The New Challenges of Contract Cheating

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Overview

• What is contract cheating?
  – *how is it different from plagiarism.*

• Extent of contract cheating
  – *published statistics*

• Detection and Attribution
  – *current approaches used*

• Prevention
  – *part of a multi-faceted approach*
Categories of “Cheating”

In assessed coursework we can characterise 3 main categories:-

- **Plagiarism**: copying from books or internet
- **Collusion**: copying from students in same cohort
- **Contract Cheating**: work is produced by an external agent
What is “contract cheating”? 

1. Student posts assignment details onto auction site

2. Coders make bids to do the work

Student → Auction Site → Coders

$20 → $50 → $50
What is “contract cheating”?

1. Student posts assignment details onto auction site

2. Coders make bids to do the work

3. Student selects bid. Payment is escrowed

4. Selected Coder does assignment

5. Student receives solution. Payment is released
What is “contract cheating”? 

“Contract cheating” occurs when a student gets a third party to do an assignment for them and then hands it in as their own work.

1. Student posts assignment details onto auction site
2. Coders make bids to do the work
3. Student selects bid; Payment is escrowed
4. Selected Coder does assignment
5. Student receives solution; Payment is released

Student

Auction Site

Coders

$20

$50

$50

$50
Plagiarism and Collusion Detection

Student assignments

Non-originality Engine

Database of previously scanned student work

Internet Search Engines

Non-originality Report
Plagiarism and Collusion Detection

Detection of “non-original” work relies on being able to compare an assignment against other sources.

Non-originality Engine

Database of previously scanned student work

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Non-originality Report
Plagiarism and Collusion Detection

Detection of “non-original” work relies on being able to compare an assignment against other sources.

Work produced by “contract cheating” is original – but it was not done by the student.
## Extent of Contract Cheating

**Number of cases of Contract Cheating by Country where the source was identified**

(912 cases from Mar 04 to Oct 06)

<table>
<thead>
<tr>
<th>Country</th>
<th>nCases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>459</td>
<td>50%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>239</td>
<td>26%</td>
</tr>
<tr>
<td>Australia</td>
<td>101</td>
<td>11%</td>
</tr>
<tr>
<td>Canada</td>
<td>61</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>34</td>
<td>4%</td>
</tr>
<tr>
<td>Turkey</td>
<td>18</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>912</td>
<td>100%</td>
</tr>
</tbody>
</table>

The “average student” posts between 4 and 7 assignments

Original Survey of Rentacoder

• The “average” student posts 4-7 assignments
  – They are not getting detected
  – They are getting “value for money”

• Source mostly courses in English language
  – Mostly USA, UK, Australia
  – Other countries run courses in English
  – Turkey shows up because material is easily Googled

• Small number of high number of postings
  – Identifies “contractors” who do post work for others
  – Usually work from different colleges and subjects
Types of assignments posted - Computing Only
(910 cases from Mar 04 to Dec 06)
Larger “Rentacoder” study in 2007

• Mostly computing topics (910 out of 950)
  – Reflects bias in website name (does what it says on the tin)
• Programming in C++/Java most common type
  – Reflects the types of assignments we post (40%)
• 32 “Major projects” were detected
  – Only 3.5% overall in this survey
  – But 9.5% (22 out of 231) bid requests from UK
• Average number of postings per student down
  – Because we are detecting more first-time offenders?
  – Wider awareness of the problem
  – More students starting to use outsourcing
Contractors
Post assignments for students

