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RETHINKING ASSESSMENT BY EXAMINATION IN THE AGE OF CONTRACT CHEATING

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Abstract: In this age of contract cheating, where students are paying and using third parties to complete their work, there are many educators who are advocating a return to assessment through tests and examinations. The standard argument is usually that the level of examination security is such that the student alone is being tested and that an external body cannot be used to provide unacknowledged support for this process. Some academics seem to be have the view that the traditional type of assessment by examination is valued by employers more than coursework. However, opponents of assessment through examination note the restrictive form of this type of assessment, that many examination papers focus mainly on recall and memory and that examinations provide little opportunity for students to develop extended arguments and portfolio pieces. Assessment through examination does not seem to be the sole solution to contract cheating.

This paper builds on previous work, mostly published in the form of presentations and blog posts, that looks at the methods of contract cheating that have been used in an examination setting. It includes examples of student contract cheating requests used in an examination scenario, including several taken from a collection of over 30,000 contract cheating requests developed by contract cheating detectives during their investigative process. Examples covered demonstrate susceptibilities in the way that many examinations are set and invigilated. These are vulnerabilities that leave exams open to external cheating and which need to be closed. An issue is particularly noted with examinations taken online and outside of a traditional supervised environment. Even within an invigilated examination, external support can be provided through new technologies, including smartwatches, cameras and earpieces. These allow a student to communicate to someone hired through a contract cheating process and operating outside of an examination room.

The paper argues that assessment needs to continue to evolve to ensure that this is secure, fit for purpose and ensures that a student who is cheating cannot receive a qualification that they do not deserve. It is stated that the use of mixed modalities of assessment is necessary to ensure academic integrity and authentic assessment now needs to be at the forefront of this process. Practical considerations for academics setting examinations are discussed in the paper to ensure that good practice is fed back into the classroom.

Key words: Contract cheating; examinations; student cheating; academic integrity

1 The Challenge of Contract Cheating

The research into contract cheating, the behaviour where a student uses a third party to have work completed for them, or attempts to use such a third party, has primarily focused on the solicitation of coursework in the form of essays, reports

and other written assessments. In this age of contract cheating, a sizeable industry of companies and individuals preparing work for students has been shown to exist (Hersey & Lancaster 2015). This industry aggressively markets their writing and assignment production services to students. Indications suggest that contract cheating is a profitable endeavour for all of those involved with the process (Lancaster 2016). Contract cheating also represents a serious breach of academic integrity.

Student requests to have work completed for them through a contract cheating process are not generally observable by researchers. The first research specifically naming contract cheating as a behaviour looked at requests posted by students on a freelancing website (Clarke & Lancaster 2006). This research discovered a group of students habitually buying their work and therefore bypassing the learning that they would be expected to complete as part of the assessment process. Studies in the economics discipline have shown that students are willing to commit contract cheating where they feel that the rewards outweigh the risks (Rigby et al 2011). Indications are that external workers can be hired to create work for students that is completed quickly and for a low price (Clarke & Lancaster 2013, Wallace & Newton 2014).

Studies looking at larger number of assignments purchased from such contract cheating services have suggested that work capable of obtaining high marks can be purchased (Lines 2016). Despite this observation, quality is not always of a consistently good standard. Such quality can vary from one company to another. Even within the same company, quality can vary between writers and assignments.

A longitudinal investigation of contract cheating services suggests that the student body is becoming increasingly savvy when making requests to have their work completed (Lancaster & Clarke 2016a). For instance, students may use essay mill websites where the assessments requested are only shown to registered and approved writers. The use of private providers means that contract cheating detectives, those people actively searching online for requests to outsource student work, cannot report these cheating attempts to others.

Directly detecting contract cheating has been a long-standing battle for academics. Pre-Internet discussions of the risks associated with essay mills date back to at least the 1970s (Stavisky 1973). They identified the concerns that academics had about the sector back then. In the modern world, students are finding new ways to solicit original work and evade detection. Students can make offline arrangements with writers, for instance through family members or the contacts of their peer group. Students may also find willing writers in the form of private tutors who are known to be sympathetic to the needs of struggling students. Perhaps because of these challenges, the literature on contract cheating seems to be moving away from a focus on detection. Many academics are now advocating alternatives to detection, including exploring academic integrity issues with students as a positive and beneficial part of their identity.

