Academic integrity: a quantitative study of confidence and understanding in students at the start of their Higher Education

Dr Philip M. Newton

College of Medicine, Swansea University, Swansea SA2 8PP United Kingdom

p.newton@swansea.ac.uk

Abstract

Establishing a positive, proactive approach to issues such as plagiarism requires that students are equipped with the skills and experience to act with integrity and that educators are fully aware of the attitudes and ability of students, particularly when they start university. This project used a questionnaire-based methodology to probe the attitudes, ability and confidence of undergraduates newly enrolled at a university in the United Kingdom, with a focus on concepts relating to written assignments. New undergraduates were confident in their understanding of plagiarism, yet performed poorly on simple tests of referencing. Students were generally of the opinion that academic misconduct should be modestly penalised compared to the standard penalties imposed by the UK higher education sector. Positive correlations were found between confidence, performance and recommended penalties, suggesting that confident students did better on tests of simple tests of referencing and recommended more severe penalties for transgressions of academic integrity. These correlations were supported by findings that new postgraduates were more confident than new undergraduates, recommended more severe penalties, and performed better in the simple tests of referencing. Findings are discussed in the context of educational needs identified for students, educators and institutions.

Keywords: Academic integrity, plagiarism, collusion, referencing, essay mill

Introduction

Modern accounts of academic integrity stress a need for an institutional approach, ensuring that staff and students are responsible for creating a culture of honesty and fairness, without losing sight of the need to address academic misconduct where it occurs (McCabe and Pavela 2004). Where misconduct occurs, it is often in the form of behaviours such as plagiarism and collusion (McCabe, Trevino, and Butterfield 2001).

Plagiarism is widely defined as 'using someone else's work as if it were your own', generally by giving insufficient credit to (incorrectly referencing) the original author(s) of the work. This can vary from paraphrasing a short piece of text all the way through to verbatim copying of an entire assignment without any attempt to credit the original author. Collusion is a related practice involving two or more persons attempting to gain credit for the same piece of work, and is often considered a form of plagiarism (Johnston 2003). In the United Kingdom, plagiarism and collusion in higher education are normally penalised through academic means such as the removal of credit for the work in question and associated assignments (Tennant and Duggan 2008). This general concept of academic penalties for violations of academic integrity is found across the international higher education sector, although there are variations in policy, penalty and even definitions of plagiarism and collusion (Bretag et al. 2011; Glendinning 2014; Hayes and Introna 2005). The use of contract essay writing companies, 'freelancers' or other paid third parties to produce work on behalf of a student, which the student submits as if it were their own work, is often considered to be a distinct form of misconduct with more severe penalties (Tennant and Duggan 2008; Walker and Townley 2012).

There is an extensive body of international literature on plagiarism and other forms of academic misconduct in all forms of education. Findings vary considerably (and are reviewed in greater detail in the discussion), but the general trend is that most university students report having 'cheated' at some point and most have seen someone else cheat (reviewed in (Lupton and Chaqman 2002) and (Brimble and Stevenson-Clarke 2005)). Many of these studies have been conducted using students in specific disciplines, such as Psychology (Newstead, Franklyn-Stokes, and Armstead 1996;

Franklyn-Stokes and Newstead 1995) and the Biosciences (Dawson and Overfield 2006). Thus, according to self-report from students, plagiarism is common.

The consequences of plagiarism have also been studied and staff-student perceptions compared. Much of this research has been conducted in the USA and UK-based research has been limited until recently (Dawson and Overfield 2006; Franklyn-Stokes and Newstead 1995). Despite differences in methodology, country of origin and participant demographics (age, degree programmes etc), common themes emerge from these studies: broadly speaking, students (1) are able to identify plagiarism, although a significant minority can't; (2) recognise that plagiarism is wrong but (3) would impose more lenient penalties than staff (Brimble and Stevenson-Clarke 2005; Franklyn-Stokes and Newstead 1995; Wilkinson 2009; Yeo 2007;). For example, when asked to recommend a penalty for a student who had paid someone else to write an assignment , the most common recommendation was that the student should fail only that assessment (Brimble and Stevenson-Clarke 2005), when most institutions would impose a much more severe penalty (Tennant and Duggan 2008).

