

On The Decision to Cheat.....or...The Market for Essays

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Abstract

We investigate the willingness of university students to buy essays provided by commercial writers. Students due to submit assessed coursework are presented, within a choice experiment, with essays of differing price and grade and characterised by differing risks of detection and associated penalties.

Half of the sample reveal a willingness to buy. The willingness to pay for essays is significantly affected by the essays' grade, price, risk and penalty and rises to £307 for 1st class essays. The valuations of the illicit essays decays as risk and penalty increase, and is significantly affected by the students' risk preferences.

1. The issue and contribution of the Paper

Plagiarism is a growing problem in the Higher Education sector. The problem is so pervasive that the personal statements submitted by students as part of their UCAS application are now systematically checked for plagiarism¹. The precise scale of the plagiarism problem is only imperfectly understood because of the illicit nature of activity – only a proportion of those cheating are caught, plagiarisers are reluctant to reveal their behaviour to researchers and Universities are often reluctant to publicise the scale and severity of the problem among their students.

As we explain in this paper, the nature of plagiarism is changing; detection systems and patterns of plagiarism are co-evolving. The most significant development regarding plagiarism detection in recent years has been the widespread adoption of the *TurnItIn*

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¹ In 2006/07 234 UCAS personal statements featured a childhood incident, which was the catalyst for their subsequent passion for science, in which the applicant accidentally burnt a hole in their pyjamas.

scanning system. Now used by over 90% of UK Universities, *TurnItIn* scans submitted work against a database of over 8 billion pages of content to identify matches between sections of submitted work and archived material.

While this system may deter some potential plagiarisers, they also have the option of adaptation. One such form of adaptation is to shift away from a ‘copy and paste’ approach to plagiarism toward the ‘contract cheating’ market. This market provides bespoke, original material which will not be identified as plagiarised by *TurnItIn*.

The information available about this illicit but growing industry is patchy and nearly all concerns the supply side of the market. *The Guardian* newspaper reported in 2006 that plagiarism problem was “compounded by the booming industry of websites which are selling tailor-made essays, some at £1,000 a time.” (October 17, 2006). The market in online plagiarism was estimated to be worth £200m in 2006. One well known ‘Essay Bank’ company (UKEssays) is reported to have 3,500 specialist writers with a turnover in 2005 of £1.6m.

This paper investigates the contract cheating market. More specifically, it investigates the demand side of this rapidly growing market. We report the results of research conducted with students at 3 UK universities into the willingness to buy, and willingness to pay for (WTP), original essays written by third parties.

The research was conducted using choice experiments in which students were offered essays which systematically differed in terms of their price and quality as well as the risk of detection and the penalty if caught. This approach allows us to identify the proportion of the sample who are prepared to buy essays, and how this willingness to buy is moderated by the grade of the essay and its price. We identify the WTP for essays of varying quality and how these valuations decay as the risk and penalty associated with purchase are increased.

We use the respondents choices between offered gambles to estimate their individual-specific relative risk aversion (RRA) scores. We find that these RRA values significantly affect their WTP for essays under different risk & penalty regimes.

2. Plagiarism and Detection

The verb to plagiarise is derived from the Latin *plagiarius* meaning ‘kidnapper, seducer, plunderer’ and is currently taken to mean “to take the work or idea of someone else and pass it off as one’s own”.

There is a dizzying array of reports on the extent of the plagiarism problem in Universities. The Guardian reported that 25% of students admitted to some degree of plagiarism in a 2004 national survey. A 2008 survey of 1000 students at Cambridge University found its way on to the front pages of newspapers when it found that 49% of the students surveyed had plagiarised, with the figure rising to 62% among Law students. The same survey reported only 1 in 20 were caught. In the UK 3 factors have been identified as exacerbating the growth in plagiarism². The expansion of higher education which means that students from more diverse backgrounds with a wider range of skills are now enrolled accompanied by a greater orientation on the final degree outcome than the learning process. The introduction of fees and removal of grants which has increased financial and hence time pressures on many students, many of whom work through their entire University course. The ever increasing range of material available online makes it harder for staff to recognise plagiarised material.

The form of plagiarism investigated in this paper is the use of commercial providers of intellectual material. The extent of the use of such providers (colloquially known as ‘essay mills’, ‘essay banks’, ‘code banks’) is not, or only poorly, understood by many academics. Historically detection of plagiarism was left to the individual marker. Detection may have occurred because of similarities between the work submitted and material publicly available, contrasts of style and/or quality within the submitted work or across submissions by a student.

However the growth in student numbers makes this formation of expectations about particular students by a marker increasingly difficult and so this mode of detection becomes less feasible. In addition, even where such expectations are formed the use of anonymised marking systems means that identifying a discrepancy between the expectation/experience of quality and that found in submitted work is increasingly infeasible. The very trends in Higher

² <http://www.jisc.ac.uk/whatwedo/programmes/plagiarism/archive/detection.aspx>

Education which are leading to greater levels of plagiarism are also undermining the classical means of detection.

The introduction and adoption of the *TurnItIn* system has changed this situation. The *TurnItIn* scanning system, endorsed by JISC, allows submitted work to be uploaded and scanned against an extensive database of material (webpages, work submitted at other universities, etc). The ‘Originality Report’ generated serves to highlight cases which warrant further attention. This system has been adopted by over 90% of UK Universities, however the use of this system is extremely uneven within and across departments, Faculties and Universities.

The use of *TurnItIn* is likely to have a deterrent effect on those who would otherwise copy and paste material into their work (as long as they were pasting from a source held within the *TurnItIn* database). In addition it is likely to be effective in identifying cases where students have used an essay, or part thereof, obtained from an online archive of previously submitted material, ie material not written to order.

However the use of *TurnItIn* is ineffective against the submission of original material obtained from commercial providers such as essay banks. There has been a proliferation of websites and companies offering essays written to order. The turnover of these companies in 2006 was estimated to be £200m and is thought likely to have grown rapidly in the period since. A JISC Plagiarism Advisory Service (JISCPAS) survey found that 11% of students thought that “buying an essay from a ghost writing service” was common.

We now describe the nature and growth of this industry in a little more detail before outlining the empirical research into the demand for its outputs.

3. Contract Cheating

The term Contract Cheating was coined by Clarke and Lancaster (2006, see also 2007, 2008) to refer to the situation where “a student gets someone else to do an assignment for them and then hands it in as their own work”. Their original interest was a particular form of Contract Cheating in which students posted details of the coding work required on the internet (using

sites such as rentacoder³) and programmers made offers of the fee necessary for them to provide the required code. These providers have feedback from previous buyers shown on the site (in a style similar to that on *eBay*). Once an offer is accepted payment is held (escrowed) and released once the work is delivered to the buyer. Contract Cheating is now the term used also to describe the more typical situation in which students simply place an order for an assignment of a given level (eg 2nd year UG), of a given length (eg 1500 words) at a given standard (eg 2(i)) to be delivered in a given period (eg 3 days) at a fixed price.