A related area in the age of contract cheating looks at how such academic misconduct can be discouraged. Preventative measures design to make contract cheating more difficult have been widely explored in the literature (Lancaster & Clarke 2007, Lancaster & Clarke 2016a, O'Malley & Roberts 2012). Many preventative suggestions focus on assessment redesign, including a move away from the traditional essays which contract cheating service providers seem to base their staffing and marketing around. Some

alternative assessment types for consideration include work simulations, authentic assessments, presentations, class debates and tutor discussions. These types of assessments meet a wider recommendation that has been encouraged in the literature to ensure that students can be shown to have been actively involved throughout the production of their assessed work.

The use of examinations to make contract cheating more difficult has also been previously suggested, although this approach is not without its own challenges (Lancaster 2014). Proponents to examinations may argue that these are more of a test of a student's memory than their subject ability. In areas where students need to develop a portfolio of completed work to assist with their future employability, for instance computing, examinations do not afford students that opportunity. Examinations are traditionally themselves susceptible to student cheating, for instance where a student conceals notes before an examination and looks at them during the examination. Further, and as this paper will affirm, a whole industry has been established that enables students to cheat using technology. Such technology includes new and novel ways of using the services offered by contract cheating providers

This paper primarily uses a case study approach, providing examples of where students have requested help for their examinations and tests online, or where individuals and companies have advertised and provided such help. Since such cheating represents a situation where a student attempts to solicit a third party to help them obtain an undue advantage over their peers, this can be considered a form of contract cheating. The definitions used for contract cheating do appear to vary across the literature, but this definition is in keeping with the overall flavour of how this phrase is used and applied.

As with all work based on contract cheating, there are inherent challenges with how thoroughly this subject can be researched and presented. There is much scope for a comprehensive study of contract cheating and how frequently this happens when examinations are used as a form of assessment. Such a study would be difficult as researchers and detectives working in this area are limited by the information that is directly observable. Since there appears to be much successful contract cheating that tutors are never aware about, this cannot be directly reported in this paper. Instead, the cases selected are intended to give a flavour of examination oriented contract cheating and to help tutors to consider if their assessment process makes them susceptible to students receiving marks and academic qualifications that they do not deserve.

This paper builds on ideas related to contract cheating in examinations that have been presented at conferences, but not formally published. Slide sets are available from those presentations (Clarke & Lancaster 2016a, Lancaster & Clarke 2016b), as are screencast videos produced to bring the ideas to a wider audience (Clarke & Lancaster 2016b, Lancaster & Clarke 2016c). The paper extends on those previous presentations by more formally considering the different contract cheating behaviours that can be observed during examinations. It also provides new illustrative examples of such cheating that have been observed online.

2 Contract Cheating Requests That Have Been Observed Online

2.1 The types of contract cheating requests that can be observed

Since contract cheating services are difficult to detect, when used well, it will likely never be possible to present a formal quantitative analysis of this type of cheating. Despite this challenge, much can be gleaned about the possible behaviour of students by looking at the marketing methods that contract cheating services are using online, along with the associated advertisements.

This section of the paper looks specifically at two main categories of contract cheating that are relevant to examinations. These categories are:

- Requests made by students for them to hire a third party to directly take their examination or to provide direct assistance during this process
- Third parties offering to complete an examination as if they were a student or to
 provide that student with substantial support for the examination taking process.
 Offers to provide this assistance can be found posted on their own websites, on
 classified sites, or through offline medium such as on university noticeboards

The second category of examples is further subdivided to identify three main types of help offered by third party sites. All these types of help may constitute contract cheating when these services are misused. These three types of help are:

- Direct offers made by third parties to act as a conduit while they take an examination, either through directly replacing the student in the examination, or by communicating the information that the student needs to provide their answers to them
- Offers made by third parties to prepare students to take examinations in a manner which may give them an unfair advantage over other candidates
- Technology sold or hired to students to students by third parties to provide the student with an advantage during their examinations. Such technology may be directly linked to an external third party providing a student with support

This section illustrates the wider threats to educational standards posed by these types of cheating through a range of examples.