Despite students reporting that plagiarism and other forms of academic misconduct are common, previous studies have also demonstrated that some undergraduate students struggle to recognise plagiarism when presented with examples. Roig (1997) designed a plagiarism knowledge survey wherein students were presented with a written paragraph and then 10 different rewritten versions of that paragraph, of which 8 were plagiarised to some degree. Approximately half the students surveyed failed to recognise 6 of the plagiarised examples (Roig 1997). A study of UK bioscience students (Dawson and Overfield 2006) asked undergraduates to choose as many definitions of plagiarism as possible from a list of five. 40% of students did not pick the statement "Plagiarism is using someone else's ideas as if they were your own". Approximately 10% of students did not pick the most obvious statement defining plagiarism, that it is "....using someone else's words as if they were your own".

The current study aimed to extend the literature describing student ability to recognise plagiarism, as well as to address two important related questions - what do students

think the consequences of plagiarism should be, and how confident are they that they understand what plagiarism is. The relationship between these three questions is potentially very important. For example, it seems reasonable to assume that a student who has limited understanding of plagiarism is more likely to get into academic difficulty if their lack of knowledge is paired with a misplaced confidence.

The study specifically asked these questions of newly enrolled undergraduates at a research-intensive UK University to determine how these students view and understand these concepts when they first enter higher education. This design was partially based on some assertions in the literature, by students, that experiences in further education leave them unprepared for the requirements of university assessments (Ashworth, Bannister, and Thorne 1997; Lea and Street 1998).

The paper is structured as follows; methods will describe the development and validation of the interactive questionnaire-based research instrument. The results will compare the views and performance of undergraduate students with newly-enrolled postgraduates and the regulations of the host institution, as well as testing for relationships between the three main areas of research (confidence, view on penalties and performance on simple tests of referencing). The discussion will consider the findings against a detailed analysis of the background literature on plagiarism and some of the specific questions asked in the research instrument.

Methods

Research questions were addressed using a 3-section scenario-based instrument. This design has a precedent in the literature on plagiarism and other forms of misconduct (Brimble and Stevenson-Clarke 2005; Franklyn-Stokes and Newstead 1995; Landau, Druen, and Arcuri 2002; Roig 1997; Ryan et al. 2009; Yeo 2007). The instrument was delivered via Powerpoint presentation, with responses collected using the Turning Point® interactive response system. A summary of the instrument is shown in Table 1 and examples are shown in Figure 1 and Figure 2.

Section A (Confidence) of the instrument contained 3 Likert-scale based questions to determine participant confidence in their understanding of referencing, plagiarism and use of the bibliography. Section B (Recognising and Responding) contained a series of fictitious scenarios and asked participants whether the behaviour of the fictitious 'Student X' in each scenario was 'acceptable' or not. If they thought the behaviour was unacceptable, then they were asked how they thought it should be penalised. These two questions were addressed as one (see Figure 1 for an example). It was emphasised that the question asked was always 'what *should* happen' in a particular scenario and not 'what *would* happen'., An additional statement presented both visually and verbally emphasised that 'there is no right or wrong answer – it's your opinion'.

Two scenarios described 'acceptable' behaviour (i.e. not academic misconduct), although one represented poor academic practice (using Wikipedia as a primary source). The remaining five outcomes represented unacceptable behaviour. Outcome options available to participants were the standard outcomes from an academic misconduct investigation at the host institution. The behaviours and outcomes map directly onto the Project Amber tariff (Tennant and Duggan 2008) and are thus broadly representative of the UK Higher Education sector.

The first question showed examination misconduct and was used an example only. Two 'control' scenarios (B1 and B3) represented 'good practice' (B3) and an extreme example of unacceptable behaviour that, alongside multiple essay purchase, included criminal activity ('selling drugs on campus') (B1).

Section C (Referencing Conventions) contained 4 basic tests of referencing/plagiarism (example in Figure 2). Designed on the basis of existing studies (e.g. (Landau, Druen, and Arcuri 2002; Roig 1997)), participants were shown an extract from a fictitious textbook alongside an extract from a fictitious student assignment which used the fictitious textbook as a source, with red font used to highlight words copied verbatim. Participants were asked whether the student assignment should cite, or had correctly cited, the textbook.

Figure 1 Example slide from the research instrument - section B (Recognising and Responding)

Figure 2 Example slide from the research instrument - section C.

