ACADEMIC DISHONESTY IN DISTANCE EDUCATION COURSES: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

This research study focuses on the growing concern of academic misconduct in distance education courses. A quasi-experimental study was conducted to measure the impact of introducing webcam recording software as an online supervision tool for high-stakes exams in two separate online courses (Management and Accounting). Results revealed that overall performance decreased following implementation of the software, and persisted after taking potential confounding factors into account. Additionally, the explanatory power of the regression analysis was higher for scores under supervision, which suggests that cheating was occurring before online supervision was introduced. It can be concluded from this study that online supervision is an effective tool to combat academic dishonesty in distance education courses.

Keywords: Distance education, remote learning, cheating, academic dishonesty.

INTRODUCTION

In recent years, distance learning has seen a tremendous rise (Mittelmeier et al., 2021). A lot of "conventional" universities now offer online courses or even full online degree plans because there is a continuous need for them (Pregowska et al., 2021). Educators in all kinds of institutions understand that an essential change has occurred, and that digital teaching and learning will play an integral role in postsecondary education in the years to come (Bozkurt & Sharma, 2020). Especially due to COVID, many educational institutions had to transition to virtual learning, making distance learning more accessible than ever before (Al Lily et al., 2020).

Rumble (2019) in his book explain the various aspects of distance education. According to him, distance learning often involves students accessing course materials online such as lectures, readings, quizzes and exams. It is also possible for learners to communicate with professors directly via email or through discussion boards and chats. Often it also includes the use of synchronous tools such as video conferencing and virtual classrooms for students to interact in real-time. Distance learning enables students from all over the world to access high-quality education and provides great flexibility with regards to when, where, and how they study. This makes it possible for people who are not able to attend traditional universities or colleges due to geographical constraints or financial issues, to still access a quality education.

Therefore, the debate around distance education has shifted to how best to provide online courses (Castro & Tumibay, 2021). Different elements of remote learning such as mode (fully digital or hybrid; synchronous or asynchronous) (Moorhouse & Wong, 2022), technology platform (W. Ali, 2020), assessment (Guangul et al., 2020) and access (W. Ali, 2020) are being discussed and assessed. Ultimately, the objective of this

exchange is to develop and deliver distant courses that provide students with a learning experience that at least equals that of traditional Face-to-Face (F2F) courses. As a result, the issue of how much learning takes place in distant courses compared to F2F is becoming an increasingly important point of discussion.

Questions concerning the validity of scores in distance education courses versus F2F courses often arise due to the potential for increased academic dishonesty when it comes to assessments (Elsalem et al., 2021). It is assumed that cheating may be more prevalent in distance learning compared to traditional setting (Kamble & Ghorpade, 2021). Therefore, if exam score distributions are comparable in distant education courses to a face-to-face one, it does not necessarily mean that similar levels of learning have taken place due to the possibility that the scores in the distant course may have been inflated by cheating.

Arguments have been put forward that suggest distance learning could be more prone to academic misconduct (Khan et al., 2022). This is due to the fact that it can be difficult to verify who is completing assessments in an unsupervised setting and people may use external sources of information, such as cheat sheets and online materials, when taking tests. Additionally, the lack of physical contact with a teacher may create an opportunity for collective work between students.

Despite there being evidence regarding academic dishonesty in distance learning, debate over the issue remains unresolved. This study presents evidence from a quasi-experimentation conducted in two distant education courses at a virtual university in Pakistan, where high-stakes exams were supervised using webcam recording software. As the structure and content of each course remained the same before and after the introduction of online supervision, any changes noticed in student performance can be attributed to the reduced incidence of cheating. This provides direct evidence on the extent of academic dishonesty in distance education courses.

This study is unique in comparison to existing literature since it does not involve a modality change for supervision. Previous studies have compared student performance between unsupervised online assessments and supervised F2F tests (I. Ali et al., 2022; Leong et al., 2022), however this can lead to discrepancies regarding the impact of the testing environment versus supervision itself (Crawford et al., 2020). By assessing performance in the same mode (online) with and without supervision, this avoids such issues. From a practical standpoint, in-person supervision of tests may not be feasible for fully online courses, so the results here provide evidence on how useful low-cost remote supervision is for distance education programs.

