

The New Challenges of Contract Cheating

Thomas Lancaster and Robert Clarke
Birmingham City University

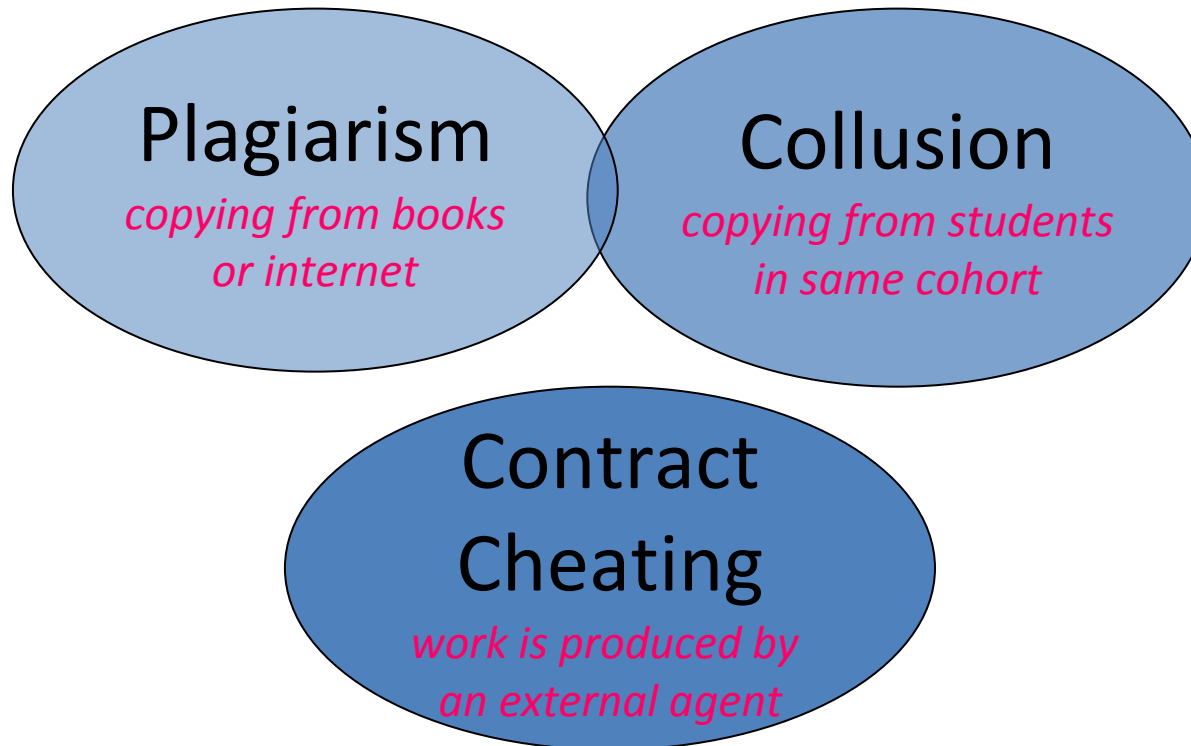


Overview

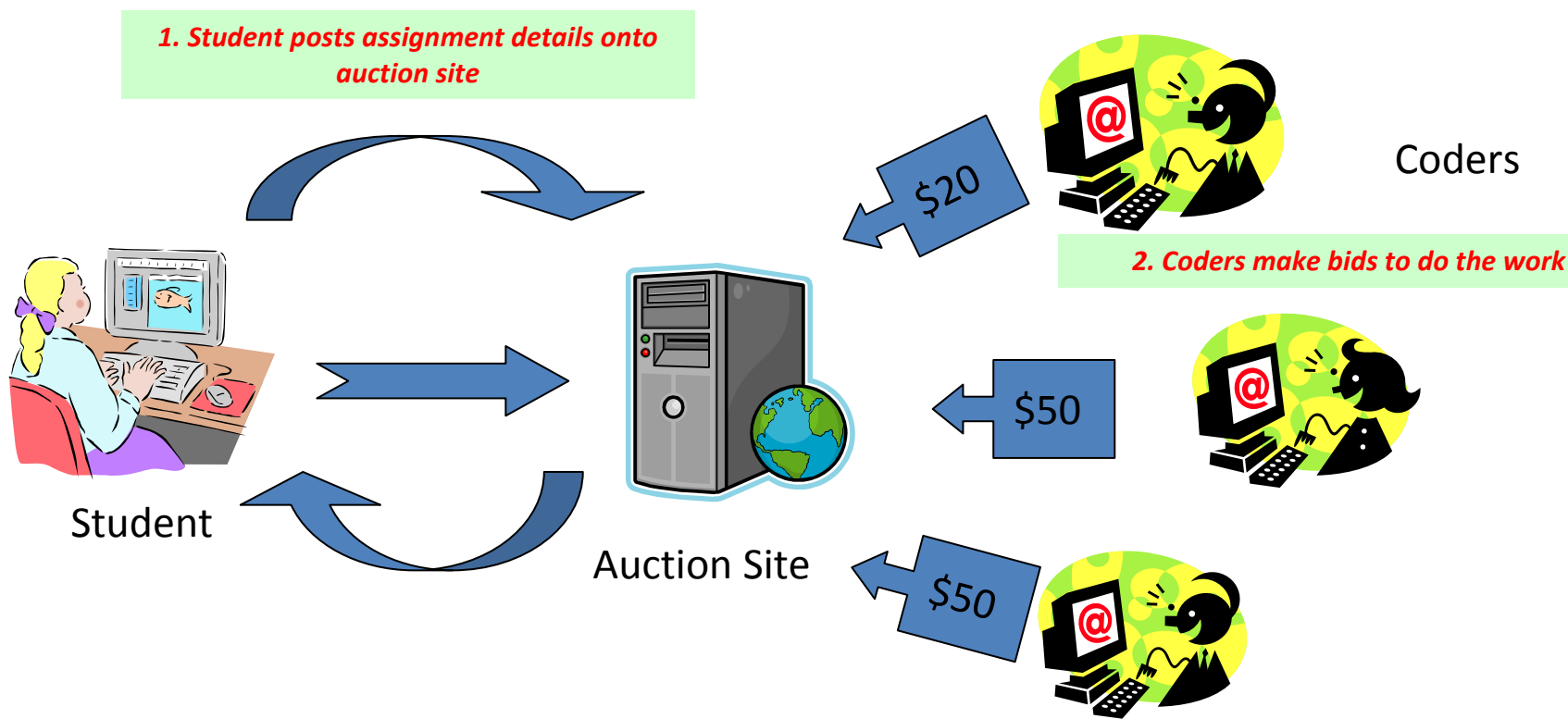
- What is contract cheating?
 - *how is it different from plagiarism.*
- Extent of contract cheating
 - *published statistics*
- Detection and Attribution
 - *current approaches used*
- Prevention
 - *part of a multi-faceted approach*

Categories of “Cheating”