This is a market with many particular and interesting features. It is an illicit market and one in which there is strong information asymmetry. In most cases it is very difficult for the novice purchaser to discern the quality of the product that will be delivered (if any is delivered at all). The sites and companies continually reinvent and rebrand themselves and time spent in online forums on these issues indicate students struggling to identify “quality” companies or complaining about having been “ripped off” by a particular site. There are also forums in which writers discuss the same issues, identifying problem companies who have not paid them for work they delivered. This suggests that many or most sites are scam operations where the buyer receives nothing, or a piece of work of an unacceptably poor standard. Bizarrely there has even been an attempt to provide a “quality assurance” mark for such essay banks via the *EssayFraud* site whose stated aim was “protecting students from foreign essays and coursework fraud”.

The crucial point about the Contract Cheating form of plagiarism is that if the work is provided from a “reputable” company and is therefore original then it will not be detectable using *TurnItIn*. Indeed in another twist to the story some of the major providers of such bespoke essays post their completed essays online when they discover the buyer used a stolen credit card to defraud them. The intention is that the essay they provided then becomes susceptible to *TurnItIn* and the fraudster will be caught.

The evidence that exists regarding the scale of the Contract Cheating problem mainly comes from the supply side. Data exist on the number of companies and the turnover of some of them. There have been interviews with writers for and managers of such companies indicating the scale of the industry. There is very little information on the demand side. This

³ <http://www.rentacoder.com>

is partly because of illicit nature of the good purchased, but also, we suspect, because of the extremely low levels of detection for work sourced in this way. In the course of this research we have heard anecdotal evidence regarding how Contract Cheating cases have come to light. They have mainly involved another student reporting the offender to the authorities, although we have heard of a small number of more bizarre cases⁴. These cases have not been the result of systematic detection procedures to identify possible Contract Cheating cases and we believe there is a significant volume of undetected Contract Cheating work being marked at UK Universities.

The research reported here is concerned with the demand for coursework provided by Contract Cheating organisations. It represents a first foray into this area to analyse the decision to buy such material and how this decision is affected by the price and quality of the work and how the valuations of such coursework are affected by the risk and penalties associated with its submission, as well as the characteristics of the buyers themselves.

4. Study Approach & Design

Much of the research that has been done previously with students on the decision to cheat has been quite routine in terms of the analytical approaches employed. For example asking students if they have in the past committed various acts, whether they know other people who have, what their perceptions are of the extent or seriousness of these behaviours. The Appendix summarises the approaches and findings of some of the key papers in this field

The research reported here uses choice experiments to address students' willingness to buy essays. More specifically it investigates whether students willingness to buy an essay is affected by the essay's price, grade, the risks of being caught and the associated penalties. Similarly we seek to identify the proportion of students who are unwilling to buy an essay no matter how the price, risk etc vary.

A more basic issue being investigated in the research was whether we could induce any student to reveal information in this regard given that it might be considered as embarrassing or incriminating. A uniform response of 'not willing to buy' might have been the truth or

⁴ Such as the case where a student's bank statement showing payments to an essay bank site came into the possession of the student's University

simply an artefact of the fear of incrimination. The choice experiment approach used in the study is now briefly explained before the empirical results are presented and discussed.

Choice experiments originate from the conjoint techniques developed in marketing (Green and Rao 1971) and are now widely used in economic analyses of, *inter alia*, health (Ryan *et al.*, 2008), agricultural (Burton *et al.*, 2001) environmental (Bateman *et al.*, 2008) and transport (Hensher *et al.*, 2005) issues. Their theoretical underpinnings date back to Lancaster (1966) and consumer theory where the value of a product can be decomposed into the sum of the values of the product's attributes. This theoretical framework was effectively operationalised with the development of random utility theory and associated statistical models of choice (McFadden 1974)

Respondents in choice experiment survey are presented with repeated choice situations. Each choice (it may be a product, a policy scenario, etc) is comprised of a series of attributes. By (systematically) varying the levels of these attributes the choices presented are varied. Respondents are not asked to report how much they prefer an alternative, nor how much they value changes in the level of a particular attribute, they are merely asked to identify which of the options they prefer.

In this case students were asked to consider essays which differed in terms of the 4 attributes shown in Table 1 (price, grade, risk and penalty).

Table 1. Attributes and Levels

Attribute	Levels
Essay grade	1st class, 2(i), 2(ii), 3rd class
Risk of being caught	None, 1/1000, 1/100
Penalty	None, 0% for module, Repeat the year
Price	£100, £50, £75, £25

With sufficient responses across a sufficiently wide range of choice situations, one can analyse the implicit weight given to attributes and their levels in the choices that have been made. Further, one can analyse how the attributes are traded off against each other in the choices made. For example, we expect potential buyers to prefer cheaper essays, and to prefer better grade essays. A particular question of interest is how the price they are prepared to pay increases as the grade improves and falls as the risk or penalty increase.

An example of a choice set presented to the students is shown in Table 2

Table 2. An example choice set.

	Buy Essay 1	Buy Essay 2	Buy Essay 3	Buy None of Them
Price of Essay	£50	£100	£75	
Risk of Being Caught	1 / 1000 chance of being caught	1 /1000 chance of being caught	1/100 chance of being caught	
Penalty if Caught	0% Mark for the Module	Repeat the Year	0% Mark for the Module	
Essay Grade	2(ii) Mark	2(i) Mark	1 st Class Mark	
What option would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Clearly here are many thousands of possible combinations of these attribute levels which would generate different essays and choice sets. The ‘best’ combinations to use in practice

are the focus of much research in the experimental design literature which has flourished in recent years (Street *et al.*, 2005, Scarpa and Rose 2008). In this study the 4 attributes were combined into 2 blocks each of 8 choice sets in a design maximising D-Efficiency (Scarpa and Rose, 2008). Each respondent was presented with one block of 8 sets.

The students recruited into the study were always presented with a “buy none” option: they were never forced into buying an essay. The None option raises a critical issue regarding the recruitment of students into study of this nature. Some students are expected to always choose the None option, whether that be for ethical reasons or because of a fear of choosing to buy (whether that be in reality or within the survey context). However, for those who will consider the purchase, then a critical issue is what the “buy none” alternative will mean for them. That is, the student will consider what will be involved if they decide not to buy and instead write the essay themselves. Consequently it is necessary to ask the participating students for a prediction of the grade they would receive if they completed the work alone. This then defines the none option for each individual: an essay of a predicted grade with zero penalty, risk and price.

