

The Integrity of Online Exams in the Online Learning Environment during COVID-19 at Higher Education Institutions in Cambodia

Bunthorn Yem

1. INTRODUCTION

“Nothing is constant but change,” Greek philosopher Heraclitus said. Since change is a natural phenomenon, if being a change leader is hard, the best way to respond is to adapt. Resisting change can be a manner that would lead one to be left behind and suffer from it. A real example of a phenomenal change that is the most current is the mode of education imposed by the COVID-19 global pandemic. If any educational institution is resisting the current change or is unable to adapt, it would mean that they have no choice but to halt the momentum of the education process willingly. Only an institution that can adapt to it can ensure the continuous education process. To gather experiences that will help institutions grow, they should learn not to get stuck in the past and let the current of existence take them to new, unknown places (Archon, n.d.). That should be echoed by Bruce Lee’s philosophy, which suggested that one should be like water and let it keep flowing, saying that ‘running water never grows stale.’ By the law of nature, however, change is natural. It is a part of life, and accepting it can lead to better growth and new possibilities. Without change, there is no opportunity. Only with change is there an opportunity for better growth. Only with change and by being capable of adapting to change is there an opportunity to learn new things and experience new possibilities.

There has been a paradigm shift in the world of education brought about by the Internet, which has taken away learning beyond the walls of universities and passed into the hands of everybody (Sarkar, 2020). Even though e-learning or online learning has become a worldwide demand or requirement during the COVID-19 pandemic, it does not mean that it is a new mode of study that has just been found. It is just that the concept has been updated. However, it was not widely practiced by schools and universities around the world before the pandemic due to the fact that they had the option to remain face-to-face. The majority of them enjoyed the comfort of the in-person mode. However, the contribution of technology towards change in education has been constantly improving. A dramatic improvement in technology in education

has been particularly noticed during the early 2020s. An abrupt shift to worldwide implementation of online distance learning when the COVID-19 pandemic started is a fact.

Distance education can be traced back to the 18th century, which became common in the 1800s and rapidly grew in the 1990s because of the advancement in the online technical revolution (Kentnor, 2015). A brief history of technology-mediated learning was traced back by Sarkar (2020) this way: Slide projectors and television-based classes began in the 1950s, an instance of online learning started in 1960 at the University of Illinois, the first completely online course was offered in 1984 by the University of Toronto, and the first online distance learning began in the early 1990s delivered by the Open University in Britain. According to the same author, Indira Gandhi National Open University in India is currently the largest university in the world, with around 4 million students enrolled, a majority among whom receive education online. A study on online education, conducted years back before the boom of online education imposed upon schools and universities around the world by the COVID-19 pandemic, found that online education was no longer a trend but a real mainstream, saying that out of 20.6 million students enrolled in higher education, 6.7 million were already enrolled in an online course (Allen & Seaman, 2013; United States Department of Education, 2013; as also cited in Kentnor, 2015). Also, Allen and Seaman (2003) found that 11 percent of all United States higher education students took at least one online course during the fall of 2002; 97 percent among public institutions, or 81 percent of higher education institutions (HEIs) in the United States, offered at least one online or blended course while 49 percent already offered an online degree program.

In the online learning process, because the faculty members have been facing many challenges regarding the teaching delivery methods, there can be many online applications for education for them to learn, adapt, and apply to their online classes. In contrast, learners at higher education levels have been well-accustomed to the online environment since the pandemic started; online student assessments such as short tests and exams have been the most critical parts of the issues that have been challenging educators and higher education institutions. Relevant stakeholders may have doubts and curiosity about the delivery methods of the online assessments and the monitoring procedure. In particular, external and internal quality monitoring or assurance units would likely question it. The question about the integrity of online assessments can even be considered more critical during the COVID-19 online learning context in higher education than in the older times.

Following COVID-19 was declared a global pandemic by the World Health Organization (WHO) in early 2020, the learning process in many schools and universities around the world either got stuck by the closure of the institutions or persisted in an online distance mode, and so did the assessment of learning processes.

Ireland's Queen's University Belfast, Queen's University of Canada, and Australia's Monash University canceled in-person exams due to COVID-19 (Meredith, 2020; James, 2020; Pringle, 2021). "Amidst universities canceling in-person exams, including University of Victoria and Queen's University, Western University isn't," according to Charani (2021). The author mentioned that some students at Western University were divided about the safety of being physically present for their exams. He interviewed a second-year accounting student who would write an exam and said he was not reluctant about writing his exams in person.

James (2020) praised online exams as a great way of maintaining momentum in higher education learning during a period not conducive to physical presence. Ahmed *et al.* (2021) acknowledged using technology for assessment purposes. They said that the execution of online exams is easier because the test takers are used to technologies through their daily usage of smartphones and other computerized systems. However, (Online Education, n.d.) claims that cheating is one frequently discussed topic in online education. King *et al.* (2009) said that the students held the perception that cheating in an online course was easier than that in the traditional one. At the same time, Watson and Sottile (2010) argued that, with the assistance of the Internet and related technologies, students could have many more ways to be academically dishonest than those of the previous generation. Ahmed *et al.* (2021) also questioned its interoperability, which may challenge the reliability of the student's answers. They said adequate facilities, testing security, and a backup plan need to be in place.

2. STUDY OBJECTIVE

The objective of the study is to address the question of the integrity of online assessments during the online learning environment imposed upon schools and universities by the COVID-19 pandemic. The focus is on online exams, such as the midterm and final exams, which happen specifically during the critical and challenging period of COVID-19. In the process, the study also intends to highlight the mode of delivery, invigilation system, and procedure of the online assessments.

The study intends to address the integrity of online assessments, namely online tests and exams. Therefore, it seeks to answer the following questions:

1. Why is academic dishonesty during online exams likely?
2. Why is ensuring the integrity of online exams a challenge?
3. How can the extent of integrity of online exams be assured?

3. LITERATURE REVIEW

Issues around academic integrity have appeared in many academic research publications. A significant number of related literature has discussed concerns related to academic integrity. However, suggestions from the previous studies focused mainly

on the technical content of the test or exam itself. The invigilation mechanism for ensuring academic integrity, the most important process when the exam is administered online or on-site, was not sufficiently explained. On the other hand, the literature on academic integrity in Cambodia's higher education context was inadequate, particularly the most related stories during the critical online learning environment imposed upon schools and universities by the COVID-19 pandemic. More importantly, no literature in the previous studies in the context of higher education in Cambodia has discussed a mechanism for administering online exams. Specifically, an appropriate and applicable mechanism for invigilating such exams is Internet-mediated and computer-based, commonly practiced in technology and digital media-led classroom settings.

3.1 Academic Integrity

Academic integrity covers more than just the concern over the students' assessments. According to 'The Massachusetts Institute of Technology' (n.d.), academic integrity is fundamental to students' academic work at MIT, reflecting integrity and responsible behavior. The handbook for students on academic integrity emphasizes honesty as the foundation of good academic work. It categorizes plagiarism, unauthorized collaboration, cheating, and facilitating academic dishonesty as aspects of it. Lee (2021) also states that plagiarism is one of the aspects of academic integrity. Lee classifies honesty, trust, fairness, respect, responsibility, and courage as the five pillars of academic integrity. In addition, Fishman (2014), cited in (Holden *et al.*, 2021), explains that academic integrity necessitates the commitment to the values of honesty, trust, fairness, respect, responsibility, and courage. One of the five fundamental principles for professional accountants in the 'Codes of Ethics and Conducts' is integrity, which means being straightforward and honest in all professional and business relationships (ACCA, n.d.; CamEd Business School, 2022). The Ohio State University highlights its expectation of the students with respect to academic integrity in that all the students will complete all academic and scholarly assignments with honesty and fairness (The Ohio State University, 2022). Harvard College (2022) declares in the 'Student Handbook 2021–2022' that members of the Harvard College community commit themselves to producing academic work of integrity and also warns that cheating on exams or problem sets, plagiarizing or misrepresenting the ideas or languages of someone else as one's own, falsifying data or any other instance of academic dishonesty is a violation of the community's standards and the standards of the broader world of learning and affairs. CamEd Business School (2022) also gives a warning statement in its 'Student Rulebook' preventing students from falsifying the result of one's research, stealing the words or ideas of another, cheating on an assignment, or not allowing or assisting another to commit all those acts, saying it corrupts the educational process (p. 15).

3.2 Academic Dishonesty or Cheating

Cheating, academic dishonesty, or misconduct are issues that have been happening and talked about in the academic world for a long time. Academic dishonesty, such as plagiarism, copying other students' work, or cheating in examinations, is a worldwide problem (Bacon *et al.*, 2019). Maeda (2019) said much research has been done on academic dishonesty, such as by Bowers (1964), Evans & Craig (1990), and McCabe & Trevino (1993), over the last century, especially in America. After the 2000s, the focus shifted to other parts of the world (Grimes & Rezek, 2005; Bernardi *et al.*, 2008; McCabe *et al.*, 2012; Buckner & Hodges, 2016); also cited in (Maeda, 2019). However, it is crucial to note that developing countries are still paying less attention to this issue, which urgently needs to be addressed.

Since the term 'academic integrity,' as discussed earlier, is all about the rule of 'honesty, trust, fairness, respect, responsibility, and courage,' the word 'academic dishonesty' or 'cheating' should simply, by contrast, be an act of breaking that rule. Academic dishonesty, according to Holden *et al.* (2021), is behavior such as the use of unauthorized materials, facilitation (helping others to engage in cheating), falsification (misinterpretation of self), and providing an unearned advantage over other students. Furthermore, the authors continue to elaborate on using the word 'E-dishonesty' to refer to behaviors that depart from academic integrity in the online environment, which raises new considerations that have never been previously considered by instructors and administrators. Rogers (2006) uses another word, 'e-cheating or digital cheating,' to describe students who find a way to cheat using computer technology. E-cheating also describes dishonest behavior in an online course (Styron & Styron, 2010; Moten *et al.*, 2013).

Brief History of Cheating

Cheating found in scholarly work has been a challenge for educators worldwide. According to McCabe and Trevino (1997), also cited in Mustapha *et al.* (2021), the first scholarly study during the 1960s found that somewhere between 50 and 70 percent of university students nationally in the United States had at least cheated once. An estimated 60 – 95 percent of undergraduate students employ dishonest tactics at some point in their university-level academic journal (Burton *et al.*, 2011; Simkin & McLeod, 2010, as cited in Bacon *et al.*, 2019). Dey (2021) stated that as colleges moved online during the COVID-19 pandemic, many universities were reporting cheating increases by more than three times during the 2020–21 school year at Virginia Commonwealth University, more than double from 2019 to last fall at University of Georgia, and more than 50 percent the previous year at Ohio State University. With reference to Schab (1991) and Jensen *et al.* (2002), as also cited in Maeda (2019), exam cheating in America is more prevalent in high school than in

university. In a study on ‘academic cheating in Cambodia,’ Sopheary (2017) reveals that cheating has run deep in the education system and has become a culture that needs a change in the attitude, policies, planning, implementation, and cooperation among all stakeholders. In addition, Maeda (2019) asserts that Cambodian students become involved in unethical and corrupt practices at very young ages. That should not be a surprise to see or hear about cheating cases because even a country known to be the best country in the world, like America, also has the same problem. A survey of over 20,000 American high school students shows that 51 percent admitted to cheating on a test, 74 percent had copied another student’s homework, and 32 percent had copied an Internet document for a classroom assignment (Sideridis *et al.*, 2016; Bacon *et al.*, 2019). A big surprise is also the UK, one of the best education countries in the world. According to a report in ‘The Times’ (2016), some 50,000 university students had admitted to academic dishonesty within the previous three years (also cited in Morgan, 2016; Bacon *et al.*, 2019). Academic misconduct in medical discipline is even another concern.