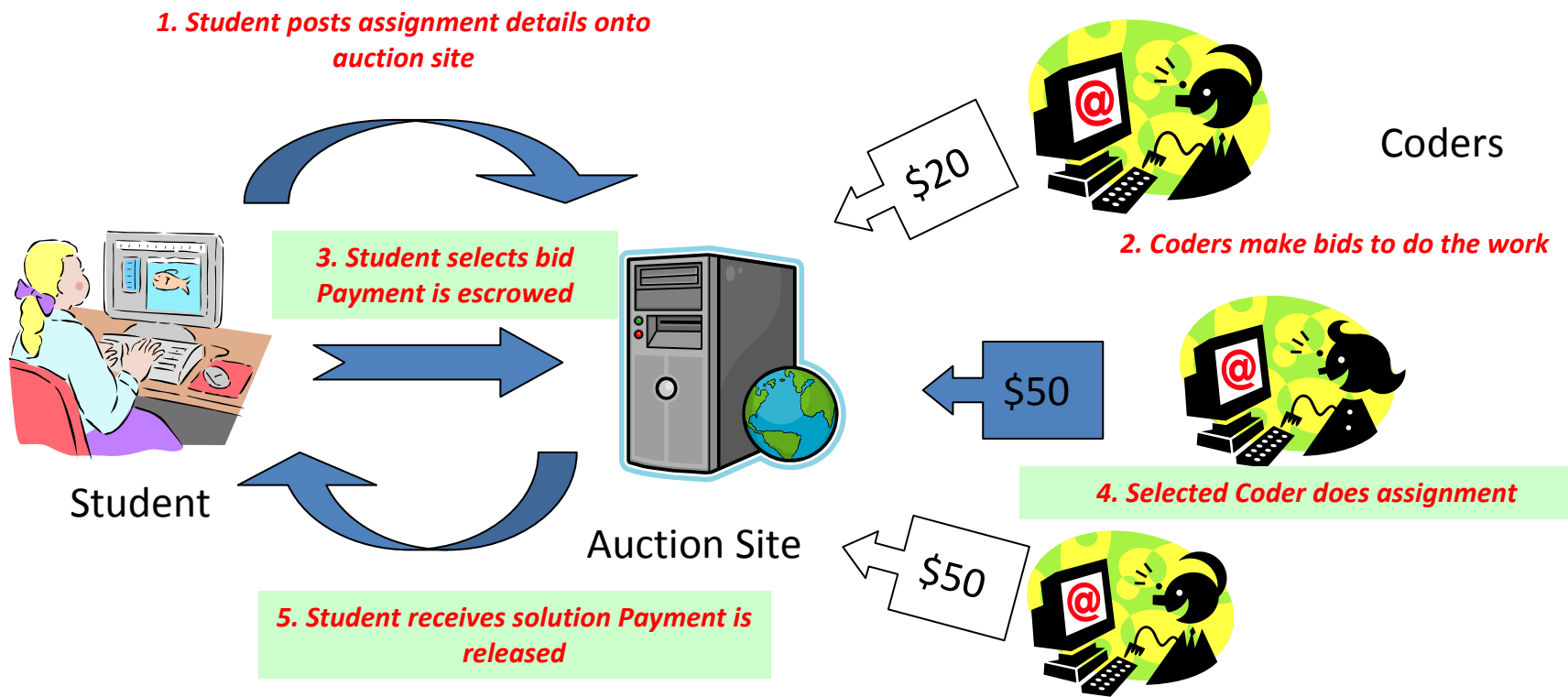
In assessed coursework we can characterise 3 main categories:-



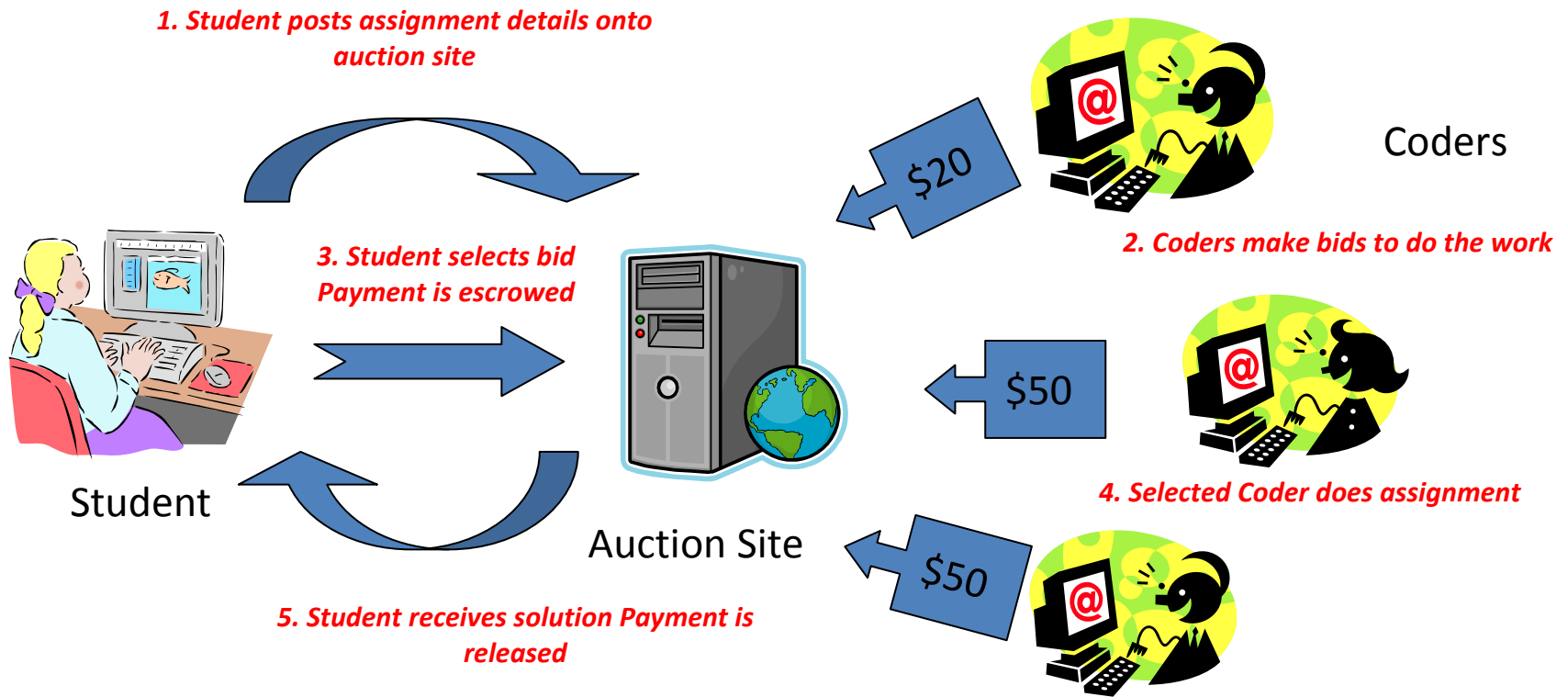
What is “contract cheating” ?



