

## Original Article

**Experiences of a Group of Faculty Members in University of Sistan and Baluchestan on Decreased Fraud Solutions for E-Tests**

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Received: 2021/06/22

Accepted: 2021/10/22

**Abstract**

The present paper is a comprehensive empirical program of a group of faculty members in University of Sistan and Baluchestan on decreased fraud solutions for e-tests. The group views and experiences were reviewed and shared on a dedicated online platform. In early 2020, shortly after the epidemic of Covid-19 and almost simultaneously with the opening of universities, this platform was established to share the experiences related to applying e-learning methods for courses that were mainly in person so far. This is a qualitative interpretative phenomenology study. Materials, views, measures, and recommendations of a group of faculty members for decreased cheating in online tests were classified under some headings. In addition to the literature review, the most effective solutions to increase

awareness and enhance students' continence and honesty against the tendency to cheat and practical suggestions to reduce students' fraud in online tests were provided. Research samples included faculty members of basic sciences, education and psychology, and engineering. Hence, however, some proposed strategies and approaches are widely used in a particular educational field and may be less practical in some other specialized areas.

### **Keywords**

Online test, remote exams (assessments), electronic learning, test anxiety, examination fraud

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### **Introduction**

Fraud is an immoral act that promotes corruption and injustice in human communities. In addition, examination fraud would lead to decreased quality of learning and scientific deficiency in learners.

However, cheating is an integral part of any test. In education and learning, fraud emerges in various forms, including examination fraud and homework cheating (1). According to relevant studies, fraud is increasing in academic contexts (3-5). In addition, some research showed that in spite of the fact that the majority of students consider fraud unethical and wrongdoing, almost half of them have committed some form of fraud during their education (6). According to Haghghi et al., 62% of Payame Noor University students duplicate their assignments (7). Another study reported that 66% of learners commit fraud during their studies, 25% of which started cheating in elementary school (8). Several studies also analyzed students' tendency to fraud and academic strategies for test confirmation (9).

Research reveals that specifying fraud motives and methods is critically important, and the specification would be useless without prevention. Further, the most effective way to control fraud is to decrease the fraud motivation (1). Some scholars have divided fraud causes into two intrinsic and extrinsic motivational factors: lack of self-confidence, poor academic performance, feeling proud of cheating, and pressure from parents and teachers, respectively. In addition, self-monitoring and autonomy methods were also proposed to control intrinsic and extrinsic motivations. According to the literature, there is a negative correlation between academic self-efficacy and proficiency assessment with cheating attitude.

On the other hand, academic motivation may influence the relationship between goal orientation and attitude toward cheating. Moreover, attitudes toward cheating, the field of study, and gender are also effective factors in fraud level. Some scholars suggested that student academic fraud would decrease if teachers are perfect at teaching and interaction.

The pandemic Covid-19 has undeniably affected various dimensions of society, especially education, so the need to use online (remote) learning has become a necessity worldwide. Covid-19 was initially detected in Wuhan, China, in December 2019. On the other side, the absence of any definitive treatment (cure) or prevention within the pandemic and according to the epidemiologist predictions on a minimum of 60% of the population infection resulted in widespread stress and anxiety among the population. The pandemic, closure of schools and universities as part of governments' preventive measures, focusing on remote and electronic learning throughout the world turned the issue of committing fraud by testers into a critical concern for test administrators and raised fraud as an increasingly serious educational challenge for those involved (18-20).

In distance e-learning, how to assess learners at various levels and higher education centers has turned into a significant challenge for education authorities. Notably, similar fraud methods have emerged in different communities; for instance, the test assistant is a way that learners hire someone to answer exam questions (21, 22). For this reason,

education officials have also provided some standard solutions to fight fraud in e-learning tests (23). A recent study introduced strategies such as using various methods, divergent questions, oral assessment, as well as analyzing students' progression trends as fraud prevention methods in e-learning (11). Another study investigated the most critical evaluation methods within the pandemic by result analysis of in-person exams, virtually written exams, oral exams (virtual interview), oral Q&A while teaching through adobe connect, and the like, class presentations via virtual (online) systems, electronic portfolio, and multiple evaluations (24).

Since e-learning will continue as an integral part of education in the post-Covid-19 era, and based on the lived experiences of faculty members, the present research provided collective views of a group of faculty members in University of Sistan and Baluchestan on fraud prevalence in e-learning; and proposed solutions on how to decrease and control this challenge based on a year of e-learning experience.