2.2 Requests by students to hire a third party to complete an examination or test for them

In some cases, it appears that students actively set out to look for ways to cheat during examinations. Table 1 shows a set of illustrative examples of the type of requests made by students online. In each case, an illustrative fragment of text is also included. The wording used by students has not been changed and errors are based on those appearing in the original requests. In some of the examples, the wording has been constructed by the students. In others, the student has taken the assignment details provided by a tutor and has posted those.

Many of the examples in Table 1 are taken from an agency website, connecting those people requiring tasks to be completed with freelancers looking for such work. These

Table 1 Examples of observed requests for contract cheating in examinations posted online

Observed Location	Example Text of Request
Classified site (craigslist.org)	"I need someone to take CPA Ethics test for me Local CPA candidate has no time to study; will PAY you to take the ethics exam for me!"
Classified site (craigslist.org)	"looking for students who are willing to take a intro to physics exam for me it it fairly simple. I will be willing to pay you \$170-\$2,000 if you can and maybe a little bonus if I get a good grade!!"
Agency website (freelancer.com)	"I study MSc Management and Finance and I have 2 referrals which are Accounting&Economics and Operation. Therefore, I have to re-work both exams as an assignment to achieve an overall pass at commendation"
Agency website (freelancer.com)	"There will be exam on The Medieval History during 2 hour and half, I need an academic essay about the topic that instructor will provide. I need to essay in 2 hours."
Agency website (freelancer.com)	"Mathematics Exam You should have whats App or skype or facebook to help me Integration Calculus Infinity Here is final exam past papers"
Agency website (freelancer.com)	"This is a take home exam. Your work should be your own. Do NOT consult members of the class in writing your exam."
Agency website (freelancer.com)	Exam on operation management "4) From there, you can click 'assignments' and then 'take a test' I am looking to have weeks 1,2,3,4,5 exams being completed. Like I said in the initial post, if these work out I may be interested in paying additional to have some quizzes completed."
Agency website (freelancer.com)	"Numerical Reasoning Test for a Job Entry These numerical reasoning tests contain questions that test your knowledge of Ratios, Percentage Increase/Decrease, Cost and Sales Analysis, Rates and Trends, and Currency Conversions."

examples form part of a wider collection of over 30,000 contract cheating requests by students collected by the one of the authors during their role as a contract cheating detective.

The examples show some students who appear to be directly looking for a third party to replace them in an examination hall. Other examples concern students looking

for help with tests that are taken online. These examples demonstrate that there are students who are planning to cheat in advance, having a third party on standby and ready to supply work at the exact time of an examination.

The cases presented also demonstrate a situation where a student has arranged an online chat connection to receive help during an examination. It is unclear if this examination was taken on a computer, where the student would have had to have a chat window running without this being spotted by an invigilator. Alternatively, the student may have used a separate device, such as a mobile phone, to undertake these online chat discussions.

Coursework style assessments have been previously shown to be susceptible to contract cheating and this observation continues to appear to hold true based on the examples shown in Table 1. In one case, a student is asked to redo a failed examination in their own time and without supervision. In a second case, a student is given a "takehome examination", essentially an unsupervised examination taken over a period of several days.

A further trend is identified with a candidate for a job looking for assistance with a test taken during the selection process. This demonstrates that cheating is not reserved to the classroom and extends into other areas of life. Similar requests have been previously observed for other functional types of tests, for instance both practical and theoretical driving tests, as well as for English language certifications often needed as the criteria for a non-native speaker to enter university study.

In all the examples in Table 1 taken from the agency website, the students making the request received multiple offers of help. They also exchanged money for the service being offered. In the absence of further information, it appears likely that their attempt to cheat was successful.

2.3 Third party offers to compete tests and examinations for students

Although one group of students appears to actively advertising for people to help them cheat, there are many more advertisements offering cheating services for those students who are otherwise more passive in their approach. The advertising of such services is of concern. These may also encourage students who would not otherwise have considered cheating to do so.

