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EFFECT OF PROCTORING SYSTEM DURING ONLINE EDUCATION

A. Baimukhanov[1], G. Netaliyeva[2], A. Ramatulla[3], D.Yermukhanov[4] , N. Shynarbek[5]

[1,2,5]*Suleyman Demirel University, Kaskelen, Kazakhstan*

[3,4]*Zhetysu University named after I.Zhansugurov, Taldukorgan, Kazakhstan*

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Abstract

The unexpected emergence of Covid-19, as well as the accelerated transition of all students to online education, caused significant disruption for both students and faculty. Overinflated grades as a result of academic dishonesty are one of these issues. Instructors were recommended to use a proctoring system in order to reduce the number of cases of improper behavior. The goal of this study is to compare the results obtained by 4 consecutive tests that were conducted on an online platform, where the first 2 were conducted without a proctoring system, and the next 2 with a proctoring system. The results of 352 students showed that the usage of the proctoring system has led to lower test scores, longer test completion times, and greater test score variances on exams.

Introduction

The Covid-19 pandemic had a significant impact on students all throughout the world; educational facilities were shuttered, and everyone remained in limbo for weeks, if not months. All educational systems have to deal with unexpected situations as rapidly as possible and make rapid decisions in terms of changing and restructuring the teaching process to distant learning. When transitioning to distant learning, there are numerous issues to address and manage, including technology issues, discipline issues, and problems created by students' poor motivation. Academic dishonesty is another issue that needs to be dealt. Academic dishonesty, sometimes known as cheating, has long been a source of worry among academics [1]. Academic dishonesty increased dramatically as the number of online courses and the chances they provided for students increased. Plagiarism on the internet is becoming one of the most widespread types of academic dishonesty [2]. Anti-cheating software that uses ai to discern between student behavior and cheating is one of the strategies to cope with dishonesty [3]. Timothy [4] looked at the discrepancies of online tests' (non-proctored vs. proctored) results and his findings indicate the need for proctored tests. In our research we will use the same method and try find out rather proctored tests needed or not. Last decade there have been many reforms in Kazakhstan's Unified national testing. All these reforms are aimed to increase academic dishonesty. From 2021 there is a principle of "one tester – one computer – one camera" in Unified national testing. It means that students will not have any opportunity to cheat during the testing, if there will be such situations, there are ai-based anti-cheating software that can detect any non-standard actions during the testing. Also, during pandemic Suleyman Demirel University provided online classes and lectures, and also midterms

and finals held online. That was a quite big problem for all. The main problem was during examining and testing. Because it was difficult to control the students from the distance and maintain academic dishonesty. There are a few ways to catch online cheaters, but virtual proctoring is one of the most successful [5]. There are some proctoring programs that can help during the exams and tests like Remote Proctor Now (RPNow) and ProctorU. And the interesting thing is that, some students think that cheating is a normal thing. As a result, a clear definition of academic dishonesty and its consequences must be taught, defined, and clarified at the university, college, and instructors' levels. After that the usage of these types of technologies to identify academic dishonesty can be reasoned [6]. According to some research we can say that proctoring during the online exams and tests reduce the frequency of cheating. Harmon and Lambrinos [7] estimated a model to predict test scores using two online courses. One of the course's final tests was proctored by webcam and for the second course's final exam was not used proctoring system. Both classes' initial tests were not proctored. The explanatory power would be reduced if cheating happened on the non-proctored exam. Cheating was discovered during non-proctored tests, according to the findings. Students in the Karim, Kaminsky and Behrend's [8] research was randomly allocated to one of two conditions: proctored via webcam or honor coded, with two online cognitive ability assessments required. By researching samples of test-score disproportion between two groups, cheating was revealed. The use of remote proctoring reduced cheating. From these two researches we can easily conclude that using proctoring/anti-cheating software really help during online exams and test.

Methodology

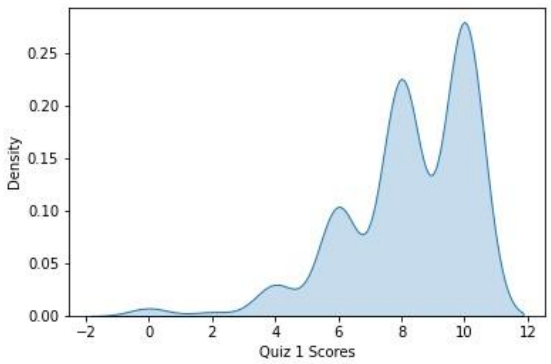
The dataset for this study includes 352 students enrolled in mathematics for computer science 1, a required course for all engineering students. This course is a prerequisite for several upper-level courses, so passing this subject is critical to success in subsequent studies because they are based on materials studied in this course. Females make up 54% of students enrolled in this course, and the average age of all enrolled students is 18.1. For this study, we administered four consecutive quizzes, the first two without a proctoring system and the next two with one. The proctoring system used in this study is the standard proctoring system used in Kazakhstani universities. Two cameras, one from a smartphone, the other from a computer webcam, and screen recording are used to monitor students' behavior during the exam. Artificial intelligence is used to identify those who are being investigated. The level of quizzes is determined by the course

