each bar is a histogram representing the percentage of respondents giving each of the four possible responses: never, once, twice, three or more. The left bar of each pair represents the US students while the right bar represents the German responses. Based on the sweeping differences noted in the German self to US self responses in Figure 9, the relative similarity of these reported rates of having acting dishonestly (Figure 11) is striking.

6 Conclusion

With regards to the specific comparisons made here, it must be noted that there may be a slight mismatch in scope between a typical US university and a German University of Applied Science. The focus of the German University of Applied Science is to provide graduates directed toward practical engineering work. A scientific career is rare for graduates of the University of Applied
Figure 11: This question asked how many times in the prior two academic semesters had the student engaged in each of 19 behaviors. Allowable discrete responses were zero, one, two, or three or more times. The segments of the bar represents the percentage of respondents selecting a given answer. The left half of each composite bar represents the responses from the German respondents (n=274), while the right half represents the students at the US institution (n=46).

Science. The traditional universities are more focused on the science, though traditional university graduates do end up in industry as well. This specific US engineering program is relatively new, and does not have a graduate program. Although steadily increasing in recent years, the number of graduates from East Carolina University who go on to graduate study is still low. The question of comparing additional types of institutions remains and the authors intend to expand the scope of this work to additional sites in future years.

Overall, these survey results indicate that the German students participate in these dishonest behaviors more often, and choose to do so more easily, though scrutiny of Figures 4 and 11 disagree on the degree of difference. A number of factors may contribute to these observations. Some of the cheating behavior is a type of intellectual self defense against how the German system has evolved, in a way. There are few to no formative assessments in the German system, which puts an enormous amount of stress to succeed on the students at the end of a term. A course is weeks of lecture with no checks or tests along the way, as that is seen by the professors as too much marking responsibility. With a teaching obligation of up to nine 90-minute classes per week at an University of Applied Sciences, the grading load would quickly become untenable. Therefore, exercises are assigned as a kind of non-obligatory self assessment. Students must then sit for 4 to 6 exams in the span of two weeks at the end of the term, and cheating is seen as the
only way to survive. For example, the German students rated Scenario 12 (asking an earlier group of students what was on an exam) with a near zero median, indicating that there is approximately nothing wrong with doing that at all. The general intention of the German professor is to present all of the course material by lecture and set up a reasonable final exam. The prevailing German student approach is to pass the exam, often with no deep concern about having learned the subject or forgetting 90% of the exam material right away.

The lack of formative assessment in Germany also explains why the unauthorized help on homework assignments is rated as more severe by US students. German students do not see it as a problem because it is not a substantial part of the course grade, where the students in the US ascribe value to such formative assessments, and therefore acknowledge the wrongdoing when short-cutting the assigned work.

In the German model, the focus on results, despite the means used to get there, leaves room for improvement. Implementation of an honor code is a suggestion that follows naturally from evaluation of these results. An increased emphasis on teaching and learning in Germany will require a shift in the focus across the system. For example, the final thesis documents of the German University of Applied Science students are written in close cooperation with industry. One thesis supervisor comes from industry and one comes from the university, and neither side typically scrutinizes the work for academic integrity, despite the plagiarism scandals that made such dramatic headlines, because the focus is to transition the student to a career. The cost of tuition in the US system also influences the relative importance of teaching and the expectation of the student of educational services for the monies paid. The German student pays nearly nothing, so on the whole, the German professors feel less obligation to deliver more than minimal effort at the education component of their work. There are differences which also depend on the professor’s experiences. Professors as well as students became socialized by the system they experienced. From Stephen Davis: “In fact, it appears that the old adage, ’cheaters never win’ may not be applicable in the face of academic dishonesty. With cheating rates that may be as high as 75% and detection rates as low as 1% it would appear that this behavior currently is being reinforced, not extinguished.”

These results show a number of interesting differences between the two main populations surveyed. While it would be irresponsible to generalize these results to all US or German institutions, any institution could use these results as a mirror or litmus test of sorts. These results indicate that the US approach is a better “cure” in most of the metrics evaluated by this work, but more importantly, this work can serve as catalyst to invoke these challenging, sometimes downright uncomfortable, conversations. Engineering is one of those fields in which ethics often plays a more central role than the underlying engineering principles. To borrow again from Stephen Davis: “The challenge is clear. Are institutions and their faculties willing to accept it?” It is our responsibility as engineering educators to impart not only technical content, but also a sense of ethics as part of an engineering education.
References


[17] Peter Jacobs. There Are Now 50 Colleges That Charge More Than $60,000 Per Year, July 2014.


[23] The Guardian. German defence minister resigns in PhD plagiarism row


Table A1: The 19 more specific behaviors used in the student survey instrument

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.
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)