Table 2 shows examples of the types of third party offers that have been made to students. These have been collected from classified sites and from sites set up specifically to help students have entire courses completed for them without such cheating being detected.

The offers identified in Table 2 suggest that courses taken entirely online are particularly susceptible to cheating. Many of these online courses still seem to want to use tests as assessment methods even though there is no physical invigilator present to check that students do not cheat.

There are companies that offer remote invigilation services to support online assessment. The way in which these services work varies, but some claim to monitor a student through their webcam, for instance. Based on the offers in Table 2, such remote invigilation services appear to still be susceptible to contract cheating.

Observed Location	Example Text of Offer
Classified site (craigslist.org)	"No time for online quizzes and tests. You don't have time to complete your online quizzes and tests? We can complete your quizzes and tests. Just send us login access either question on email and we will help you with all your quizzes and tests for all subjects."
Classified site (craigslist.org)	"I TAKE THE STANDARDIZED TEST FOR YOU. **Any Subjects: math economics accounting statistics"
Web site service (noneedtostudy.com)	"We have the best tutors (ones who have without a doubt taken the test you want taken many, many times)."
Web site service (onlineclasstutors.com)	"Our anti-proctor solutions cover a wide variety of features, from countering IP based geo-location to browser fingerprinting and more."

Table 2
Examples of observed offers of contract cheating for examinations posted online

Previous research has found that it can be easy to beat the protection offered by examinations taken with Bring Your Own Devices (Dawson 2016). It appears likely that similar techniques would also work for online tests, with very little in the way of sophisticated technical knowledge required. Indeed, one of the companies listed in Table 2 advertises that they have methods available to defeat the protection offered by remote invigilation services.

Although the examples in Table 2 focus on offers to help with online tests, there are also mechanisms through which a student can hire a third party to physically take their place during an in-person examination.

For instance, one media source discusses an impersonator for hire who it is said has been paid to sit multiple in-person examinations at universities in Australia (Potaka & Huang 2015). Similar stories are sprinkled throughout the international media. This suggests that the techniques being used within education to verify the identity of candidates are not sufficient. In some cases, it appears that no such verification takes place at all.

2.4 Third party offers to prepare students for examinations and tests in a manner that may constitute assistance beyond that which is acceptable

The literature on contract cheating in essays and written assessments has identified a grey line between contract cheating services and those private tutors and proof readers who state that they will take a draft completed by a student, then they will edit and improve upon this. It is always unclear how much work remains from a student using one of those services that is their own and what volume has been contributed by the hired support.

A similar question of academic integrity also exists for students electing to take advantage of the online services offering test and examination support. An example of the exam support services offered by a well-known UK essay writing service (ukessays.com) is indicative of services that are widely available and is summarised in Table 3.

Table 3
Examples of exam support services offered by an online service

Type of Exam	Example of Advertising
Seen exam	"Seen exams are a special type of exam where you are given the question in advance—you must prepare an answer and learn it. When the exam comes around, you must reproduce your answer and demonstrate that you understand the question in full. With our 'seen exam' option, you'll receive a fully written exam answer."
Exam Notes	"Just tell us the topic or area which your exam is about, how you would like your notes to be delivered (e.g., bullet points, brief sentences, short summaries) and if you require references in the notes. We'll then find a qualified writer in your subject area to produce high-quality written notes to aid in your exam preparation."
Exam Answer	"Just provide our expert with your question(s), choose the style of answer you require and whether or not you need references, and we'll show you how to ace the exam!"

Within the set of services suggested by the essay writing firm and shown in Table 3, seen exams are clearly of concern. Such examinations allow a candidate to pay for, receive, rote learn and regurgitate the answer to an examination question, thus bypassing the learning process entirely.

Other services offered appear to be taking advantage of the inherent weaknesses in the ways in which many examinations are structured, where certain questions are repeated on a cyclic basis, or very similar questions are sometimes used in a mock examination and a real examination. Although this is a grey area, requesting notes or answers could be said to be providing an unfair advantage to those students with money to spend.

For a service specialising in contract cheating, offering examination support appears to be a clever marketing move. The company acquires a new customer who they can then promote their main essay writing support towards. In a similar move to how the services offered by some proof readers operate, it may be worth considering if the analogy of a "gateway drug" is appropriate for essay mills that are offering examination help services.