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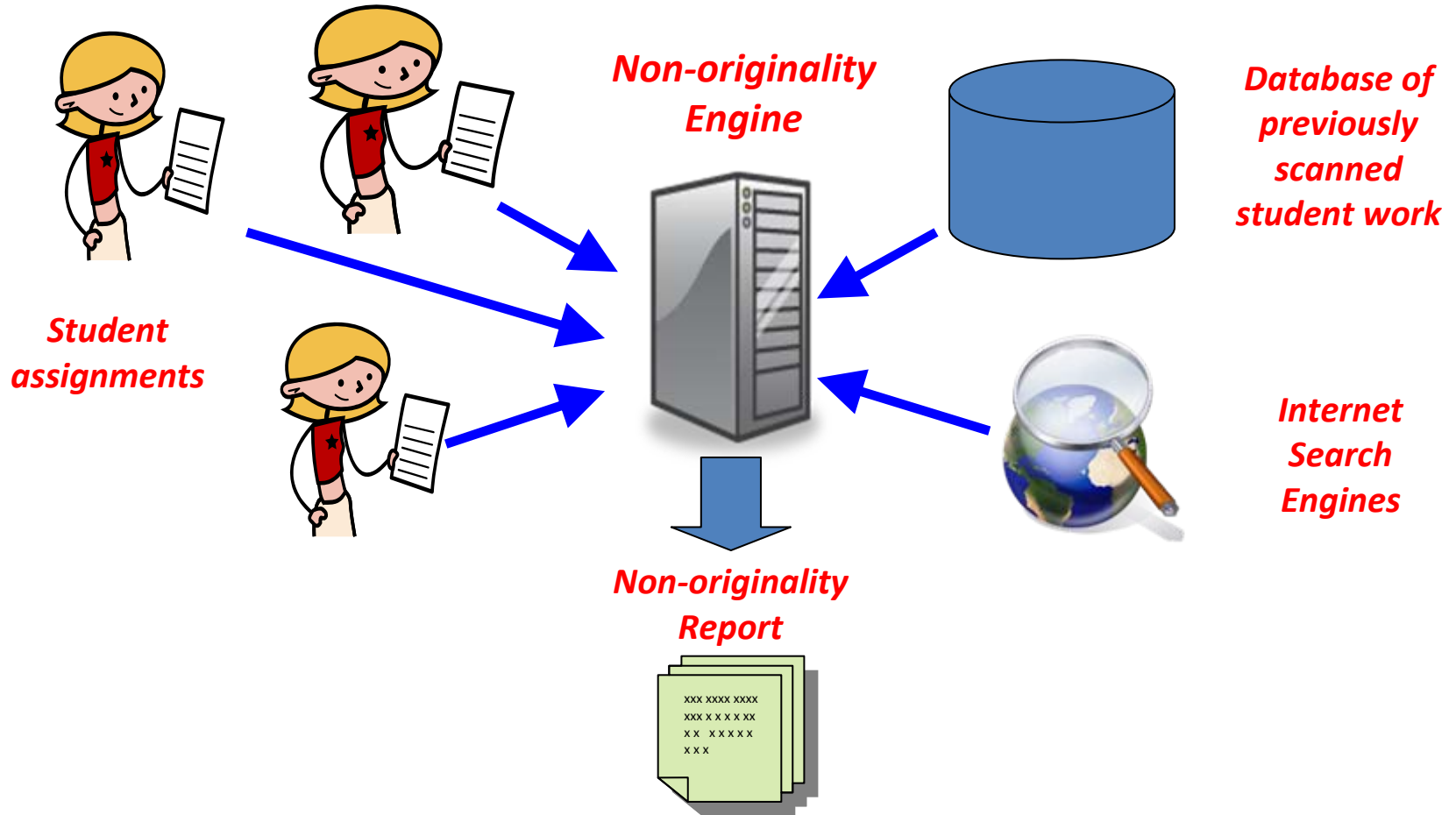


What is “contract cheating” ?

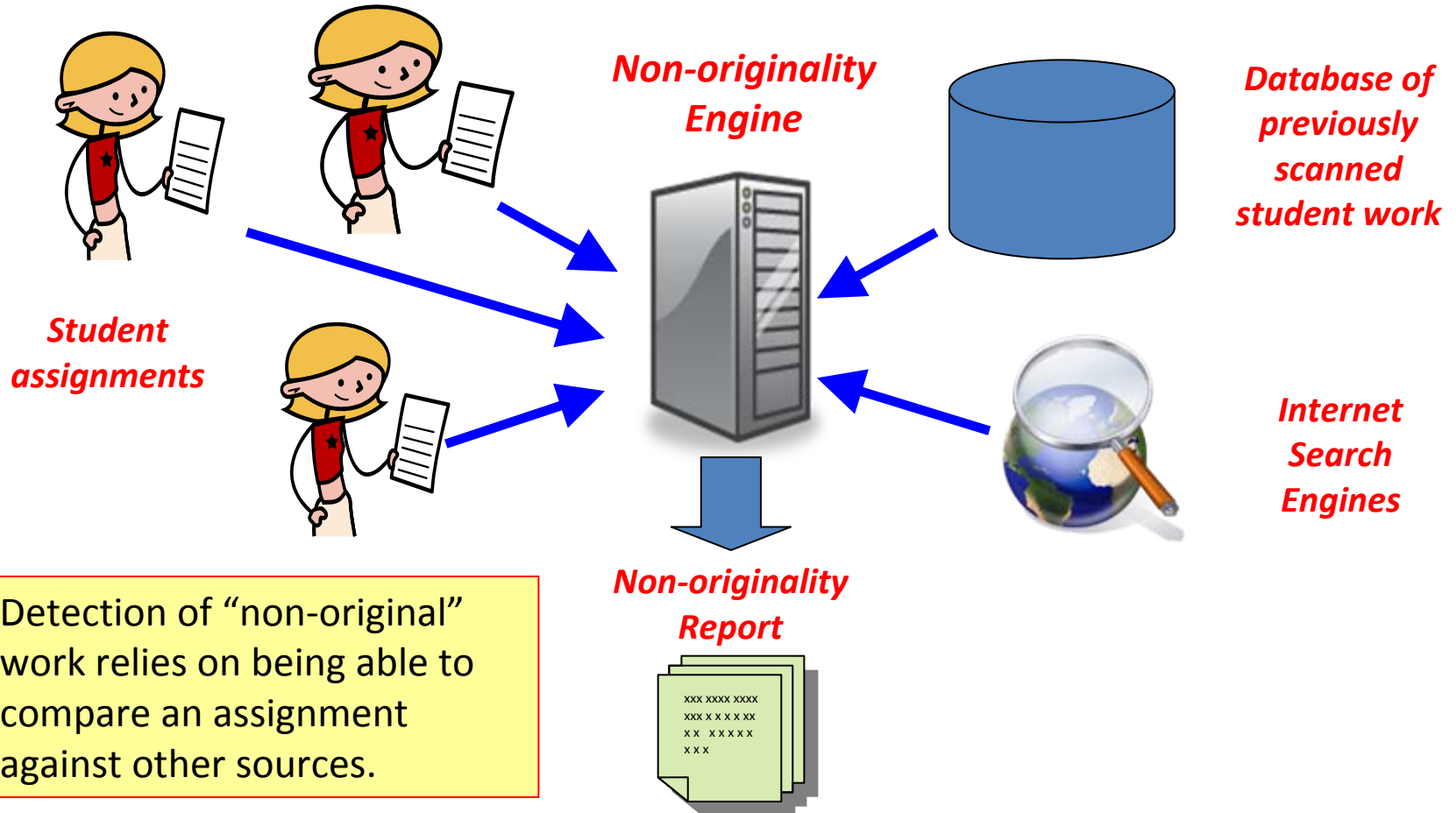


“Contract cheating” occurs when a student gets a third party to do an assignment for them and then hands it in as their own work.