instructor, and no changes in teaching methods have been made. The quizzes consisted of 6-7 questions based on the topics covered and were scored out of ten. The time limit for each quiz was 10 minutes, and the time range when students could begin the examination was 20 minutes. So, if the start time for the quiz is 12:00, the student may begin the quiz at any time up to 12:20 and spend no more than 10 minutes writing it. Table – 1 shows statistic about student scores and the time they spend writing quizzes.

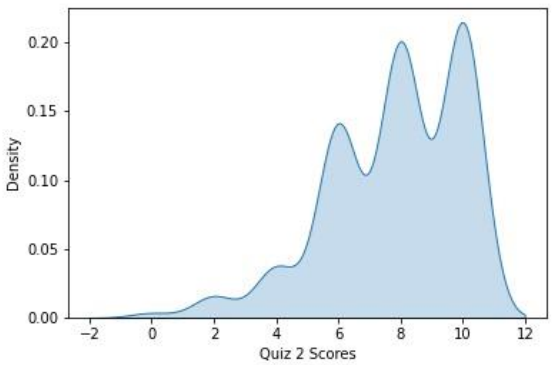
	Quiz 1 score	Quiz 1 time in seconds	Quiz 2 score	Quiz 2 time in seconds	Quiz 3 score	Quiz 3 time in seconds	Quiz 4 score	Quiz 4 time in seconds
Count	352	352	352	352	352	352	352	352
Mean	8.23	398.4	7.8	413	5.17	468.4	5.19	532.4
Std	1.99	151.1	2.13	146.5	2.26	130.5	2.6	112.4
Min	0	72	0	102	0	122	0	68
25%	8	275	6	286.25	2.86	385	2.86	515.75
50%	8	397.5	8	424	5.71	512	5.71	589
75%	10	543	10	553	7.14	593	7.14	601
Max	10	603	10	721	10	604	10	643

Table – 1

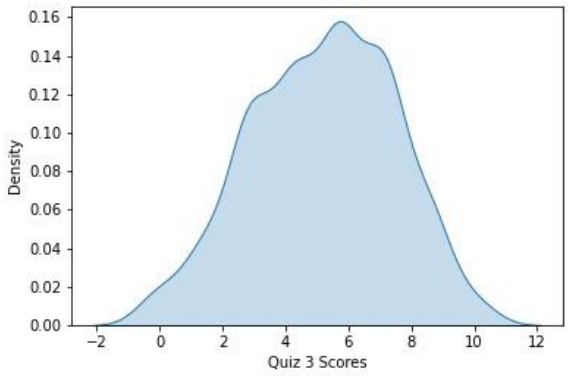
The data distribution for quizzes 1 and 2 is negatively skewed, whereas it is close to normally distributed for quizzes 3 and 4. Because we have 352 students, we expect quizzes to be normally distributed, which is not the case for quizzes 1 and 2. Graphs 1-4 demonstrate this.