Group + Stem	Q	Description
Confidence	A1	"I know what plagiarism is"
Rate your agreement	A2	"I know what referencing is"
with the following	A3	"I know what a bibliography is"
statement		
	B1	Purchase of multiple essays and criminal behaviour [1]
	B2	Purchase of a single essay
Academic Misconduct	B3	Correct referencing
Do you think that the	B4	Plagiarise from Wikipedia - no references
behaviour described is	B5	Use of Wikipedia - correctly cited
acceptable and, if not,	B6	Plagiarism of ideas
how should it be	B7	Plagiarism in multiple modules
punished	B8	Plagiarism from a friend
	B9	Collusion - two students collude to write one essay
Referencing	C1	Direct copying without quotation marks etc
Conventions Does the	C2	Citing source once then return to it later without citing
sample writing	C3	Paraphrasing without citation
correctly acknowledge	C4	Correct referencing
the source text?		

Table 1 Summary of questions/scenarios analysed from the instrument.

[1] see text

The instrument was initially piloted separately to each of four members of the host institution's Academic Integrity Working Group; staff members with extensive experience of dealing with plagiarism. The aims of this first pilot stage were to (1) ensure clarity and remove ambiguity and (2) agree the 'standard penalty' that would be imposed in the relevant scenarios, using the institutional regulations on academic misconduct.

An additional validity test was performed with Section C (Referencing Conventions), wherein scenarios were presented to nine additional, experienced staff members who had, at some point in their career, been responsible for investigating issues relating to plagiarism. The percentage of these 13 (total – inc first pilot) staff members giving the correct answer to questions in section C was at least 85% for every question (C1 – 92%, C2 – 85%, C3 – 85%, C4 – 92%).

A second pilot of the full instrument was undertaken with 4 academics who did not have abundant experience of dealing with plagiarism. They were asked to engage with the resource as if they were students, although pointing out where they perceived ambiguity or a lack of clarity.

Ethical approval for the study was obtained from the local research ethics committee. The instrument was delivered to new undergraduate and postgraduate student participants within their first 6 weeks of study. The instrument was delivered at sessions for which attendance was compulsory as part of education about referencing and plagiarism. Responding to questions was voluntary. Participant consent for collection of their responses (or not) was obtained using a Yes/No Turning Point® slide, following two information slides.

The researcher did not speak to participants when they were answering the scenarios, apart from to readout scripted instructions.. A printed reference slide containing instructions for the interpretation of scenarios in section B (Recognising and Responding) was given to all participants and projected at the beginning of section B. This information, in summary, was that Student X was a second year student completing a standard UK undergraduate programme, with all modules being 20 credits from a total of 120 required to progress into year 3. Written assignments constituted 50% of the module mark and one attempt would be allowed to resit failed written assignments.

Participants were requested not to discuss scenarios while they were displayed. The number of responding participants was shown on the slides. Scenarios were displayed for approximately 30 seconds or until the majority of participants had responded, whichever came sooner. Participants were informed approximately 5s before each scenario transition. Once all scenarios had been presented they were reviewed with students to help them learn about referencing and plagiarism. Four scenarios were shown for educational purposes only and have not been analysed here. (these two were additional versions each of scenarios B4 and B8).

Statistical analysis was performed using Graphpad Prism®. Differences were considered significant where 'P'<0.05. *Post hoc* tests were conducted where appropriate, with correction for multiple testing (guided by (Streiner and Norman 2011)).

Participant types and numbers

94.2% (586 out of 622) students consented to having their responses collected. Participants were from a variety of programmes across the host institution, representing all areas of educational provision (Table 2).

Course (Bachelors or Masters)	U/P	Yes	No	DNA
Computer Science	U	31	0	0
Computer Science	P	27	0	0
Egyptology	U	46	1	1
Genetics + Biochemistry	U	77	0	6
Graduate Entry Medicine	P[*1]	54	0	0
Mass Spectrometry	P	4	0	2
Med Sci + Humanities/Social Work [*2]	U	43	1	6
Nursing	U	134	3	9
Psychology	U	82	0	1
Psychology	P	13	0	0
Science Foundation	U	68	6	0
Social Research Methods	P	7	0	0
Total	**622**	586	11	25
Percent	**100**	94	2	4

Table 2 Breakdown of student participants and their consent to participate

*U/P = Undergraduate or Postgraduate (first year of study). DNA = Did Not Answer (data were not analysed for these or for respondents who selected 'no'). [*1] Although considered as postgraduates for the purposes of this study, Graduate Entry Medicine students are undergraduate medical students. [*2] both programmes were in the same session.*

There was a mean response rate per question of 96.9% (range 93.4-98.5). with no statistical difference between undergraduates and postgraduates when compared by Mann-Whitney test (P = 0.65, U = 181). A total of 411 (70%) students responded to all questions in all three sections (338 undergraduates and 73 postgraduates).

