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CHEATING DURING ONLINE EXAMINATIONS – LITERATURE REVIEW

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Abstract

The COVID-19 pandemic forced the closure of many human activities. As a result, education quickly shifted from a classroom setting to an online one, challenging educators and students alike. Multiple issues that had barely been known to educators surfaced: technophobia, lack of rules or guidelines regarding online learning, politeness in a virtual environment, limited social interaction, but some of the greatest challenges remain cheating, and academic integrity concerns during online examinations. Technological and software advances can oftentimes identify cases of academic dishonesty. However, with mass education and faculty unpreparedness it is rather problematic to combat and avoid cheating during online assessment. This mixed-methods review based on the limited empirical research on the topic of cheating during online examinations will identify the factors that lead to cheating and will discuss the best ways of combating and avoiding academic dishonesty.

Keywords: academic dishonesty, assessment, cheating, online examination, online learning.

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Rezumat

Pandemia COVID-19 a dus la sistarea multor activit i umane. Drept urmare, procesul educativ a fost transferat din sala de clas într-un mediul virtual, impunând numeroase provoc ri atât pentru profesori, cât i pentru educabili. Exist multe probleme care, pân în acest moment, nu au fost cunoscute de cadrele didactice: tehnofobia, lipsa regulilor sau ghidurilor privind înv area online, polite ea în mediul virtual, interac iunea social limitat , îns una dintre cele mai mari provoc ri este copiatul, o problem de integritate academic , în timpul examenelor online. Progresele tehnologice i aplica iile software pot identifica adesea cazurile de fraud academic . Cu toate acestea, din cauza educa iei în mas i lipsei de preg tire a cadrelor didactice, combaterea i prevenirea copiatului în timpul evalu rii online este problematic . Aceast analiz critic limitat a literaturii bazat pe cercetarea empiric despre tema fraudei în timpul examenelor online va identifica factorii care duc la fraud i va discuta cele mai bune modalit i de combatere i evitare a fraudei academice.

Cuvinte-cheie: *copiere, evaluare, examinare online, fraud academic , înv are online.*

Introduction

Although the origin of the proverb *one man's meat is another man's poison* is unknown, it is attributed to the Roman poet and philosopher Titus Lucretius Carus who was the first to record it in the first century BC. Starting from this proverb, it can be inferred that dishonesty, transgression, or cheating, the focus of our paper, is regarded differently across cultures. Smith (2012) states that there are four main ethical theories which influence ethical perspectives in online classrooms. Whether we regard things from the point of view of subjectivism, cultural relativism, utilitarianism, or Kantian ethics, the dichotomy between right and wrong will always exist. As such, bringing it closer to the topic of our paper, what one student may perceive as dishonesty, another one might simply consider it honest behaviour, as we will prove in the forthcoming sections.

On the other hand, the reasons why students resort to cheating are various. Wenzel and Reinhard (2020) mention test anxiety, social anxiety, stress, parental pressure, to name just a few, the main underlying reasons being

tests and difficult learning tasks. The authors refer to the rational choice theory and the strain theory according to which students decide whether to cheat or avoid academic dishonesty. Students also cheat in order to get higher marks so as to preserve scholarships or with a view to future internships, employment, etc. They find that the internet is easy to use for cheating and plagiarism, and there is lack of serious consequences if cheating is discovered (Mellar et al., 2018).

In the view of teachers, who are aware of the fact that cheating during online examinations is frequent (Ebohon et al., 2021), there are other reasons why students turn to cheating: not knowing what cheating and plagiarism are, parents' expectations, some students may be employed and have little time to study, the frequency of assessments and the workload that they carry, course content is not presented in an attractive way (Mellar et al., 2018), to name a few.

Ensuring academic integrity has been a challenge ever since the introduction of online teaching and assessment (Farland & Childs-Kean, 2021) and is currently under investigation in many higher education institutions worldwide.

1. Cheating in general

1.1.   Cheating in written exams

There are many factors that lead to cheating. Personality traits, consciousness, emotional episodes are simply some. While few people would presume that gender influences cheating, there is evidence that different genders have different motivations to cheat (Krou et al., 2021). However, prior to any further comments regarding cheating, we will rely on the definition of Bucciol et al. (2020), namely, "breaking the rules of conduct during a written examination". The meta-analytical approach of Krou et al. (2021) investigated whether gender moderates the relationship between motivation and cheating. The authors found that men cheated more often and had more positive attitudes towards cheating than women.