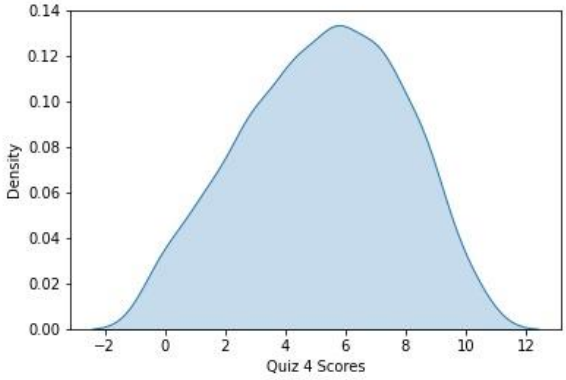
Graph – 1



Graph – 2

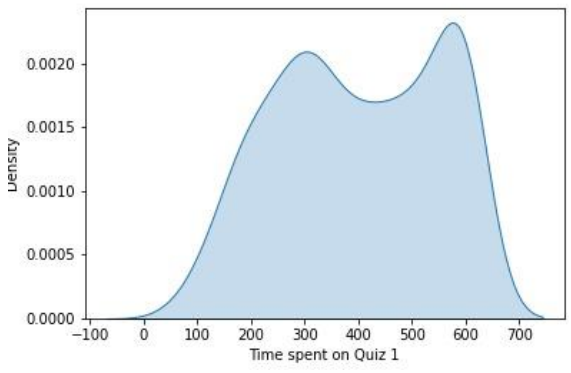


Graph – 3

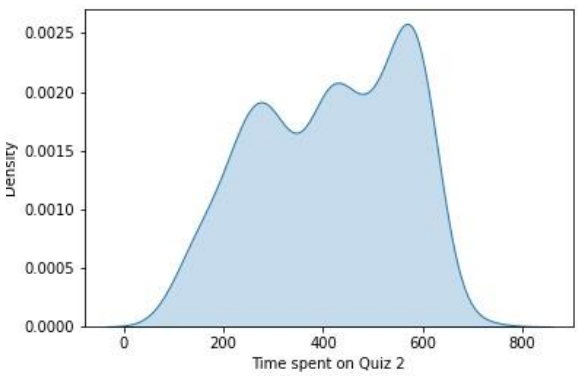


Graph – 4

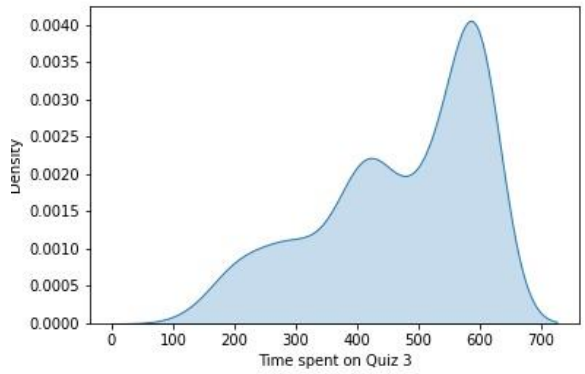
We have a different situation for the time spent on each quiz. Time spent on quizzes 1 and 2 is nearly symmetrical, whereas time spent on quizzes 3 and 4 is negatively distributed. This can be explained as a portion of students waiting for their peers to finish their quizzes in order to get answers from them. In proctored quizzes, students attempt to solve all problems on their own, taking as much time as possible. Graphs 5 - 8 demonstrate this.