The research findings demonstrate that cheating was occurring in unmonitored exams. Analysis of the data revealed a noticeable decline in average test scores after online supervision was enacted, frequently by more than one grade. This drop held even when student characteristics were similar pre and post-supervision, suggesting selection bias was not at play. Furthermore, the results from a multiple regression analysis could not be used to explain away the decrease in marks. Lastly, when comparing the explanatory power of regressions based on student ability and maturity indicators, it was found that supervised exams had higher scores. This implies that online monitoring is an effective approach for abating cheating in distance learning courses.

LITERATURE REVIEW

Academic Dishonesty

Davis et al. (1992) has explained academic dishonesty as any type of cheating that occurs in relation to a formal academic exercise. It can include plagiarism, the fabrication of information or citations, collusion with others on assignments, knowingly using unauthorized materials during an exam and/or attempting to gain unfair advantage by misrepresenting facts relating to an academic exercise. McCabe & Trevino (1993) emphasize that academic dishonesty not only undermines the integrity of a course and the institution, but it also violates the principles of academic honesty.

Students may engage in academic dishonesty for a variety of reasons. Some students feel pressure to succeed and to get the highest grades possible (Krou et al., 2021), leading them to use dishonest tactics as a way to "ensure" success. Some students simply do not understand the rules and regulations around academic honesty (Yang et al., 2013). McCabe et al. (2001) suggest that a variety of reasons contribute to academic dishonesty, including insufficient preparation or interest, pressure to succeed, misunderstanding rules or

expectations surrounding cheating, thinking others are behaving similarly, and feeling there will be no major repercussions if one is caught. The type of dishonesty – whether it's spontaneous or premeditated – also affects which of these factors come into play.

Becker et al. (2006) suggested that academic dishonesty is a result of three major elements: incentives, opportunities and rationalization. Incentives refer to both internal and external pressures driving the student to cheat; opportunity pertains to an environment that enables cheating; while rationalization allows the individual to justify their actions as not being in violation of their beliefs or ethics. These components together form a type of fraud triangle which is used to investigate fraudulent behavior in various business contexts.

Research has looked into the impact of certain personality traits on cheating, such as the Big Five factors (neuroticism, extraversion, openness to experience, agreeableness and conscientiousness) (Giluk & Postlethwaite, 2015). Additionally, the Theory of Planned Behavior has been used to look into how beliefs surrounding anticipated outcomes, reference individuals or groups, and challenge/obstacles affect the intention to cheat and cheating behavior (Harding et al., 2007). Research has demonstrated that economic, interpersonal, and individual factors all contribute to academic dishonesty (Eshet et al., 2021). Becker et al. (2006) discovered that students under greater amounts of stress or pressure from external sources are more prone to cheating. In contrast, Day et al. (2011) found that when teaching fosters learning over competition and grades, the incentive to cheat is reduced. Lastly, Pulfrey et al. (2019) revealed that emphasizing mastery-based learning and providing autonomy can reduce instances of cheating in the classroom.

Studies have highlighted the importance of honor codes and faculty/institutional efforts in reducing the prevalence of academic misconduct (Raman & Ramlogan, 2020). A lack of well-defined rules, expectations and sanctions can result in an environment that encourages dishonesty. Thus, it is necessary to inform students about the principles of academic integrity and make sure that these are being enforced by having clear consequences for rule-breaking.

Impulsivity and a strong need for sensation may be linked to more tolerant views towards cheating, as well as an increased tendency to do it (Smith et al., 2021). On the other hand, traits such as prudence, self-control, and purpose that relate to conscientiousness might lead people to think of cheating as unacceptable and less likely to commit acts of academic dishonesty (Steinberger et al., 2021). A meta-analysis by Giluk & Postlethwaite (2015) found that two major factors were related to academic dishonesty: agreeableness and conscientiousness, with both of them having a negative effect on it.

Furthermore, research examining academic dishonesty in higher education reveals that social norms and culture can play a role. Chudzicka-Czupała et al. (2016) found that moral obligation is a key factor in predicting intention to cheat among university students across seven countries. Additionally, Orosz et al. (2013) determined that feelings of guilt and shame had a strong influence on academic dishonesty. Furthermore, Maloshonok & Shmeleva (2019) found that subjective norms - specifically, how students perceive the cheating behavior of their peers – are more influential in collectivist cultures like Russia than own beliefs. Thus, social/- subjective norms often override individual beliefs when determining involvement in academic dishonesty.