Results

Section A - Confidence

New undergraduate students were very confident in their understanding of all three concepts, in particular plagiarism, where 86% of respondents selected responses reflecting the two highest levels of agreement (Table 3).

Rank	I know what (a)......... is		
	Plagiarism	**Referencing**	**Bibliography**
Completely disagree	1.1	1.5	3.4
Heard of but don't really know what is	1.1	6.1	10.0
Heard of it and know something about it	11.6	18.4	16.0
Reasonable understanding	61.5	56.8	38.0
Completely agree	24.8	17.2	32.6

Table 3 Undergraduate student responses (percentage) to questions in section A (Confidence)

Relative confidence in the concepts of referencing, plagiarism and the bibliography was compared using a Friedman (non-parametric repeated measures) test for the 459 undergraduate students who responded to all three of these questions. This returned a significant difference ($P<0.0001$). *Post hoc* Dunn's tests, combined with use of the mean as being indicative of central tendency for the data set, revealed that students were less likely to agree with the statement 'I know what referencing is' (A2) compared to 'plagiarism' (A1) ($P<0.001$) or 'a bibliography' (A3) ($P<0.05$).

Responses from postgraduates were compared to undergraduates using a Mann Whitney test to analyse each question combined with use of the mean as being indicative of central tendency for the data set. Postgraduate students were significantly more confident than undergraduates in their understanding of plagiarism ($P<0.0001$, U

=17950) and referencing (P<0.0001, U = 13849) but not 'a bibliography' (P = 0.1036, U = 21336).

Results - Section B – Recognising and Responding

The majority of students recognised transgressions of academic integrity when presented in the scenarios. However a substantial majority of students consistently thought that these behaviours should be dealt with through the application of a penalty less severe than that which would be imposed by the University. Undergraduate student responses to the questions asked in Section B are shown in

Table 4 and Figure 3.

Code	Summary	Is fine	PAP	Warning	Failure of	
					Assignment(s)	Module
B1	Purchase of multiple essays + criminal behaviour	1.3	0.4	0.6	4.9	8.1
B2	Purchase of a single essay	2.6	3.4	5.1	41.8	20.6
B3	Correct referencing	93.4	3.0	0.6	1.7	0.2
B4	Plagiarise from Wikipedia - no references	0.0	5.1	6.4	57.8	**16.7**
B5	Use of Wikipedia - correctly cited	28.1	**55.7**	7.7	6.6	0.4
B6	Plagiarism of ideas	31.2	34.2	16.1	12.7	**3.9**
B7	Plagiarism in multiple modules	1.1	8.5	6.5	24.3	32.6
B8	Plagiarism from a friend	0.9	3.2	2.8	53.8	**18.7**
B9	Collusion - two students collude to write one essay	0.6	6.2	7.9	62.3	**14.1**

Table 4 Undergraduate responses to Section B (Recognising and Responding). Responses
participants who selected that option. Cells shaded yellow indicate penalty which would be applie
academic practice, Student X would lose marks but the behaviour described was 'acceptable'.

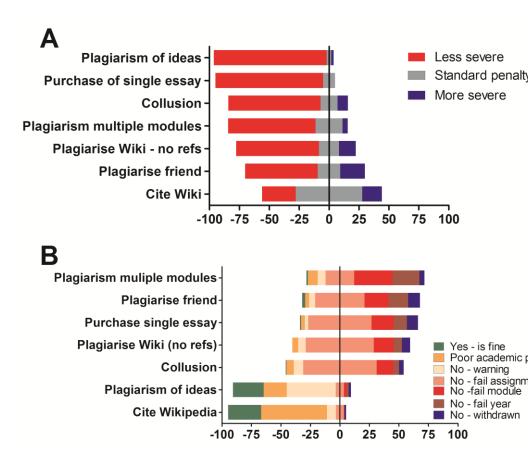Figure 3 New undergraduate responses to common academic integrity violations. (A) The percen...

recommending a penalty that was less severe, more severe or the same as the standard penalty reco...