### **Material and Methods**

This is interpretative phenomenological-qualitative research to study the opinions and personal experiences of a group of faculty members in University of Sistan and Baluchestan who held online classes and exams during the pandemic Covid-19. Research samples included twelve faculty members in University of Sistan and Baluchestan who voluntarily wanted to participate in educational experience sharing committees and e-learning tests and were interested in investigating the issue of fraud examination by students. Research data were collected using semi-structured interviews. The research questionnaire included two open-ended questions in connection with analyzing colleagues' personal experiences on fraud causes and drivers among students and fraud prevention approaches among learners. Two experts summarized the practitioners' opinions on research questions with higher experience in virtual learning and testing. Questions and answers sessions were electronically held in groups.

### **How to Decrease Fraud in E-Learning**

Prior to addressing fraud reduction strategies in e-learning, it is necessary to seek fraud motivations among students. Motivation stems from the difficulty of the course, student academic procrastination, lack of interest in the subject, the impossible or ineffective teacher guidance in online tests, the mark decisiveness, and or credentialism (obsession with paper qualifications). In general, striving to be better is an inseparable part of fraud motivation. If the driving force is apparent, picking one or more proper approaches from existing would be more straightforward. In the following, a brief description of the approaches and experiences of the faculty members is categorized under nine different and related headings.

#### **A. Fostering commitment and honesty in learner**

The emphasis on honesty and integrity in the classroom is a good starting point. However, stating the importance of this issue may not necessarily prevent fraud, but it may cause the student to rethink one more time, at least, their decision on wrongdoing. For instance, the teacher may upload an ethical text that must be observed on the portal and explain the significance of education and learning and focus on the critical role of testing and assessment. This will give a more realistic view of the educator to the learner, indicating that the educator cares for teaching and puts critical importance on the test and students' test results, and faces any violation and fraud. "Code of ethics for education," prepared and notified in April 2021 by the deputy education minister, has introduced educational ethics principles and models applicable for learners' ethical education.

### **Colleagues' experiences**

1. "To prevent such incidents in exams, at the beginning of each semester, I highlight the significance of honesty and the need to avoid fraud and its negative consequences and remind students of a self-made proverb that "no two people make the same mistake." Hence, if such a case occurs, it would be definitely an example of fraud committed, leading to negative consequences."

2. "In the first place, the educator's motivation is to promote ethics. Personally, I failed the learners who gave similar descriptive answers to conceptual items. Also, I will send a message to the learner that they have to drop the course in case of repetition. No complaints yet!"

3. "The vice-chancellor's office must update student disciplinary instructions according to the e-learning conditions; fear of punishment may impede more regret. Educators can prevent and decrease fraud and enhance public ethics by promoting ethic-based culture in the classroom."

4. "Learners did not complain to the observers during in-person exams, as they were accustomed to the presence of observers to maintain security and protect learners' rights during the test session. Even now, if any solution is proposed or institutionalized for fraud lessening, the learners themselves would support it. It is necessary to correct learners' misconception that legalizing remote exams refers to the educators' suspect view of learners."

### **B. Informing students on using authorized tools and facilities**

As e-learning uses electronic references and methods for teaching and learning, it is suggested that the educator remind learners of some of the essential e-learning principles and rules in the first session. For instance, mentioning to what extent e-sources are allowed in tests may familiarize learners with legal opportunities and decrease fraud motivations.

### **Colleagues' experiences**

1. "We can introduce authorized software for calculations, curves, equations, and integrations to learners before mathematical (computational) exams, so they manage their time in finding better answers and getting a higher score with no need to cheat."

2. "It is beneficial to offer necessary formulations required in the exam to avoid wasting time, stress, and confusion on finding proper textbooks; instead, it helps in increased concentration of examinees to find solutions based on their knowledge without any fraud."

3. "You may also ask learners to outline a summary of the book before the exam; then, pick the best summary and distribute it to other cramming learners. This would lead to enhanced achievement and higher self-confidence to stay away from fraud."

### **C. Create variety in the items' content and order**

Another solution is to design a test in various multiple versions. However, according to the psychometric principles, efforts should be made to formulate various questions where the number, purposes, level of difficulty, and ease of questions must be as similar as possible. The only difference is in the content. In computational items, for instance, change in some numbers and figures; random selection in essay-type questions where the item order and appearance are differently presented; or change in the statement of the problem and problem requirement.