This will vary across students and across courses/modules. A student might be prepared to buy an essay for one course unit in which they struggle, but not in a unit in which they excel. This means that the research into the willingness to purchase needs to be conducted regarding specific course units, it can not be meaningfully done in a generic setting. This makes the collection of data considerably more burdensome, and we explain more about the recruitment process for the study in Section 5.

The questionnaire used in the study comprised 5 sections:

- I. demographics and educational past
- II. students views and experience of plagiarism, education about plagiarism and their perceptions of levels of plagiarism
- III. students assessment of a series of educational malpractice behaviours in terms of (i) how often they had engaged in the behaviour, (ii) their assessment of the seriousness of the behaviour
- IV. the choice experiment tasks
- V. a series of paired gambles

The last section warrants some explanation. We wanted to explore whether individual students' attitudes to risk would affect their willingness to buy and, more specifically, would affect how they viewed the risk and penalty associated with purchase. The gambles served to elicit information which could be later analysed (see Section 7) to provide a measure of each individual's degree of risk aversion.

The paired gambles were of the form shown in Figure 1

Figure 1. An example gamble choice.

Game A

20% chance of £4	80% chance of £3
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OR

Game B

20% chance of £8	80% chance of £0.20
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Enter your choice (A or B) here:

I want to play Game ____

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The students were simply asked to choose which of the games they preferred to play (A or B). There were 8 such paired gambles with the % chances of winning varied within them. At the end of the survey, 1 of the 8 paired gambles was chosen randomly to be played out, the outcome was determined via a roll of electronic dice and the students were paid out accordingly. In addition to allowing us to measure the risk preferences of each respondent, the game provided a means by which to compensate the students for their time in attending the session (c.40 minutes).

5. Recruitment & Sample

As explained above, to make the choice situations as realistic as possible they had to be presented with respect to a specific piece of work that was due to be submitted not long after the survey was conducted. The process conducted at the 3 universities⁵ was to identify a 2nd/3rd year module which had a piece of coursework due which accounted for a significant proportion of the unit's final mark. Then, with the approval of the unit lecturer, students were recruited to attend the survey/experiment which was held 2-3 weeks before submission was due. At this session the precise purpose and format of the survey was explained and students given the opportunity to leave. It was made clear that the research was unequivocally based on confidentiality, and had been approved by the University of Manchester Research Ethics Committee on that basis.

Recruitment was conducted in Autumn 2008/ Spring 2009. Given the need to identify a suitable unit, get the permission of the relevant lecturer, circulate the recruitment letters and then run the session this was a difficult and time consuming recruitment process. In total we recruited 90 students to the sessions.

This was split unevenly across the 3 universities. The students were a mix of Humanities and Science students. There were 51 male and 39 female students and all but 1 were in the 18-24 age range. For 18 of the 90 students English was not their first language. The students came from a broad range of educational backgrounds asked in terms of the type of institution at which they had taken their exams before coming to their current University, as shown in Table 3

Table 3. Educational Past of the Sample.

Pre-University Educational Establishment	Nos	%
UK State School	17	18.9
UK Independent School	27	30.0
UK Selective Grammar School	7	7.8
UK FE College	16	17.8
UK Higher Education Institution	7	7.8
Any Non - UK Institution	15	16.7

⁵ Identified here only as Universities A, B and C

Other	1	1.1
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6. Results I - Attitudes towards, and experiences of, plagiarism & cheating

All but 2 of the students participating indicated that they had been informed about the policies regarding plagiarism and cheating.

Responses to a question about their perception of the frequency with which plagiarism occurred at their University are shown in Table 4. Over a third of the sample thought that it occurred “often” or “very often” at their University.

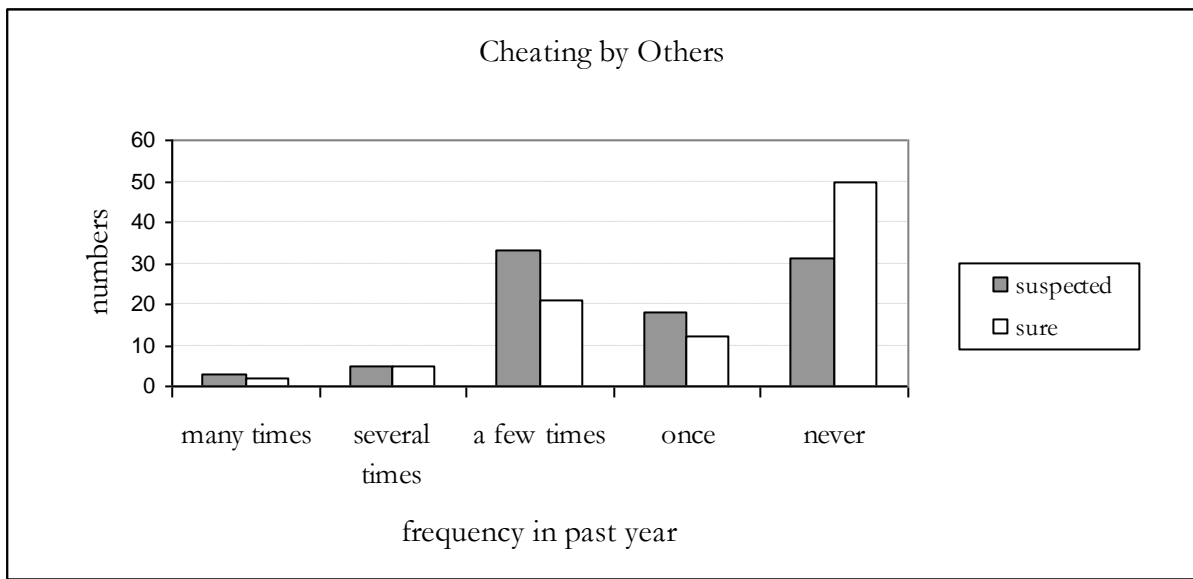
Table 4. Perceived frequency of plagiarism.

“frequency with which plagiarism occurs at your University”	Nos	%
very seldom	18	20.0
seldom	40	44.4
often	30	33.3
very often	2	2.2

The students were asked more about their perceptions about the prevalence of cheating. They were asked how frequently in the past year they had ‘suspected’ a student they knew of cheating. They are then asked the same question but this time asked how frequently they had been ‘sure’ someone they knew had cheated. As Figure 2 indicates, two thirds of the students had suspected a fellow student cheating in the past year, and 45% reported that they had been sure of such cheating on one or more occasion. 37% reported having suspected cheating “a few times” while this figure was 23% for those who had been sure of the cheating.