Cheating Factors

It may be common to find a cheating case in an exam process being reported, particularly cheating cases found during online exam processes. What motivates cheating, however, is something worth looking at. It is a different issue whether cheating happens because of inadequate procedures, insufficient prevention measures, lack of policy, no detection method or system, or lack of highly secure exam platforms, or it happens because it is situational due to any other opportunity or environment. Rogers (2006) mentioned that over half of the faculty use online assessments, and there is some concern about online cheating. However, most of them do not proactively implement measures to prevent it. Crittenden *et al.* (2009) assert that a cheating culture, whereby everybody cheats because everybody else does it, is not just a capitalistic phenomenon but that attitudinal differences are driven by gender, country, corruption, and socioeconomic environment. Another issue worth studying is whether cheating factors tend to be more individual, institutional, or dependent upon the delivery method. It is suggested that four-dimensional factors should be looked at: internal, organizational, institutional, and social (Bertram, 2008; also cited in Chesney, 2009; Maeda, 2019). King *et al.* (2009) sought to gauge the behaviors of business students when taking an exam online, and the result indicated that respondents felt quite liberal in their view of potentially cheating behaviors when the course instructor set no test-taking policy. According to Baldwin *et al.* (1996), the best predictor of whether someone was likely to cheat was whether they had cheated before or not. Similarly, Crittenden *et al.* (2009) claim that a significant predictor of cheating in an undergraduate program is a history of cheating in high school, and it also increases the likelihood of cheating in a graduate program. In an assessment of

the prevalence of cheating in 31 medical schools in the US, only about five percent reported cheating during the first two years of medical school, while more than 70 percent reported cheating in high school (Baldwin *et al.*, 1996). The finding by Bacon *et al.* (2019) shows that the likelihood of engagement in cheating is associated with personality traits reflecting impulsivity and Fight-Flight-Freeze behaviors. Dey (2021) mentioned a real case at Columbia University where an assistant professor at the university tried to keep the students from cheating by getting the students in the Cognitive Neuroscience class to sign an honor code for their 1-week open-book exam, yet disappointingly found that they were still cheating. As for the case of Cambodia, Maeda (2019) found that the pass rate of grade 9 and grade 12 exams dramatically declined when strict anti-cheating measures were applied, compared to the pass rate in the previous years when such measures were not in place. Maeda (2019) said the influencing factors were curricula, parents' attitudes, peer behavior, institutional policies, and relationships with teachers. Sopheary (2017) found that cheating happening in the early 1980s was positively viewed from a human aspect, claiming that it was an attempt to save children from the risk of becoming a soldier if they did not pass the exam. However, according to Sopheary, corruption during the exam process was also one of the main factors for cheating among Cambodian students. Whitley (1998) reviewed factors associated with cheating among college students and found the strongest correlates to be such as having moderate expectations of success, having cheated in the past, studying under poor conditions, holding positive attitudes towards cheating, perceiving that social norm supports cheating, and anticipating a large reward for success. However, students are more likely to cheat if they believe that cheating is a social norm that everybody does (Genereux & McLeod, 1995) and if they believe that there is little chance of detection (also cited in Bacon *et al.*, 2019). Cheaters are differentiated from non-cheaters based on their perceived social norms regarding cheating, knowledge of the institutional policy, and attitudes toward cheating (Jordan, 2001). Jordan notes that students likely to cheat are motivated by extrinsic or performance factors such as academic standing, grades, or other performance evaluations.

Cheating on Online Exams

The students may find it much easier to cheat if the exam is conducted online than if it is delivered face-to-face in the exam room. In a traditional, face-to-face exam, a cheating student would be found having pocket notes, writing answers on the exam tables, rulers, or on pen and pencil cases, or even on their hands/arms or clothes (Curran *et al.*, 2011, also cited in Noorbehbahani *et al.*, 2021), or even hiding an answer sheet under their shoes, shirt, pants/skirts or hair (common for girl students); however, there is a significant change in cheating behaviors in online exams, although a few traditional actions may still be found. Some listed ways of cheating, which are

described to be unique to the online course environment, are downloading papers from the Internet and claiming them as one's work, using materials without permission during an online exam, communicating with other students through the Internet to obtain answers, or having another person complete an online exam or assignment rather than the student who submit the work, or using a remote desktop or computer with a share screen function (Jung & Yeom, 2009; Moten *et al.*, 2013; Rogers, 2006; Underwood & Szabo, 2003, as also cited in Holden *et al.*, 2021; Noorbehbahani *et al.*, 2021). The advancement of technology has eased ways of cheating on tests or exams in an online environment. There is an increasing number of ways that students can cheat through the support of the Internet, for example, with access to copyable articles, purchasing of coursework essays (so-called essay mills), and the facility to text examination questions and answers in real-time (Etter *et al.*, 2006; Simkin & McLeod, 2010; Thibodeau, 2007; also cited in Bacon *et al.*, 2019). Moreover, a more stunning way to cheat online has been made possible by an expert in the area. According to Thibodeau (2007), one may be able to earn an IT certification at home with the least effort; they only need to get a service from what the author calls the 'IT certification exam piracy market' available on a China-based website, which guarantees to take the test for their clients. Half of the high-tech vendors reported to the Association of Test Publishers in Washington in a survey that their exams were made available on the Internet, and 75 percent of them had encountered cheating on exams (Thibodeau, 2007). A recent study at Imperial College London found that the number of questions and answers posted on 'Chegg's homework help section' for five STEM subjects, only between April and August 2020, increased by 196 percent (Subin, 2021). Gill (2021) reveals 10 ways the students can cheat on the online exam by doing a screen share, using tech equipment such as Bluetooth mouse and keyboard, using auto-coding software for programming tests, pasting questions into a URL to find answers, asking a high achieving student to take the test, using a hard drive, USB or a smart device to copy the exam and sell it to other students after the exam, having a friend or a family member hiding behind the screen or webcam to help, simply doing a copy and paste, and giving excuses of poor Internet or power shortage to exit the exam or shut down the camera in order to look up answers. Challenging poor Internet during the exam might be an excuse for some cases. However, around 25 percent of the students reported not preferring online mode due to the Internet connection problem (Yem, 2021). Nonetheless, Subin (2021) asserts that working around the system is still possible even with proctored tests. According to Subin (2021), some ways the students do this include placing a phone on the desk after the room check, writing answers on their arms, using a calculator that plugs in answers, using a second monitor to switch between the screen and answers (also noted by Binstein, 2015), taping notes to the edge of the computer and desks or filling their keyboards with notes, and using a group chat to spread information.

Prevention of Cheating

When cheating is possible during student assessments, such as exams, the implication is that the system that ensures the integrity of the assessment is not adequate, or perhaps the method is not appropriate enough. There is a weak point in it, whether technically or unintentionally. It is worth considering the saying, 'Prevention is better than cure,' when preparing for the student examination and developing the measures to be taken against academic wrongdoing. The consequence will be well managed if the cause is well prevented. If the chance or opportunity for misconduct is made unavailable to the greatest extent, wrongdoing will also be unlikely. The performance of the students who take the exams will be proven, too. ProtorExam (2021) suggests six ways or strategies that cheating may be avoided. The first three of the tips are also suggested by Budhai (2020). First, the questions should be created to require higher-order thinking levels. Second, open-ended questions should be used to extract outstanding responses to their understanding of the course materials. However, objective or multiple-choice questions (MCQ) are argued by Dendir and Maxwell (2020) to be more amenable to cheating. Third, create a psychological impact by exposing the students to the academic integrity policies such as the online exam guidelines and the consequence of cheating if it is found. Fourth, multiple versions of the same test or exam should be created to ensure that it is not likely that all the students will have the same questions. Fifth, the true identity of the exam or test takers should be verified to ensure that the admitted person is the person who is supposed to attend the exam. Dignify (n.d.) also signifies the importance of authenticating the students during the exam, admitting that it is not as easy as an in-person exam to ensure the right person is sitting for the online exam. Lastly, a 360-degree scan in the exam space or room of the candidate or the test/exam taker should be ensured. One of the 14 tips given by Budhai (2020) is to delay the availability of the immediate score to prevent the student who finishes early from being able to advise the others who are still doing so. Lessening the exam score percentage that contributes to the overall course grade is also one of the strategies to mitigate online exam cheating (Noorbebhahani *et al.*, 2021).

Prevention can be almost impossible, however, if the primary variable is liable to too many other variables that need to be involved, which are, in reality, beyond one's control. Being beyond the control may mean it is not financially affordable, not technically manageable or doable, not technologically available, or not even time efficient. To be able to deliver online exams to the students, the school's capacity must not be questioned. As Yem (2021) mentioned, to support the online learning environment well, educational institutions must invest in technology infrastructure (p. 148). In that instance, even if the administrators are ready, it will be beyond the administrator's control if the institution is not. Also, the online exam solely depends

upon the Internet's stability. If the Internet is not stable, that is obviously beyond the control of the administrator or the student. Yem (2021) also said that the negative side of online learning has been known for the unstable Internet/WiFi (p. 147). One of the requirements for the online exam proctor at Harvard Summer School is that he/she must have reliable access to the Internet. The students' cheating behavior can be under control provided the institution is ready and the administrators are well-equipped. Thai Son from HCM City Food Industry University Teaching said, "Teaching online is hard work, and organizing the exams online is even harder" (Huyen, 2022). Huyen (2022) said that students always have ways to cheat on online exams, while schools always find new methods to discover them.

Honor Codes and Exam Rules and Regulations

All educational institutions, in general, when it comes to delivering, controlling, and/or invigilating the exams, apply their exam rules and regulations to the students. That may also include emphasizing the student code of honor or ethics, usually found in the school or university's rule or honor code book. However, honor codes may not prevent cheating even though they are indispensable (Baldwin *et al.*, 1996). However, a strict mechanism to ensure the implementation of exam rules and regulations may make cheating opportunities hard. Punishing students engaging in academic misconduct can be a highly effective way to ensure academic integrity. In usual practice, the exam rules and regulations are made available, disseminated, and/or read to the students before the start of the assessment in a certain way according to the protocol applied by the administrators at the institution. The message of the rules usually warns about any behavior that is not permitted and entails the consequences if that behavior is detected. This is a prevention method for quality purposes to ensure academic integrity during tests, exams, or other assessments.