Some educators do not inform students of different items; this causes students to treat items the same and give irrelevant answers; hence, it facilitates fraud detection; while other

educators prefer to inform students of different questions in advance to diminish fraud motivation in learners. Given that the purpose of the test is to determine the amount of learning instead of merely identifying and punishing cheating examinees, apparently, premonition on test item difference (without details and difference type) not only decreases examinees' fraud motivation but also diminishes the likelihood of cheating via making them aware of fraud punitive consequence.

### **Colleagues' experiences**

1. "In-person and short video interviews taken in addition to the open-ended, computational, and multiple-choice exams are strongly effective in presenting detailed data to learners for necessary evaluations. Despite good experiences, unfortunately, I must admit that this is a time-consuming approach."

2. "Learners may send a one-minute audio attachment and written descriptions to describe their answers. Luckily, an electronic learning management system (e-LMS) offers this option, so there will be no need for other peripheral audio recording software. In this way, even if the learner fails in problem-solving, they will describe how they think about the problem or why they could not solve it. Such explanations are an excellent audit to determine those who did not study, cheated, or went on astray. In addition, explaining the reasons for the lack of problem-solving skills would help educators to identify their teaching weaknesses."

3. "Lots of tests and different items are ineffective but only add to the troubles for the test designer. Cheaters do not care whether it is one test or more! It seems that mid-term and final tests as well as class quizzes with a valid assessment are sufficient. Video calling with all individuals immediately after the exam can be beneficial and is the most accurate assessment validation method. However, individual calling may be tiresome; and also, it is impossible to ask and answer all items. Making calls on the following day is useless. Given all aspects, sending audio of all answers would be the best. However, to prevent fraud and or to find the cheater, the validation method (like the video call) must be announced in advance to students."

4. "A classified question bank mentioned in the test description may be beneficial for courses where multiple test items are available. For instance, 15 of 100 items would be randomly selected for each individual. This will diminish fraud motivation, primarily by sharing and exchanging answers among examinees. For other courses, a compulsory self-assessment test for each chapter may also help learners to move forward with the class and think less about cheating."

### **D. Score distribution in multiple tests over the semester**

Multiple tests evaluate the depth and volume of learning. Learning depth can be assessed at any time during teaching, while learning volume is planned at the end of one or more chapters. A larger volume of material is assessed with more weight in the final exam score so that fraud motivation will decrease. Thus, creating a relative balance between quiz and final exam scores is effective with exercises measuring learning depth. On the other hand, learners' stress would be relieved by more tests and lower scores per exam. In this regard, educational objectives, tests, and timetable, as well as the weight of continuous evaluations over the semester, must be included in the e-LMS portal and explained at the first session.

### **Colleagues' experiences**

1. "I suggest splitting numeration where one test has little effect. I defined separate scores for each project, practice, and test to timely view the educational content consistent with each session's content. I recommend that complex and challenging issues are defined as workshops in the system for peer-to-peer evaluations instead of long exams. Learners will learn better by evaluating their peers and viewing their strengths and weaknesses. Also, in online classes, I randomly ask questions about the previous class, some of which are related to assignments and tests."

2. "However, multiple tests and various assessment methods would get a more realistic view of how much the learner is learning. However, when the quantity increases in a student-oriented education system, the learner will not have enough time for studying, projects and exercises. This, in turn, motivates students to convince themselves that their only chance is fraud. Sometimes, in order to reduce the volume of material learners have to study, they agree to share the materials and even answers on the exam. To avoid such incidents, it is better to take multiple quizzes and tests for a limited material; or set a regular schedule for test distribution from the semester onset."

3. "Continuous assessment is done via various methods depending on the material nature and teaching method. The blended-teaching method recommends using software that provides electronic educational content based on Scrom standard (Sharable Content Object Reference Model), enabling learners to view content. Another solution is to upload an assignment, a ten-line unit summary, a short audio summary for each chapter, and oral questions in online/in-person sessions asked by the teacher for scoring. Discussion groups in e-LMS can be another solution. Easy self-assessment tests, including yes/no questions, short answers, and multiple-choice questions at the end of each chapter to determine whether the learner studied or not, can also be a practical action. For some lessons where a random question bank is available, it is possible to repeat tests for a better score. In a better word, by which attaining the possible best result would substitute failing or passing (all or none). This may aid in choosing the proper path to the best possible result based on self-efforts, ability, and knowledge instead of appealing to the wrong choice of fraud. On the other side, as somehow it provides a self-learning during testing, it would be treated as an effective and valuable occurrence for the test's primary purpose, which is learning."