Research into the relationship between academic misconduct and student demographics, characteristics and behaviour patterns has not produced clear results (Lofstrom et al., 2015). Generally, younger students (such as freshmen) and males appear to be more likely to engage in cheating (Bertram Gallant et al., 2015); however, some research has found no effect or even an inverse relationship (Isakov & Tripathy, 2017). Lack of preparation time, lower grades, and alcohol use have all been linked to higher rates of cheating (Korn & Davidovitch, 2016). Studies have also suggested that certain academic disciplines (such as engineering and business) tend to have a higher rate of academic dishonesty, though other studies have disagreed with this position (Ramberg & Modin, 2019). Additionally, prior experience with cheating, risk-taking behavior and an emphasis on personal values (e.g. pleasure-seeking or power) can also increase the likelihood of cheating while in college (Orosz et al., 2016).

Academic Dishonesty in Online Courses

Studies examining self-reported acts of cheating have yielded mixed results. Some studies indicated that the same level of academic dishonesty existed in both live and virtual courses (Gamage et al., 2020; Hylton et al., 2016). Conversely, other research showed higher levels of cheating among online students (Corrigan-Gibbs et al., 2015; Nguyen et al., 2020). Additionally, some studies found that self-reported academic dishonesty was higher in traditional courses (D'Souza & Siegfeldt, 2017).

It has been suggested that traditional courses may be more prone to academic dishonesty due to the close social connections formed amongst students, which encourage peer pressure and collusion (Zhang & Yin, 2020). Additionally, studies indicate that those taking entirely online courses tend to be more mature and motivated than those taking both online and traditional courses, leading to lower levels of cheating being reported (Kidwell & Kent, 2008). Furthermore, Sendag et al. (2012) found that those taking entirely traditional courses were more likely to be involved in e-dishonesty compared to those enrolled in at least one hybrid or online course.

Recent surveys indicate that academic misconduct is more prevalent in online classes than in face-to-face ones (Chiang et al., 2022). Research across different disciplines shows engineering students tend to cheat more often, a tendency which may be amplified in virtual settings (Chirikov et al., 2020). Business students also perceive higher rates of cheating in the digital environment (Lord Ferguson et al., 2022). Harton et al. (2019) conducted a study and the majority of those surveyed from multiple fields at one public university view cheating and plagiarism as greater issues in the online environment. However, according to a study from Peled et al. (2019) in six US and Israeli schools, students were less likely to participate in unethical academic practices in online courses than traditional ones.

Academic Dishonesty in Supervised vs Unsupervised Exams

Research has indicated that supervision is deemed crucial in the realm of exams. Noorbehbahani et al. (2022) found that cheating was far more common in unsupervised online tests than those which were remotely monitored. Holden et al. (2021) surveyed engineering students from four universities and their results showed that students believed cheating was more permissible in an unsupervised setting. Research has revealed that cheating is a major issue in unsupervised testing environments. Harmon & Lambrinos (2008) compared the explanatory power of supervised exam scores to those taken without supervision, and found that supervised exams had higher explanatory power, indicating that cheating was likely taking place in the unsupervised tests. Arnold (2016) conducted a similar study with a large economics class, finding that student performance on supervised formative tests was more closely associated with student characteristics than unsupervised tests, suggesting cheating also took place in the latter. However, these results were not as strong as Harmon & Lambrinos's findings.

In cases where there is no obvious evidence of poorer performance in a supervised settings, other factors may lead to doubts about unsupervised circumstances. Hylton et al. (2016) compared the online exams of two different groups, one supervised by a web-based proctor and the other not monitored. Although their performance was similar, those in the unsupervised group spent more time on tests. Holden et al. (2021) had comparable findings when looking at scores from three groups of students: those taking the online unsupervised exams, onsite supervised ones, and online supervised using remote software. The results showed that although there was no significant difference in terms of performance, the unsupervised group took longer time during tests which could suggest they were attempting to look up answers. Furthermore, Golden & Kohlbeck (2020) compared the results of those who had to answer verbatim test questions with those of students asked reworded queries. Those taking the pre-set inquiries attained higher marks (by 11 percent), revealing that many were likely searching for answers on the web. The gap between the two groups was reduced when monitoring software was employed, demonstrating that this technique contains some cheating.