The ACCA (Association of Chartered Certified Accountants) exam guidelines require the students to comply with every aspect of the guidelines (ACCA, n.d.). The guidelines list items permitted at the student's desk, 'what else' the students need to comply with, and instructions for the student's attention after the examination. Its exam regulations list twenty-two points for the students to be aware of and comply with and warn them that they will be liable to disciplinary action if found to breach the rules or guidelines. One of the points in the 'exam regulations' in a case of remote exam, for example, states that the exam will be discontinued, or the student will be removed or excluded from the exam if the student is suspected of irregularity or improper conduct (point #8). Taking an online exam at Harvard Summer School requires the students to find a qualified proctor to administer the exam because the students cannot come to an on-campus classroom exam (Harvard University, 2022). The procedure for finding a proctor states that the proctor must be a teacher, professor,

librarian, or administrator in a nearby secondary school, college, university, or test center and cannot be a family member, friend, acquaintance, or co-worker. There is a procedure that also requires the proctor to be able to have or to do such as the proctor must have an institutional email, reliable access to the Internet, the ability to download and print PDF documents, and access to a fax machine or scanner in order to return completed exam materials to the Summer School. The warning in the policy as a prevention method, according to Harvard, is that the students will be subject to referral to the Administrative Board for review if they submit false or inaccurate information to the proctor. Guidance and rules for online examinations and assessments at Birmingham University provide instructions to the students in three stages: the preparation stage, the examination stage, and further information. It lists rules and regulations in about fifteen bullet points. In one of the bullet points about sanctions, the rule states that sanctions that can be given for plagiarism or other forms of academic misconduct include reducing the mark to zero without an opportunity to re-sit, reducing the degree classification, and withdrawing from the university (University of Birmingham, 2022).

Professing such unethical behavior in the university environment has caused concern, as it might be replicated in the workplace in their later profession after university, thereby applying risk detection and severe penalties can be very effective (Haswell *et al.*, 1999). The rules and regulations may not be respected without considerable penalties for cheating students. “The exam invigilators did not see any reason to report a student cheating as there were no real consequences for the students,” claims Cerimagic and Hasan (2019). The Invigilator Statement of CamEd Business School warns the students that all forms of cheating, including attempting and appearing to cheat, will automatically fail the course in question (CamEd Business School, n.d.). The ‘Guidelines for Online Exams’ of CamEd Business School require the students to strictly follow all the guidelines, procedures, rules, and regulations. The procedures for online exams require the students to open two live cameras during the exams. One of the cameras is live on Google Meet from the laptop for the invigilator to control the student’s facial expression and eye contact during the exam, while the other camera is live on Google Meet from either a webcam or a phone for the invigilator to monitor the surroundings from where the students are taking the exams online. The invigilator and the students maintain live communication with each other via the video conferencing platform using the mic function or chat function on Google Meet throughout the exam session.

3.3 Assessment of Learning

Heywood (2000) briefly defines *assessment* as a multidimensional process for judging individuals and instructions in action (p. 13). Student assessment is the process of

evaluating the student's abilities and achievements (Scarsdale Public Schools, 2022); it is gathering and assessing the gaps between knowledge rendered and knowledge retained (ProPros, 2022). Doyle (n.d.) defines *student assessment* as the ongoing process of establishing clear, measurable expected outcomes of student learning, ensuring that the students have sufficient opportunities to achieve those outcomes, and systematically gathering, analyzing, and interpreting evidence to determine how well student learning matches the outcomes or expectations, and using the resulting information to understand and improve student learning.

In standard practices, more or less, but more often than not, undergraduate learners are expected to undergo some kind of assessment, be it a formative or summative assessment, or both. A formative assessment is regularly conducted to assess the ongoing learning progress to fundamentally adjust effective teaching methods to address the learning gaps or needs. On the other hand, a summative assessment is likely conducted at the end of the course or program to conclude the achievement of the learning performance in the framework of the expected learning outcomes of the course or program. Types and loads of assessments may vary by subjects, courses, or study programs. Some courses may list exams as one of the essential assessment criteria, while others may require no exams at all. Some may have many tests and exams, while others may have fewer. Science subjects may popularly be known for strict and complex examinations, while humanities and social science subjects or courses may not.

Assessments in 'English Language and Literature,' an undergraduate program at the University of Oxford, include examinations and portfolios of essays (University of Oxford, 2022). The university page writes that most Oxford courses are assessed by examinations at the end of the first and last years, clarifying that learners must pass all the exams to progress to the second year and pass the final exams or finals to pass the degree. Similarly, submitting a satisfactory senior essay and completing the oral examination are the conditions for receiving the degree of 'Bachelor of Arts in Liberal Arts' at St. John's College (St. John's College, 2022). The oral exam explores the ideas the student put in his/her senior essay. St. John's College page writes, "During an oral examination, a committee of tutors sits down with the student and challenges the implications and conclusions the student put forth in their essay. No degree is awarded unless the essay and the oral examination are satisfactory." CamEd Business School's bachelor program specification states that the students will earn the degree after passing 35 courses in the program (CamEd Business School, 2022). In addition, each course in the program, available on the school's website, lists similar assessment criteria: participation, attendance, tests or quizzes, assignments, midterm exams, and final exams. However, loads of work or assessments can vary by different courses in the program. According to the curriculum on the school's website, the 'MKTG 101' course, one of the courses in the foundation year program, lists only

three short tests, one assignment, a midterm exam, and a final exam, while the second-year course 'ECON 201' lists up to 20 short tests plus two assignments, midterm exam, and final exam. However, midterm and final exams are required in almost all of the 35 courses in the program, according to the 'assessment and grading' section listed in each of the courses in the curriculum available on the school website.

4. CONCEPTUAL APPROACH TO ENSURING EXAM INTEGRITY

In an attempt to strengthen the quality and to eliminate cheating, which had been so notorious in Cambodian upper secondary exams, the Ministry of Education, Youth and Sports (MoEYS), under the leadership of His Excellency Dr. Hang Chuon Naron, launched a grade-12 exam reform in 2014, which significantly affected the pass rate. A dramatic decline in the pass rate, from more than 80 percent over the previous 4 years to less than 50 percent in the 2014 upper secondary exams, was noted by Sopheary (2017). Taguiam and Moss (2015) also reported that the MoEYS enforced anti-cheating measures in the 2014 grade-12 exams, which resulted in a low pass rate. Even though the pass rate was severely affected, UNESCO Education Specialist Santtosh Khapri praised the reform as Cambodia's most significant leap forward (Taguiam & Moss, 2015).

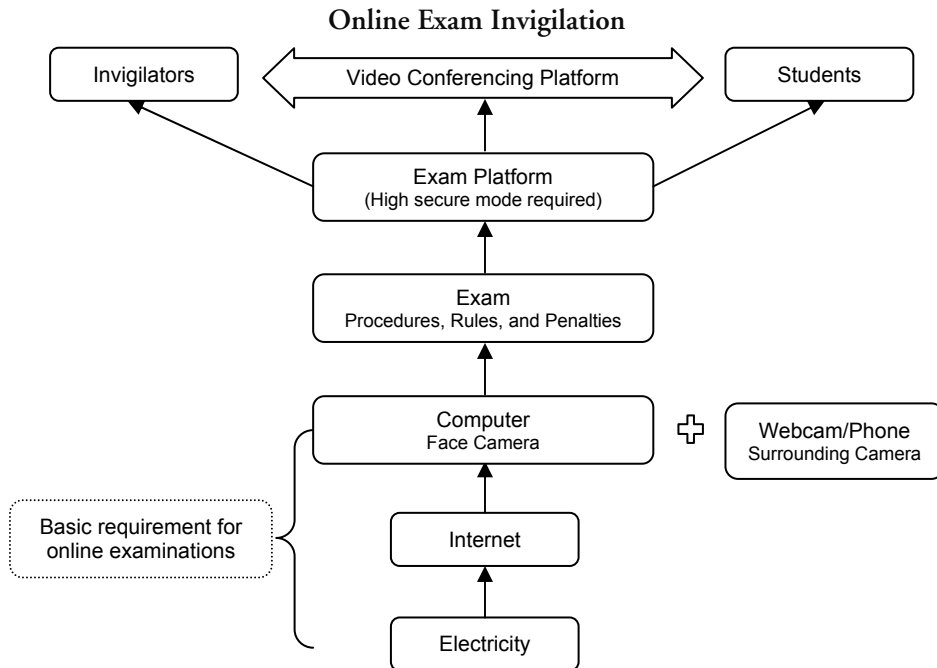


Figure 12.1: Conceptual Approach to Ensuring the Integrity of Online Exams

Source: Author

While strengthening the procedures and rules may be effective for preventing cheating in in-person paper-based exams, the strategy can be inadequate for the same purpose for online exams and/or in-person computer-based exams. Paper-based exams are still practiced in schools and universities in Cambodia during this technology-driven world of education. However, Internet-mediated, computer-based exams have become the trend since the shift of education mode when COVID-19 started. The new trend of such modes of exams emerged among fee-charging schools or universities. Thus, having a clear and strong procedure to ensure the integrity of exams in such a mode is crucial.

Figure 12.1 presents a self-elaborated conceptual approach to ensuring the integrity of online tests or exams. Technically, the mechanism can be applied to both on- and off-campus modes of computer-based and Internet-mediated exams. The first may differ from the latter in that one requires a live video conferencing platform and positioning of the cameras that may be required, whilst the other does not. Variables are interdependent, ensuring that the exam invigilation process meets the exam's objective to a certain extent.

5. STUDY METHODOLOGY

5.1 Research Site and Participants

Due to convenience and opportunities to reach the research participants in the technology-enriched environment of the institute, the study purposefully selected a private higher education institution located in the center of Phnom Penh, Cambodia, as a research site. The study's subjects were all the students in an undergraduate program majoring in accounting and finance.

The study also took into account the capacity of the higher learning institution to ensure digital facilities for teaching and learning processes, the English-speaking environment, the habit or culture of communication using digital devices such as smartphones and computers, and platforms and apps for communication such as email and other apps regularly used in the school environment.

The total number of accounting students, excluding duplicates, was 1,974, according to the calculation of all the first-year, second-year, third-year, and fourth-year students studying in the first semester of the academic year 2021.

5.2 Data Collection

The study accessed primary and secondary data. The primary data was collected through an online survey using the Google Form application. The questionnaire was created on the Google Forms platform and emailed to all the participants. Participation in the online survey was voluntary. All responses received were kept confidential. The

study did not provide any financial incentive for participation in the online survey. Classification of the genders of the research subjects was not considered necessary based on the research objective. All the questions were in English, and no translation into a different language of any question in the questionnaire was required as the accounting program that the study selected was an internationally accredited program in which English was the medium of instruction. Further, all the students had to pass an English admission test when entering the program. Also, students were used to online education tools such as Google Forms and others as they had been experiencing hands-on online learning mode since the COVID-19 pandemic.