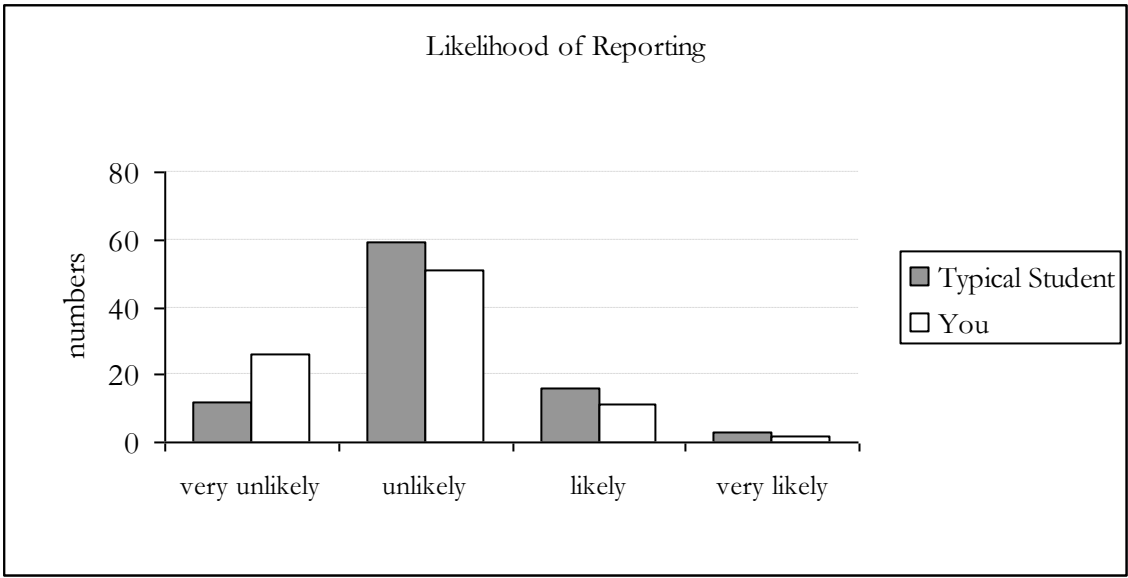
Despite the prevalence of such suspicions (or stronger) of cheating only 1 of the 90 students indicated they had ever reported a fellow student for plagiarism.

Figure 2. Perceptions of cheating by others in the past year.



This issue of willingness to report was further explored by asking respondents about the likelihood of a student reporting another student that they suspected of plagiarism. This question was asked in terms of (i) the respondent themselves, (ii) the typical student. As shown in Figure 3 86% thought it “unlikely” or “very unlikely” that they would report such a student, while the figure was 79% for the ‘typical student’.

Figure 3. The likelihood of reporting.



These (low) levels of willingness to report students who are suspected of, or known to be, cheating are particularly significant for the Contract Cheating issue given the difficulty of identifying material sourced in this way as plagiarised by other means. Universities are heavily dependent on students reporting but these results do not suggest a culture of reporting offenders. Ten of the 90 students interviewed knew of someone who had bought one or more essays online. In each of the 3 universities where we surveyed the number was non zero, with 4/29, 5/46 and 1/15 students indicating this at universities A, B and C respectively.

We now turn to the results from the choice experiment.

7. Results II – The Choice Experiment

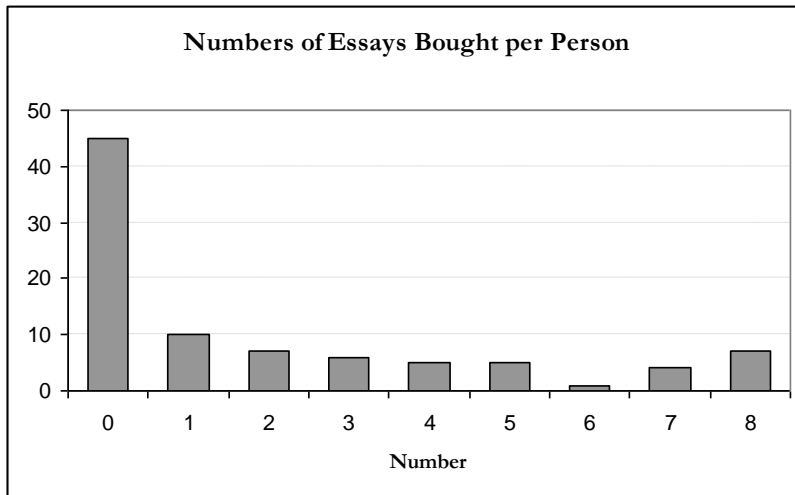
Each of the 90 respondents was presented with 8 choice sets, leading to 720 choice occasions in total. Initial analysis concerns the numbers of respondents who chose to buy an essay on one or more occasion (as opposed to those who choose “buy none” on each occasion). We find that 50% of the sample indicated they would have bought one of the essays offered on one or more occasion. This 50% proportion of “buyers” was stable across the 3 universities (Table

Table 5. Essay ‘purchasing’ patterns.

	University			
	A	B	C	Total
Buyer?				
No	13	24	8	45
Yes	16	22	7	45
Total	29	46	15	90

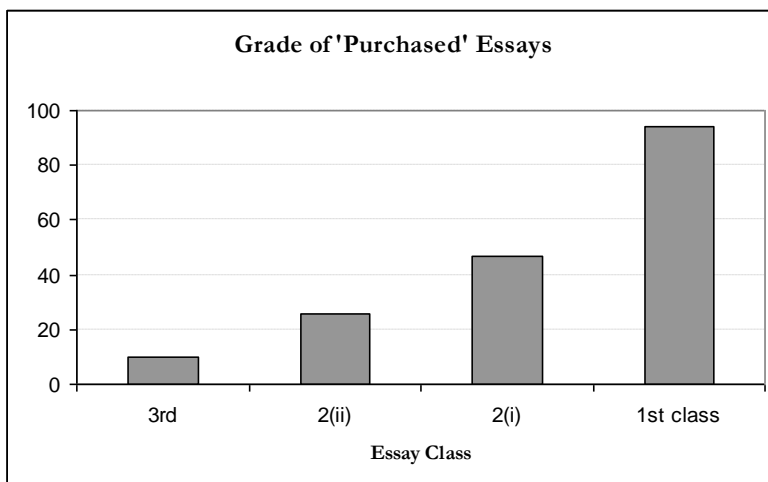
The frequency of ‘purchase’ was variable across the sample, with 7 indicating they would buy on each occasion.

Figure 4. Essays ‘purchased’ per person.