A study by Mellar et al. (2018) conducted in two universities, one in Bulgaria

and one in Turkey, analysed the various ways students used for cheating both in examination rooms and in a virtual environment. The authors identified the following methods of cheating in examination rooms: impersonation, copying work from another student, receiving hints from other students, copying from materials, submitting text written prior to the examination, using a communication device to receive help from outside the examination room, giving an excuse in order to temporarily leave the room, plagiarism, and ghost writing. Additional ways of cheating reported by the authors included planting information in the room prior to the examination, using invisible ink, as well as translations from other languages.

Plagiarism, a huge problem in the academic world, implies copying parts of a work without acknowledging the source. Fabrication might frequently accompany plagiarism, that is, falsifying or modifying data and/ or information. Plagiarism, which is more common for take-home examinations, assignments, and homework, and which is the most common form of academic dishonesty among college students (Ampuni et al., 2020), occurs because students need to meet various deadlines and are pressed for time (Kang & Zhang, 2020). Plagiarism may stretch as far as to the selling of theses (Ampuni et al., 2020). However, various disciplines may have richer sources at risk for plagiarism. Plagiarism may be widely used for essay or thesis writing in humanities and social sciences, whereas it may facilitate the fabrication of information and data in science, technology, engineering, and mathematics (Bucciol et al., 2020). Plagiarism may not only be a cultural perception, but it may also differ across academic disciplines (Denney et al., 2021).

Moreover, other reasons for cheating could be added to our list: students may have a different perception related to cheating, they may fail to understand the rules, they may find the topic too challenging and difficult (Turner & Uludag, 2013).

According to certain authors, cheating in written examinations takes on various forms (Chirumamilla et al., 2020; Wenzel & Reinhard, 2020):
- cheat sheets, forbidden aids;
- copying answers in tests;
- inappropriate collaboration: peer collaboration, student-staff collaboration;
- outside assistance;

- peeking at the answers of other candidates;
- impersonation.

Cheat sheets are answers, possible solutions, paragraphs, essays written before the examination by students to be introduced into the examination room. They might be rather difficult to spot especially when a student's desk is full of other papers (Chirumamilla et al., 2020), but fairly easy to take into the examination room if they are hidden in books, folders, in clothes, or under wrist watches (Bawarith et al., 2017). Cheat sheets are a way of premeditated cheating (Daffin Jr. & Jones, 2018).

A survey conducted in Australia and the UK by Awdry and Newton (2019) pointed out the fact that students turn to ghost writing, that is, an assignment carried out by someone else or purchased from a website (Mellar et al., 2018), for various reasons: higher education has become transactional, students go to universities to earn a degree, it is difficult to verify the authorship, namely the fact that an essay was purchased rather than written by the student, and also because there is little personalisation of the writing tasks set by the teachers.

1.2.   Online cheating prior to COVID-19

Teachers are inclined to think that students cheat in online examinations because it does not imply much difficulty, on the other hand, students report that they turn to cheating because they face various learning difficulties (Amzalag et al., 2021).

Conducting assessments online has various advantages, such as lowering costs, several multimedia assessment tools, faster grading of the tests (Vazquez et al., 2021). Student authentication has been in use in the case of online proctored examinations for a few years now and was introduced with the advent of MOOCs (Massive Open Online Courses) and remote education (Atoum et al., 2017). However, it may be of different types. Apart from simple authentication, namely, using a password or answering some security questions, developments in computer science and technology allow biometric authentication as well. Such systems range from the simplest to the most complex ones which include user

authentication, movement, sound, and keystroke monitoring (Butler-Henderson & Crawford, 2020), face and voice recognition (Nigam et al., 2021). While the contribution of technology has become essential, the use of it is not the only or most important preventative measure (Mellar et al., 2018).

Mellar et al. (2018) list the five following ways of cheating during online examinations including the submission of assignments: impersonation, communication, copying from materials on electronic devices, plagiarism, and ghost writing. The survey by Chirumamilla, et al. (2020) considered six cheating practices: impersonation, forbidden aids, peeking, peer collaboration, outside assistance, and student-staff collusion in an on-campus controlled setting. Their analysis, conducted in Norway and involving 212 students and 162 teachers, found that only 3% of students admitted to cheating with the most frequent practices being forbidden aids, peeking, and peer collaboration during on-campus examinations. Moreover, cheating on e-examinations was simpler when students were allowed to bring their own devices. The study also found that peeking was easier in e-examinations than paper-based ones. Another cheating scenario that should not be ignored is that which occurs in asynchronous examinations. Live proctoring in such cases is highly unlikely to be implemented because of the necessity to keep the test open for extended periods of time (Sullivan, 2016) as is the case of MOOCs or LMSs (Learning Management System).