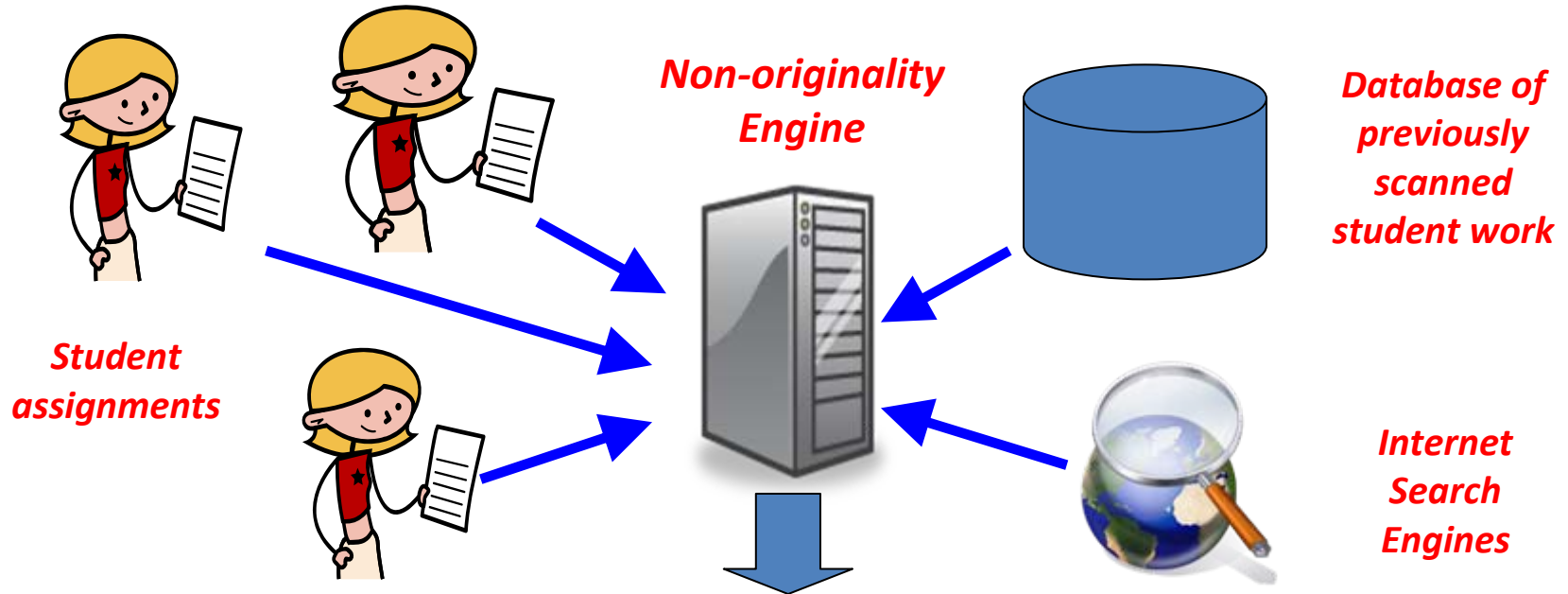
Plagiarism and Collusion Detection



Plagiarism and Collusion Detection



Plagiarism and Collusion Detection



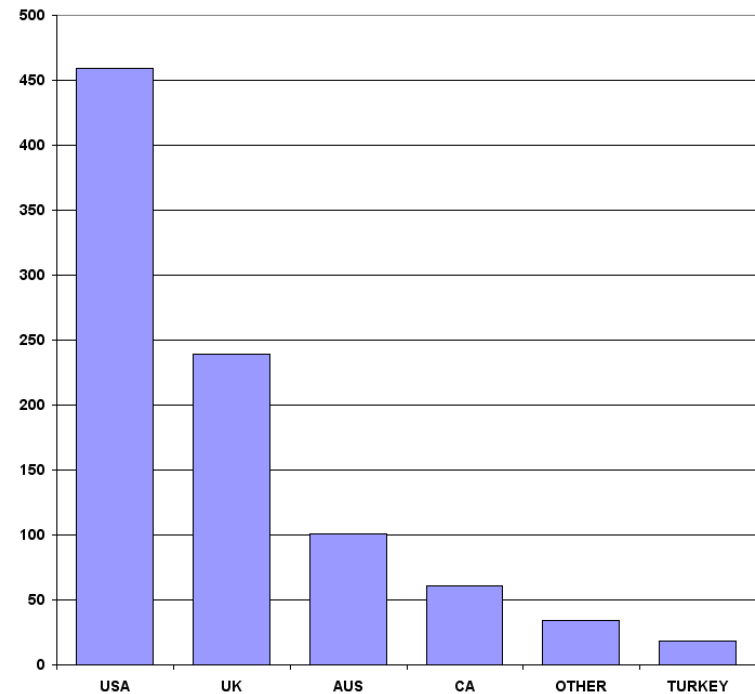
Detection of “non-original” work relies on being able to compare an assignment against other sources.

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)

Country	nCases	%
USA	459	50%
United Kingdom	239	26%
Australia	101	11%
Canada	61	7%
Other	34	4%
Turkey	18	2%
<i>Total</i>	<i>912</i>	<i>100%</i>



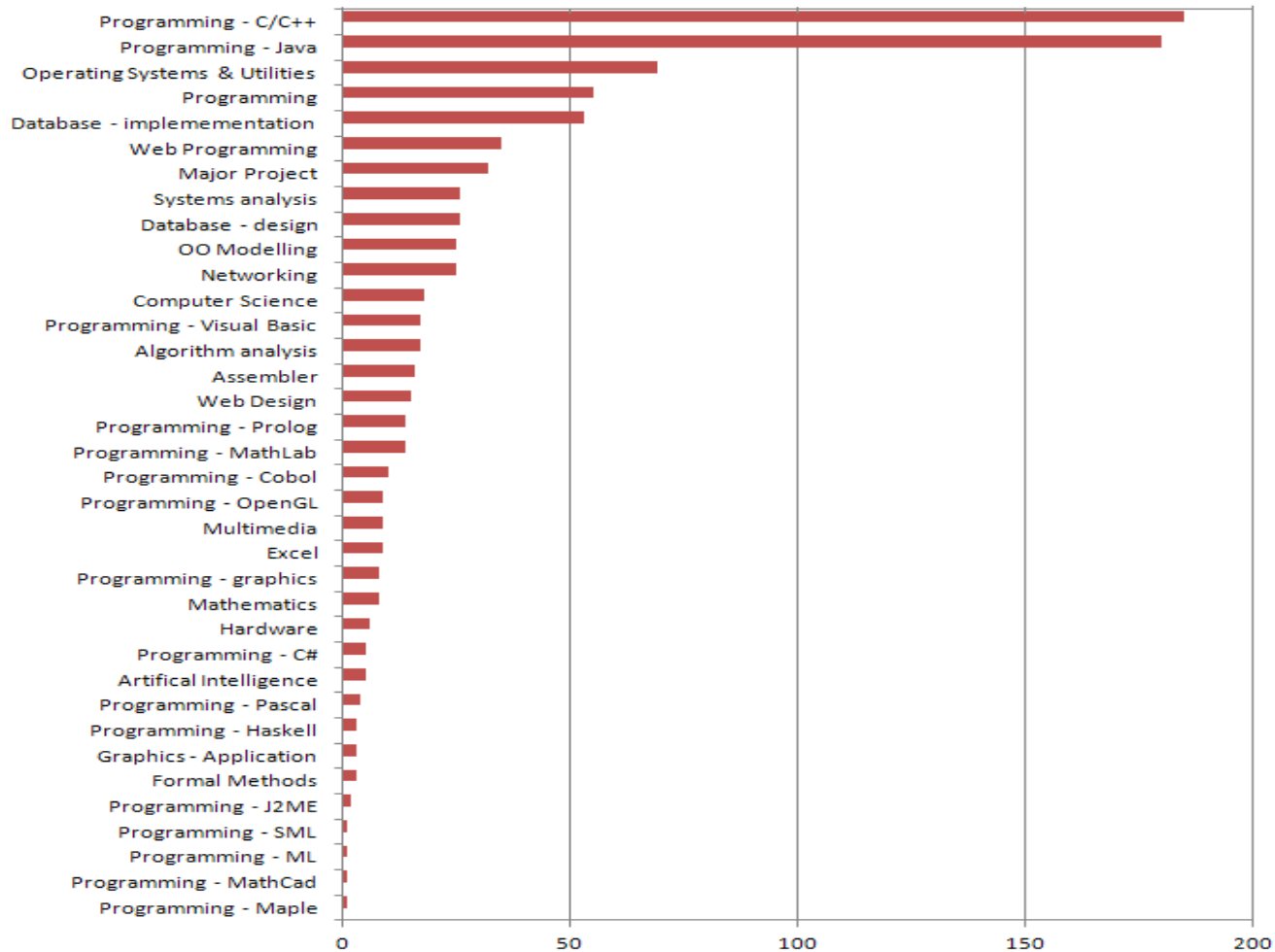
The “average student” posts between 4 and 7 assignments

R. Clarke, and T. Lancaster, “Eliminating the Successor to Plagiarism? Identifying the usage of contract cheating sites”, in *Proceedings of 2nd International Plagiarism Conference, Gateshead, United Kingdom, June 19-21, 2006*