METHOD

This research was conducted in two online courses at one of Pakistan's largest distance education universities. The courses were Principles of Management and Principles of Accounting. Both classes had been running for some time and were taught by experienced lecturers in a fully asynchronous online environment. This study focuses on nine sections of Principles of Management (offered between Spring 2020 and Spring 2022) and ten sections of Principles of Accounting (offered between Fall 2020 and Spring 2022). The course structures, contents and exams remained consistent during the given period; however, major changes came in Spring 2021 when online supervision was introduced through a webcam recording software. This altered the way high-stakes assessments were conducted in both courses.

Prior to Spring 2021, exams in each course were composed of multiple-choice questions and would make up 45 to 70 percent of the course grade. These tests focused on one-third of the total course material, but were not cumulatively assessed. To discourage cheating, special measures were adopted such as a specific browser being used while taking the test, randomizing the order of questions and options, limiting the time in which students had to take it, and setting a time limit on its completion.

Beginning in spring 2021, the implementation of monitoring software has enabled direct observation of students during their exams, which are given in an online environment. This process includes instructions for the student along with a photograph and video recording to verify identity and surroundings. The software will then record the student throughout their test period, after which instructors will have access to the recording, as well as random screenshots. The program also provides a report to the instructor of any uncommon occurrences (e.g. reduced visibility or face recognition) and when these incidents happened.

This study utilizes two types of data. Exam scores were gathered from the instructor's records, while student demographic and academic background variables were obtained from the university's institutional research office. The additional information was collected to determine whether there was any observable change in student composition related to the introduction of online supervision, as well as for use as explanatory variables in regressions of student performance.

The literature has suggested that a student's aptitude, gender and maturation are potential factors for performance in college courses. GPA is used to indicate a student's capability (Grove et al., 2006). To evaluate this, the incoming GPA before the start of the semester was used. If this isn't available, the final semester GPA excluding the grade of the course being studied was used. Age and amount of college credit hours obtained before enrolling in the class were both utilized to determine a student's maturity, which has been associated with reduced cases of academic dishonesty.

FINDINGS

Tables 1 and 2 show descriptive details of the sample studied. The inclusion criterion was that students had to remain in the course until it concluded (i.e., they must have taken all three exams). When observations with missing information on key variables were removed, the sample size totalled 594 students (240 in Management and 354 in Accounting). The stats are organized by course and supervision status (i.e pre-supervision/spring 2021 post-supervision/spring 2021). A test of means equality is included to determine if there was a noticeable difference in sample composition following the implementation of online supervision.

Table 1 illustrates that the sample size in management who took their course under online supervision was composed of fewer females, a younger age group, and individuals with less academic experience. However, these differences were not statistically significant. The only statistically significant distinction between the two groups was that the average GPA for those who took their course under online supervision was lower than that of the pre-supervision sample (t = 2.19, p-value = .03). The results of the accounting course (as seen in Table 2) did not show any significant differences between samples with and without supervision when looking at gender proportion among students or average GPA. However, the sample group that completed the post-supervision exam was younger on average (t = 1.90, p-value = .06) and had 7 fewer accumulated credit hours at the start of the course (t = 2.50, p-value = .01).

This research is looking for dependable proof of academic cheating in online learning which transcends educational disciplines, so data from two distinct courses is being used. The majority of previously conducted

performance-based studies had results that were limited to a single area of study (or college/department) or group. The courses utilized in this inquiry are derived from two different educational streams of the university. Additionally, as Tables 1 and 2 demonstrate, despite both classes being classified as-level (for sophomores), there are clear disparities in the student profiles. Compared to the management course, the accounting class is more likely to be populated with female students, who tend to be older, more experienced (as juniors instead of sophomores) and have a higher aptitude.