#### **E. Using analytical and open-book questions**

It is suggested to use questions measuring students' critical thinking instead of items measuring student memory. In other words, it is better to use items of higher levels of learning (comprehension) and focus on providing examples (based on the materials) instead of asking for memorized items (knowledge level). Clearly, each lesson includes notes and hints to be memorized and evaluated; but it is necessary to allocate a less amount of questions to the memory-related items.

#### **Colleagues' experiences**

1. "I mention in all exams that it is an open-book test that questions are not directly copied from the book so students are ensured that there is no need to memorize solutions."

2. "Three or four questions are given for the doctoral test to answer based on the content provided over the semester. Questions must be such that all materials are reviewed and summarized to answer the questions. For instance, "according to the presented perspectives, write to main distinguishing points and offer a theory containing the highlights of all perspectives through an integrated view." The student opinion and document ability have points in each question. To prevent copying and fraud, students are announced that they will get a half mark if they only write their own opinion.

Nevertheless, copying and plagiarism will have no bonus or score, and the scores within the semester will also be measured more strictly. Further, students are also notified that they do not worry about the average similarity of answers as copying (plagiarism) and fraud are detected by other factors, such as witnessing a specific mistake repeated in several papers. Hence, due to such factors, other tests are compared more carefully.”

#### **F. Free educator guidance in the test**

Inform the learners in advance about the importance and possibility of receiving guidance and disambiguation when needed during the exam. However, it is necessary to set proper terms and conditions for more justice and escape wasting time; for instance, the student can receive limited and helpful hints to reduce a certain percentage of the mark. In addition, question transparency should also be considered in test designing. Indeed, any ambiguity or flaws in the question may lead to irrational test item complexity or difficulty. In such cases, a simple short explanation without direct reference to the answer may also aid the learner to clear ambiguity.

#### **Colleagues' experiences**

1. “Basically, the presence of educators in online tests for debugging and responding to students' ambiguities may primarily increase test validity. Further, it also decreases stress among students, helping them remove negligible or severe barriers.”

2. “In exams where the number of examinees is less, responding or guiding, if requested, could be effective in reducing stress, as a fraud motivation and fraud possibility. However, for a large population, guiding or speaking may intensify their stress and anxiety and even leads to inequality since it is practically impossible to have a comprehensive conversation and appropriate guidance for all examinees in the limited time of the test. To prevent stress and anxiety of students about possible test ambiguities, reassuring students about making up the missed marks due to the item errors may help in relieving students' stress and preventing them from being tempted to commit fraud.”

3. “It is critically important to spend enough time on test designing to decrease unnecessary communication with an educator at test time. It also helps in more effective time allocation and a more valuable and constructive connection between the tester and examinee. Accordingly, it is imperative to use the “test review” tools and gain sufficient confidence about the lower risk of any test ambiguity and errors before testing.”

#### **G. Change in learner evaluation criteria**

It is advised that the score effect is diminished for evaluation and evaluation criteria value participation in class discussion, debugging peers, and even perseverance instead of just test-taking, getting a score in the final test.

#### **Colleagues' experiences**

1. “Some leading global universities have eliminated the effect of average mark requirement for higher education to decrease learners' tendency to abuse online test conditions for the higher average mark. Suppose Iran also announces a general evaluation test for the final degree, or certificates are classified into two with and without reevaluation. In that case, it may be an effective solution to decrease cheating. However, at present, such classification exists in education- and research-oriented studies for public and Azad universities and is considered in some requirements or appointments.”