The secondary data were reports available on the school portal and sources received from the institution's administration office. The secondary data discussed and analyzed were cheating reports, exam attendance report sheets, and invigilation mechanisms of online exams. Other sources, such as procedures and platforms related to the online exam invigilation process, were also considered. In addition, information verbally disclosed from the administrative office and the researcher's observation were also included in the result.

5.3 Data Analysis

The study applied quantitative and qualitative methods to analyze the primary data gathered from the participants. Although the survey questionnaire asked the participants eight questions in total, in one of the questions, 40 items were listed for the participants to respond. Mainly, the participants were asked to level their agreement or disagreement to statements listed on the questionnaire on a scale of 'strongly agree, agree, neither agree nor disagree/neutral, disagree and strongly disagree.' Out of the eight questions, however, three were open-ended questions asking the participants to provide a more critical idea or thought about the topic. Their thoughts were analyzed, summarized, and/or grouped into themes. A few original statements by the study participants related to the integrity of online exams were also quoted and presented. The data were analyzed and presented in tables and figures using spreadsheets as an analytic tool.

6. EMPIRICAL FINDINGS

The number of responses in the survey was limited to 171 students. The limited number of participants in the study could be interpreted in two ways. First, the online survey asked the participants to answer the questions voluntarily. Second, the topic of 'integrity of online exams'—cheating on exams—was perceived as sensitive to the students. Also, the total number of responses was eventually reached after we sent two follow-up reminders to the participants.

6.1 Demographic Responses

Most of the study participants were in the first year of the undergraduate program, accounting for up to 53.2 percent of all the respondents. Surprisingly, the students in the third year provided the fewest responses (9.4 percent). The second and fourth-year students accounted for more than one-third (37.4 percent) of the responses.

6.2 Excuses or Factors Leading to Cheating during Online Learning Classes

As a way to get around to the core topic, ‘cheating on online exams,’ the study asked the participants to first level their agreement or disagreement on a scale of ‘strongly agree, agree, neutral, disagree, and strongly disagree’ with the given factors that could lead to cheating on online classes. The given factors were not opening the computer camera during class, forgetting to scan or sign the online attendance, and never participating in any online class activity. As shown in Figure 12.2, more than one-third of respondents took a neutral view when answering the three questions. The reason behind this could be because, as verbally reported by the administrative staff of the school and also from the researcher’s observation, it generally happened with all online

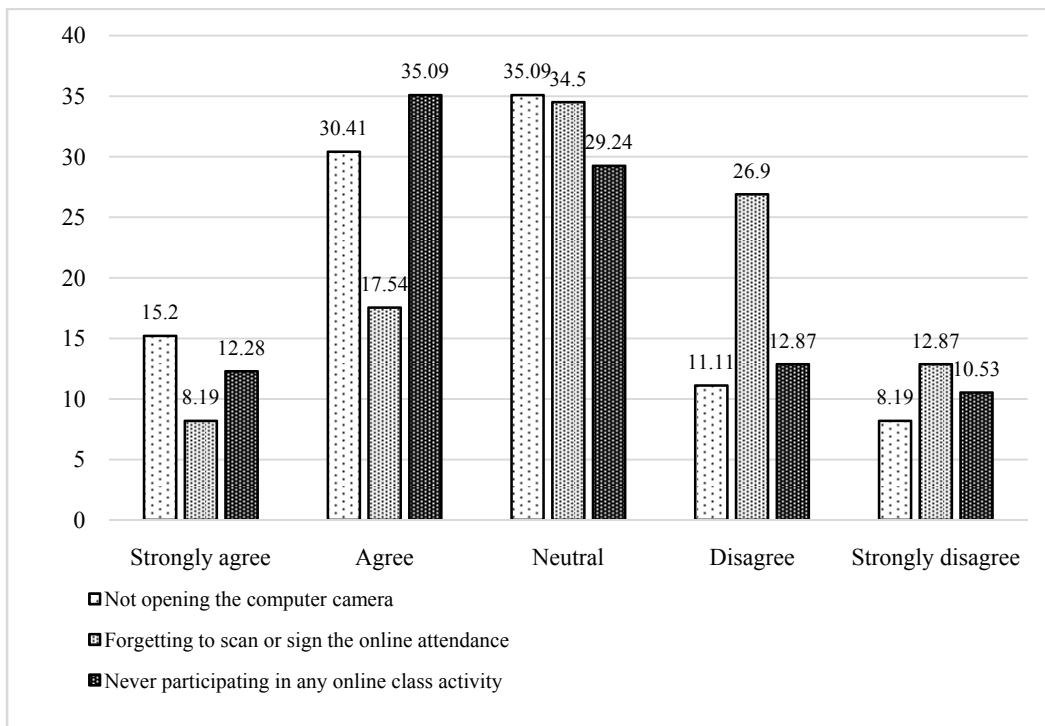


Figure 12.2: Presentation of Excuses or Factors of Cheating on Online Classes %
Source: Primary data computed by the author.

classes where the students rarely put their cameras on during class unless insisted by the class professor for a certain purpose for particular duration during the session. This includes class participation, quiz, or test. However, a higher percentage of respondents agreed on not opening the computer camera during class (45.61 percent against 19.3 percent disagreed) and never participated in any online class activity (47.37 percent against 23.4 percent disagreed). Obviously, the respondents did agree with the two statements that those were the factors that could lead to cheating. Nonetheless, 'forgetting to scan or sign the online class attendance,' received higher responses from the 'disagree' side than from the 'agree.' The respondents disagreed that it could be cheating.

6.3 Behaviors or Excuses or Pretenses or Factors Leading to Cheating during Online Exams

The participants were asked to respond through their agreement or disagreement to 40 sub-items or questions on a scale of 'strongly agree, agree, neutral, disagree, strongly disagree.' The 40 sub-items in Table 12.1 focused mainly on all behaviors, excuses, pretenses, or factors happening during online exams that could lead to cheating.

Table 12.1: Excuses or Factors of Cheating on Online Exams

#	Excuse or Factor or Behavior	Levels of Agreement (%)				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Not opening any cameras	20.47	39.18	26.90	7.60	5.85
2.	Opening only the computer camera	10.53	35.67	36.26	9.94	7.60
3.	Opening only the side camera	7.02	22.22	41.52	18.13	11.11
4.	Disconnecting the computer camera	9.94	15.20	40.94	25.15	8.77
5.	Disconnecting the side camera	12.28	16.37	38.60	22.22	10.53
6.	Not showing face on the computer camera properly	11.70	40.35	30.41	11.70	5.85
7.	Not positioning the side camera properly	9.94	27.49	39.18	14.04	9.36
8.	Not following the 360-degree camera procedure properly	9.94	30.41	33.33	16.96	9.36
9.	Spending too much time setting up the cameras	9.94	14.04	38.60	22.81	14.62

#	<i>Excuse or Factor or Behavior</i>	<i>Levels of Agreement (%)</i>				
		<i>Strongly Agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
10.	Often disconnecting the Internet	8.77	16.37	35.09	23.98	15.79
11.	Having a slow Internet connection	8.19	11.11	24.56	27.49	28.65
12.	Having a power outage	7.02	11.11	25.15	25.73	30.99
13.	Wearing a headset or earphone	10.53	29.24	36.26	7.02	16.96
14.	Wearing a face mask	8.19	22.22	41.52	13.45	14.62
15.	Putting a hand over the mouth	8.77	18.71	42.11	17.54	12.87
16.	Answering a phone call	9.36	12.28	38.60	25.15	14.62
17.	Reading the exam questions out, whilst the exam rule does not allow to do so	12.87	18.13	35.09	15.20	18.71
18.	Going to the bathroom	7.02	11.70	40.94	23.39	16.96
19.	Using someone else's email account	19.30	34.50	26.32	10.5	9.36
20.	Using someone else's laptop	9.94	15.20	36.84	22.81	15.20
21.	Sharing own login access with someone else	18.13	32.75	26.3	11.70	11.11
22.	Logging in with more than two devices	17.54	19.88	32.16	16.96	13.45
23.	Doing it next to other students or family members (having friends or family members around, hiding behind the camera)	17.54	33.92	29.24	12.28	7.02
24.	Not hearing the invigilator speaking	7.60	18.71	38.60	21.64	13.45
25.	Ignoring the invigilator's instructions	14.62	39.18	32.75	5.85	7.60
26.	Seeing/knowing/hearing that some students cheat	9.36	26.90	42.69	12.87	8.19

#	Excuse or Factor or Behavior	Levels of Agreement (%)				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
27.	Socializing with cheating students	11.70	26.90	34.50	15.20	11.70
28.	Struggling to pass the subject	12.87	19.30	39.18	16.96	12.87
29.	Ignoring the exam rules	11.70	35.09	36.26	8.19	8.77
30.	Pretending to forget about the exam rules	16.37	33.92	25.73	12.87	11.11
31.	Doing it in a room without enough light	7.02	14.62	39.18	22.81	16.37
32.	Doing it in a room with too much light	5.26	11.70	43.86	22.81	16.37
33.	Having too much brightness on the laptop screen	5.85	17.54	40.35	19.88	16.37
34.	Not having enough brightness on the laptop screen	6.43	14.62	46.20	16.96	15.79
35.	Having a noisy background	6.43	15.79	33.92	22.22	21.64
36.	Always having technical problems	8.77	18.13	37.43	19.88	15.79
37.	Behaving suspiciously to the invigilator	12.87	35.67	33.33	9.94	8.19
38.	Not projecting the camera properly to the place when asked, as instructed by the invigilator	22.81	40.35	22.22	6.43	8.19
39.	Showing up very late for the online quiz/exam	7.0	20.47	46.20	14.04	12.28
40.	Leaving the online quiz/exam very early	5.85	12.28	42.69	18.13	21.05

Source: Primary data computed by the author.

Of all the 40 given factors, eight outstandingly received the most responses, between 50 to more than 60 percent, way higher than those on the ‘disagree’ side (Figure 12.3). The respondents either strongly agreed or agreed that those were cheating behaviors or factors during an online examination. Those eight given factors were not opening the camera (59.65 percent agreed against 13.45 percent disagreed),

not showing the face on the camera properly (52.05 percent agreed against 17.54 percent disagreed), using someone else's email account (53.8 percent agreed against 19.88 percent disagreed), sharing the login access with someone else (50.88 percent agreed against 22.81 percent disagreed), having other students or friends or family members around hiding behind the camera (51.46 percent agreed against 19.3 percent disagreed), ignoring the invigilator's instructions (53.8 percent agreed against 13.45 percent disagreed), pretending to forget about the exam rules (50.29 percent agreed against 23.98 percent disagreed), and not projecting the camera properly to the place, when asked, as instructed by the invigilator (63.16 percent agreed against 14.62 percent disagreed).