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

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

Assignments traced to
18 UK universities
since Feb 2011

Example Contractor (2)

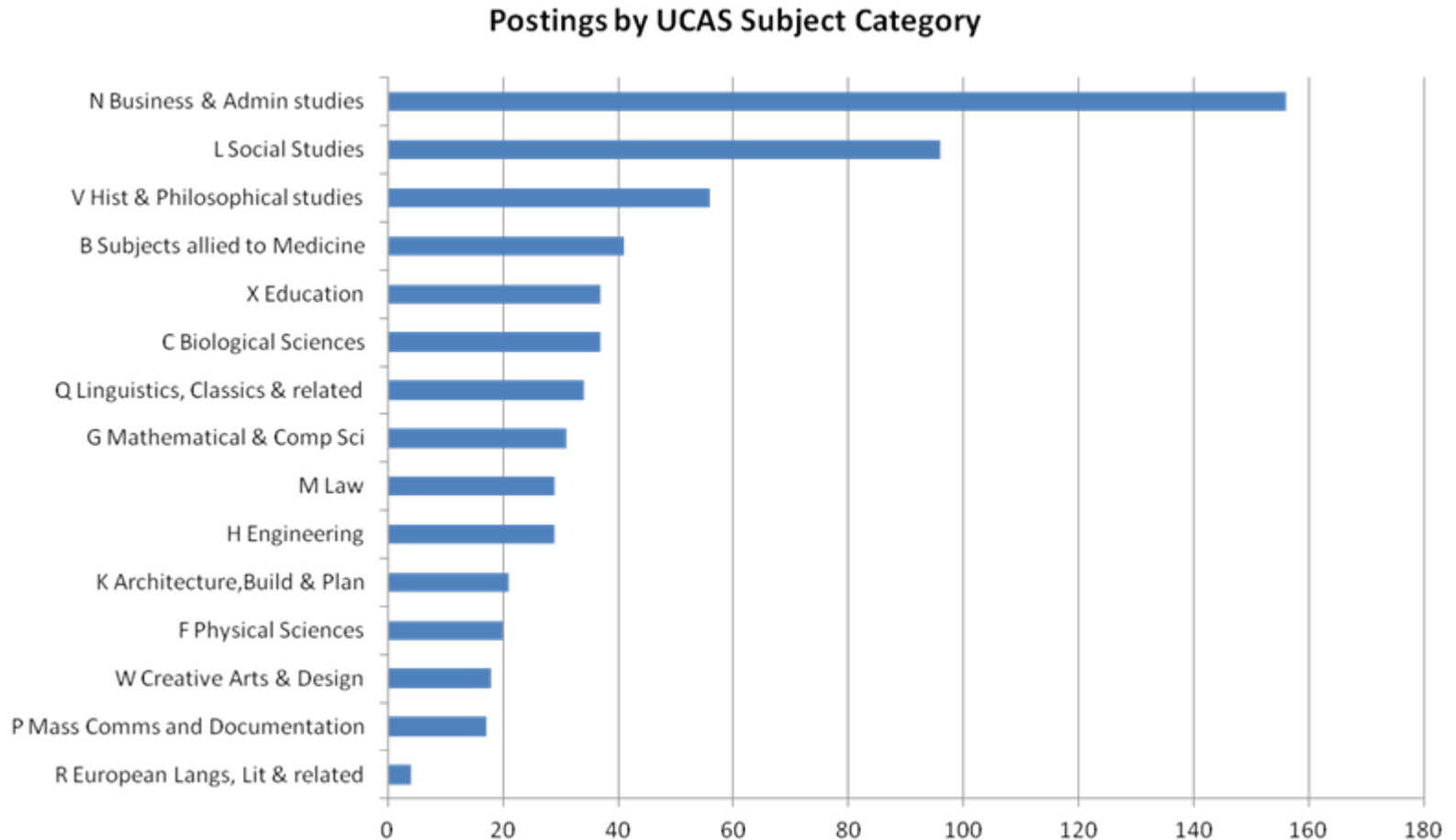
Not all postings are detailed here

jnk87	5000 words Essay about fashion management G1303	\$220 USD in 5 days
Balistas40	1000 words essay quantitative data analysis using SPSS G1278	\$70 USD in 5 days
writer048	CocaCola and Pepsi Dissertation help 10,000 words G1140	£250 GBP in 25 days
ibalseq	URGENT write an Investment analysis Dissertation G1309	\$525 USD in 15 days
ibalseq	write a project management essay 3000 words G1316	\$150 USD in 10 days
sdk2788	1500 words case study about Walmart G1321	\$70 USD in 5 days
waqar21081974	write a 5000 words business report G1325	\$150 USD in 7 days
writingsplitt	write a Financial Strategy report with 3000 words G1275	£90 GBP in 5 days
writingsplitt	write a report about Job analysis URGENT D1310	\$45 USD in 3 days
sdk2788	URGENT write a 5000 words HRM literature review G1319	\$225 USD in 4 days
sdk2788	2500 words Accountability essay help needed G1258	£70 GBP in 7 days
ibalseq	Report about testing brain training games URGENT IN 10 DAYS	£375 GBP in 10 days
writingsplitt	need someone better with law background write a essay G1266	£90 GBP in 4 days
saeedyasir	Write an essay of 1500 words D1287	\$80 USD in 4 days
sdk2788	Management Literature Review - Answer 9 questions G21326	\$80 USD in 3 days
writingsplitt	Write a research proposal G1292	\$120 USD in 4 days
hotline69	1500 words Research Proposal help needed URGENT D1208	£90 GBP in 3 days
hourempenwalla	Dissertation of MA International Business #1066	£200 GBP in 25 days
writingsplitt	4000 dissertation needed in 4 days G1262	£120 GBP in 3 days
sdk2788	HRM 5 small essays help needed G1288	£55 GBP in 5 days
waqar21081974	2000 WORDS Accounting essay P1318	\$80 USD in 4 days

saeedyasir	2500 words REPORT ABOUT customer relationship G1262	£70 GBP in 3 days
jnk87	1500 words pre-master essay (plan provided) G1255	£50 GBP in 4 days
ibalseq	1500 words essay about Banking and finance D1195	£50 GBP in 3 days
dmjuma	Report writing - Management information system #1102	£45 GBP in 4 days
jnk87	4000 words Essay about Teaching URGENT D1207	£150 GBP in 6 days
hotline69	3000 words essay help - risk management G1197	£80 GBP in 5 days
hotline69	2400words essay about Management Psychology G1209	£55 GBP in 4 days
ibalseq	Financial Modelling 9 Tasks help needed 1000words - G1204	£75 GBP in 3 days
sdk2788	1800 words marketing essay needed G1193	£55 GBP in 5 days
hotline69	2500 words essay help - Strategic Management D1128	£50 GBP in 5 days
ibalseq	RISK Capital Market for ibalseq	£80 GBP in 3 days
ibalseq	economics assignment 1500 words + EXCEL R1117	£80 GBP in 5 days
sdk2788	ACCOUNTABILITY Essay 2500 words R1103	£70 GBP in 4 days
writer048	Undergraduate Report - Consultancy Project #1083	£150 GBP in 10 days
ibalseq	Master Level Report - ECONOMETRICS #1075	£175 GBP in 7 days
dmjuma	Undergraduate Report - Organisation Reflection #1070	£75 GBP in 6 days
sdk2788	Pre-master Essay - Social Science Principle #1080	£55 GBP in 3 days
ibalseq	Essay - risk management URGENT needed in 2 days	£100 GBP in 2 days
dmjuma	Undergraduate Essay - quick work in 3 days	£36 GBP in 3 days
sdk2788	Undergraduate Business Essay needed in 3 days	£70 GBP in 3 days

EssayBay Study (2010)