(control scenarios B1+B3 are excluded). (B) The percentages of students selecting each answer option...

the penalty scale (fail assignment).

available online: www.tandfonline.com/doi/full/10.1080/02602938.2015.1024199

The data presented in Figure 3 complement those shown in Table 4, but clarify substantial differences between some of the scenarios. As can be seen from both Table 4 and, in particular Figure 3, the majority of new undergraduate students indicated that they thought a more lenient penalty should be given compared to that which would be imposed by the university.

Undergraduates vs Postgraduates - Penalty Sum Analysis

To determine whether there was an overall difference in the outcomes recommended by undergraduates versus postgraduates, a penalty sum score was calculated for each of the 411 respondents who answered every question in this section by simply adding together, for each participant, all their responses to the scenarios shown in Table 2. There was a significant difference between undergraduates and postgraduates when compared by Mann Whitney U test (U = 10466, P = 0.0414). Comparing the means of these two groups demonstrated that postgraduates favoured more severe penalties (27.5 vs 26.8 for undergraduates).

Results Section C - Referencing Conventions

Participants were tested on their ability to identify common mistakes in academic writing - lack of correct citation of block text (C1), failure to cite a source every time it is used (C2) and paraphrasing without citation (C3). A 'control' question (C4) showed correct referencing. A summary of the four questions is given in Table 5 and an example is shown in Figure 2.

Code	Scenario	Question on slide
C1	Student assignment uses a large chunk of text, followed by an in-text citation but *not* placing the sourced text in quotation marks or identifying it in some other way	Does the student assignment correctly acknowledge the source?
C2	Student assignment uses the source text multiple times but only inserts an in-text citation after the first use.	Does the student assignment correctly acknowledge the source?
C3	Student assignment paraphrases the source text without including it as a source, either in text or bibliography	Should the source text be cited by the student, either in text or bibliography?
C4	Student assignment correctly cites the source text	Does the student assignment correctly acknowledge the source?

Table 5 Summary of questions used in Section C (Referencing Conventions)

The performance of undergraduate students (**Table 6**) and postgraduate students (**Table 7**) is shown below.

Question	Incorrect	Correct	Don't Know
C1 - quote marks	36.7	50.8	12.6
C2 - multi use	39.6	46.7	13.7
C3 - paraphrase	18.3	71.1	10.7
C4 - correct ref	17.7	67.7	14.7

Table 6 Undergraduate student responses to questions in Section C (Referencing Conventions), shown as a percentage. 'Correct' and 'Incorrect' refer to whether the students answered correctly or not.

Question	Incorrect	Correct	Don't Know
C1 - quote marks	26.0	69.0 (+18.2)	5.0
C2 - multi use	30.4	64.7 (+18)	4.9
C3 - paraphrase	17.6	75.5 (+4.4)	6.9
C4 - correct ref	8.9	84.2 (+16.5)	6.9

Table 7 Postgraduate student responses to questions in Section C (Referencing Conventions), shown as a percentage. Figures in brackets represent the percentage difference from undergraduates (correct answers only). 'Correct' and 'Incorrect' refer to whether the students answered correctly or not.

Although undergraduate students generally answered correctly, the percentages were modest compared to experienced teachers (85-92% - see materials and methods) and postgraduates. In addition, only 16% of undergraduate students answered correctly for all four questions, compared to 39% for postgraduates.

Correlations between confidence, performance and penalty recommendations

available online: www.tandfonline.com/doi/full/10.1080/02602938.2015.1024199

A key aim of this study was to determine the status of new undergraduate university student attitudes to, and understanding of, all aspects of academic integrity with regard to written assignments. The research instrument collected information about three distinct, important facets of academic integrity; confidence in their own understanding, (Section A); their views on how common transgressions of academic integrity should be penalised (Section B) and their ability to identify some common mistakes in academic writing (Section C).