1.3.   Online cheating during COVID-19

Online examination can take various forms that do not have to replicate in-class testing (Linden & Gonzalez, 2021). LMSs may have been the most widely used ones prior to the 2019 global pandemic because they can facilitate online formative assessment (Ngqondi et al., 2021). The occurrences of cheating that may arise are sometimes difficult to identify. Apart from the reasons listed above, personal traits, consciousness, age, etc., cheating is also influenced by other characteristics such as gender or nationality. A study by Amzalag et al. (2021) found that younger students and Arab ones cheat more in online examinations. From a statistical point of view, it was found that female players cheated less in online chess competitions during the coronavirus pandemic (Bilen & Matros, 2021).

Based on previous research conducted in the field (Amzalag et al., 2021), the authors also identified the three reasons for academic dishonesty in the case of students which can be summarised into: purpose, ability, and costs. Their study categorised the reasons why students cheated during COVID-19 examinations into:

- unwillingness to fail;
- dissatisfaction with the lecturers;
- the benefits of dishonest behaviour which surpass the risks of being caught.

Students are more likely to resort to cheating when the tasks they need to complete are difficult and when these are graded, whereas anxiety levels do not rise when assignments are ungraded (Farland & Childs-Kean, 2021).

The study by Lancaster and Cotarlan (2021) proved that the growth of a market leading file sharing website coincided with the COVID-19 pandemic. File sharing can occur on various websites as free to download assignments, course materials, notes, essays, answers, these services may also be charged or based on exchanges, i.e., the user has to upload a file in order to be able to download another one. Such services are usually cheap and quick and are even legal in certain countries (Awdry & Newton, 2019). The reasons why students use such essay mills fall under three main categories, which, however, may not be applicable to all geographical regions: dissatisfaction with the teaching and learning environment, the student's language spoken at home, and the multitude of opportunities to cheat (Awdry & Newton, 2019).

2. Proctoring

Test and examination anxiety, as a result of cognitive burden, significantly encourages academic dishonesty of students (Sullivan, 2016). The Reedy et al. study found that both students and staff perceived that lack of supervision is the main factor that provides students with the opportunity to cheat (Reedy et al., 2021). Conducting a randomised control trial, Vazquez et al. (2021) recorded 11% higher scores in the results of students who took an unproctored examination. Moreover, the Vazquez study also emphasised the fact that differences in the results of proctored and non-proctored examinations were

smaller when web-based proctoring tools were used versus in-class live proctoring.

According to Nigam et al. (2021), there are three types of online proctoring systems: live, recorded, and automated. Live proctoring, also termed remote proctoring (Linden & Gonzalez, 2021) happens in real time and it requires a human proctor who is digitally competent. Recorded proctoring, as the name suggests, records the activity of the exam taker, eye movement, object and face detection, whereas automated proctoring implies that the system is able to detect fraud based on different algorithms and technologies.

Various types of digital proctoring systems have already been developed. Such systems rely on the access to the exam taker's web camera and microphone (Nigam et al., 2021). Their development, however, has to consider multiple operating systems as students, generically termed exam takers, may be using an Android, an iOS, or a Windows device. Artificial Intelligence Based Proctoring Systems (AIPS) can be implemented in different types of distance education including MOOCs in order to prevent academic fraud. Such a system delivers the test in a secure browser in order to prevent the student from using other computer resources. It monitors keyboard activity, keystroke dynamics, screen sharing, and, with the aid of the webcam and microphone, the system can detect suspicious student behavior and can bring the image of that particular student to the forefront of a human proctor's screen. Such a system can be cost effective since one human proctor can supervise the activity of many students.

Nevertheless, one important feature in the use of AIPS is the privacy of the students, since their microphones and cameras can be accessed by the system, it could store sensitive data which can be against data protection regulations in various countries. As such, there may be geographical regions in which the implementation of such a system would lead to breaching of the law.

3. Threats, difficulties, disadvantages of online examinations

However, distance learning and assessment are not void of disadvantages and threats. Probably one of the greatest impediments that can occur is the

limited access to a broadband internet connection (Pregowska et al., 2021). Students may find themselves under the burden of stress and anxiety during proctored online examinations (Linden & Gonzalez, 2021) which leads them to refrain from typing too much, scrolling extensively. A sense of fatigue may arise after having spent months in online education (Pregowska et al., 2021) and, as a result, they may perform poorly in assessments and examinations. The online testing environment negatively affects student performance due to ambient distractions, student discomfort, technical issues, or the impossibility to ask for clarifications if some questions are ambiguous (Fask et al., 2014).

It should not be ignored that teachers may be unfamiliar or inexperienced in online teaching and assessment methods (Ebohon et al., 2021) which can lead to improperly formulated questions or tasks.