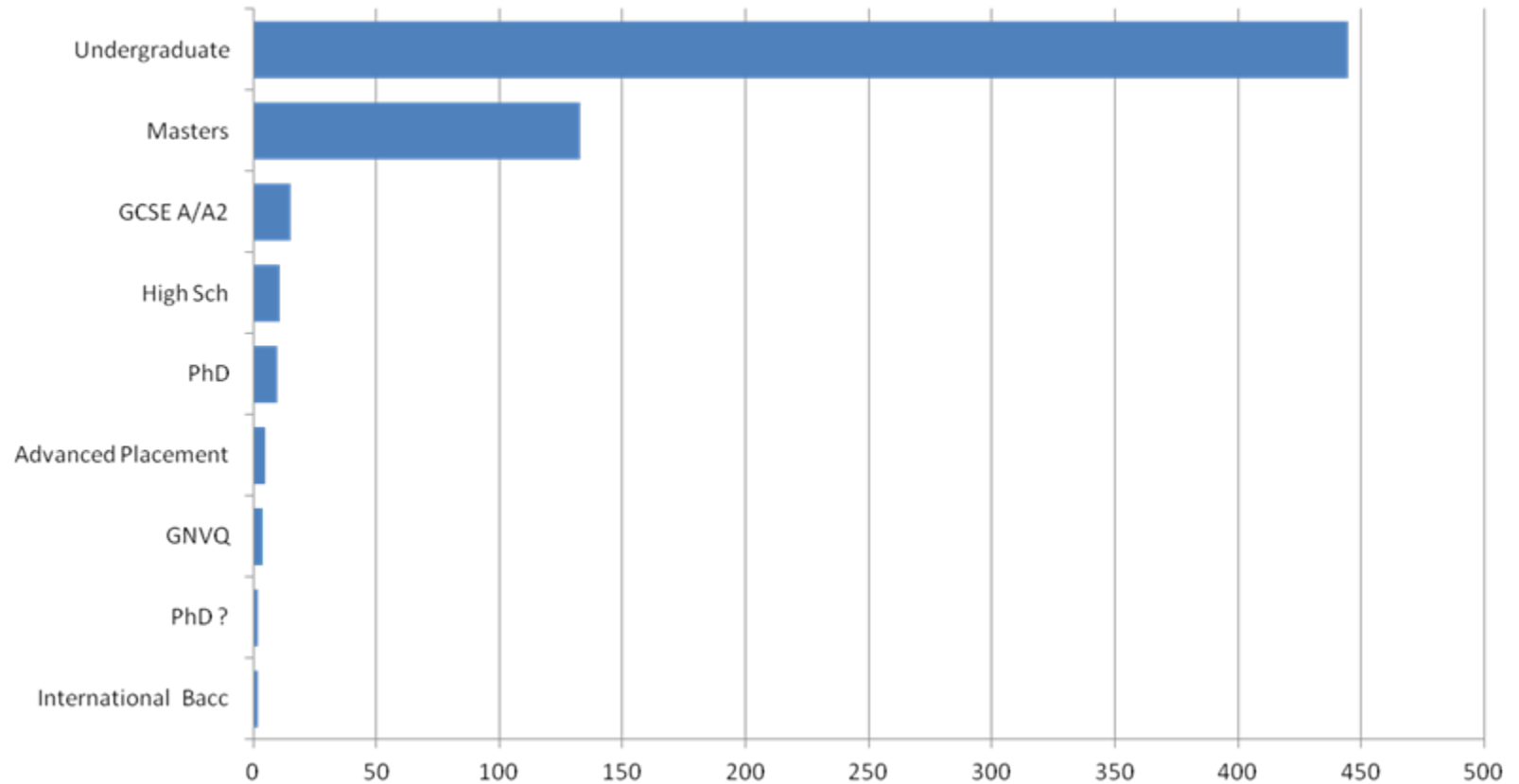
(627 postings in 5 months)



*Dealing with Contract Cheating: A Question of Attribution;
Lancaster & Clarke; HEA STEM Conference April 2012*

EssayBay Study (2010)

Postings by level



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)

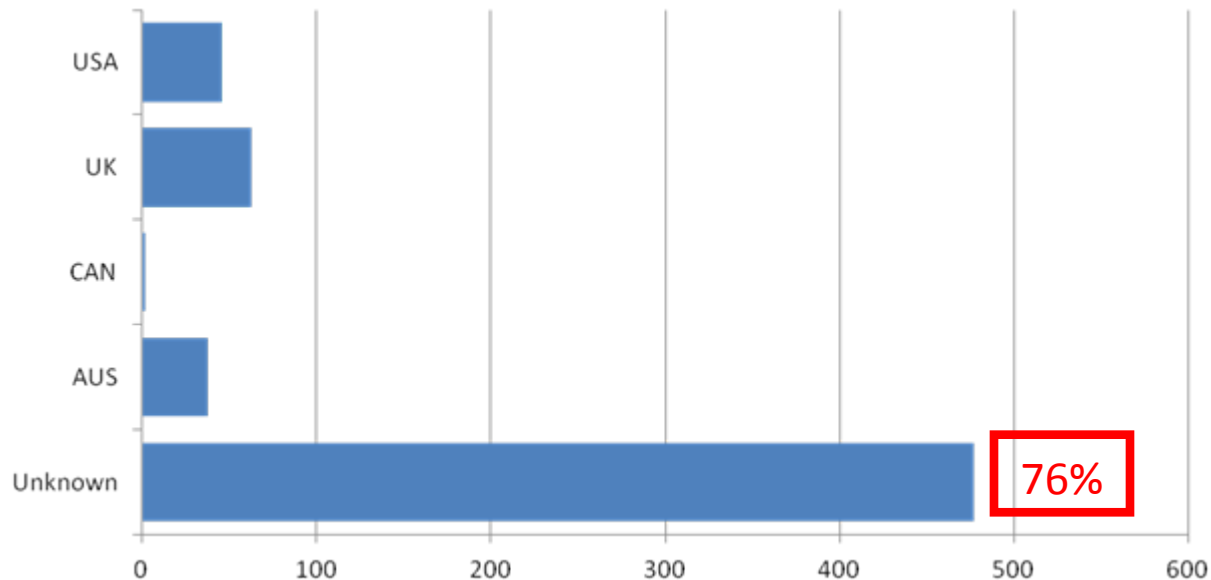
- **Topic: a.) Select a topic or issue you would find within a culture (i.e. art forms, health issues, family relations, hairstyles, food, symbolism, beliefs). Select any topic that you think could capture your interest: warfare, transportation, political systems, money, styles of dress – there is no 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)

EssayBay

Analysis by Source Institution



Only 24% of postings traced back to their originating institutions

“Attributability” of assignments is a key factor

Attributability = Searchability + 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 Business](#) Similar

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-an-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.htmlCached - 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 ...](#)

www.busi.mun.ca/sksaha/b9020/B9020_CO_W2011.pdf

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 ...](#)