Table 1. Student Characteristics (Management)

	Unsupervised			Supervised			t	P > t
	Mean	Standard Deviation	N	Mean	Standard Deviation	N		
Female	.40	.50	155	.30	.50	85	.79	.40
Age	20.50	2.10	155	20.00	1.45	85	1.10	.30
GPA	2.90	.65	155	2.69	.65	85	2.19	.03
Credit Hours	49.50	31.25	155	47.85	26.80	85	.89	.40

Table 2. Student Characteristics (Accounting)

	Unsupervised			Supervised			t	P > t
	Mean	Standard Deviation	N	Mean	Standard Deviation	N		
Female	.55	.49	231	.59	.49	123	.65	.49
Age	21.38	3.09	231	20.80	3.80	123	1.90	.06
GPA	2.90	.65	231	2.90	2.90	123	.16	.90
Credit Hours	76.80	34.00	231	69.50	34.59	123	2.50	.01

Bivariate Analysis

Tables 3 and 4 demonstrate the influence of online supervision on student performance in management and accounting courses. The tables illustrate student scores with and without supervising for each exam, allowing one to determine if cheating was occurring in the absence of supervision, as well as how effective online supervision is. The results indicate that when supervision was introduced, the performance of students in all exams decreased significantly. The median score dropped considerably, sometimes as much as over 30 percentage points, and the variability (dispersion) of scores increased due to a noticeable decrease in lower-scoring individuals.

Table 3. Score Summary (Management)

	Unsupervised			Supervised		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Exam 1	80	42	94	63	26	85
Exam 2	84	56	100	58	24	94
Exam 3	79	45	96	56	22	85

Table 4. Score Summary (Accounting)

	Unsupervised			Supervised		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Exam 1	80	68	88	75	63	81
Exam 2	84	75	93	71	62	78
Exam 3	93	84	98	77	64	82

Tables 5 and 6 show the average results and standard deviations on tests in management and accounting, respectively, with supervision. The evidence indicates that performance was significantly lower under supervision, with mean scores decreasing by between 10-20 percentage points in both courses. The greatest difference of 18.6 percentage points was seen in management, while the average difference in accounting was 13.5 percentage points - all differences being statistically significant.

The significant shift in the score distributions and the substantial decrease in average results point to the fact that cheating was likely widespread before online supervision was implemented. This goes to show that online supervision is a viable means of preventing cheating during high-stakes tests.

The changes in the score distributions and the decrease in average performance demonstrate that academic dishonesty may have been a frequent occurrence before online supervision was implemented. This implies that using online supervision has been successful in reducing cheating during significant tests. The ANOVA results strongly imply this; however, the upcoming subsection will utilize multiple regression-based analysis to further explore academic dishonesty in the courses.

Table 5. Exam Scores (Management)

	Unsupervised			Supervised			t	$P > t$
	Mean	Standard Deviation	N	Mean	Standard Deviation	N		
Exam 1	80	12.03	155	63	14.39	85	7.19	.00
Exam 2	84	12.40	155	58	16.81	85	10.05	.00
Exam 3	79	14.51	155	56	16.84	85	9.87	.00

Table 6. Exam Scores (Accounting)

	Unsupervised			Supervised			t	$P > t$
	Mean	Standard Deviation	N	Mean	Standard Deviation	N		
Exam 1	80	10.70	231	75	12.90	123	8.21	.00
Exam 2	84	11.19	231	71	13.19	123	12.29	.00
Exam 3	93	9.79	231	77	13.39	123	13.59	.00

Regression Analysis

In this paper, the regression methodology of Harmon & Lambrinos (2008) is adopted to investigate academic dishonesty among online students, as also used by Beck (2014) and Arnold (2016)this raises the issue of academic dishonesty. In the literature, a debate is waged on the prevalence of cheating in unproctored online environments. The issue is whether online exams are invitations to cheat. We add to this literature by using the Harmon & Lambrinos (2008. The model examines how test scores are affected by human capital and other student characteristics such as gender, age, class rank etc. In the context of this paper, "human capital" refers to the skills, knowledge, education, and other attributes possessed by students that contribute

to their ability to perform well academically. It looks at the impact of these variables on supervised and unsupervised tests separately, with Harmon and Lambrinos (2008) arguing that human capital should have a more pronounced effect on the former than the latter due to the presence of cheating in unsupervised settings. The R^2 statistic is employed to compare the explanatory power of both types of tests. In study, different combinations of student characteristics were used to calculate baseline regressions. Ultimately, it was determined that the only significant factors influencing performance were a student's GPA and age, while sex and credit hours earned had little-to-no effect on results.