<table>
<thead>
<tr>
<th>Username</th>
<th>Assignment Description</th>
<th>Cost/Currency</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>jnk87</td>
<td>5000 words Essay about fashion management G1303</td>
<td>$220 USD</td>
<td>5 days</td>
</tr>
<tr>
<td>Balistap40</td>
<td>1000 words essay quantitative data analysis using SPSS G1279</td>
<td>$70 USD</td>
<td>5 days</td>
</tr>
<tr>
<td>writer048</td>
<td>CocaCola and Pepsi Dissertation help 10,000 words G1140</td>
<td>£250 GBP</td>
<td>25 days</td>
</tr>
<tr>
<td>raiseq</td>
<td>URGENT write an investment analysis Dissertation G1309</td>
<td>$525 USD</td>
<td>15 days</td>
</tr>
<tr>
<td>raiseq</td>
<td>write a project management essay 3000 words G1316</td>
<td>$150 USD</td>
<td>10 days</td>
</tr>
<tr>
<td>sdk2788</td>
<td>1500 words case study about Walmart G1321</td>
<td>$70 USD</td>
<td>5 days</td>
</tr>
<tr>
<td>waqar21081974</td>
<td>write a 5000 words business report G1325</td>
<td>$150 USD</td>
<td>7 days</td>
</tr>
<tr>
<td>writingspirit</td>
<td>write a Financial Strategy report with 3000 words G1275</td>
<td>£90 GBP</td>
<td>5 days</td>
</tr>
<tr>
<td>writingspirit</td>
<td>write a report about job analysis URGENT D1310</td>
<td>$45 USD</td>
<td>3 days</td>
</tr>
</tbody>
</table>

Assignments traced to 18 UK universities since Feb 2011
Example Contractor (2)

_Not all postings are detailed here_

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Cost</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jnk87</td>
<td>6000 words Essay about fashion management Q1203</td>
<td>$220 USD in 5 days</td>
<td></td>
</tr>
<tr>
<td>Ballistas20</td>
<td>1500 words trade questionnaire a data analysis using SPSS Q1275</td>
<td>$70 USD in 5 days</td>
<td></td>
</tr>
<tr>
<td>write401</td>
<td>CocaCola and Pepsi Dissertations help 10,000 words Q1140</td>
<td>$250 GBP in 20 days</td>
<td></td>
</tr>
<tr>
<td>raised</td>
<td>URGENT write an investment analysis Dissertation Q1309</td>
<td>$525 USD in 18 days</td>
<td></td>
</tr>
<tr>
<td>raised</td>
<td>write a project management essay 3000 words Q1316</td>
<td>$95 USD in 10 days</td>
<td></td>
</tr>
<tr>
<td>djk2781</td>
<td>1500 words case study about management Q1325</td>
<td>$70 GBP in 5 days</td>
<td></td>
</tr>
<tr>
<td>Mike2/051974</td>
<td>write a 5000 words business report Q1325</td>
<td>$150 USD in 7 days</td>
<td></td>
</tr>
<tr>
<td>writingslitt</td>
<td>write a financial Strategy report with 2000 words Q1275</td>
<td>$80 GBP in 5 days</td>
<td></td>
</tr>
<tr>
<td>writingslitt</td>
<td>write a report about job analysis URGENT Q1340</td>
<td>$45 USD in 3 days</td>
<td></td>
</tr>
<tr>
<td>djk2781</td>
<td>URGENT write a 5000 words Strategic literature review Q1319</td>
<td>$225 USD in 7 days</td>
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</tr>
<tr>
<td>djk2781</td>
<td>2500 words Accountability essay help needed Q1265</td>
<td>$70 GBP in 7 days</td>
<td></td>
</tr>
<tr>
<td>raised</td>
<td>need someone better with low background write an essay Q1265</td>
<td>$375 GBP in 10 days</td>
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<tr>
<td>djk2781</td>
<td>write an essay of 1500 words Q1267</td>
<td>$80 USD in 4 days</td>
<td></td>
</tr>
<tr>
<td>writingslitt</td>
<td>Management Literature Review - Assignment 9 questions Q11328</td>
<td>$80 USD in 4 days</td>
<td></td>
</tr>
<tr>
<td>writingslitt</td>
<td>Write’s research proposal Q1292</td>
<td>$120 USD in 4 days</td>
<td></td>
</tr>
<tr>
<td>djk2781</td>
<td>1500 words Research Proposal help needed URGENT Q1305</td>
<td>$80 GBP in 5 days</td>
<td></td>
</tr>
<tr>
<td>djk2781</td>
<td>Dissertations of MA International Business Q1106</td>
<td>$200 GBP in 2 days</td>
<td></td>
</tr>
<tr>
<td>djk2781</td>
<td>2500 words Accounting essay</td>
<td>$120 GBP in 26 days</td>
<td></td>
</tr>
<tr>
<td>djk2781</td>
<td>1500 words Accounting essay</td>
<td>$85 GBP in 5 days</td>
<td></td>
</tr>
<tr>
<td>djk2781</td>
<td>Write’s research proposal Q1316</td>
<td>$85 GBP in 5 days</td>
<td></td>
</tr>
</tbody>
</table>
EssayBay Study (2010)