2. “Despite the necessity and order of different interests for evaluation, it should be noted that evaluation may sometimes lead to adverse side effects. For instance, a. sometimes, evaluation suffocates creativity as the examinee will get the score if they

respond from the evaluator's point of view. Inevitably, the examinee must ignore their perspective, which is the basis of creativity. a. Evaluation may abate the power of self-control and individual virtue, meaning that dealing with fraud temptation for the online test may decrease the ability and potential to fight for ethical values. It gradually leads to lower self-control. On the other hand, this can be taken as an opportunity to cultivate and enhance self-control. However, if the test content and condition are less motivating the fraud committing, disadvantages would also decrease; c. evaluation, in some individuals, may lead to lower self-confidence and even less self-esteem; d. final assessment that may lead to academic failure or make-up exam incurs enormous costs and loses opportunities. If repeated, it reduces interest in education. It promotes indifference to the unique and valuable status of benefiting golden times and life-limited opportunities, particularly the cherished ones, adolescence, and the educational period.

However, some of the variables mentioned above are more important than knowledge acquisition. Hence, today, educational scholars and practitioners claim that educational centers must remove final exams, not entrance and formative evaluation. However, to prevent unprofessional or fraudulent individuals from entering the professional arena, it is necessary to hold specialized evaluation exams merely in the initial stage of employment-whether the individuals attained the whole or part of the required knowledge and expertise within the educational period or they are qualified based on practical experience, before and after the learning."

3. "This semester, I asked undergraduate students to summarize what has been taught based on my recorded voice in the class and share their files in a virtual group. The students were also scored based on summarizing another book. Six marks were left for the final test scored on a 24-multiple choice test in two 12 groups via the e-LMS."

#### **H. Using e-LMS**

All electronic learning management system software enjoy inbuilt options for test design that could be used to decrease fraud levels in tests. For instance, item orders may vary randomly from student to student. It is recommended to keep the multiple-choice test time as short as possible. In addition, returning to previous test items may be removed, if necessary. It is also possible to restrict the network address and set a test access password.

#### **Colleagues' experiences**

1. "E-LMS offers an auto-scoring system for multiple-choice, short-answer, and matching tests. This presents more opportunities for shorter and various tests to educators and learners, on the one hand. Furthermore, it reduces stress, enhances academic potential, and decreases fraud tendency by facilitating and accelerating feedback to learners and educators, identifying and fixing bugs and errors in conveying meaning, and helping in effective and efficient education, on the other hand."

2. "Using advanced tools of educational systems such as test item "duplication" and "editing" tools to quickly prepare a set of various similar items to classify under a particular category in the test bank and then randomly select a "random item" in the test content design stage could be effectively helpful in providing varied test items and inhibiting examinees' fraud. Accordingly, it would also be beneficial to apply test design means of "computational test," whether open-ended or multiple-choice, which practically and automatically turn an individual item of a computational problem into several problems with similar content and different inputs and outputs. Without much time and effort on the part of the educator, this method can effectively and efficiently reduce examinees' fraud via varied test items and answers (while observing the standard of justice in the level of difficulty or ease of questions)."



### **I. Considering psychological characteristics among examinees during the test**

Stress and anxiety stem from fear of failing and are the factors that multiply the fraud tendency and motivation. Therefore, strategies to decrease stress and anxiety among university students are required.

#### **Colleagues' experiences**

1. "Stress and anxiety are an indispensable part of each exam we all have suffered during our education. However, a small amount of anxiety would be pretty motivating, raise the level of awareness and preparedness, and provide a better chance for more effort and learning. As a result, it may lessen the fraud motivation. Nevertheless, excessive anxiety can adversely affect normal functioning leading the helpless learner toward fraud and cheating to escape stressful situations. An irrational test may seriously multiply the senseless anxiety among learners. The number, type, and level of difficulty of test items must align with educational objectives following educational activities within the educational period. Test timing based on the type and the level of difficulty, and ease of test items is a critical issue that is often underestimated. Obviously, the time factor is not the only fraud inhibitor among learners, but irrational test time limitations may double unnecessary anxiety among examinees. A full description of the type and number of test items as well as test duration at least 48 hours prior to the exam may significantly decrease unnecessary anxiety. Poor internet connections and unexpected restrictions for uploading test items are serious test challenges out of the learner's control. Thus, it is better to take a few minutes extra (around 5 minutes). Furthermore, an alternative e-mail address to send answer sheets before the test ends may also lower the anxiety in case of unexpected and uncontrollable issues. Ultimately, this demotivates students of fraud committing."