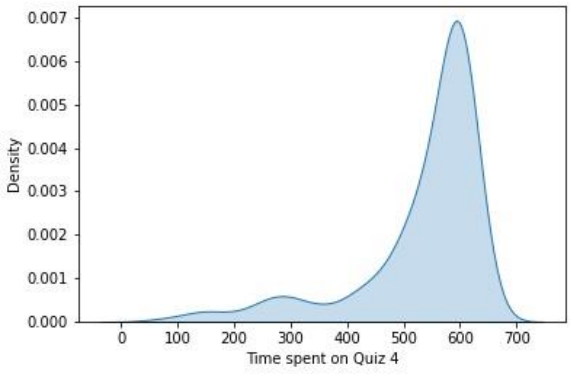
Graph – 5



Graph – 6

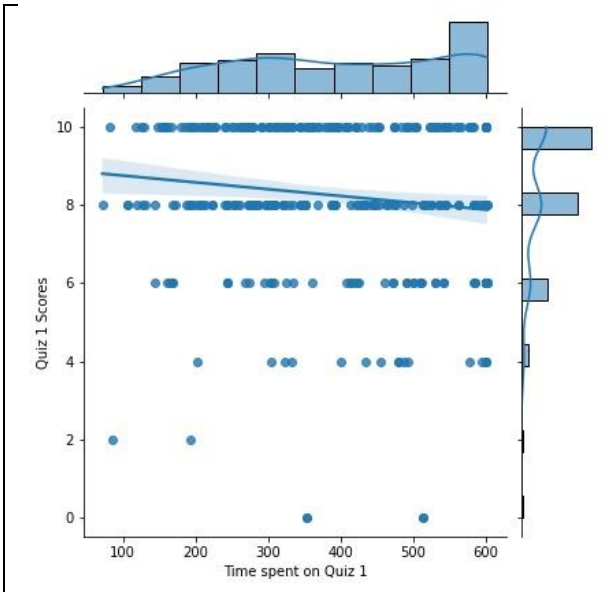


Graph – 7

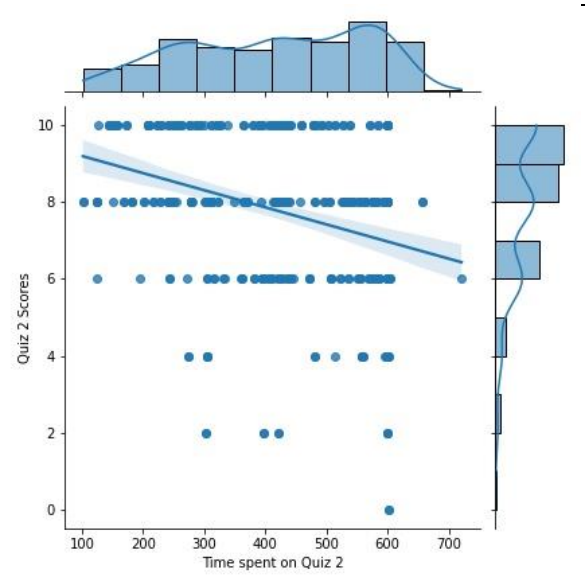


Graph – 8

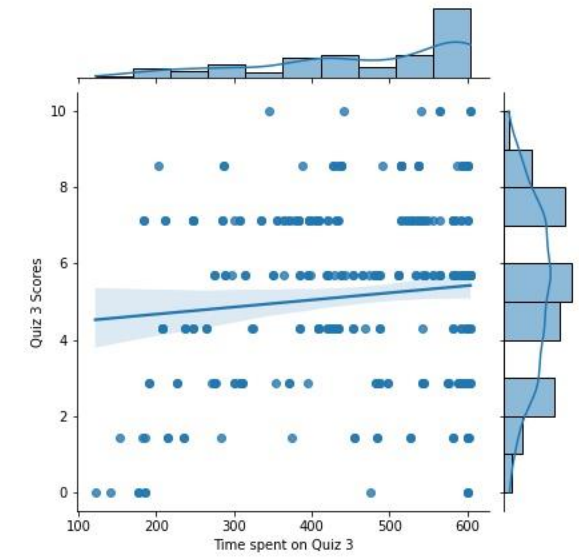
Correlations between quiz scores and time spent show that students spend less time and score higher on unproctored exams than on proctored ones. For quizzes 1 and 2, there is a negative correlation between score and time spent, which means that the less time you spend, the higher your score. The situation is reversed in a proctored examination. Quiz scores and time spent are positively correlated, which means that the more time you spend, the higher your score. Students in unproctored examinations begin their quizzes later than some of their peers, wait for answers, and finish their quizzes quickly, whereas those who do it themselves spend more time and receive lower scores, resulting in a negative correlation. Graphs 9-12 show this.



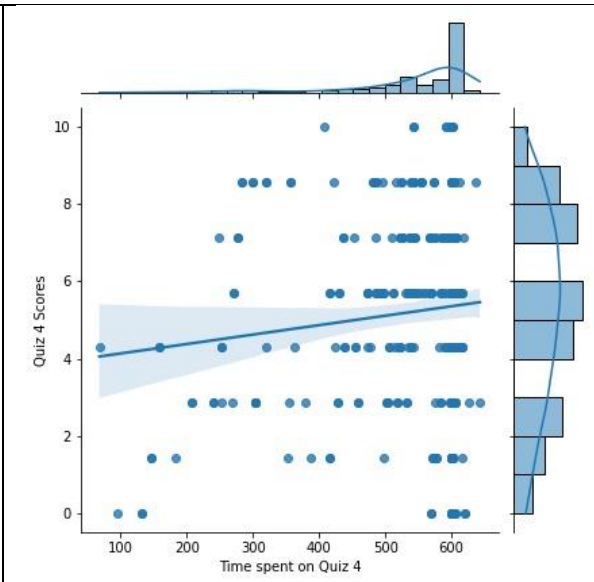
Graph – 9



Graph – 10



Graph – 11



Graph – 12

Finally, a t-test was performed between quizzes 1 and 2, as well as quizzes 3 and 4. The t-test results show that the mean of quizzes with and without a proctoring system are significantly different, with an average p-value of 9* 10 (-54). We reject the null hypothesis of similar means and conclude that the proctoring system has a significant impact on quiz scoring.

Conclusion

The proctoring system is a critical component in regulating and preventing academic dishonesty during online education. In this paper, we looked at four consecutive quizzes to see if there were any differences in mean scores between proctored and unproctored exams. We discovered that mean scores in proctored quizzes are significantly lower, while standard deviation scores are higher, and overall scores are close to normal distribution. When a proctoring system is used, the time spent on the quiz increases significantly, and the standard deviation decreases, indicating that students mostly behave in the same way. To summarize, a proctoring system is necessary to promote academic integrity among students and ensure academic honesty.

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