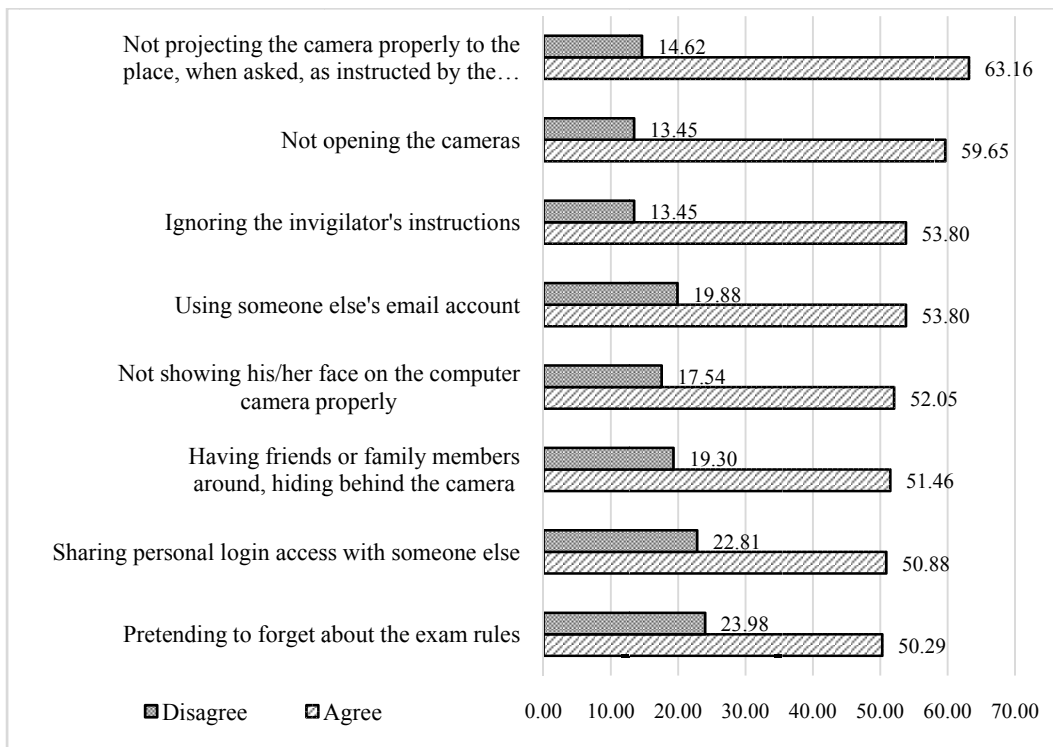


Figure 12.3: Presentation of Cheating Behaviors or Factors by Students % (Part 1)

Source: Primary data computed by the author.

On the 'disagree' side, however, six out of the 40 given factors noticeably received a high percentage of responses (40 - 57 percent) compared to those on the 'agree' side (Figure 12.4). The respondents either strongly disagreed or disagreed that those were cheating behaviors or factors during an online exam. Those six factors include going to the bathroom (40.35 percent disagreed against 18.71 percent agreed), having a noisy

background (43.86 percent disagreed against 22.22 percent agreed), often disconnecting the Internet (39.77 percent disagreed against 25.15 percent agreed), answering a phone call (39.77 percent disagreed against 21.64 percent agreed), having a slow Internet connection (56.14 percent disagreed against 19.3 percent agreed), and having a power outage (56.73 percent disagreed against 18.13 percent agreed).

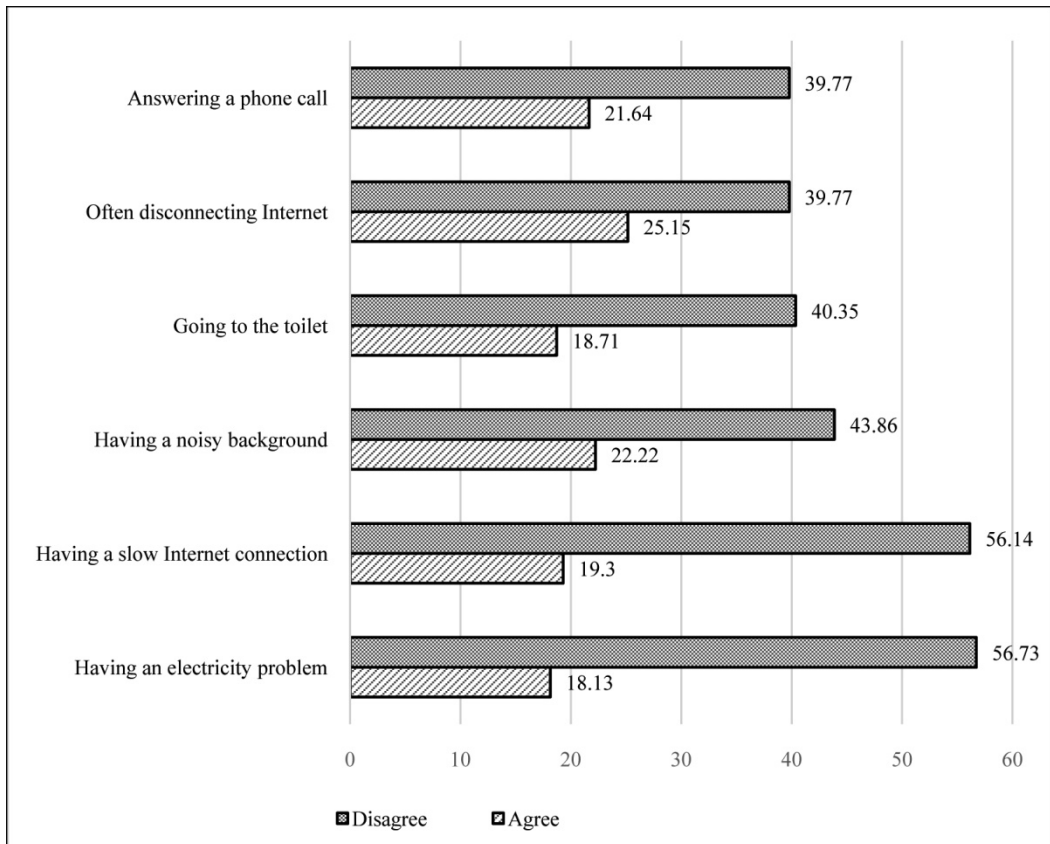


Figure 12.4: Presentation of Cheating Behaviors or Factors by Students % (Part 2)

Source: Primary data computed by the author.

In contrast to the disagreement, on the ‘agreement’ side, five other given factors received a high percentage of responses from the participants, 40 to 49 percent, approximately twice as high as those on the ‘disagree’ side (Figure 12.5). The respondents either strongly agreed or agreed that those were cheating behaviors or factors during an online exam. Those five factors include opening only the computer camera without the side camera (46.2 percent agreed against 17.54 percent disagreed), not following the 360-degree camera procedure properly (40.35 percent agreed against 26.32 percent disagreed), ignoring the exam rules (46.78 percent agreed

against 16.96 percent disagreed), behaving suspiciously to the invigilator (48.54 percent agreed against 18.13 percent disagreed), and wearing a headset or earphone (39.77 percent agreed against 23.98 percent disagreed).

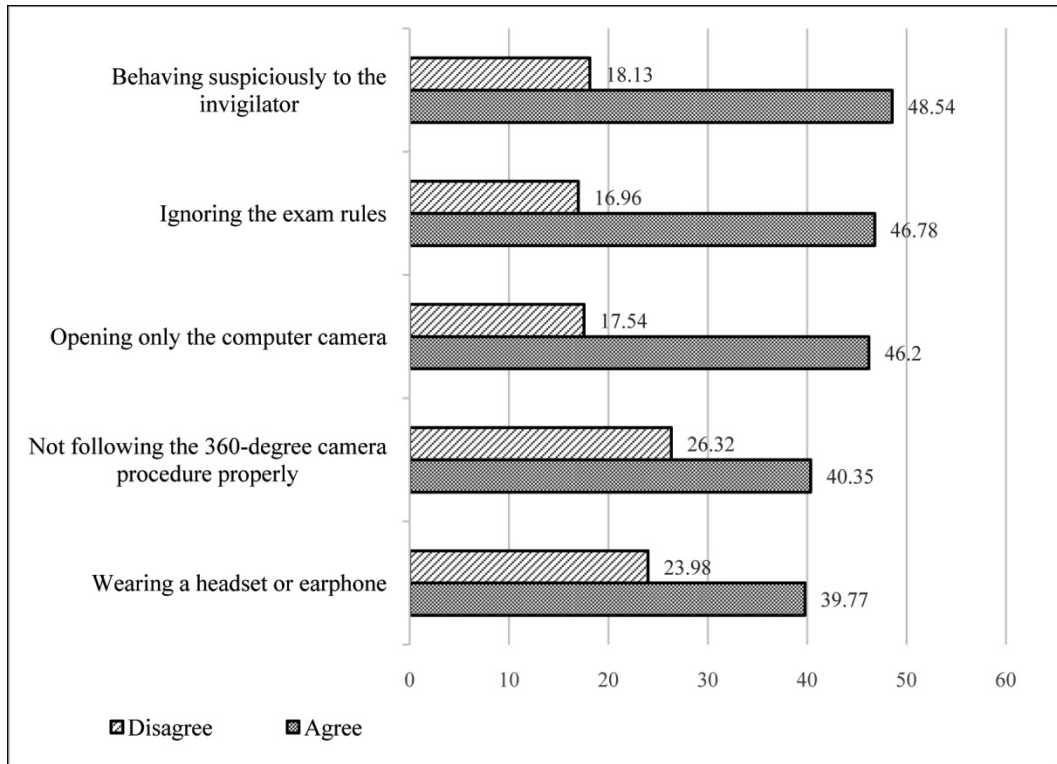


Figure 12.5: Presentation of Cheating Behaviors or Factors by Students % (Part 3)

Source: Primary data computed by the author.

Figure 12.6 shows that the remaining 21 given factors interestingly received almost a similar percentage of the responses from both 'agree' and 'disagree' sides, and their percentages were lower than 40 percent for all. More interestingly, one of the given factors, opening only one camera, that is, the side camera, during the online exam, received the same rate of responses: 29 percent agreed against 29 percent disagreed. Even though those remaining given factors received a similar rate of responses from both sides, the response rate from the neutral side was 40 percent of the total, whilst the 'agree' side received about 28 percent and the 'disagree' side 32 percent. So, it showed that, on average, 40 percent of the participants neither agreed nor disagreed with the 21 given factors, whether each was a cheating behavior or not.