Overall, the ‘buyers’ chose to purchase rather than complete their own essay in 177 of the 720 situations. As one would expect, and is shown in Figure 5, better quality essays were chosen more frequently with 1st class essays most often bought [94/177]. However 2(i) grade essays [47/177], 2(ii) essays [26/177] and some 3rd class essays [10/177] were also bought.

Figure 5. Quality of the essays ‘purchased’.



Next we formally analyse the decision to buy essays within the survey employing random utility approach. The central idea driving the analysis of choice experiment data is that people choose the option they prefer. Formally, the approach is based within the framework of Random Utility Theory which contends that consumers choose the alternative that yields

the greatest utility to them and hence the probability of selecting an alternative rises as the utility associated with them increases.

The utility to consumer i from option j comprises a deterministic (observable) component (v_j) and an unobservable or stochastic component (e_j):

$$U_j = v_j + e_j \quad (1)$$

In this case the utility for person i from essay j is given as:

$$U_{ij} = \text{Grade}_j + \text{Risk}_j + \text{Penalty}_j + \text{Price}_j + e_j \quad (2)$$

This approach is made operational in the conditional logit (CL) model (McFadden 1974) with a linear utility function and a Gumbel distributed error term. The probability of respondent i selecting essay j from N options can be expressed as:

$$\text{Prob}(Y_i = j) = \frac{\exp\left[\lambda \sum_{k=1}^K \beta_k X_{kj}\right]}{\sum_{j=1}^N \exp\left[\lambda \sum_{k=1}^K \beta_k X_{kj}\right]} \quad (3)$$

where Y_i is a random variable denoting the choice made and X_k ($k=1, \dots, K$) are the choice attributes. λ is a scale parameter which is inversely related to the variance of the error term ($\lambda = \pi^2 / 6\sigma^2$, where σ^2 is the variance of the error term). This scale parameter is typically normalized to one (although there is a great deal of current research into the validity of this assumption and into the impacts of deviating from it, see for example Louviere and Eagle, 2006).

We now present results from a series of conditional logit models which become progressively more complex. We start from a simple model on attributes and then manipulate the risk and penalty attributes before finally allowing individuals' risk preferences to modify the marginal

utility derived from essay attributes. Of particular interest is the willingness to pay for essays of differing quality and associated with differing risks and penalties.

We start from a simple conditional logit model on attributes shown in Table 6 All the coefficients are significant and have the expected sign: essays of higher grade are more likely to be chosen, as are essays which are cheaper, and associated with lower risks and less stringent penalties.

Table 6. A simple conditional logit model on attributes – all universities

	Coef	Std. Err	z	P>z	[95% Conf. Interval]	
price	-0.013	0.003	-3.76	0.000	-0.020	-0.006
grade	0.786	0.072	10.9	0.000	0.644	0.927
risk	-1.141	0.196	-5.81	0.000	-1.526	-0.756
penalty	-0.919	0.179	-5.14	0.000	-1.270	-0.569
none	-1.307	0.521	-2.51	0.012	-2.328	-0.286

ll= -494.26792
N=2880

The ‘none’ term is an alternative specific constant (ASC). Such ASC’s are used when the utility associated with an option derives in part from the ‘collective identity’ of the option over and above that derived from its attribute levels. In this case a dummy variable takes a value of 1 if the option is the ‘buy none’ option, and zero otherwise.

The estimated coefficient on the none ASC is negative and highly significant, implying that there is a tendency to select one of the purchased essays more than one would predict based on the attributes levels alone. Recall that the none option is, in each of the 8 choice sets faced by an individual, defined as an essay with zero penalty, risk and price and the individual’s predicted grade for the work. The negative coefficient on the none ASC reflects the fact that

this option is chosen less frequently than the zero level of its price, risk and penalty imply. The zero levels of these attributes make it appear a more attractive option than the choice patterns observed. There is however an attribute not included within the dataset which is the workload associated with non purchase. The none ASC is picking up some of this effect: not buying is less attractive because you have to do the work yourself.

In the model in Table 6 the assumption is that the marginal utility associated with the attributes is common across participants at the 3 universities. Tests of this proposition reveal that while this assumption holds for Universities A and B, the preferences of the students at University C are markedly different. The models presented hereafter exclude those 15 students from University C, meaning the sample is reduced from 90 to 75 students.

We show the results of the conditional logit model on attributes with University C excluded in Table 7. A similar pattern is evident with changes in the attributes' levels having the expected impact on the probability of an essay being chosen.

Table 7. A simple conditional logit model on attributes – Universities A & B

	Coef	Std. Err	z	P>z	[95% Conf. Interval]	
price	-0.013	0.004	-3.410	0.001	-0.020	-0.005
grade	0.761	0.077	9.880	0.000	0.610	0.912
risk	-1.294	0.216	-5.990	0.000	-1.717	-0.871
penalty	-0.764	0.190	-4.010	0.000	-1.137	-0.390
none	-1.301	0.564	-2.310	0.021	-2.407	-0.195

ll= -421.19593
N=2400

To facilitate a better understanding of the role of attributes in the choice process we next combine the risk and penalty attributes. The rationale for this is that the risk attribute itself has little intuitive meaning if there is no penalty if the offender is caught, and vice versa.

Therefore we create combined risk-penalty dummy attributes (*rp*) which take the values shown in Table 8.

Table 8. A combined Risk-Penalty Measure

Risk	Penalty	rp
If either risk or penalty is zero		rp0
1/1000	0% for the module	rp1
1/1000	repeat the year	rp2
1/100	0% for the module	rp3
1/100	repeat the year	rp4

We present a model in Table 9 in which this combined risk-penalty attribute (*rp*) is introduced in levels, with zero risk-penalty as the baseline. The grade attribute is also introduced in levels with a 3rd class essay as the baseline. The none ASC is dropped from this specification because of collinearity issues. The sequence of magnitudes of the marginal utilities are consistent with expectations (and indicate that respondents appearing to be weighing up the attributes' levels when making their choices). The magnitude of the sequence of disutilities from more stringent risk-penalty regimes are consistent: $MU_{rp1} > MU_{rp2} | MU_{rp3} > MU_{rp4}$. Similarly the marginal utility of a 1st Class essay exceeds that of a 2(i) which exceeds that of a 2(ii) essay.

