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Cheating in Higher Education Teaching:

Classification of the current situation at TU Dresden and derived possibilities for action

C. Böhm, A. Jantos*, K. Lauber

ZiLL - Center for Interdisciplinary Learning and Teaching, Technische Universität Dresden

Abstract

Seit dem Sommersemester 2020 werden an der TU Dresden, sowie fast allen deutschen und internationalen Hochschulen, Prüfungen zum wesentlichen Anteil digital durchgeführt. Diese Veränderung in der Prüfungslandschaft, auch an der TU Dresden, hat unweigerlich bereits bekannte, aber auch neue Fragen zur Planung und Durchführung betrugssicherer (digitaler) Prüfungen mit sich gebracht. Diskussionen zu Prävention, Nachweis oder Sanktion von Betrugsversuchen werden mitunter leidenschaftlich geführt, bedürfen allerdings einer evidenzbasierten Grundlage, um die Sachlage angemessen einschätzen und Handlungsmöglichkeiten ableiten zu können. Nachfolgend werden bestehende Erkenntnisse zur aktuellen Situation aus Umfragen an der TU Dresden sowie (inter-)national gebündelt dargestellt, die TUD und eine Fakultät an der TUD unter die Lupe genommen und Handlungsmöglichkeiten abgeleitet sowie einzubeziehende Aspekte der Thematik diskutiert. In diesem Beitrag wird in keiner Weise ein Generalverdacht des Betrugs in digitalen Prüfungen gegenüber Studierenden ausgesprochen. Ziel ist, die Thematik von Betrugsversuchen in digitalen Prüfungen unter einer wissenschaftlichen und didaktischen Brille zu betrachten.

Since the summer semester of 2020, exams at TU Dresden, as well as at almost all German and international universities, have been conducted digitally for the most part. This change in the examination landscape, also at TU Dresden, has inevitably brought with it already known, but also new questions about the planning and implementation of fraud-proof (digital) examinations. Discussions on the prevention, detection, or sanctioning of attempted cheating are sometimes passionate, but require an evidence-based foundation in order to adequately assess the situation and derive possible courses of action. In the following, existing findings on the current situation from surveys at the TU Dresden as well as (inter-)nationally are presented in bundled form, the TUD and one faculty at the TUD are put under the microscope and possibilities for action are derived as well as aspects of the topic to be included are discussed. This article in no way expresses a general suspicion of cheating in digital exams against students. The aim is to look at the issue of attempted cheating in digital exams from a scientific and didactic perspective.

*Corresponding author: anne.jantos@tu-dresden.de

1. Current Situation

The national and international data situation shows an ambiguous picture regarding an increase and decrease or constant numbers of cheating attempts in digital course and exam situations. In this paper, we consider only written exam situations in the higher education context with the target group of students. Cheating is meant as the usage of unauthorized aids or persons to gain an advantage with full knowledge. [adapted from 1 and for higher education context]. Dendir & Maxwell define any form of "academic dishonesty," i.e., any behavior under which one falsely passes off one's academic work as one's own, as cheating [2]. However, Norris cautions that universal definitions are not discoverable, as each institution/faculty/teacher also establishes and communicates their own set of rules [3].

Within the currently expanding data base, the tendency of an increased number of cheating attempts in digital exam settings compared to face-to-face exams becomes apparent: According to a survey of 1608 students at German universities by Janke et al. (2021), 31.7% of the students surveyed report having used unauthorized aids or communicated with other students in face-to-face exams. In online exams, this figure is almost twice as high at 61.4% [4]. It should be noted that no statistics of officially confirmed cheating attempts in face-to-face and digital exams could be found or viewed so far. The following data refers to surveys, comparison of test results, and respondents' self-reports.

Alessio et al. (2017) also show that exam groups that took online exams without proctoring performed significantly better than exam groups with proctoring. The authors concluded that the better test scores of the exam group without proctoring was due to the use of unauthorized aids [5]. King and Case (2014) also find that not only do a higher number of students cheat on online exams, but those who cheat do so with increased regularity (3.3 times per semester) compared to cheating in face-to-face exams within a semester (2.9 times per semester) [6]. The result of increased number of cheating attempts in online exams, compared to face-to-face exams, is also reached by Dendir and Maxwell (2020) [4] or Varble (2014) [7]. At the same time, Weiner and Hurtz (2017) show that there are no significant differences between exam groups working in a PC pool and those taking the exam outside the PC pool - where both groups were under observation with proctoring measures [8]. In contrast to these findings, Ladyshewsky (2015) and Beck (2014) found no differences in test scores between students who wrote proctored face-to-face exams and unproctored online exams [9,10]. However, studies that found no change in test scores included academic cheating in courses overall, not exclusively in exams, as the object of investigation.