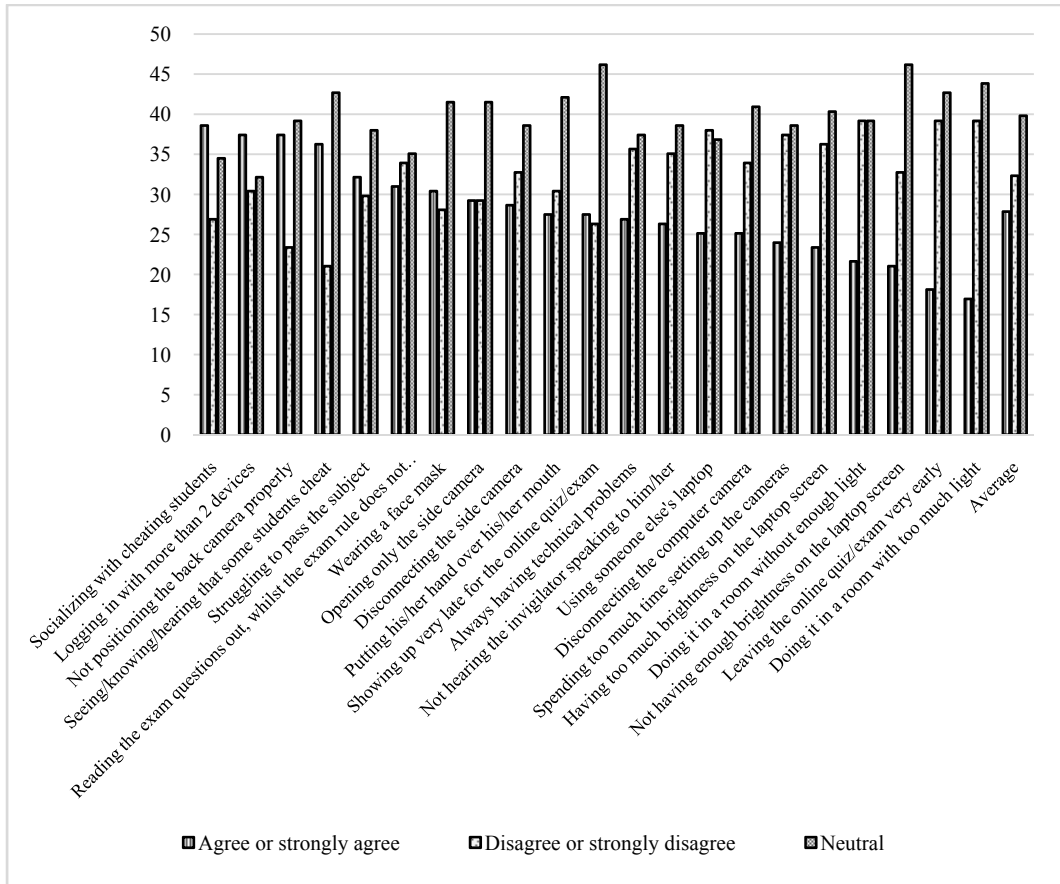


Figure 12.6: Presentation of Cheating Behaviors or Factors by Students % (Part 4)
 Source: Primary data computed by the author.

Awareness of Cheating

The study asked three open-ended questions to gather critical ideas on academic dishonesty, specifically cheating on online exams.

The first question asked, ‘How did the students cheat on an online exam without being noticed by the invigilator?’ The survey reveals that more than 73 percent of the responses claimed they had no idea how the students could cheat without the invigilator noticing them. A respondent was surprised and asked, “Can students cheat?” A few others said they had no such experience. “Do they even dare to do that?” one participant asked. Some said they were too busy with their exams and never had time to notice anyone else. A few others said they had no idea and guessed that perhaps they had a phone call or may have used earphones to talk to others during the exam. A few said they had no idea and thought the students did it when

the camera was off or when they only had the face camera on. They opened a new tab and made it so small that the invigilator did not notice it. More than 26 percent of the participants said the students had their answers written on the table/desk or in their hands. They divided their computer screen into two, one side for the exam and the other for online chat. They had a third-party app to help them contact each other during the exam. They wore face masks, had group calls, and used earphones. They could search on the Internet. They checked the answer when they were in the bathroom. They copied the answer before the exam started and pasted it during the exam. They had someone access their computer through a means of team viewer. They pretended to be working on the exam and not to look suspicious. They used a piece of tape to cover the microphone of the back camera phone, even if it was unmuted, so as not to let the voice be heard when talking. They used an online app like Discord to communicate during the exam. They could have someone read out the answer to them during the exam. They put the answer behind their computer screen or on a wall and away from the visibility through the back camera, and the invigilator would think that they only looked at their computer screen. They could gather in groups in the same place to take the online exam. They could join with multiple devices. They put the document under the table/desk. They could have a second device placed far behind their computer to show themselves the answers during the exam.

The second open-ended question asked, ‘Why did the students cheat?’ The responses were summarized and grouped into themes shown in Table 12.2. According to the findings, 37.43 percent suggested that cheating occurred due to the desire for grades, either to get a pass or a good grade. Interestingly, around 18 percent said that cheating occurred due to the students’ laziness during their study and exam review

Table 12.2: Additional Factors of Cheating by Students

<i>Additional factors of cheating</i>	<i>Responses (%)</i>
Grade (To pass or to get a good grade)	37.43
Being lazy	17.55
Not understanding the lesson	7.60
Being situational (Online)	4.68
The exam was hard	4.09
Result of the study load	1.75
Being nervous	1.75
No comment	25.1

Source: Primary data computed by the author.

processes. In comparison, 7.6 percent said cheating happened when the students did not understand the lesson. Only 4.68 percent said cheating occurred due to the online environment being situational for cheaters. Another 4.09 percent said it happened due to the exam being too hard. Only around 2.0 percent suggested that cheating was the result of study load and nervousness. Also, 25.15 percent did not provide any opinion on that.

The third open-ended question asked, ‘How can cheating be prevented?’ The answers from the participants were summarized and grouped into themes, as shown in Table 12.3. Although the result showed that around 41.0 percent of the respondents did not provide any suggestions or ideas, around 31.0 percent suggested the exam platform was already secured enough, and the school was already doing it right and should continue to be strict and fair in terms of executing the exam rules and punishments against cheating behaviors. Notably, one of the responses was, “Nothing more as the school is doing the right thing.” Also, 13.45 percent suggested that students should pay more attention, study hard, do more reviews of the lessons, and practice more before the exam, implying that cheating was the result of not doing all of them. One of the responses was, “Not the majority of students are cheating, but only a few; the students must know their duty of being honest.” Only 5.85 percent of respondents inferred that cheating resulted from online exam mode, so they encouraged it to be conducted in a physical mode at school. Around 4.0 percent of the responses suggested that the exam should be created in multiple versions or test open-ended questions rather than remembrance. Similarly, 3.51 percent of respondents recommended that ethics should be instilled and promoted more regularly among students.

Table 12.3: Cheating Prevention Measures Suggested by Students

<i>Measures to Prevent Cheating</i>	<i>Responses (%)</i>
Keep strict and fair, execute the rules and punishments, and have a secure platform.	30.99
The students should pay more attention, study hard, review more of the lessons, and practice more exam-type questions before the exam.	13.45
The school should provide more tutorial classes free of charge.	1.75
Promote ethical behavior and instill it in students more regularly.	3.51
The exam should test knowledge from the book, more open-ended questions, or have different versions.	3.51
The exam should be conducted in person rather than online.	5.85
No comment	40.94

Source: Primary data computed by the author.

Cheating Report

The study also collected secondary data from the institute’s administration office regarding the number of cheating cases reported by the invigilators to the administration department. The data was not made public due to some sensitivity that the administration prevented. The cheating report shown in Figure 12.7 presents the number of cheating cases reported by the invigilators and does not show the student’s name involved in cheating and the exam subject on which they cheated. It also shows the number of cheating cases reported in the midterm exams and final exams in different academic terms from the January-June 2021 term to the first half of July to December 2022 academic term, during which all the exams were conducted online, either everyone was doing the exam entirely online, or some were online, and some others had the option to take it at school physically. Whether the exams were online or conducted physically in the classroom, all exams were computer-based and Internet-mediated.

According to the data presented in Figure 12.7, cheating was very likely in online exams, mainly when the exam was conducted without using a secure platform to prevent cheating. A total of 20 cheating cases were reported in the January – June 2021 midterm exams, and the number kept increasing by 35 percent for the midterm exams and 100 percent for the final exams from January – June 2021 to July – December 2021, respectively. The number went down to 36 and 31 in the January – June 2022 exams when the institute conducted the exams in a hybrid mode.

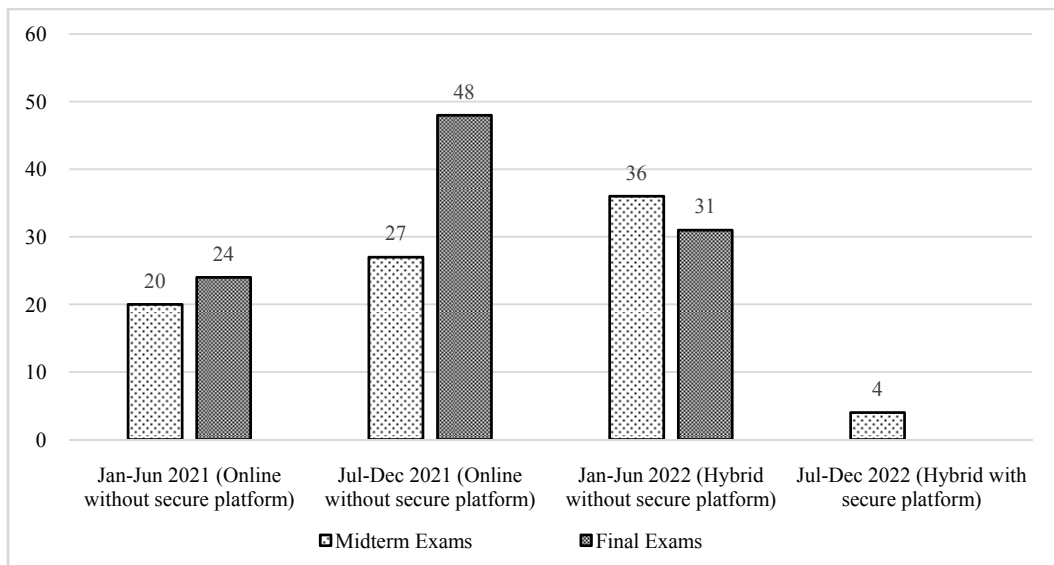


Figure 12.7: Number of Cheating Cases in Exams

Source: Secondary data compiled by the author.

The most common cheating behaviors reported were ‘talking during the exam,’ ‘using unauthorized apps,’ ‘surfing the Internet,’ ‘having multiple IP addresses simultaneously,’ ‘receiving help from a third person hiding behind the screen,’ ‘using a share screen or extended screen function,’ ‘copying and pasting things,’ or simply ‘looking at something else away from the computer screen during the exam.’ However, when a highly secure platform for online exams was applied, most of the cheating behaviors were preventable. The number of cheating cases dropped sharply to only four in the midterm exams conducted in the first half of July - December 2022. This success resulted from implementing a ‘high secure platform’ for online exams, which was an effort to prevent all kinds of cheating behaviors.