Table 9. A conditional logit model on attribute levels

	Coef	Std. Err	z	P>z	[95% Conf. Interval]	
price	-0.009	0.004	-2.30	0.021	-0.017	-0.001
rp1	-1.132	0.356	-3.18	0.001	-1.829	-0.434
rp2	-1.575	0.300	-5.24	0.000	-2.163	-0.986
rp3	-1.961	0.277	-7.07	0.000	-2.505	-1.418
rp4	-3.611	0.432	-8.37	0.000	-4.457	-2.765

Grade_2(ii)	1.483	0.310	4.79	0.000	0.876	2.090
Grade_2(i)	1.915	0.303	6.33	0.000	1.322	2.508
Grade_1 st	2.767	0.317	8.72	0.000	2.144	3.389

ll= -413.84131

N=2400

The economic value of any the change in the level of any attribute is given by the ratio of the attribute's marginal utility to the negative of the marginal utility of the cost term. Hence WTP for an improvement in the grade of the essay purchased is given by $\beta_{\text{grade}}/-\beta_{\text{price}}$.

Hence the model in Table 9 reveals implicit WTP values for essays of increasing quality⁶ (assuming a zero risk/zero penalty) of:

Grade	WTP
2(ii)	£164
2(i)	£212
1 st class	£307

An immediate question when considering these implicit valuations is how they compare with the prices observed in the market. The problem that arises when trying to evaluate this is that, as discussed in Section 2, many/most of the prices one observes online for essays are from companies which will deliver nothing or deliver virtually worthless material. However the equivalent prices observed on some of the more 'reputable' sites were £101, £135 and £270 respectively. The implication is that the WTP of these students exceeds the marginal cost of provision: a requirement for the market to exist.

These WTP values are those in effect at the baseline (zero) level of the risk-penalty regime, ie the values associated with a zero risk and/or a zero penalty. One might well argue that the given the use of anonymised marking systems and large student cohorts within which to 'hide' the essay that the effective risk is indeed close to zero. We now explore how these valuations decline as the risk-penalty regime becomes more stringent.

⁶ The equivalent valuations when University C is retained in the sample are £102, £172 and £247, however tests reject this pooling of the data.

Given the attributes in the model the utility from, for example, a 1st class essay under the first non-zero risk-penalty regime (rp1) is given by:

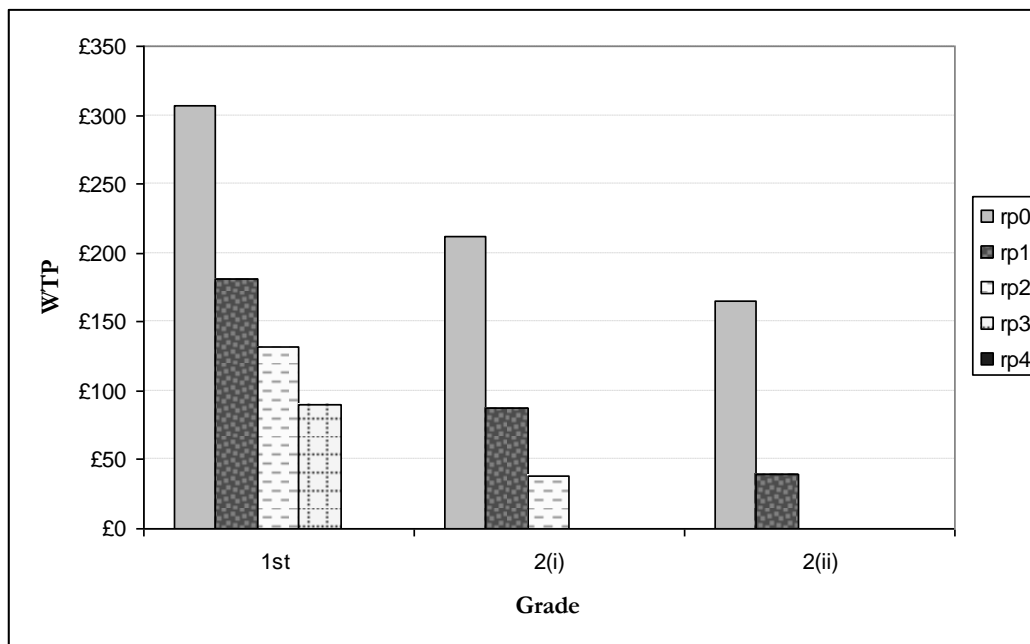
$$\beta_{1stClass|rp1} = \beta_{1stClass} + \beta_{rp1} \quad (4)$$

and the WTP for such an essay is given by:

$$WTP_{1stClass|rp1} = (\beta_{1stClass} + \beta_{rp1}) / -\beta_{price} \quad (5)$$

The effect is that the marginal utility, and hence the WTP, for an essays degrades as the risk-penalty regime within which it is being purchased and submitted becomes more stringent. If the disutility from the ramping up of the risk-penalty regime is sufficiently large then eventually the WTP for an essay of given grade will fall to zero. Figure 6 shows the decay in the WTP as the risk-penalty regime changes. The WTP falls to zero (or less) for all essay grades under the toughest regime (rp4: 1/100 chance of detection & repeat the year if caught). This zero value is reached also for a 2(ii) under rp3.

Figure 6. The decay in WTP as risk-penalty increases



The final extension to the model incorporates personal characteristics to moderate the utility derived from changes in attribute levels. One could include demographics, educational background, or attitudinal characteristics. At present we limit ourselves to only one characteristic: the individuals' risk preferences.

As explained in Section 4 participants in the survey were asked to choose between pairs of gambles of the form shown in Figure 1. They were presented with 8 such pairs. These data represent a new choice dataset: respondents are choosing between 2 options which differ in terms of their expected payoff and the associated variance. This allows estimation of a risk aversion coefficient for each individual. Pratt's risk aversion coefficient is defined as:

$$p_{i,j} = \frac{U''(w_i)}{U'(w_i)} \quad (6)$$

where $U(w_i)$ is the utility function conditional on wealth (w_i), and $U'(w_i)$ and $U''(w_i)$ are the first and second order derivatives of the utility function. Given a fair gamble (j) with variance σ^2 then the amount that individual (i) will pay (p_{ij}) to take a fair bet is:

$$p_{i,j} = \frac{r(w_i)}{2} \sigma_j^2 \quad (7)$$

A negative value of p_{ij} would signify that the individual is risk averse, and would need to be compensated to take a fair bet. In order to estimate the risk aversion coefficients we proceed as follows: first, define $U_{i,j}^*$ as the expected utility (conditional on wealth of individual i) of the gamble j with expected payoff μ_j and variance σ_j^2 . We assume that the expected utility of Gamble j to individual i is of the form:

$$U_{i,j}^* = \alpha_i \left(\mu_j + \frac{\tau_i}{2} \sigma_j^2 \right) \quad (8)$$