2.5 Third party offers to directly support students during an examination or to supply technology designed to allow students to acquire such support

An alarming method of contract cheating has been observed whereby students can hire a third party to verbally provide answers to them during an examination (Glendinning et al 2017). Students in South East Europe have revealed that adverts for services offering to help them cheat during examinations are common and that they believe that other students use such technologies.

In such cases, a typical method of operation is as follows. The student makes a payment to hire a mini earpiece, which is concealed within their ear during an examination. A third party, situated outside the examination room, communicates with the student through the hidden earpiece. The student then transcribes the answers given onto their examination script. It is not clear how the third party finds out what questions they are providing help for, but a variety of cheating technologies have been previously observed to allow such communication, including hidden cameras and microphones.

Since a student is directly paying a third party to provide answers to them during examinations, this can be considered a further example of contract cheating.

The use of earpieces is just one example of the types of cheating technologies available by students to hire or purchase to help them with examinations. The use of cheating technologies is clearly not acceptable, although there is a wider question to be addressed by the academic community regarding where this constitutes contract cheating and where this represents other types of academic misconduct.

Figure 1 shows examples of technologies offered using the search term "cheat exam" on a popular online marketplace (ebay.com) in March 2017. These were selected as illustrative of the range of products available out of 207 results obtained for the search term.

Adverts to supply concealed earpieces dominate the 207 results obtained during the search. These earpieces appear either as individual items or as part of packages that also include extended transmitters. Companies offering earpieces also appear to be making substantial numbers of sales, with the product shown in Figure 1 having 81 reported customers from one advert alone.

Other technologies available for students to purchase that have been widely reported include hidden cameras, for instance as concealed in buttonholes or pens, as well as smartwatches and devices that look like calculators but on which solutions can be stored. Some smartwatches are specifically sold as "cheating watches" with screens that appear blank unless special glasses are worn. A variety of transmission devices are available to extend the reach of earpieces, microphones and cameras for when mobile phones are banned, concealed in apparent credit cards, pens and even customised underwear.

The majority of the products presented in Figure 1 appear to have relied on advances in technology for their development. Some cheating devices offered are more simplistic in design. For instance, would-be cheats can purchase a pen with a roll-out paper section of which notes can be written or printed in tiny fonts and concealed. This suggests that there is a continued need for a close watchful eye on students during the invigilation of examinations.

For many of the technologies shown, including the mini earpieces, there are also offers listed on the site to sell the products in bulk. One advert offers 100 earpieces items shipped as a single order. It appears likely that mini earpieces are being regularly used in examinations, but are very rarely detected.

It also bears noting these examples show the products available on only one site. Similar items are available worldwide on other similar sites, including through major



Figure 1. Examples of exam cheating technology available for purchase on a popular online marketplace

players in the e-commerce trade. There are also specialist manufacturers working on and advertising their own advances in cheating technologies.

The following quote, pulled from one such site manufacturing cheating equipment, attests to this continuing challenge:

"Our engineers are working hard to develop a camera that helps you cheat on tests. The camera will be available soon."

3 Further Considerations and Recommendations

This paper has raised issues regarding the security of examination processes in respect of the modern world in which some students engage with contract cheating.

There are several examination formats that appear to be particularly susceptible to academic misconduct, including:

- Unsupervised paper-based examinations (taken in an educational environment)
- Unsupervised paper-based examinations (taken outside an educational environment—these include assessments such as take-home examinations)
- Unsupervised electronic examinations (taken in an educational environment)

- Unsupervised electronic examinations (taken outside an educational environment)
- Supervised examinations (taken in an education environment, assessed using electronic medium)
- Examinations for which questions are made available to students in advance in order that they can prepare

This listing of formats is neither intended to be complete, nor comprehensive. Some of the formats listed may overlap.

Observations suggest that careful training of tutors is needed regarding how they can assess which types of examinations are most appropriate for students and how high quality examination questions can be set. These papers need to be fair and thorough enough to allow students to demonstrate differential levels of knowledge and ability. They also need to avoid the formulaic question style as well as the reuse of questions which makes them susceptible to learned solutions.