(627 postings in 5 months)

Postings by UCAS Subject Category

- N Business & Admin studies
- L Social Studies
- V Hist & Philosophical studies
- B Subjects allied to Medicine
- X Education
- C Biological Sciences
- Q Linguistics, Classics & related
- G Mathematical & Comp Sci
- M Law
- H Engineering
- K Architecture,Build & Plan
- F Physical Sciences
- W Creative Arts & Design
- P Mass Comms and Documentation
- R European Langs, Lit & related

Dealing with Contract Cheating: A Question of Attribution;
Lancaster & Clarke; HEA STEM Conference April 2012
EssayBay Study (2010)

Postings by level

- Undergraduate: 450
- Masters: 100
- GCSE A/A2: 10
- High Sch: 5
- PhD: 2
- Advanced Placement: 1
- GNVQ: 1
- PhD ?: 1
- International Bacc: 1

SIG_Keynote
EssayBay - conclusions

• First study of a web-site dedicating to enabling contract cheating
  – Rentacoder (now vWorker) 85% legitimate work
  – Site ceased fully functioning in Aug 2010

• Shows wide range of subjects involved
  – Maths & Computing only 5%
  – Business Studies main category (25%)
  – Everything from “anthropology to theology”

• Range of levels of work
  – Difficult to verify (mostly self-reported by student)
  – Significant number at Masters level (21%)
  – Some PhD requests – mostly research proposals
Anthropology #06942 (not traced)

• Topic: a.) Select a topic or issue you would find within a culture (i.e. art forms, health issues, family relations, hairstyles, food, symbolism, beliefs). Select any topic that you think could capture your interest: warfare, transportation, political systems, money, styles of dress – there is no limit. b.) Once you have selected a topic or issue, select a living culture and discuss your selected topic or issue within that culture. For instance, you may be interested in the rise of diabetes in indigenous people such as the Kayapo, or the educational boundaries of women in the Middle East. Or you may compare and contrast two cultures with the same issue, such as the role of adolescence in the United States and China, or the comparison between the Amish consumption and labor to that of their neighboring cities. Be sure to choose a culture(s) appropriate for a study within cultural anthropology (a study of living people). Thesis: Develop a clear thesis statement/topic sentence. This will become the point or perspective you will compare or discuss in the paper.
Theology #06360 (not traced)

• The paper should focus on the discrete aspect of Karol Wojtyla/John Paul II's anthropology or ethics. This is a reflection paper that analyzes his book "Love and Responsibility" and Wojtyla's sexual ethic. Choose some aspect of "Love and Responsibility" (such as the personalistic norm, the nature of love, or chastity etc) to write about and then also demonstrate the issue's relationship to anthropology.

• I am not the smartest student in the class so please make the paper believable (a 80%-90% grade range)
Only 24% of postings traced back to their originating institutions.

“Attributability” of assignments is a key factor.

$\text{Attributability} = \text{Searchability} + \text{Uniqueness}$
Business studies # 06724 (not traced)

• Take Home Exam

• An Innocent Abroad: Fred Bailey in Tokyo Case Study Analysis based on Cross Cultural Management view point (using Hofstede's Cultural Indices and MBI Frame work)

• Google finds About 181,000 results – examples:-

  Essay: An Innocent Abroad -A Case Study in Cross-Cultural ...
  www.coursework.info › GCSE › Business Studies › People in BusinessSimilar
  You +1’d this publicly. Undo
  28 Jan 2005 – here’s a short preview of this essay with formatting removed for you to read. Have a little read: ... Fred Bailey: An Innocent Abroad -A Case ...