2. Factors

Cheating in (digital) exams is studied by Becker et al. (2006) with the help of the "cheating triangle" according to Donald R. Cressey. The following three factors are named as positive predictors for the occurrence of cheating behavior:

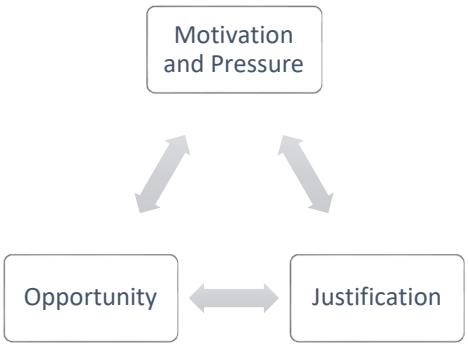

Figure 1: Reasons for cheating in summative exams [11].

The opportunity presents itself if cheating attempts are highly unlikely to be (or cannot be) detected. For example, according to King and Case (2014), 74% of 385 students surveyed reported that it appeared very or relatively easy in their eyes to cheat on online exams [6]. This is especially true in unsupervised exam situations, such as those that necessarily had to be conducted often during spontaneous remote teaching. The factors of motivation, pressure, or necessity may also be invoked in times of pandemic, still unfamiliar teaching and learning situations or restrictions on social contact: For example, it is suggested that students experienced greater difficulty in preparing for

online exams due to changes in family and social circumstances, difficulties with the demands of self-regulated learning, or difficulties with the online exam format, among other factors. The resulting increased pressure can be used as an explanation for a possible increased willingness to cheat, during online exams [4].

Especially at the beginning of the pandemic, the changeover from face-to-face to online teaching was experienced as extraordinarily challenging and exhausting on the part of both teachers and students. This resulted in uncertainty and changed communication patterns [4]. As Arndt et al. (2020) also summarize, many students often felt less prepared for digital exams than for face-to-face exams [12].

Stammen and Ebert (2002) show that there is a possible correlation between uneasiness about insufficient subject exchange in digital teaching-learning settings and the fear of being disadvantaged in digital exams [13]. In contrast, in a survey at the University of Potsdam, instructors were more positive than students about adequate exam preparation through virtual teaching [14]. Justification is given if forms of cheating or cheating per se are compatible with one's own values. If students notice a high degree of cheating among their fellow students, in their course of study, or at the university, a higher tolerance for cheating can arise - or the concern that it is necessary to cheat in exams in order to be able to pass them themselves [15].

In times of pandemic and digital apprenticeship, there may be increased factors that favor the occurrence of fraud attempts. The studies considered in this paper agree with this assumption, with few exceptions. Based on the presented and discussed findings from different surveys, the current situation at the TU Dresden as well as a concrete example from the Faculty of Business and Economics will now be discussed.

3. Situation at the TU Dresden

The Center for Quality Analysis of the TU Dresden conducted a survey among lecturers and students of the TU Dresden on the topic of digital exams in the summer semester 2021 on behalf of the Prorectorate of Education and in cooperation with the Center for Interdisciplinary Learning and Teaching (ZiLL). 62% of the respondents stated that in their estimation digital exam formats lead to cheating (much) more often, 33% estimate that it remained unchanged and 7% have the impression there are fewer cheating attempts. 54% of teachers and students feel, at least in part, that online exams lead to unfair results because of various cheating opportunities.

When fraud was observed, 60% was plagiarism, 10% identity deception, and 54% other methods of deception. For this reason, some auditors decided against digital auditing and even rejected it in general as long as fraud could not be ruled out, because this would make the objectivity of the audit impossible. The main criticism is that the conversion to digital formats, considering the possibility of fraud, would involve a great deal of effort. Under the exception rule in force in the summer semester at the TU Dresden that grades are not binding, this effort is considered too high [16].

4. An example from the Faculty of Business and Economics

A survey at the Faculty of Business and Economics after examinations in the 2020/2021 winter semester revealed that 28% of students gained an advantage in written online examinations with the help of unauthorized aids. The most important motives here were opportunity to cheat, lack of scruples, and the fact that students perceived the exam format as unfair and/or outdated.

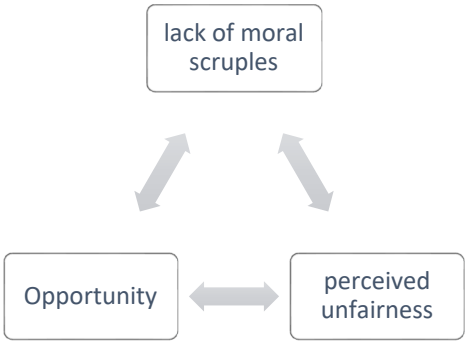

Figure 2: Reasons for cheating in summative exams at the Faculty of Economics of the TUD [17].

More than half of the students who successfully cheated indicated that they were glad they had done so because the exam was perceived as unfair [17].