2. "Presenting test instruction a day before the exam may help learners properly plan for their exam. Test instruction is a guide including the number, type of multiple-choice and open-ended questions, test duration, order of test items, and how to answer the items (written, audio, or video). Also, uploading a mock exam on the website may help students learn how to work with e-LMS, upload files, and manage test duration. The mock will simulate the real-time test conditions that ultimately decrease anxiety levels and fraud motivation."

3. "An accurate, comprehensive, and precise test formulation is also influential in lower stress and less fraud among learners. In particular, activation, setting test duration, learners' access to the test (from the onset to the end), and the test deadline in the electronic learning management system must be configured so that the test duration is a little longer (around some minute) than test deadline so that no one fails due to poor connection or disconnection problems. A counter showing the remaining time may effectively decrease stress in students. Also, the feedback option is a crucial fraud prevention."

#### **References**

- [1] Abou Faour, M., & Ayoubi, Z. (2017). The effect of using virtual laboratory on grade 10 students' conceptual understanding and their attitudes towards physics. *Journal of education in Science environment and health*, 4(1), 54-68.
- [2] The purpose of the present paper was to provide the empirical results of a group of faculty members' experiences in University of Sistan and Baluchestan with e-evaluation and to decrease the risk of fraud in these assessments. Some solutions reported here were obtained via e-learning experiences of these educators (colleagues) over a one-year period that effectively decreased fraud in online tests. This is a qualitative interpretative phenomenology study.

- [3] The proposed solutions included nurturing commitment and practical honesty in learners, informing students of the test rules and regulations, designing various different test items, distributing test scores in multiple tests over the semester, analytical and open-book questions, and notifying students about the possibility of obtaining guidance from educator during the test, changing student evaluation criterion, using e-LMS facilities, and considering psychological variables such as test anxiety.
- [4] Reviewing related literature reveals that the experiences provided in this paper cover a wide range of solutions and some shortcomings. For instance, [11] reviewed 20 articles to investigate fraud causes and prevention. It divided fraud causes into two classes: a. intrinsic motivations such as lack of self-confidence, poor academic performance, pride after cheating, and b. extrinsic motivation like the pressure imposed by parents and educators. This paper, focusing on the controlled extrinsic motivations and learners monitoring, introduced the use of various methods, divergent test items, oral assessments, and learners' progression as fraud prevention strategies for e-learning.
- [5] According to the literature, it is recommended to identify fraud motivations and technology (10). Reviewing experiences in the present research demonstrated that faculty members mainly proposed solutions relying on decreased fraud motivation. However, the most efficient strategy to overcome fraud is demotivation (10); to defeat fraud, the simultaneous use of fraud detection and prevention methods is required. Unfortunately, as fraud detection and prevention strategies are evolved, various new fraud technologies also appear. As a result, no comprehensive version may limit fraud levels in online tests, and fraud prevention strategies must be daily updated.
- [6] Hence, further studies are needed to propose fraud detection strategies. Most critical evaluations within the pandemic were made using e-learning systems via virtual written tests, virtual interviews, oral questions and answers over teaching, and multiple evaluations (24). Knowing the system features correctly can strengthen fraud prevention.
- [7] In addition to developing proposed strategies and solutions by updating fraud detection methods, further practical studies are needed to attain more accurate and reliable evidence of the effective proposed solutions.
- [8] Kasaian S.F, Ebrahimi R, Heidari Laghab E, Investigating Reasons of cheating in virtual education and schemes for reducing It based on new methods of electronic evaluation methods: a review study, The 9th National Conference on Sustainable Development in Educational Sciences and Psychology, Social and Cultural Studies, 2021, <https://civilica.com/doc/1239748/>
- [9] (In Persian) Farasat Maryam, Mahram Behrooz, Aminkhandaghi Masoud. A Study of the Students' Attitude Towards Cheating and the Rate of Cheating Among Them and the Predictability of Their Attitude Based on the Implemented Curriculum. *journal of educational measurement and evaluation studies*. 2017; 7(17):133-155
- [10] (In Persian) Bakhtiyari Khoei Nafiseh, Soleymani Esmaeil. Structural Equation Modeling of the Relationship Between Goal Orientation and Attitudes Toward Cheating: Academic Motivation as a Mediating Variable. *journal of instruction and evaluation*. 2019;12(46):47-63.
- [11] (In Persian) Qasemzadeh Rabeeh Sadat, Khamesan Ahmad, Rastgoumoghadam Mitra. The Perceived Role of a University Teacher Regarding Academic Morality and Preventing Cheating from Students' Points of View. *ETHICS IN SCIENCE & TECHNOLOGY*. 2020;14(4):14-22.
- [12] (In Persian) Shamsi shahrabadi, Mahmoud (2021), A report on coronaviruses and a review of new information in the definition and characteristics of Quid-19 causative virus, *Journal of Culture and Health Promotion. Academy of Medical Sciences*. forth year. Page(s) 26 To 30.