Unfortunately, the administration office said not all exams were on the ‘high secure platform.’ Due to the platform’s limitations, some exams had to be on Google Forms and Google Spreadsheets. The ‘high secure platform’ was incompatible with some of the exams that included questions that required the students to answer using a spreadsheet or Excel. Thus, one of the forms of cheating during exams that was a big challenge for the administrators was when the exam was not on the ‘highly secure platform’ but instead on Google Forms or Google Spreadsheets, as revealed by the administration office. They uncovered that Google Forms or Google Spreadsheets could not restrict a unique account of the students taking the exams online, whether they were taking them from a distance or in the exam room. That means the students had a chance to provide the credentials of their account and were able to have a third party behind the scenes to help them write the exams simultaneously. At the same time, they were present on the cameras or physically in the exam room. On the other hand, zero cheating cases were reported during exams on the ‘high secure platform.’ The office admitted the capability of the ‘high secure platform’ that it was capable of securing the exam screen very safely, and more importantly, it was capable of restricting a unique credential of every student’s account in such a way that only the student could access the exam. Thus, when the exam was on the ‘high secure platform,’ neither the unique account of the student was accessible to more than one person, nor the unique account could be logged in simultaneously at the same time as in the case of Google Forms and Google Spreadsheets. Unfortunately, some exams were on Google Forms and Google Spreadsheets instead of the ‘high secure platform’ because the ‘high secure platform’ was incompatible with some of the exams that included questions that required the students to answer using a spreadsheet or Excel. Thus, the office had to use Google Forms and Google Spreadsheets as the platform, which could not do two things (securing the exam screen and restricting unique account access), which are considered the most important functions when administering online exams.

7. CONCLUSION

7.1 Summary of the Study

According to the study findings, there was an opportunity for the students who struggled to pass the course, as well as for the students who were lazy and struggled to pass, to act dishonestly in the online environment during both an online class and exam, provided that a strict procedure was not in place. Although everybody had an option not to open the camera during their online class for many reasons, the chance the students did not have to study during class was high. Similarly, it was also an opportunity for the students to act dishonestly during online exams. Although it was not as easy to cheat on an online exam as on a normal online class due to the strict procedures and rules in exams, the chance was still there. However, the possibility of cheating on an online exam would be reduced to a great extent, provided a secure platform for online exams could complement the implementation of the procedures and rules.

Academic misconduct, or cheating on assessments, exists in various forms, ranging from plagiarism, impersonation, fabrication, falsification, bribery, and others. Administrators face a significant challenge in administering student assessments, particularly exams, to ensure the integrity of every student's behavior. Invigilating online exams may even be a more substantial challenge, mainly when procedures and infrastructure such as invigilators, exam rules and procedures, exam platforms, and others are not in place or are inadequate.

Integrity, however, should cover more than concerns over plagiarism and cheating on student assessments such as exams, assignments, and other coursework-based assessments. The profound aspect of integrity should be about some other qualities behind those academic assessments. As commonly seen, every educational institution tries to instill it in students' behavior through content-based courses in the study program and academic disciplines during their academic journey with the institution. This places a significant responsibility on educators and administrators. Rules, regulations, and disciplinary actions against academic wrongdoings are critical in inculcating honesty and responsibility in the student's behavior. The most important thing about this is that honesty in a person's behavior is the depth of integrity instilled in them, and they should always uphold it throughout and beyond their academic life.

7.2 Implication of the Findings

The study implies that administrators may compromise the procedures if the infrastructure needed to ensure online exams is inadequate, which would affect the integrity of the exams. In a scenario, for instance, where the administrators, exam rules, and regulations for online exams are ready, but the main exam platform required

to complement those rules and regulations is not in place, it may result in the administrators compromising the integrity of the online assessment or exam to the best capability that they could manage within the limited time and resources at hand.

7.3 Study Recommendations

The administrators, instructors, and relevant stakeholders should consider some of the critical technical things to ensure the integrity of student assessments, such as exams conducted online. First, a simple and standard procedure for online exams for the students, administrators, and other stakeholders should be in place. Secondly, the rules and regulations for online exams should be simple, straightforward, strict, and fair to every student. This should mention precisely the consequences if anyone breaks the rules. Thirdly, an online exam platform that can prevent and detect fraud or cheating behaviors complementing the exam rules and regulations should be set up. Also, the study highly recommends a simple system, software, or online app. Lastly, a group of invigilators should be well-trained and well-equipped with the necessary skills for administering online exams.

7.4 Study Limitations

The study was not free from limitations. First, the study was confined to only one private, fee-charging higher educational institution. Therefore, study results should not necessarily be generalized to other institutions, particularly public universities with limited infrastructure and budgets. However, a comparable conclusion may be found in some of the fee-collecting higher learning institutions, which can ensure a considerably competitive study environment for targeted groups of students. Further attempts should be made in future studies to extend the scope of analysis to a broader context of higher learning institutions in Cambodia and outside Cambodia.

REFERENCES

- ACCA. (n.d.). *Rulebook: Codes of ethics and conduct*. <https://www.accaglobal.com/gb/en/about-us/regulation/rulebook/code-of-ethics-and-conduct.html>
- ACCA. (n.d.). *Rules and regulations*. <https://www.accaglobal.com/hk/en/student/exam-entry-and-administration/rules-and-regs.html>
- Ahmed, F. R. A., Ahmed, T. E., Saeed, R. A., Alhumyani, H., Abdel-Khalek, S., & Abu-Zinadah, H. (2021). Analysis and challenges of robust e-exams performance under COVID-19. *Results in Physics*, 23, 1–7. <https://doi.org/10.1016/j.rinp.2021.103987>
- Allen, I. E., & Seaman, J. (2003). *Seizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003*. <https://files.eric.ed.gov/fulltext/ED530060.pdf>
- Allen, I. E., & Seaman, J. (2013). *Changing course: Ten years of tracking online education in the United States*. <https://eric.ed.gov/?id=ED541571>
- Archon, S. (n.d.). *Bruce Lee's profound philosophy of life: 7 mind-shifting insights that will awaken your inner warrior*. <https://sofoarchon.com/bruce-lee-philosophy/#:-:text>

- Bacon, A. M., McDaid, C., Williams, N., & Corr, P. J. (2019). What motivates academic dishonesty in students? A reinforcement sensitivity theory explanation. *British Journal of Educational Psychology, 90*(1), 152–166. <https://doi.org/10.1111/bjep.12269>
- Baldwin, D. C., Daugherty, S. R., Rowley, B. D., & Schwarz, M. R. (1996). Cheating in medical school: A survey of second-year students at 31 schools. *Academic Medicine, 71*(3), 267–273. DOI: 10.1097/00001888-199603000-00020
- Bernardi, R. A., Baca, A. V., Landers, K. S., & Witek, M. B. (2008). Methods of cheating and deterrents to classroom cheating: An international study. *Ethics & Behavior 18*(4), 373–391. <https://doi.org/10.1080/10508420701713030>
- Bertram, G. T. (2008). Academic integrity in the 21st century: A teaching and learning imperative. *ASHE Higher Education Report, 33*(5). <https://eric.ed.gov/?id=EJ791635>
- Binstein, J. (2015). *On knuckle scanners and cheating - How to bypass proctortrack, examity, and the rest.* <https://jakebinstein.com/blog/on-knuckle-scanners-and-cheating-how-to-bypass-proctor-track/>
- Bowers, W. J. (1964). *Student dishonesty and its control in college.* Bureau of Applied Social Research. Columbia University Press.
- Buckner, E., & Hodges, R. (2016). Cheating or cheated? Surviving secondary exit exams in a neoliberal era. *Compare: A Journal of Comparative and International Education, 46*(4), 603–623. <https://doi.org/10.1080/03057925.2015.1088379>.
- Budhai, S. S. (2020, May 11). *Fourteen simple strategies to reduce cheating on online examinations.* <https://www.facultyfocus.com/articles/educational-assessment/fourteen-simple-strategies-to-reduce-cheating-on-online-examinations/>
- Burton, J. H., Talpade, S., & Haynes, J. (2011). Religiosity and test-taking ethics among business school students. *Journal of Academic & Business Ethics, 4*, 1–8. <https://www.aabri.com/manuscripts/11759.pdf>
- CamEd Business School. (2022). Bachelor of Accounting and Finance (Honors). <https://cam-ed.com/ba-program/>
- CamEd Business School. (2022). *Student rulebook.* <https://cam-ed.com/ba-program/>
- CamEd Business School. (n.d.). *Guidelines for physical exams. Guidelines for online exams.* <https://sites.google.com/view/exam-rules/home?authuser=0>
- Cerimagic, S., & Hasan, M. R. (2019). Online exam vigilantes at Australian Universities: Student academic fraudulence and the role of universities to counteract. *Universal Journal of Educational Research, 7*(4), 929–936. DOI: 10.13189/ujer.2019.070403
- Charani, J. (2021, December 15). Universities are canceling in-person exams, Western University isn't. Here's what the students had to say. *CBC News.* <https://www.cbc.ca/news/canada/london/universities-are-cancelling-in-person-exams-western-university-isn-t-here-s-what-students-had-to-say-1.6284598>
- Chesney, T. (2009). Academic integrity in the twenty-first century: A teaching and learning imperative (review). *The Review of Higher Education, 32*(4), 544–545. <https://muse.jhu.edu/article/262801>
- Crittendent, V. L., Hanna, R. C., & Peterson, R. A. (2009). The cheating culture: A global societal phenomenon. *Business Horizons, 52*, 337–346. <https://doi.org/10.1016/j.bushor.2009.02.004>