Faculty members, on the other hand, put in a lot of extra effort to prevent cheating in digital exams. One of the organizational methods to prevent cheating is grouping. This involved examiners putting participants in groups and issuing different versions of an exam to reduce collaborative work. Other common methods included randomizing questions and/or answers in multiple-choice and single-choice questions. The most popular didactic method in economics was raising questions to a higher taxonomy level. Bloom's (1956) six cognitive taxonomy levels help determine different cognitive learning objectives in teaching and testing situations. The taxonomy levels are hierarchical and distinguish different levels of complexity and difficulty [18]. For the most part, fact retrieval was not used. Instead, application and reflection questions were asked. For 7 out of 7 exams, the examiner indicated that there were many opportunities for cheating, especially for unauthorized group work. However, 7 out of 7 examiners also confirmed that the exam could not be passed without good preparation and that both grade point average and failure rate and range of grades were similar to previous years (faculty interviews).

5. Possible courses of action

An effective method to reduce the possibility of cheating in summative online exams is the open-book exam with adaptation of the question taxonomy. In this case, all aids are permitted from the outset and, instead of questions for the reproduction of knowledge, application, transfer, and reflection tasks are set that are based on the course materials and test the students' understanding [18,19,20]. In this context, transparency in the communication of the course and the sequence of tasks is particularly important, because the greatest criticism from students of the Faculty of Business and Economics was the lack of clarity of the exam [21].

A further change in the direction of comprehension testing can be made by having the students create their own tasks according to a certain pattern (e.g. related to a formula that has been discussed). Here, not the memorization of a mnemonic or a formula is required, but the derivation of meaningful tasks related to the same. Furthermore, it is advisable to switch to oral exams, if possible, since this format opens few opportunities for cheating [22].

Changing the examination concept from summative examinations to formative assessment forms promises another sustainable solution, which can also be used in a learner-centered way to enrich teaching [23]. However, this solution usually involves redesigning the entire course and therefore demands increased workload. Whether the effort of such a restructuring is justified, however, must always be examined in detail, since it is highly dependent on framework conditions such as the number of students to be examined, the technical equipment of those involved, the feasibility under the applicable study and examination regulations, time and personnel resources, support possibilities of the teachers, and many more.

6. Discussion

The controllability of online exams is sometimes perceived by teachers as a challenge with regard to online teaching [24]. The term controllability is accompanied by the question of what should be controlled - in the context of online exams, the aspect of equal opportunities for students and their performance is emphasized here [25]. Cheating attempts are therefore in conflict with the desired equality of opportunity for all students under examination conditions.

In addition, the shift towards open source in working and teaching practice must be considered, which manifests itself in the promotion of open educational resources, open access with regard to scientific publications or open content platforms, among other things. The joint development and provision of content that can be reused under certain licensing conditions is moving into the focus of practical working life. A fundamental expression of this change in values is the high value placed on teamwork and cooperative work as soft skills

in work groups and teams. It can be assumed that students must be equipped with these soft skills in the future, i.e. they must have learned and applied them during their studies. If this idea is followed, the question arises as to the competence-oriented design of examination performance - whereby teamwork should come into focus as a competence that is just as serious and fundamental as, for example, professional competence. What would be an attempt at cheating under these circumstances?

The data situation reflects that cheating attempts tend to occur more frequently in unsupervised online examinations and, as shown in the example of the Faculty of Economics, can only be reduced with great effort. Therefore, the question has to be asked which practical definition of cheating in the academic context for measuring the performance of different questions seems to be useful at all with regard to professional practice. However, this will be influenced by various factors such as discipline, subject culture, objectives, subject content, size of the student cohort, etc., and will have to be evaluated in a differentiated manner.

7. Critical View

Finally, we would like to discuss and share some thoughts and conclusions that have emerged for us in the course of dealing with the issue of attempted cheating in digital exams. It is difficult to deal with cheating attempts in online exams without taking a look at cheating attempts in face-to-face exams: Cheating in face-to-face exams has also occurred and continues to occur in varying proportions [4], even if it is made more difficult by proctoring. Presumably, there are also people among the university members who are not (any longer) students who have deposited a cheat sheet in their pencil case, looked at the neighboring table or secretly exchanged information with fellow students during school and/or study times. In some faculties of the TU Dresden it is even allowed to bring along a one-page cheat sheet. It is not the "digital exam" format per se that tempts students to cheat, but rather the context in which exams take place, largely independent of whether they are held in person or digitally. We therefore need a differentiated and open discussion about what kind of examinations or performance measurements will be needed in the future and what the framework conditions for them must look like. We can also ask ourselves how we can move as quickly as possible into types of examinations that develop knowledge, in the examination itself, and thus leave the lower reproductive taxonomy levels of learning.

In times in which questions and problems are becoming increasingly complex, often require interdisciplinary approaches, and the working world increasingly functions digitally and is organized by digital means, it is not so much the ability to replicate as methodological skills, the ability to work in a team, or the understanding of cause-and-effect relationships that appear to be important competencies for later professional activity, but also for assuming social responsibility.

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