The Goldfeld-Quandt test, developed to identify heteroscedasticity, is employed by Harmon and Lambrinos (2008) and Arnold (2016) to compare the regression results between the two conditions (with and without supervision). The aim of this comparison is to establish whether cheating occurs more often when supervision is absent, by examining if the error variances and R^2 in each of the models are significantly different.

The Chow test is utilized to analyze if the effects of human capital and age on performance have changed with the implementation of online supervision. This test checks if three variables (b0, b1, and b2) are equal to corresponding values (a0, a1, and a2) as outlined by Wooldridge (2008). The hypothesis is that if cheating took place before the supervision was introduced, then this test would be able to detect a shift in the relationship between human capital (demographics?) and exam performance as well as an increased impact of the former on the latter.

RESULTS

The data in Table 7 shows that GPA was a very significant factor in exam performance both when supervision was and was not employed. A one-unit increase in GPA on average raised the score of an unsupervised exam by half a letter grade (5 percentage points). This effect became even more pronounced with supervision, where an increase of one unit in GPA translated to an 8-percentage-point increase in exam scores.. As such, supervision allowed human capital and maturity factors to play a more influential role in determining outcomes on exams. Additionally, age had a positive effect on performance only when supervision was involved. It is thus likely that online supervision reduces cheating and allows for more accurate results.

The results of a pairwise test using the Goldfeld-Quandt method indicated that there was a statistically significant difference in error variances between supervised and unsupervised exams for Exam 2, but not for Exams 3 or the average score (p values just outside of 0.05). The Chow Test revealed that the estimated coefficients in the supervised regression were significantly different from those in the unsupervised regression (p < 0.05). This suggests that there is a structural break between the two forms of exams. The results in Table 3b regarding accounting show that higher grades are linked to improved performance with and without supervision. The impact of a one-unit increase in GPA is more noticeable when there is supervision, comparable to the data from management exams (where it is around half or three-quarters of a letter grade). Interestingly, age is found to be a factor in unsupervised exams, where older students tend to perform better than younger ones when controlling for ability.

The results of the regressions suggest that cheating may have been occurring in the accounting course before online supervision was introduced. The Goldfeld-Quandt and Chow tests both revealed significant F-statistics at 1% levels, meaning the estimated coefficients between pre- and post-supervision were significantly different. This implies that cheating may have been taking place.

Table 7 a. Regression, Management (Unsupervised)

	Exam 1	Exam 2	Exam 3	Average
GPA	5.670 *** (3.49)	5.256 *** (3.20)	4.819** (2.39)	5.250***(3.65)
Age	-.029 (.06)	-.649 (1.29)	.169 (.30)	-.170 (.40)
Constant	62.834 *** (5.70)	80.889 ***(7.20)	57.479 *** (4.25)	67.070***(6.79)
R^2	.089	.090	.041	.095
N	155	155	155	155

Table 7 b. Regression, Management (Supervised)

	Exam 1	Exam 2	Exam 3	Average
GPA	10.570 *** (3.49)	7.249 *** (2.60)	5.780** (2.00)	7.829***(3.80)
Age	2.340 ** (2.30)	2.680** (2.04)	2.950** (2.25)	2.651*** (2.80)
Constant	-9.739 (.45)	-10.459 (.39)	-21.149 (.75)	-13.781 (.70)
R^2	.263	.120	.099	.215
N	85	85	85	85
GQ Test F (71,129)	1.17	1.79***	1.30	1.30
Chow Test F (3,201)	17.59***	34.19***	30.74***	41.89***

Table 8 a. Regression, Accounting (Unsupervised)

	Exam 1	Exam 2	Exam 3	Average
GPA	5.630 *** (6.00)	4.760 *** (4.80)	3.226*** (3.59)	4.538***(6.01)
Age	.380** (1.99)	.475**(2.37)	.090 (.50)	.310** (2.05)
Constant	57.234*** (12.40)	60.790***(12.29)	77.665*** (17.35)	65.229***(17.46)
R^2	.135	.098	.046	.131
N	231	231	231	231

Table 8 b. Regression, Accounting (Supervised)