To gain a more holistic picture of how new undergraduate students view academic integrity, we analysed relationships between these factors. For each of the 338 undergraduate students who responded to every question in the instrument, the combined score for each section was calculated. A confidence score was calculated by assigning a numerical value to each of the responses where 'completely agree' scored 5 and 'completely disagree' scored 1 and then adding together the responses given for each of questions A1-3. We calculated a penalty score sum as described above, using the scenarios shown in Table 1. A performance score was calculated by adding together the scores for C1-4, which tested student's ability to recognise whether a section of text was correctly referenced. For each scenario, students were given '1' for a correct response, '0' for 'don't know' and '-1' for an incorrect response. A Spearman Rank correlation analysis was then undertaken which returned highly significant positive correlations between each of the factors, showing that increased confidence was associated with increased performance ($r_{(336)}$ = 0.267, P<0.0001) and a higher recommended penalty sum ($r_{(336)}$ = 0.274, P<0.0001). Higher penalty sum was also correlated with higher performance ($r_{(336)}$ = 0.183, P<0.001). Thus confident students were more likely to perform well on simple tests of referencing, and recommended more severe penalties for transgressions of academic integrity.

Discussion

There are a number of important findings in this study. New undergraduate students at a university in the UK are, according to the findings reported here, confident, lenient and lacking in a basic understanding of referencing and plagiarism. However, confidence, ability and views on how academic misconduct should be penalised were all related, with confident students performing better on tests to identify common mistakes in the referencing of academic writing and also recommending more severe penalties for transgressions of academic misconduct. This relationship is supported by observations that new postgraduate students are, compared to undergraduates, more confident, stricter and more aware of basic concepts in referencing.

Although there are studies which have previously examined whether students can recognise academic misconduct and their opinion on how it should be addressed (Brimble and Stevenson-Clarke 2005; Ramzan et al. 2012; Ryan et al. 2009; Yeo 2007; Wilkinson 2009), most did not include an analysis of student confidence. In the present study, students were extremely confident. Of interest was the observation that students were extremely confident that they know what plagiarism is (86% selecting one of the two responses which reflected the highest level of confidence), yet were significantly less confident that they know what referencing is, despite correct referencing being the obvious means by which plagiarism can be avoided.

Students were indeed able to recognise very simple plagiarism - for example, no students thought it was acceptable to cut and paste an essay from Wikipedia without references (Table 4). Similarly, the majority of students recognised that simple collusion – two students writing half an assignment each and then both submitting as if it were their own work – is not acceptable, although again the majority of respondents recommended a penalty (failure of the assignment) which is more lenient than that recommended by the university (failure of the module).

The majority of students (55.7%) stated that that using Wikipedia as a primary source is poor academic practice, even when it is correctly cited, although 28.1% considered that it was 'fine'. There is little doubt that Wikipedia and similar sites are a significant

source of information for university students preparing written assignments. For example, a recent study from Australia showed that 94% of medical students admit to using Wikipedia, although 85% of those considered it to be unreliable (Allahwala, Nadkarni, and Sebaratnam 2013).

Less obvious examples of plagiarism caused more difficulty for students. For example, scenario B6 showed an example of 'plagiarism of ideas', wherein the ideas for an assignment have been copied entirely from elsewhere, although the text written by Student X is original. This scenario was a clear example of plagiarism, yet showed the greatest divergence between undergraduate student opinion and that of the university. The type of plagiarism displayed in this scenario is considered by some to be more serious than the plagiarism of words (e.g. (Bouville 2008)) yet 31.2% of new undergraduate respondents here considered that the behaviour described was 'fine' and a further 34.2% considered it only to be poor academic practice. Thus over 65% considered the behaviour to be 'acceptable', demonstrating that a majority of these new undergraduates simply did not recognise that plagiarism constitutes ideas as well as words. A similar finding has been seen with undergraduate Bioscience students, 40% of whom did not recognise plagiarism as 'using someone else's ideas as if they were your own' (Dawson and Overfield 2006).