Care needs to be taken to avoid examinations that are really coursework assignments in a disguised format. Take-home examinations are one such example. Some proponents of take-home examinations have suggested that setting a coursework with a short time-period for completion may not allow students enough time to commit contract cheating. Such an approach has been disproved elsewhere in the literature. It has been demonstrated that contract cheating agency sites are able to support requests made at short notice (Wallace & Newton 2014). They also have the capacity to fulfil these requests many times over. More traditional essay mills also advertise short turnarounds times, often on the same day, albeit at an inflated price. Setting an assessment with a short timeframe for completion simply disadvantages those students who would wish to reflect more on the assessment and deliver work to a higher academic standard.

The identity of candidates taking examinations needs to be carefully verified. This means that more than a cursory look at identification is needed. Checks may need to go beyond simple verification of photographs, to include fingerprint scanning or iris scanning. Examinations without invigilation should not be considered culturally acceptable. They are simply providing students with the temptation to cheat.

Issues also exist where examinations are taken using a computer and close monitoring of student identity and their use of the computer is not undertaken. There are particular risks that have to be considered here for courses that are taught entirely online. Here, there are services advertised that promise to impersonate students from the course start to end. There are also challenges in a computer lab, where students who are not carefully monitored can directly communicate with the outside world. It may that close scrutiny and recording of student screens is needed. This alone is not sufficient. Invigilation in the traditional style is still needed, watching students carefully and focusing on their movements and any unusual behaviours that they are indicating.

Wider studies are needed to consider the effect of technology on examination cheating. Measures do need to be in place regarding the appropriate items that are allowed to be taken into an examination room. Some universities now require students to place watches in plastic bags. There is also a movement to supply students with pens, calculators and other necessary equipment during an examination rather than

to allow them to bring in their own equipment. It will be difficult to ever find a complete solution that reduces all possible types of cheating, even if examinations represent a partial solution. Since there appear to be academic integrity issues with all types of assessment, this gives some credence to the idea that a varied diet of student assessment is needed.

The professional accreditation world has good practice to offer regarding how to set secure and differential examinations that are taken on a computer under supervised conditions. Examples are available of the questions for these examinations are set through a carefully verified process, with randomised questions continually graded for difficulty and to decide how many marks they should award based on the performance of a whole cohort of candidates (Murphy 2014). Higher education does now seem to considering the future employability of its students as a much more integral part of course design that it used to do. This means that exposing students to the style of examinations that they may be required to take as a professional could also be of more widespread use.

Other stakeholders may need to be considered as part of the wider efforts to prevent contract cheating. The argument has also been put forward that essay mills and contract cheating services are the enablers of fraudulent activities (Draper et al 2017). Attempts are being made worldwide to address contract cheating through legal frameworks, all with varying levels of success. The question does need to be asked if a similar approach, based around a tight legal framework, can be developed. Action could then be taken against those companies and individuals who are helping students to cheat in examinations.

There have been positive moves towards working with students as partners to prevent contract cheating. A series of contract cheating awareness events have taken place internationally. Many students have expressed their disgust that this type of cheating happens. A similar student movement to enforce the need for useful and balanced assessments and clearly defined examinations may be another step that is worth considering.

Finally, a cautionary note. The world of contract cheating and examinations is not just reserved to students. As part of their observations of agency sites, the authors have observed several requests posted by tutors. One memorable example saw a tutor ask people to bid to compile a new examination paper for them. They also provided examples of what the style of the examination paper should look like. Since a payment was made, it appears likely that this examination paper was successfully delivered and a new academic contact made. It is not known how the final examination paper turned out, or if it was used in a real or mock examination setting.

The case presented of a tutor themselves using a contract cheating service ties in well with the examples of requests and offers scattered through this paper. This all showcases the need for tutors to lead academic integrity by example. The fact that many examinations are so open for students to cheat on and for third parties to answer questions reinforces the need for tutors to reconsider the formulaic nature of many examination papers. In this age of contract cheating, poor examination paper practices are an area which companies have demonstrated time and again that they are both willing and able to exploit.

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