For a certain payment p , $\mu_j = p$ and $\sigma_j^2 = 0$. Therefore, the utility derived from a certain payment is:

$$U_i^* = \alpha_i p \quad (9)$$

For a fair bet(j), $\mu_j = 0$. Therefore:

$$U_{i,j}^* = \alpha_i \frac{\tau_i}{2} \sigma_j^2 \quad (10)$$

The individual's certainty equivalent ($p_{i,j}^{ce}$) (the amount they would pay to play or be compensated for playing a fair gamble) is where $U_i^* = U_{i,j}^*$. This requires that:

$$p_{i,j}^{ce} = \frac{\tau_i}{2} \sigma_j^2 \quad (11)$$

Thus, from (7) and (11) we can see that τ_i in (8) represents the estimate of the risk aversion coefficient. The parameters of expected utility function can be estimated by adding an error term $e_{i,j}$:

$$U_{i,j}^* = \alpha_i \left(\mu_j + \frac{\tau_i}{2} \sigma_j^2 \right) + e_{i,j} \quad (12)$$

where $e_{i,j}$ is assumed to be extreme value. The individual will choose gamble j over other gambles with probability:

$$Prob(\text{gamble } j \text{ is preferred}) = \frac{\exp\left(\alpha_i \left(\mu_j + \frac{\tau_i}{2} \sigma_j^2\right)\right)}{\sum_{k \neq j} \exp\left(\alpha_i \left(\mu_k + \frac{\tau_i}{2} \sigma_k^2\right)\right)} \quad (13)$$

Therefore, if individuals are offered a choice between gambles of differing means and variances, the parameters of the individuals utility function α_i and τ_i can be estimated using a random parameter logit model (Train, 1998, Revelt and Train, 1998).

In our gamble choice sets individuals were not presented with the expected payoffs and variances associated with each Gamble. As shown in Figure 1 they are simply presented with pairs of gambles and asked which they would prefer. We then reformulate the choice task in terms of the expected payoffs and variances for the purposes of estimation. Thus, we can obtain estimates of the risk aversion coefficients τ_i for each individual. In addition we can condition these parameters on the characteristics of the individual.

Having retrieved these individual specific estimates of the respondents' RRA scores we incorporate them in the conditional logit model of essay choice. More specifically we interact the risk-penalty attribute (rp) with the RRA scores. The results of this estimation are shown in Table 9. The attributes are found to play significant roles as before. The sign of the rp*RRA interaction terms are all negative: the disutility of moving to a more stringent risk-penalty regime is greater the more risk averse one is. The only interaction which is not significant is that between rp4 and RRA which is only significant at the 12% level. This suggests that this regime is so tough that its effects are uniform across individuals of varying degrees of risk aversion.

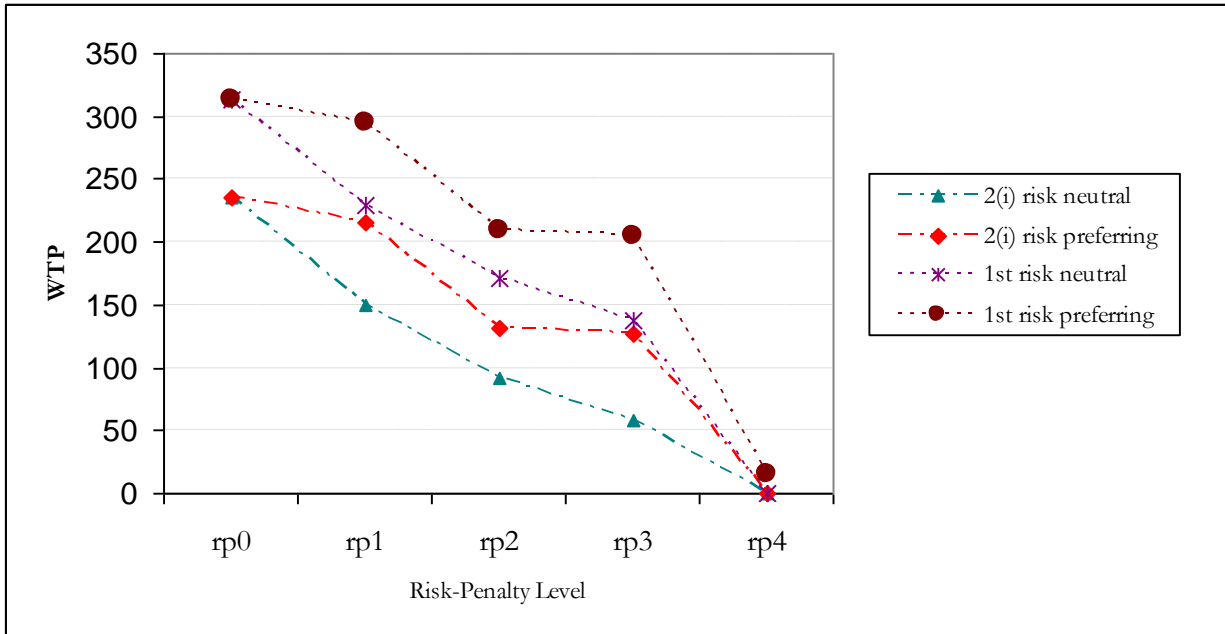
Table 9. Choice model incorporating risk aversion scores.

	Coef	Std. Err	z	P>z	[95% Conf.	Interval]
price	-0.009	0.004	-2.38	0.017	-0.017	-0.002
rp1	-0.802	0.366	-2.19	0.029	-1.520	-0.084
rp2	-1.355	0.316	-4.30	0.000	-1.974	-0.737
rp3	-1.671	0.289	-5.78	0.000	-2.238	-1.105
rp4	-3.353	0.442	-7.58	0.000	-4.220	-2.486
rp1*RRA	-3.508	0.892	-3.93	0.000	-5.255	-1.760
rp2*RRA	-2.101	0.909	-2.31	0.021	-3.883	-0.319
rp3*RRA	-3.632	1.170	-3.11	0.002	-5.924	-1.340
rp4*RRA	-2.961	1.929	-1.53	0.125	-6.742	0.820
Grade_2(ii)	1.602	0.331	4.84	0.000	0.953	2.252
Grade_2(i)	2.226	0.330	6.74	0.000	1.579	2.873
Grade_1 st	2.973	0.342	8.69	0.000	2.302	3.643

ll= -399.67331
N=2400

This model specification generates WTP values for an essay which will depend upon the essay's grade, the risk penalty regime in operation and the individuals' degree of risk aversion. Figure 7 shows the decline in WTP for a 1st class and a 2(i) essay under different *rp* regimes for both a risk neutral and a risk preferring individual. Note that for the risk preferring person the WTP for a 1st class essay is non-zero under even the *rp4* risk-penalty regime.