- [13] Anderson, RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet*. 2020; 10228:931-4
- [14] Fontaine, S. (2020). La tricherie aux examens : un aperçu de la recherche. *Formation et profession*, 28(1), 139–141. <http://dx.doi.org/10.18162/fp.2020.a195>.
- [15] Khamesan, Ahmad and Mohammad Asghar Amiri (2012). Investigating academic fraud among male and female students. *Quarterly Journal of Ethics in Science and Technology*. The sixth year. The first number. Page(s) 53 To 61.
- [16] McCabe, D. L. & L. K. Trevino. (1997). Individual and Contextual Influence on Academic Dishonesty: A Multicampus Investigation. *Research in Higher Education*. 38. 379-396. In: Alikhah Fardin, Bulaghi Mahdi, Yaquti Hoda. (2014). *Cheating In Exams; A Look From Within; A Study Among Students Of Guilan University*. STRATEGY FOR CULTURE fall 2014 , Volume 7 , Number 27 ; Page(s) 161 To 188.
- [17] McCabe, D. L.; L.K. Trevino. & K. D. Butterfield. (2001). Cheating in Academic Institutions: A Decade of Research. *Ethnicity & Behavior*. 11 (3). 219-232. In: Alikhah Fardin, Bulaghi Mahdi, Yaquti Hoda. (2014). *Cheating In Exams; A Look From Within; A Study Among Students Of Guilan University*. STRATEGY FOR CULTURE fall 2014 , Volume 7, Number 27 ; Page(s) 161 To 188.
- [18] Farnese, M. L.; C. Tramontano; R. Fida & M. Paciello. (2011). Cheating Behaviors in Academic Context: Does Academic Moral Disengagement Matter? *International Conference on Education and Educational Psychology (ICEEPSY 2011)*. *Procedia Social and Behavioral Sciences*. 29. 356-365. Retrieved from: <http://www.scienceDirect.com>. In: Alikhah Fardin, Bulaghi Mahdi, Yaquti Hoda. (2014). *Cheating In Exams; A Look From Within; A Study Among Students Of Guilan University*. STRATEGY FOR CULTURE fall 2014 , Volume 7 , Number 27 ; Page(s) 161 To 188.
- [19] Amini M, Parizad M, Rivaz S, Sagheb MM, Rivaz M. The Comparison of Medical Students Attitudes and Performance Regarding Different Types of Academic Cheating During Clinical Courses. *Strides in Development of Medical Education*. 2016 Feb 1;12(5):709-17. Available from: <https://www.sid.ir/en/journal/ViewPaper.aspx?id=502550> .
- [20] (In Persian) Haghghi Fahimeh Alsadat, Faraji Mehran. E-Cheating and Plagiarism as the Challenging Hidden Face of the Evaluation System of Open and Distance Education Universities and Ways to Prevent Them: THE CASE OF PNU. (JOURNAL OF INSTRUCTION AND EVALUATION) *JOURNAL OF EDUCATIONAL SCIENCES*. 2015;7(28):39-49.
- [21] (In Persian) Moradi V, Saidi Jam M . (2001). A Study of Identifying The Cheating Trend In Exams of Medical Students of Hamedan University of Medical Sciences. *Quarterly Teb Va Tazkieh*, Number 40, pp 19-23, <https://www.sid.ir/fa/journal/ViewPaper.aspx?id=13149>.
- [22] Frenette, E., Fontaine, S., Hébert, M.-H. & Éthier, M. (2019). Étude sur la propension à tricher aux examens à l'université : élaboration et processus de validation du Questionnaire sur la tricherie aux examens à l'université (QTEU). *Mesure et évaluation en éducation*, 42(2), 1–33. <https://doi.org/10.7202/1071514ar>.
- [23] Noorbahani F, Mohammadi A, Aminazadeh M. A systematic review of research on cheating in online exams from 2010 to 2021. *Education and Information Technologies*. 2022 Mar 7:1-48.
- [24] Kasaian S.F, Ebrahimi R, Heidari Laghab E, Investigating Reasons of cheating in virtual education and schemes for reducing It based on new methods of electronic evaluation methods: a review study, The 9th National Conference on Sustainable Development in Educational Sciences and Psychology, Social and Cultural Studies, 2021, <https://civilica.com/doc/1239748/>
- [25] (In Persian) Farasat Maryam, Mahram Behrooz, Aminkhandaghi Masoud. A Study of the