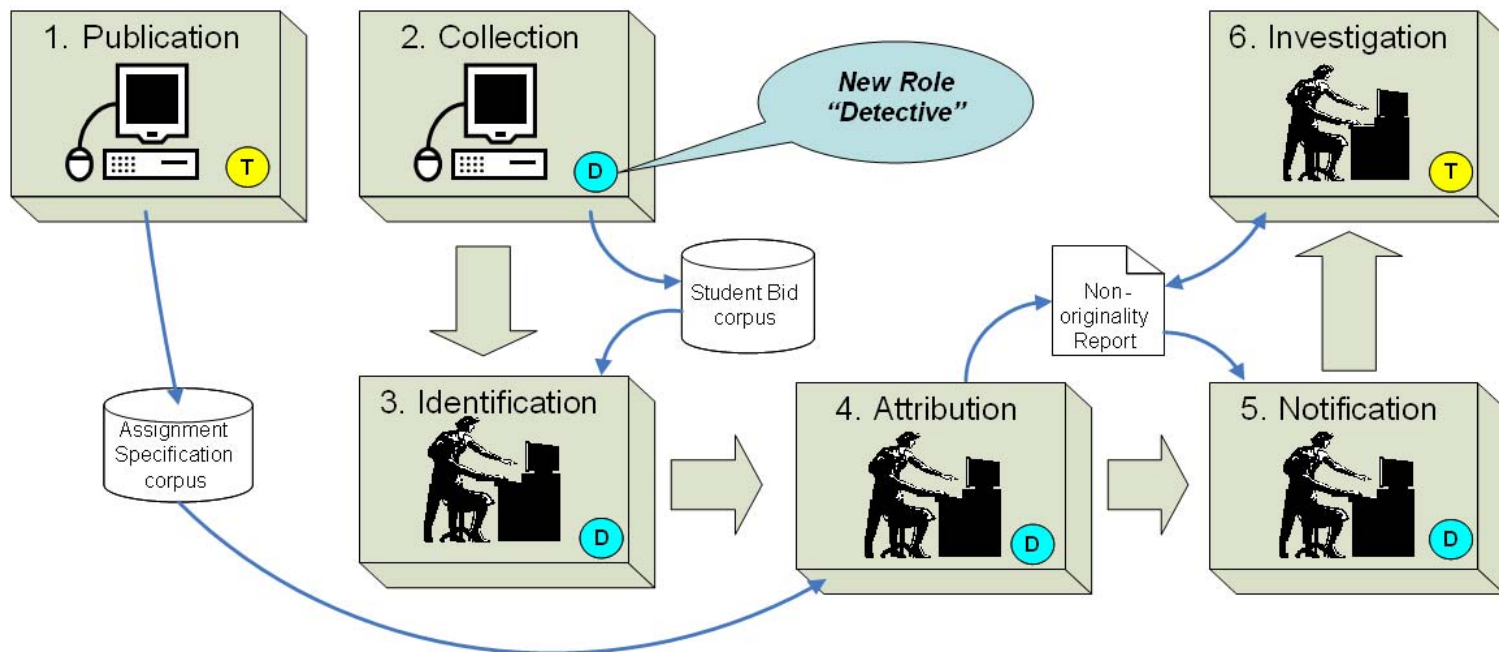
www.utas.edu.au/mgmt/Documents/.../BMA777_Unit_Outline.pdfSimilar

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-* ...

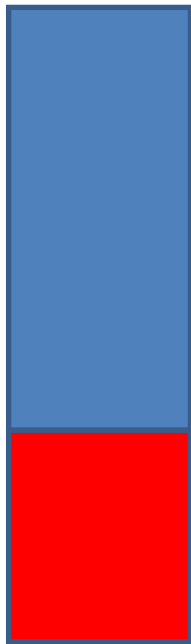
Systematic Six-Stage Process for Detecting Contract Cheating



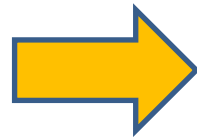
Establishing a Systematic Six-Stage Process for Detecting Contract Cheating; Clarke, R & Lancaster, The Second International Conference on Pervasive Computing and Applications (ICPCA07) 2007

Stages of Detection and Attribution

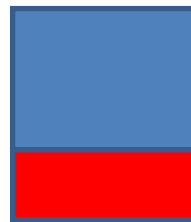
Assignments
Posted



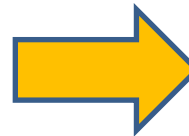
*1 in 3 postings
detected*



Source
Attributed



*1 in 3
attributed*



Student
Identified

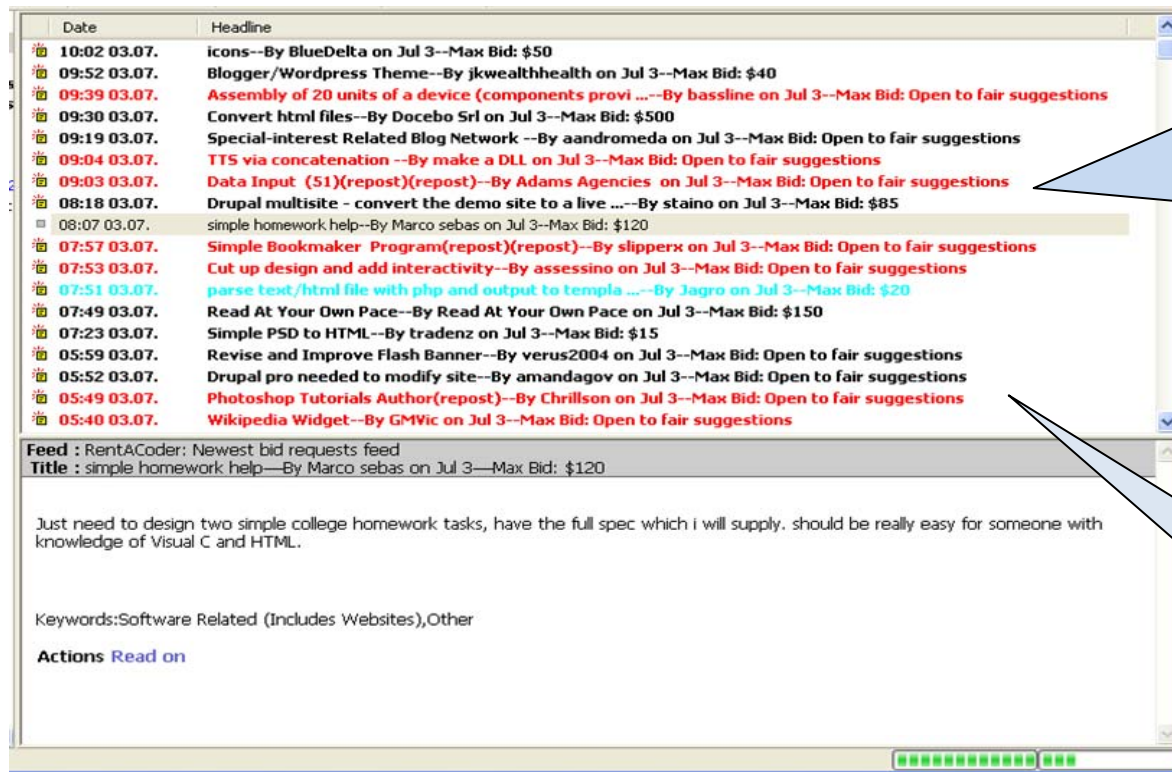


*1 in 3
students found*

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

Completed Work (5) | Work in Progress (2) | Open Projects (0)

Private Project for DMjuma \$140 USD ★★★★★ 4.8

dmjuma
"Thanks for the task. Worked well."

Report on Business Intelligence + SAS programming. [Sealed] ★★★★★ 5.0

Ohuma
"Good employer and would definitely work for again."

Writing a Business Plan for a U.K e-business Company [Sealed] ★★★★★ 5.0

dmjuma
"Thanks for the project. He is a man of his words. A good buyer even paid for a change in project requirements. A+++"

Implementing, populating and querying the db design[Sealed] ★★★★★ 5.0

us SQL

Bids made by a coder

Completed Work (200) | Work in Progress (20) | Latest Bid On

Research paper regarding Dashboard \$100 USD Today

Take any software firm and write its bussiness Intelligence dashboard paper and it should have its image for 6 papers in APA format and it has to be 100% plagiarism free and i need two seperate Reasear...

Economic report \$99 SGD Today

With ref to the attached file, analyse the article using economic concepts. Report should provide comprehensive, balance and in-depth analysis with ref to economic concepts and models. Re...

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... I am looking for someone who is willing to speak to me about my writing needs over Skype. The...