One of the most surprising findings was the leniency with which participants regarded the purchase of an essay (B2), relative to the likely standard penalty imposed by the university. Many institutions consider this to be one of the most serious forms of academic misconduct and a cause for disqualification from university, even if it is a first offence (Tennant and Duggan 2008). Yet 89.9% of undergraduate students thought that a more lenient penalty than expulsion should be applied, with 41.8% thinking the penalty should be to fail the assignment in question and 6% rating the behaviour in one of the two 'acceptable' categories. This is a substantial discrepancy and raises questions for further study, perhaps using a more focused qualitative methodology to explore student and staff views - are there circumstances in which essay purchase should be viewed more leniently or even as a minority of students seem to think, viewed as acceptable? Regardless, the current likely penalties for essay purchase clearly need to

be communicated to students.. There are currently very few ways by which this sort of plagiarism can be effectively identified (O'Malley and Roberts 2012) or prevented (Wallace and Newton 2014).

Collusion is a form of academic misconduct that is related to, but distinct from, simple plagiarism. It is a difficult and subjective area - students have to strike a fine balance. On one side is a desire to collaborate with, and even help out, their colleagues. On the other is the principle that one student is doing the work of others. Rennie and Crosby directly addressed this distinction as part of a questionnaire survey where medical students were asked to rate whether certain behaviours were acceptable or not. 61% answered that it was acceptable to 'lend work to another student to look at', whereas 61% responded that it was unacceptable to 'lend work to another student to copy' (Rennie and Crosby 2001). Clearly the stated intention of the recipient is very important when making this distinction. In the present study, the majority of students recognised that copying from a friend was unacceptable, yet, as in other scenarios, the majority recommended a more lenient penalty than that which the university would impose.

The overall picture presented by findings from the academic misconduct scenarios in
Table 4 and Figure 3 is that new undergraduate students can recognise very straightforward examples of academic misconduct, but do not have a full grasp of the complex nature of issues such as plagiarism. In addition, they would recommend more lenient penalties than their university.

A fundamental component of the design of section B (Recognising and Responding), and one which was emphasised during the introduction to the section, is that participants were asked for their opinion regarding the penalty that *should* be imposed, rather than any penalty they thought the university *would* impose. This raises two important points for discussion. The first is the consideration of whether participant responses would be different when asked what penalty they think would be imposed. Although this is a different research question, it is an important one, because it directly relates to student perceptions of the consequences of plagiarising. This could be investigated in future

iterations of the research. The second question is whether some consideration should be made of changing the penalties, since participants consistently favoured more lenient penalties than those that would be imposed across the sector (Tennant and Duggan 2008). There has been some research in this area, which demonstrates clearly that a severe penalty acts as a deterrent to deliberate plagiarism (Haswell, Jubb, and Wearing 1999), while core principles of academic integrity emphasise the need to address academic misconduct when it occurs, with other students often feeling let down when academic misconduct is not addressed (McCabe and Pavela 2004). Thus it would not seem appropriate to reduce penalties, but rather to make sure that both students and staff are aware of the penalties to ensure that they are effective as deterrents, balanced against an understanding of whether students have a firm grasp of what academic integrity is.

The performance of new undergraduate students on simple tests of referencing was modest, with an average 59% of students answering correctly on questions C1-4. In particular, only 50.8% of students recognised the need for the use of quotation marks when copying a large block of text verbatim (question C1), reflecting results from a similar study conducted with psychology students in the USA (Roig 1997). Even fewer students (46.7%) recognised the need to re-cite a source where quoting from it on more than one occasion (C3). The sort of paraphrasing shown in question C3 would, if repeated throughout an assignment, constitute serious plagiarism and thus it appears there is the potential for many students to get into serious difficulty through a simple lack of understanding about how credit is given for the work of others.

The finding that the severity with which students would penalise transgressions of academic integrity is also correlated with confidence and performance is interesting. One possible interpretation is that, given a greater understanding of these concepts, students are more likely to take a negative view of those who commit simple errors and/or plagiarism. This interpretation is supported by studies showing that students take a 'moral' view of plagiarism by their peers (Ashworth, Bannister, and Thorne 1997) and also has important implications for educators who, by the very nature of their position, will have a better understanding of referencing and plagiarism. The penalties

imposed by those educators may possibly be influenced by a mismatch between their level of understanding and those of the students that they are penalising.