- Students' Attitude Towards Cheating and the Rate of Cheating Among Them and the Predictability of Their Attitude Based on the Implemented Curriculum. *journal of educational measurement and evaluation studies*. 2017; 7(17 ):133-155
- [26] (In Persian) Bakhtiyari Khoei Nafiseh, Soleymani Esmaeil. Structural Equation Modeling of the Relationship Between Goal Orientation and Attitudes Toward Cheating: Academic Motivation as a Mediating Variable. (*journal of instruction and evaluation*). 2019;12(46 ):47-63.
- [27] (In Persian) Sadeghi Abbas, Ofoghi Nader, Banapour Hamidi Mohammad Hasan, Emami Fatemeh. The Survey of Factors Related to Cheating Among Students of Higher Educational Institutions City of Rasht. STRATEGIC RESEARCH ON SOCIAL PROBLEMS IN IRAN. 2018;6(4 (19)):35-52
- [28] (In Persian) Qasemzadeh Rabeeh Sadat, Khamesan Ahmad, Rastgoumoghadam Mitra. The Perceived Role of a University Teacher Regarding Academic Morality and Preventing Cheating from Students' Points of View. ETHICS IN SCIENCE & TECHNOLOGY. 2020;14(4 ):14-22.
- [29] (In Persian) Shamsi shahrabadi, Mahmoud (2021), A report on coronaviruses and a review of new information in the definition and characteristics of Quid-19 causative virus, Journal of Culture and Health Promotion. Academy of Medical Sciences. forth year. Page(s) 26 To 30.
- [30] Anderson, RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet*. 2020; 10228:931-4.
- [31] Nguyen, Joseph G., Keuseman Kristopher J. and Humston Jonathan J. (2020). Minimize Online Cheating for Online Assessments During COVID-19 Pandemic Cte by J. Chem. Educ. 2020, 97, 9, 3429–3435, Publication Date: August 3, 2020, <https://doi.org/10.1021/acs.jchemed.0c00790>.
- [32] Nizam, N.I.; Gao, S.; Li, M.; Mohamed, H.; Wang, G. (2020). Scheme for Cheating Prevention in Online Exams during Social Distancing. Preprints 2020, 2020040327 (doi: 10.20944/preprints202004.0327.v1).
- [33] Lancaster, T., Cotarlan, C. (2021). Contract cheating by STEM students through a file sharing website: a Covid-19 pandemic perspective. *Int J. Educ. Integr* 17, 3, 2021. <https://doi.org/10.1007/s40979-021-00070-0>.
- [34] Bordas, W. (2020), Examens en ligne à l'université: quand la triche devient la norme, *Le Figaro*, [https://etudiant.lefigaro.fr/article/examens-en-ligne-a-l-universite-quand-la-triche-devient-la-norme\\_36576b08-95ff-11ea-9d8c-ecf550c3bd6e/](https://etudiant.lefigaro.fr/article/examens-en-ligne-a-l-universite-quand-la-triche-devient-la-norme_36576b08-95ff-11ea-9d8c-ecf550c3bd6e/).
- [35] Mandin, L (2021), Frauder aux examens en ligne, simple comme une annonce sur Leboncoin, <https://www.journaldunet.com/management/formation/1498211-frauder-aux-examens-simple-comme-une-annonce-sur-leboncoin/>.
- [36] Marketing, P. (2020), Comment empêcher la triche dans un examen en ligne?, <https://www.onlineexambuilder.com/fr/base-connaissances/base-de-connaissances-examens/empecher-triche-examen-en-ligne/item10616>
- [37] (In Persian) Rezaei Alimohammad, Student learning evaluation during the Corona: Challenges and Strategies. *Quarterly of Educational Psychology*, 2020; 16(55): 179-214. doi: 10.22054/jep.2020.52660.3012.



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