- Curran, K., Middleton, G., & Capson, D. (2011). Cheating in exams with technology. *International Journal of Cyber Ethics in Education*, 1(2), 54–62. <https://doi.org/10.4018/ijcee.2011040105>
- Dendir, S., & Maxwell, R. S. (2020). *Cheating in online courses: Evidence from online proctoring*. <https://doi.org/10.1016/j.chbr.2020.100033>
- Dey, S. (2021, August 27). *Reports of cheating at colleges soar during the pandemic*. <https://www.npr.org/2021/08/27/1031255390/reports-of-cheating-at-colleges-soar-during-the-pandemic>
- Dignify. (n.d.). *How to prevent cheating on online exams*. <https://digify.com/blog/clever-ways-students-cheat-during-online-exams/>
- Doyle, T. (n.d.). *Definition of assessment of students' learning*. <https://learnercenteredteaching.wordpress.com/teaching-resources/definition-of-assessment-of-student-learning>
- Etter, S., Cramer, J., & Finn, S. (2006). Origins of academic dishonesty: Ethical orientations and personality factors associated with attitudes about cheating with information technology. *Journal of Research on Technology on Education*, 39(2), 133–155. <https://doi.org/10.1080/15391523.2006.10782477>
- Evans, E. D., & Craig, D. (1990). Teacher and student perceptions of academic cheating in middle and senior high schools. *The Journal of Educational Research*, 84(1), 44–52. <https://doi.org/10.1080/00220671.1990.10885989>
- Fishman, T. (2014). *The fundamental values of academic integrity*. Second Edition. International Center for Academic Integrity, Clemson University.
- Genereux, R. L., & McLeod, B. A. (1995). Circumstances surrounding cheating: A questionnaire study of college students. *Research in Higher Education*, 36(6), 687–704. <https://doi.org/10.1007/BF02208251>
- Gill, C. (2021). *10 unique ways students cheat in online exams*. <https://www.irisinvigilation.com/students-cheat/>
- Grimes, P. W., & Rezek, J. P. (2005). The determinants of cheating by high school economics students: A comparative study of academic dishonesty in the transitional economies. *International Review of Economics Education*, 4(2), 23–45. [https://doi.org/10.1016/S1477-3880\(15\)30133-X](https://doi.org/10.1016/S1477-3880(15)30133-X)
- Harvard College. (2022). *Harvard College student handbook 2021–2022*. <https://handbook.college.harvard.edu/>
- Harvard University. (2022). *HSS 2022 student rulebook: Policies and procedures for Harvard Summer School students*. <https://studenthandbook.summer.harvard.edu/examinations>
- Haswell, S., Jubb, P., & Wearing, B. (1999). Accounting students and cheating: A comparative study, South Africa and the UK. *Teaching Business Ethics*, 3, 211–239. <https://link.springer.com/article/10.1023/A:1009830308143>
- Heywood, J. (2000). *Assessment in higher education. Students learning, teaching, programmes and institutions*. Higher Educational Policy Series 56. Jessica Kingsley Publisher.
- Holden, O. L., Norris, M. E., & Kuhlmeier, V. A. (2021). *Academic integrity in online assessment: A research review*. <https://doi.org/10.3389/feduc.2021.639814/full>
- Huyen, L. (2022, February 2). *Universities struggle to prevent cheating on online exams*. <https://vietnamnet.vn/en/universities-struggle-to-prevent-cheating-on-online-exams-813102.html>

- James, F. (2020, October 13). *The challenges and advantages of conducting exams during the COVID-19 crisis*. <https://www.qs.com/the-challenges-and-advantages-of-conducting-exams-during-the-covid-19-crisis/>
- Jensen, L. A., Arnett, J. J., Feldman, S. S., & Cauffman, E. (2002). It's wrong, but everybody does it: Academic dishonesty among high school and college students. *Contemporary Educational Psychology, 27*(2), 209–228. <https://doi.org/10.1006/ceps.2001.1088>
- Jordan, A. E. (2001). College student cheating: The role of motivation, perceived norms, attitudes, and knowledge of institutional policy. *Ethics & Behavior, 11*(3), 233–247. DOI:10.1207/S15327019EB1103_3
- Jung, I. Y., & Yeom, H. Y. (2009). Enhanced security for online exams using group cryptography. *IEEE Transactions on Education, 52*(3), 340–349. <https://doi.org/10.1109/TE.2008.928909>
- Kentnor, H. E. (2015). Distance education and the evolution of online learning in the United States. *Curriculum and teaching dialogue, 17*(1 & 2), 21–34. <https://ssrn.com/abstract=2643748>
- King, C. G., Guyette, R. W., & Piotrowski, C. (2009). Online exams and cheating: An empirical analysis of business students' views. *The Journal of Educators Online, 6*(1). DOI: 10.9743/JEO.2009.1.5
- Lee, C. (2021, August 11). *What is the difference between academic integrity and plagiarism?* <https://www.turnitin.com/blog/what-is-the-difference-between-academic-integrity-and-plagiarism#:~:text=>
- Maeda, M. (2019). Exam cheating among Cambodian students: When, how, and why it happens. *Compare: A Journal of Comparative and International Education, 55*(3), 337–355. <https://doi.org/10.1080/03057925.2019.1613344>
- Massachusetts Institute of Technology. (n.d.). *Academic integrity at MIT: A handbook for students*. <https://integrity.mit.edu/handbook/academic-integrity-handbook>
- McCabe, D. L., Butterfield, K. D., & Trevino, L. K. (2012). *Cheating in college: Why students do it and what educators can do about it*. Johns Hopkins University Press.
- McCabe, D. L., & Trevino, L. K. (1993). Academic dishonesty: Honor codes and other contextual influences. *The Journal of Higher Education, 64*(5), 522–538. <https://doi.org/10.2307/2959991>
- McCabe, D. L., & Trevino, L. K. (1997). Individual and contextual influences on academic dishonesty: A multi-campus investigation. *Research in Higher Education, 38*, 379–396. <https://doi.org/10.1023/A:1024954224675>
- Meredith, R. (2020, March 20). Coronavirus: Queen's University cancels exams. *BBC News*. <https://www.bbc.com/news/uk-northern-ireland-51979583>
- Morgan, J. (2016). University financial health check 2016. *Times Higher Education*. https://www.westernsydney.edu.au/__data/assets/pdf_file/0005/1097708/6.Article_University_financial_health_check_2016.pdf
- Moten, J., Fitterer, A., Brazier, E., Leonard, J., & Brown, A. (2013). Examining online college cyber cheating methods and prevention measures. *Electronic Journal of e-Learning, 11*(2), 139–146. <https://eric.ed.gov/?id=EJ1012879>
- Mustapha, R., Abdullah, Z., Mahmud, M., & Aisyahmalkan, S. N. (2021). Academic dishonesty in current years comparison 2018 to 2020: The Malaysian higher education evidence. *Solid State Technology, 63*(6), 1109–1122.

- Noorbehbahani, F., Mohammadi, A., & Aminazadeh, M. (2021). A systematic review of research on cheating in online exams from 2010 to 2021. *Education and Information Technologies*, 27, 8413–8460. <https://doi.org/10.1007/s10639-022-10927-7>
- OnlineEducation. (n.d.). *Cheating on online education: Myth vs. reality*. <https://www.onlineeducation.com/features/cheating-in-online-education>. Online Education Research, LLC.
- Pringle, J. (2021, December 13). Queen's University cancels in-person final exams due to COVID-19 concerns. *CTV News*. <https://ottawa.ctvnews.ca/queen-s-university-cancels-in-person-exams-due-to-covid-19-concerns-1.5704604>
- ProPros Quiz Maker. (2022, February 10). *What is student assessment?* <https://www.proprofs.com/quiz-school/blog/what-is-student-assessment/#:-:text>
- Proctorexam. (2021). *6 simple strategies to prevent cheating in online exams*. <https://proctorexam.com/6-simple-strategies-to-prevent-cheating-in-online-exams/>
- Rogers, C. F. (2006). Faculty perceptions about e-cheating during online testing. *Journal of Computing Sciences in Colleges*, 22(2), 206–212. https://www.researchgate.net/publication/262311152_Faculty_perceptions_about_e-cheating_during_online_testing
- Sarkar, S. (2020, May 16). *A brief history of online education*. <https://adamasuniversity.ac.in/a-brief-history-of-online-education>
- Scarsdale Public Schools. (2022). *Student assessment in Scarsdale schools*. <https://www.scarsdaleschools.k12.ny.us/domain/1038#:-:text>
- Schab, F. (1991). Schooling without learning: Thirty years of cheating in high school. *Adolescence*, 26(104), 839–847.
- Sideridis, G. D., Tsaousis, I., & Al Harbi, K. (2016). Predicting academic dishonesty on national examinations: The roles of gender, previous performance, examination center change, city change, and region change. *Ethics & Behavior*, 26(3), 215–237. <https://doi.org/10.1080/10508422.2015.1009630>
- Simkin, M. G., & McLeod, A. (2010). Why do college students cheat? *Journal of Business Ethics*, 94(3), 441–453. <https://www.jstor.org/stable/40784704>
- Sopheary, P. (2017). Diachronic analysis of newspaper articles on academic cheating in Cambodia. *Educational Issues from Global Perspectives*, 75, 392–393. https://doi.org/10.11555/taikaip.75.0_392
- St. John's College. (2022). *Academic programs/undergraduate program/senior essay*. Senior Essays—Culmination of a Student's Learning, St. John's College.
- Styron, J., & Styron, R. A. (2010). Student cheating and alternative web-based assessment. *Journal of College Teaching & Learning*, 7(5), 37–42. <https://eric.ed.gov/?id=EJ895256>
- Subin, S. (2021). How college students learned new ways to cheat during pandemic remote schooling. *CNBC*. <https://www.cnbc.com/2021/03/21/how-college-students-learned-new-ways-to-cheat-during-covid-.html>
- Taguiam, S., & Moss, R. (2015). *Progress, hurdles for education*. <https://www.phnompenhpost.com/national/progress-hurdles-education>
- The Ohio State University. (2022). *Academic integrity and misconduct*. <https://oaa.osu.edu/academic-integrity-and-misconduct>
- The Times. (2016). *Universities face student cheating crisis*. <https://www.thetimes.co.uk/article/universities-face-student-cheating-crisis-9jt6ncd9vz7>

- Thibodeau, P. (2007, April 30). Cheating on IT exams may cast doubt on their value: Thieves, 'gunmen' look to profit from stolen technology certification tests. *Computerworld*. <https://www.computerworld.com/article/2552614/cheating-on-it-exams-may-cast-doubt-on-their-value.html>
- Underwood, J., & Szabo, A. (2003). Academic offenses and e-learning: Individual propensities in cheating. *British Journal of Educational Technology*, 34(4), 467–477
- University of Birmingham. (2022). *Guidance for online examinations and assessments*. <https://intranet.birmingham.ac.uk/as/registry/exams/rules/guidance-for-online-examinations-and-assessments.aspx>
- University of Oxford. (2022, February 25). *Undergraduate. English language and literature*. <https://www.ox.ac.uk/admissions/undergraduate/courses/course-listing/english-language-and-literature>
- Watson, G., & Sottile, J. (2010). Cheating in the digital age: Do students cheat more in online courses? *Online Journal of Distance Learning Administration*, 13(1). <https://core.ac.uk/download/pdf/232714568.pdf>
- Whitley, B. E. (1998). Factors associated with cheating among college students: A review. *Research in Higher Education*, 39(3), 235–274. <https://doi.org/10.1023/A:1018724900565>
- Yem, B. (2021). The impact of COVID-19 on students' preferences of learning mode: A basis for consideration. In T. R. Dash and K. P. Charman (Eds.), *COVID-19: The economy and society* (pp. 133–150). Allied Publishers Pvt. Ltd. <https://doi.org/10.62458/CamEd/OAR/Symposium/2021/133-150>