  Essay: An Innocent Abroad Fred Bailey in Tokyo
  .speedyessay.com/essay-on-innocent-abroad-fred-bailey-in-tokyo/Cached
  You +1’d this publicly. Undo
  This case study talks about an expatriate employee Fred Bailey's experience during his assignment in Japan. Fred's company offers him a proposition that is ...

  Assignments for 6K:201
  dollar.biz.uiowa.edu/col/ye/6k201/assignment.html/Cached - Similar
  You +1’d this publicly. Undo
  Reading: Fred Bailey: An Innocent Abroad ... Is there anything you could do to prepare Fred Bailey differently in "Fred Bailey: An Innocent Abroad"? Research a ... PDF]

  Faculty of Business Administration Memorial University of ...
  You +1’d this publicly. Undo
  File Format: PDF/Adobe Acrobat - Quick View
  Competitive Frontiers: Women Managing Across Borders. (Reading # 2.3, MOS ). Case Analysis: Case 2.3, Fred Bailey: An Innocent Abroad on (MOS). Case 2.2 ...

  BMA777 International Human Resource Management Semester 2 ...
  You +1’d this publicly. Undo
  File Format: PDF/Adobe Acrobat - Quick View
  own; for example downloading an essay from a cheat site, copying another student's .... FRED BAILEY: AN INNOCENT ABROAD—A CASE STUDY IN CROSS-...
Systematic Six-Stage Process for Detecting Contract Cheating

1. Publication
2. Collection
3. Identification
4. Attribution
5. Notification
6. Investigation

New Role “Detective”

Establishing a Systematic Six-Stage Process for Detecting Contract Cheating; Clarke, R & Lancaster, The Second International Conference on Pervasive Computing and Applications (ICPCA07) 2007
Stages of Detection and Attribution

Assignments Posted
1 in 3 postings detected

Source Attributed
1 in 3 attributed

Student Identified
1 in 3 students found

1 in 27 cheaters dealt with
Methods of Detection - 1

Modified RSS Feed Reader (aka “radar”)

Looks for keywords like “homework” and “algorithm” in a variety of spellings

Also maintain a list of “frequent offenders”

Good for sifting through large auction sites
Produces a large number of “false positives”
Not all sites provide a suitable RSS feed
Methods of Detection - 2

Active searching - Hunting

Posting by a Student

- Private Project for DMjuma
  - $140 USD
  - "Thanks for the task. Work is due in 48 hours."

- Report on Business Intelligence + SAS programming.
  - [Sealed]
  - "Good employer and would definitely work for again."
  - 17 Sep 2011

- Writing a Business Plan for a U.K. e-business Company
  - [Sealed]
  - 23 Jan 2011
  - "Thanks for the project. It is a mix of big words. A good story even paid for a change in project requirements."

- Implementing, populating and querying the db design[Sealed]
  - [Sealed]
  - 6.0

Bids made by a coder

- Research paper regarding Dashboard
  - $100 USD
  - Today
  - "Take any software firm and write its business intelligence dashboard paper and it should have its image for 8 pages in APA format and its title has to be 100% plagiarism free and 'need two separate revisions'."

- Economic report
  - $99 SGD
  - Today
  - "With ref to the attached file, analyse the article using economic concepts. Report should provide a broad and comprehensive, balanced and in-depth analysis with ref to economic concepts and models. Referencing must be proper."

- Thesis proofreading, Editing and Rewriting.
  - £150 GBP
  - Today
  - "I am working on a thesis (UK) and would like to get professional help and advice to expand some sections and am looking for someone willing to speak to me about my writing needs over Skype. The task consists of working on two sections of the thesis for about 90 minutes."