	Exam 1	Exam 2	Exam 3	Average
GPA	8.851 *** (5.70)	7.300 *** (4.40)	7.069*** (4.20)	7.740***(6.01)
Age	.091 (.34)	-.051 (.20)	-.244 (.90)	-.070 (.30)
Constant	44.502*** (6.10)	49.860***(6.40)	58.270***(7.40)	50.879***(8.40)
R^2	.180	.115	.115	.200
N	123	123	123	123
GQ Test F (149,286)	1.40***	1.40***	1.75***	1.45***
Chow Test F (3,435)	27.21***	56.60***	68.69***	78.26***

DISCUSSIONS AND CONCLUSION

As the use of remote learning accelerates across universities and colleges, administrators and educators are endeavouring to handle various matters related to it such as its quality, level of participation, fairness, availability, and legitimacy. Ultimately, they want to keep refining these elements in order to make sure that all relevant people - students, faculty members, and institutions - are happy with the teaching and learning they receive.

This paper has provided new information on one element of distance learning to improve it: academic honesty in online classes. Past research was not clear about how much cheating took place, however more

recent studies have suggested it is widespread (Golden & Kohlbeck, 2020; Norris, 2019). Compared to existing literature, this study offers several advantages. It includes two courses from the same university, making it unlikely that results are due to discipline-specific characteristics. Additionally, data was collected across multiple semesters which shows that the findings are reliable and not just a representation of one moment in time.

In order to analyse cheating, the research took advantage of a quasi-experimental design where online supervision was implemented at a certain point during the investigation. This allowed for an assessment of how performance changed before and after supervision, since there were no significant alterations in course structure, content or format. Additionally, demographic and academic data was taken into account to illustrate that there were no significant modifications in the sample size due to supervision, which would have impacted the results. This also addressed a criticism in other studies where it was difficult to distinguish between effects of supervision and assessment environment, due to comparing performance in unsupervision online tests with those done in person (Fask et al., 2014). These types of studies were also more susceptible to selection bias.

The findings of the analysis clearly point to cheating before online supervision was implemented. All exams administered in the two courses had significantly lower scores when supervised, and regression exercises demonstrated that GPA had a larger influence on scores for monitored exams than those without monitoring. These results were corroborated by various statistical tests, showing a shift in coefficient estimates and greater explanatory power for tests with supervision.

The investigation ascertained that academic deceit is a genuine concern in online courses, even with the implementation of countermeasures such as a specialized browser, limited testing period, randomized queries and answers, and a strict timer. The results further showed that cheating was rewarded with improved test scores. These findings suggest that direct supervision is likely the most effective way to shield against cheating during important online tests, with other deterrents working best as supplementary methods.

Another crucial aspect to consider is that supervision should not necessarily be implemented in a live or in-person setting for it to be an effective deterrent of academic dishonesty. Often, traditional supervision involves overseeing exams with the assistance of an instructor or delegate either on campus or at a testing center, or through remote monitoring. Unfortunately, this type of supervising is often too costly or simply not feasible for students studying online. The expenses and inconvenience associated with live supervision can thus discourage potential students from pursuing online education, as well as instructors and educational institutions that may otherwise have explored distance learning but think it lacks integrity without supervised assessments.

The findings of this research suggest that an online monitoring system, which uses webcam recording software, can effectively reduce instances of academic dishonesty. This solution is not foolproof, and neither is traditional in-person monitoring; however, its affordability and user-friendliness make it a viable option for faculty and universities looking to prevent cheating. These results should be seen as encouraging for all stakeholders.

Limitations

A few potential issues and areas for further research need to be addressed in relation to this study. It is possible that some of the decreased performance observed under supervision could be a result of increased tension or stress experienced by students when being recorded during an exam (Crawford et al., 2020). However, as current students are very familiar with technology, this impact could be minor. Additionally, the educators did not receive any responses indicating that the majority of students were anxious about the process.

This study has certain desirable features, yet there are a few limitations as well. It is possible that the student populations before and after supervision may have differed systematically in ways not taken into account by our regressions. Furthermore, it is not possible to draw direct conclusions about the effectiveness of online supervision compared to F2F supervision from this study. In order to make more general inferences, a truly experimental design with control and treatment groups should be utilized alongside a DiD analysis. Additionally, it would be interesting to observe the effects of web-based supervision over an extended period, as students become more familiar with the system and possibly modify their behavior accordingly

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