Figure 7. The decay in WTP for 1st and 2(ii) class essays: risk neutral and risk preferring individuals.



8. Conclusions and Discussion

This paper has investigated the willingness to buy, and willingness to pay for, bespoke, original essays from external commercial providers. It has done so using choice experiments and is the first study of its kind. To investigate these issues meaningfully it is necessary to pose the choices with respect to a realistic scenario for the potential buyer. Given that an individual's willingness to buy may differ across course units, it is necessary to frame the choices with respect to a specific piece of work on a specific course unit. This approach was employed with a total of 90 students at 3 UK universities. This sample is small (because of the difficult sampling process described above) and while the results are indicative, they are statistically robust and rather disturbing.

Half of the sample, in each of the universities, indicated a willingness to buy one or more essays. Statistical analysis of the choice data reveal that respondents typically considered all of the essay's attributes, with all attributes having significant impacts on the probability of an essay being chosen. The naive WTP values for essays range between £164 for a 2(ii) class essay, up to £307 for a 1st class piece of work. These valuations decline as the risk and penalty associated with the illicit behaviour increase. This decay in the WTP for academic

work as the risk & penalty increase is significantly moderated by the individuals' risk preferences.

A degree of caution is required when considering results from such stated preference studies as one needs to consider how reliable and realistic the choices, and implicit valuations they reflect, are. When considering such hypothetical bias one is wary of systematic misreporting of preferences. For example, economists often conduct such choice experiments regarding choices where there may be a 'warm glow' associated with certain choices, for example choosing to buy a 'green' product. This leads to over-valuation of that green product. In this case it might be the case that students might not treat the choices sufficiently seriously and over-report their willingness to buy. However, in this study there may be an opposite effect: the fear of self incrimination may have caused respondents to under-report their willingness to buy. The warm glow of giving might have been replaced by the cold fear of self-incrimination. Given the illicit nature of the choices we tested for significant misreporting using the Bayesian misreporting framework of Balcombe *et al.*, (2007). We found little or no evidence of a tendency to misreport and over-select the "buy none" option.

We are currently developing the approach employed to accommodate a randomised response mechanism within the choice process and associated estimation of the choice models. In addition, replicating the investigation with a much larger sample alongside a deeper exploration of heterogeneity among respondents are the obvious next steps for this research.

In conclusion, it is (to us) quite remarkable how many students indicated a willingness to buy. Their apparent lack of concern at revealing this in a survey run by academics at their university is startling. The assurances of confidentiality were genuine but the level of purchasing indicated was still contrary to our expectations. Why is there such an apparent lack of stigma in revealing a willingness to purchase coursework? It may be that the ethical line that most lecturers perceive as being crossed when such purchases are made is not that significant to many students. One could argue that in the modern University the student is treated as, and increasingly identifies and mobilises as, a consumer demanding 'value for money'. Perhaps subcontracting some of the work required to achieve the qualification, which is the ultimate goal of the process, is seen as just another rational choice by many informed consumers on campus.

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Appendix. Plagiarism research: approaches and findings^Φ

Study	Major focus¹	Cheating type considered	Self report (SR) or perception (PR)	<i>Main findings</i>
1. Franklyn-Stokes & Newstead (1995)	A	all	SR & PR	Over 50% involved in a range of cheating (including essay buying).
2. Newstead et al. (1996)	B	all	SR	Cheating is widespread (essay buying is not top ranking); more common in: men, less able, younger and science & technology students.
3. Ashworth et al. (1997)	C	Plagiarism (no mention of essay buying)	SR & PR	Students' perceptions of different cheating behaviours vary: some are regarded as acceptable others are not.
4. Norton et al. (2001)	B + (study approaches)	all	SR	Cheating is widespread (essay buying is not top ranking).
5. Dordoy (2002)	A	all	PR	Cheating is widespread (including essay purchase).
6. Park (2003)	D	all	Review	Cheating is widespread and on the rise.

^Φ Criteria for inclusion in this survey: any study: dealing with cheating in the UK HE sector (9 studies); essay buying from the rest of the world (1 study); economic/ econometric study on student cheating (7 studies, all from the USA); other (1).

Study	Major focus¹	Cheating type considered	Self report (SR) or perception (PR)	<i>Main findings</i>
7. UB (2006a)	A	Plagiarism	PR	Moderately widespread
8. UB (2006b)	A	Plagiarism	PR & SR	Moderately widespread; occurrence of essay buying too.
9. Smith & Ridgway (2006)	A	all	PR & SR	There is a grey area between acceptable & unacceptable forms of cheating. Essay buying is considered a serious form of cheating
10. Campbell et al. (2000)	Description of online term paper provision	Online essay buying		Purchasing papers from the internet isn't yet prevalent, but may well be so in due course.
11. Bunn et al. (1992)	A & B	Cheating on exam or written assignment	PR & SR	Widespread cheating; propensity to cheat inversely related to GPA & positively related to observing others cheating. Expected punishment has no effect.
12. Kerkvliet (1994)	B + (effect of additional anonymity)	Exam cheating	SR	High incidence of cheating (42% in RR & 25 % in DQ). Most likely cheater is male, heavy drinker, & a resident member of a fraternity.

Study	Major focus ¹	Cheating type considered	Self report (SR) or perception (PR)	Main findings
13. Mixon JR. & Mixon (1996)	B	Cheating on exam or written assignment	PR & SR	37% cheated at least once; 25% knew someone routinely cheating. Propensity to cheat inversely related to GPA & positively related to observing or perception of others cheating.
14. Nowell & Laufer (1997)	B	Cheating in self-grading of tests	SR + Direct measure	9% in RR and 27% in actuality of cheating. Propensity to cheat inversely related to grade & positively related to work schedule.
15. Kerkvliet & Sigmund (1999)	B	Exam cheating	SR	13% of students cheated at least once. Students taught by faculty 32% less likely.
16. Magnus et al. (2002)	Cross-country comparison of cheating	Exam cheating	PR	Cheating culture varies by country and by level of education.
17. Caudill & Mixon, JR. (2005)	Methodological improvement of surveys	Cheating on exam or written assignment	SR	True incidence of cheating is 20% higher than estimated by direct questioning.

Study	Major focus¹	Cheating type considered	Self report (SR) or perception (PR)	<i>Main findings</i>
18. Brandão & Teixeira (2005)	D	All	PR & SR	Nothing specific.

¹Notes:

- A). Assessing staff & student perception of seriousness and frequency (& causes of cheating).
- B). Exploring determinants of cheating and impact of deterrent measures.
- C). Discovering students' perception of cheating and plagiarism.
- D). A review on all aspects: A – C.