Posting by another Student

- Implementing, populating and querying the db design[Sealed]
  - [Sealed]
  - 6.0

Bids made by another coder

- Project ID: 1755225
  - Project Type: Fixed
  - Budget: $80-$150 USD
  - Project posted by
  - Project Description:
    - "Take any software firm and write its business intelligence dashboard paper and it should have its image for 8 pages in APA format and its title has to be 100% plagiarism free and 'need two separate revisions'."

- Awarded Bids
  - $500 a day
  - 80% Milestone completed
  - 21 days to complete
  - Awaiting Acceptance
    - please deal with.
Active Hunting

• Search for keywords to find new postings
  – Assignment, Essay, Plagiarise, Academic, Literature
  – Can’t search in attachments
  – Not all sites have good search facilities

• Need a list of frequent offenders and frequent coders
  – List starts to get unmanageable
  – Best to keep list of “contractors” and “coders”
  – New coders and contractors come and go

• Contractors may respond to losing business
  – Using encrypted attachments
  – Using private messaging and auctions
  – Restricting names and qualifications of selected coders
Methods of Attribution

• Google search
  – *Text in the body of the posting*
  – *Text in attachments*
  – *May also use Turnitin*

• Alias used by student
  – *Also used on social networking sites*
  – *Gives details of location*
  – *Photo used by student*

• Usually relies on trace evidence
  – *use text editor to examine files*

• Multiple postings may be needed
  – *By same student over a period of time*
  – *By different students at same time*

• May need to use several items
  – *eg module code + location*
Providing an “Evidence base”

We now regularly archive examples of contract cheating so that evidence can be presented when a positive identification of the student has been obtained.

In this example the items in red were the ones collected and enabled the source institution to deal with the student.

Of the 22 bids paid for, we provided evidence for 12 items.

“To ensure a conviction – get plenty of evidence”
Closing the Loop

The “Holy Grail” is to get hold of the original the student bought

- **Contact the auction site**
  - *they will claim client confidentiality without a court order*
- **Bid for your own assignment (“Doin’ a Dan”)**
  - *but could be “entrapment”; evidence could be “tainted”*
- **Post the assignment yourself and select the same coder**
  - *Expect a similar solution to be provided*
- **Pay the coder to hand over the original**
  - *Unlikely to succeed – unless student is in dispute with coder*
- **If the coder is a student at another institution**
  - *Contact the HoD and persuade the coder to hand over the items*
Notification

Notifying staff that their assignment has been posted

• Relies on being able to attribute the source to the correct institution
  – Harder when standard assignments used
  – Harder when standard module codes used (eg CS101)

• We try to notify lecturer first; then HoD
  – Some contact lists are now private
  – May have to use a “general email” address

• A particular problem with “private” colleges
  – eg: NCC, WGU, Uni Phoenix
Outsourcing Web Sites

- Freelancer + vWorker
  - main sites we examine
  - easy to search
  - give most details of users
  - tracking sub-contractors

- vWorker
  - has “no homework” policy
  - but closed auctions

- Kasamba (Liveperson)
  - “tutorial” site

- Student Of Fortune + Transtutors
  - sells HW solutions
Detection is not enough

• No magic bullet
  – A multi-faceted approach is needed

• Fear of detection is the best deterrent
  – must improve attribution rate (post assignment specs on Turnitin)
  – increase use of individualised assignments
  – watermarking assignment specifications

• Increase awareness amongst staff
  – Common to hear “didn’t know this type of thing happened”
  – Need to look out for idiosyncratic elements in coursework

• Ensure regulations are robust enough
  – Level of “proof” available not same as for plagiarism
  – Attempt to cheat (as in an exam) should be an offence

• Increase awareness amongst students
  – Cheating is not a victim-less crime
  – Problem with a new intake each year
The future?

- More students see “buying” a solution as an option
- Staff have less time to design and administer assignments
- Increased use of on-line/distance learning activities
- Increased use of franchising of courses
- Increased number of contractors providing solutions
- Difficulty in progressing cases of cheating
Questions?