Posting by another Student

Project ID: 1701203 | Project Type: Fixed

Budget: \$30-\$250 USD

Project posted by alex... at 0.0 (0)

Project Description:
Take any software firm and write its bussiness Intelligence dashboard paper and it should have its image for 6 papers in APA format and it has to be 100% plagiarism free and i need two seperate Reasearch papers. I only have 1 and half day to complete it.

Awarded Bids

Freelancers	Bid (USD)	Time of Bid	Freelancer Re
silverhope	\$60 in 1 day \$30 Milestone Requested	10 hours ago new bid	★★★★★ 75% Comp

Awaiting Acceptance
please check PM.

Bids made by another coder

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 unmanagable*
 - *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

Show Bid Request

Simple Design Document and Small C Program		Bookmark in my 'To Do' list	
Posted by:	XXLAKERSXX (6 ratings)	Phase:	Bidding open
Non-action Rating:	Very Good - 18.18%	Max Accepted Bid:	\$70.00
Buyer Security Verifications:	Excellent	Project Type:	Personal Project / Homework Help
Approved on:	Sep 21, 2006 6:40:46 AM EDT	Bidding Type:	Open Auction
Bidding Closes:	Sep 24, 2006 12:16:08 PM EDT		
Viewed (by coders):	183 times		
Deadline:	2 days.		

<p>Categories: (Note: Like everything else on this page, these categories are part of the original contract for this bid request.) C++ / C</p> <p>Description: DETAILS OF THIS PROJECT ARE ATTACHED. THIS PROJECT IS TO BE DONE IN SIMPLE STAGES.</p> <p>Project: Write a GPA (Grade Point Average) calculator in C that will run on the campus UNIX system.</p> <p>Part 1: Write a technical (design) document that describes the project as you understand it. Part 1 is due on September 23 at the beginning of class.</p> <p>Part 2: Revise your technical document that you turned in to include the information received during the class on September 23.</p> <p>Part 3: Documentation within the program is an essential part of any program. Write, document, debug and test your program based on the design you describe in your technical write-up. The full source of your program is to be included in your paper as an appendix.</p> <p>Part 4: Data testing is necessary to ensure that the program works as designed. Programs should be carefully tested using typical and extreme data. Include as the second appendix to your technical write-up session scripts of tested programs, and numerical computations obtained using other means that verify the correctness. The final project is due September 28.</p> <p>Platform: I want the documentation delivered in a word document.</p> <p>Additional Files: This bid request includes IMPORTANT additional attached files. Please download and read fully before bidding.</p>	2.80 kb
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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”

About Buyer r0m4n4

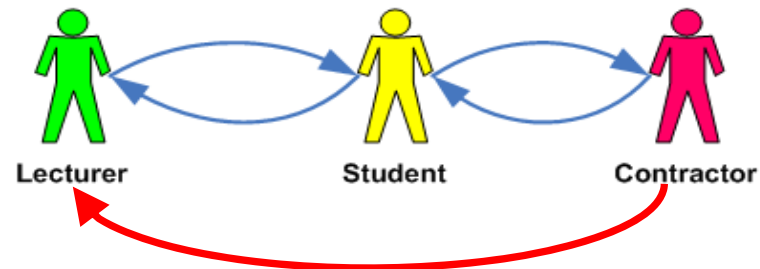
http://www.rentacoder.com/RentACoder/SoftwareBuyers/ShowBuyerInfo.asp?lngAuthId=1736754
Status as at 1:30pm Tuesday 28 Nov 2006

Name:	r0m4n4
Location:	in London, London United Kingdom (see local datetime)
Buyer Rating:	10 (Excellent) (see 16 ratings)
Sign up date:	Dec 8, 2005 10:00:49 PM EDT
Last Logged In:	Nov 27, 2006 0:43:21 PM EDT
Non-cancelled:	27 Bid Requests
Bids Accepted On:	24 Bid Requests
Work Accepted and Paid:	22 Bid Requests

Title	Bid #	Coder	Date
Oracle SQL statements (Very Simple)	571521 571521.ZIP	the_coder85	November 22, 2006
Website Review	568157 568157.ZIP	Swityrs	November 17, 2006
Calendar Web Application (repost)	560551	Quantum Computers	November 12, 2006
Sequence Diagram from USE CASE diagram (easy work, quick cash)	560306	ali_bhatti	November 6, 2006
Report on Software Disasters (repost)	559957 559957.ZIP	RealFriti	November 4, 2006
Java Program (beginner's level) Quick Money	559959	Anati Softwares	November 3, 2006
Sequence Diagram from USE CASE diagram (easy work, quick cash) (repost)	562349	genispoder	November 1, 2006
Report on Software Disasters	552177 552177.ZIP	bosdfasfdafafaf	November 1, 2006
Report on Use Case Modelling Exercise	556311	Quantum Computers	October 29, 2006
Use Case Modeling	552182 552182.ZIP	Quantum Computers	October 25, 2006 8: 50:46 PM EDT
Simple Database Design Project MAX 1.5 Hour Work	554535 554535.ZIP	the_coder85	October 21, 2006
Easy UML Project, MAX 2hours	554650 554650.DOC	zipetz	October 21, 2006
Report Writing on Issues of computer law	442861	budster	May 1, 2006
Beginners UML Assignment (Modelling the (repost)) (repost)	444539	Whizzad	April 17, 2006 10: 16:40 AM EDT
Beginners UML Assignment (Modelling the (repost)) (repost)	442552	soolquy_jill	April 12, 2006
Simple Java Applet Tutorials, Easy for a Pro	429843 429843.ZIP	Van Tuyl Software	March 20, 2006

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

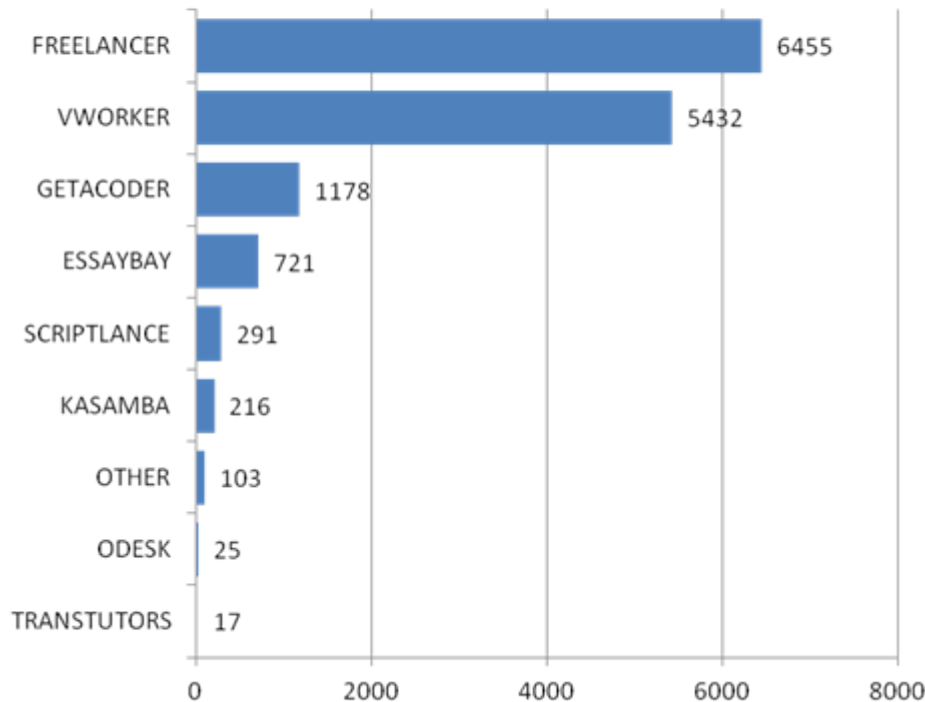
Notifying staff that their assignment has been posted

- 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

Postings by source 2005-2012

Total of 14,438 detected items



- 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?