As described above, there are a number of studies which have used a questionnaire-based methodology to examine whether students can recognise academic misconduct and their opinion on how it should be addressed (Brimble and Stevenson-Clarke 2005; Ramzan et al. 2012; Ryan et al. 2009; Yeo 2007; Wilkinson 2009). These studies largely used hand or mail-distributed paper questionnaires rather than an interactive system such as Turning Point® . There are some important differences between these methods of data collection. Using Turning Point allows for simultaneous data collection from large numbers of participants under controlled conditions, meaning that the participant experience is likely more homogenous. The analysis and collection of data is also facilitated by the use of Turning Point® compared to paper questionnaires. These positive factors may also have negative implications however – some participants may have wished for longer to consider their answers, or may have felt pressured to answer before they were fully ready, even though the scenarios were fairly straightforward. Turning Point® also has, at the time of writing, a very limited capacity for recording qualitative comments – to collect such data may have allowed for a deeper interpretation of some of the findings.

There are some limitations to the findings presented here. The first is possible ambiguity in the research instrument and the findings collected from it. This ambiguity may come from the scenario-based design, combined with the use of an interactive audience-response system to collect the data. The detail required to create meaningful scenarios necessarily introduces the possibility that individual participants may interpret the scenarios differently. The audience-response system may then be associated with error, for example by participants accidentally (or deliberately) choosing an unintended option. These sources of ambiguity were accounted for at many stages in the research process. Firstly by conducting multiple pilots of the instrument, wherein ambiguity could be clearly identified and the standard outcomes validated. The inclusion of 'control' scenarios in section B was also then used to identify issues with data collection. The behaviour described in scenario B1 (multiple essay purchase and

criminal behaviour) is clearly unacceptable, and 98.3% of undergraduate responses identified it as such. Similarly the behaviour described in scenario B3 (correct use of referencing) is designed clearly reflect 'good practice' and 93.4% of respondents stated that it was 'fine'. These findings indicate that there were no fundamental problems with data collection, but do suggest that a small amount of 'noise' may be present in the data. The amount of noise may be different in other scenarios. The final strategy adopted to account for ambiguity was the use of a large sample size – the statistical analyses conducted generally returned findings that were clear.

Implications for Higher Education

Taken separately, the findings from individual sections may suggest the existence of a 'perfect storm'; students starting university having a seriously misplaced confidence in their understanding of referencing and plagiarism, combined with a lenient view of how transgressions of academic integrity should be penalised. This concern is somewhat tempered by the finding that performance, confidence and penalties are positively correlated. These correlations provide support for academic integrity approaches that emphasise education as a strategy for combating plagiarism, (e.g. (Park 2004)); Providing students with effective education and experience in the areas of referencing and plagiarism will boost confidence, which will in turn boost performance. Specific areas for further education highlighted by the findings include detailed definitions of plagiarism (e.g. to include plagiarism of ideas and collusion), plus a clear message on institutional views toward essay writing services.

These correlations also provide support to the notion that violations of academic integrity by inexperienced students may be due to a simple misunderstanding of some core concepts regarding referencing and plagiarism, as suggested in previous studies (Landau, Druen, and Arcuri 2002; Roig 1997). These interpretations are further supported by the finding that new postgraduate students are more confident than new undergraduates in their understanding of referencing and collusion, perform better on simple tests of referencing, and recommend more serious penalties than their undergraduate colleagues. These postgraduate students have generally experience at least 3 more years of higher education, achieving an undergraduate degree

classification which made them eligible for postgraduate study. One of the learning outcomes assessed in their undergraduate degree would almost certainly have been to reference written work correctly.

Conclusions

Previous international literature on student plagiarism in higher education identifies three themes: that most students: (1) are able to identify plagiarism, although a significant minority can't; (2) recognise that plagiarism is wrong and (3) would impose a more lenient penalty than that imposed by staff (Wilkinson 2009; Brimble and Stevenson-Clarke 2005; Yeo 2007; Franklyn-Stokes and Newstead 1995). The present study shows that these findings are also true of undergraduate students newly enrolled at a university in the United Kingdom, and that the impact of the findings is potentially exacerbated by students having a misplaced confidence in their ability to recognise plagiarism. However, there was also a positive correlation between confidence and performance on simple tests of academic referencing, supported by findings that postgraduates are more confident, less lenient and perform better on simple tests of referencing. Despite the limitations of using a scenario-based quantitative instrument and the findings coming from only one higher education institution, in the UK, the findings appear to be of relevance for the field of higher education generally.

Acknowledgements

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