It has to be acknowledged that the global pandemic which occurred early in 2020 has had, and with the current 4th wave (as of September 2021), still has serious consequences on the lives of millions of students. A student does not always turn to cheating as a sign of academic dishonesty, but, as previously mentioned, they may be faced with a plethora of problems in their daily lives. The COVID-19 pandemic, which has already made millions of victims, has left families shattered by financial burdens, unemployment, health sequalae, to name just a few. As such, some cases of cheating should be viewed and quantified and qualified through a lens of compassionate perception which should serve as extenuating circumstances. These vulnerable students should be exempt from certain penalties (Amigud & Pell, 2020) in order to restore and improve their potential of academic behaviour.

4. Ways of avoiding cheating

While certain types of assessment may be more effective in an online setting, from the point of view of instant grading, not all of them are suitable if the aim is to prevent students from cheating. Multiple choice questions (MCQs) are fairly easy to be answered (Ebohon et al., 2021), thus, avoiding them is a good measure in preventing cheating during online assessments and

examinations. However, LMSs allow the randomisation of questions so that the order in which they are displayed to any two exam takers is different. Randomisation and shuffling can be used for MCQs not only to change the order of the questions, but also to change the order of the choices. Although MCQs are associated with a higher likelihood of cheating, randomisation can, however, be used to discourage it (Arnold, 2016). Some LMSs can also generate various types of reports which can enable the measurement of the likelihood of cheating (Chirumamilla et al., 2020). On the other hand, MCQs may not always be conclusive and reflect a greater depth of learning (Darling-Aduana, 2021) and if the teacher uses the same question bank, the students may run the risk of not understanding the study material as they will only memorise the answers to the questions (Golden & Kohlbeck, 2020). Whenever relying on question banks, teachers should periodically revise and rephrase the answers in order to prevent instances of cheating (Golden & Kohlbeck, 2020).

Other methods can be employed such as: essays, reports, oral assessments, short answers. Evaluators can devise tests with timed questions so that exam takers do not have the chance to find answers in course materials, on the internet, course notes, etc. (Reedy et al., 2021).

According to Wenzel and Reinhard (2020), taking learning tests after having completed some study materials, but before a final examination has its benefits, however, learning tests can increase levels of anxiety and can be acute stressors. As such, their use should be limited and adapted to the realities and particularities of the course and course participants in line with learning outcomes.

Apart from making assessments more personalised and reflective, teachers can also turn to oral examinations in order to reduce contract cheating. There are other approaches as well to combat occurrences of contract cheating, such as legislation (Butler-Henderson & Crawford, 2020), which, however, may not apply to all countries.

MOOC providers nowadays, such as Coursera or edX (Indi et al., 2021), Udemy or Future Learn, allow access to a test only after the user has read the terms of it, and selected the *agree* option. Implementing honour codes may not have the same results in all universities (Ampuni et al., 2020).

However, to lower cheating levels, such codes have to explain why cheating is detrimental not only for the student, the peers, but also for the society (Bucciol et al., 2020). To have effective results, students should be reminded about honour codes prior to an examination. On the other hand, honour codes may be more effective in face-to-face examinations (Fontaine et al., 2020) than virtual ones.

Abuhammad (2020) hypothesises that the current pandemic period will result in the introduction of new laws, regulations, and solutions regarding education. One solution that might reduce plagiarism and cheating is the training and preparation of both students and their parents for online learning.

Academic integrity plays a crucial role in shaping an individual in terms of profession, society, family, ethical values and principles. As a conclusion of the Amzalag study (2021), the authors recommend instructing students on various ethical principles, encouraging discussions between faculty and students, rebuilding trust via meetings and dialogues.

Another means that would discourage the use of contract cheating services and plagiarism is the use of a plagiarism detection software. Written assignments can be scanned with the aid of such software applications (Beck, 2014) or even web-based ones. Moreover, plagiarism software detectors can also be used to check the understanding of the learned material of students following their submission of a written task (Bdair, 2021).

Conclusion

As this literature review highlights, cheating in examinations is a frequent occurrence, especially in regard to online ones. From a pedagogical point of view, restoring a healthy academic conduct is the desideratum of future education, whether in a face-to-face or in a virtual environment. Mitigation, dialogue, sometimes even punishment may be a preventative measure to discourage future episodes of cheating and to forestall such behaviour of becoming second nature and to poison the social and professional life of the individual. One key feature of any teacher should be the ability to balance recovery and punishment, but we should also bear in mind that each case

may have distinct underlying reasons which can explain why the student acted that particular way.

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