

Research Article

Students Turned Off by Turnitin? Perception of Plagiarism and Collusion by Undergraduate Bioscience Students

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Abstract

Research on undergraduate bioscience students and the incidence of plagiarism is still in its infancy and a key problem arises in gauging the perception of undergraduate students on plagiarism and collusion in biosciences subjects because of the lack of empirical data. The aim of this study was to provide qualitative data on the perceptions of plagiarism and collusion of final year Pharmacology students. Data with respect to student ethnicity, age and gender are discussed. The results from the pilot study suggested that students did not find Turnitin (UK) easy to use neither did they perceive it as a useful learning tool. This study demonstrated that the overall majority of the students would like an alternative way to detect for plagiarism and collusion. Understanding these perspectives of undergraduate bioscience students can assist educators in developing new strategies when encountering plagiarism and collusion in final year undergraduate biosciences.

Keywords: Turnitin; undergraduate; biosciences; plagiarism; collusion

Introduction

Universities and other Higher Education Institutions (HEIs) offer a multitude of support that caters for the diverse learning atmosphere experienced by the student. One such example is exemplified by policies and various pedagogical paradigms enshrined in the academic environment that provides adequate provision for students with additional needs (Ahluwalia, 2009). Some of these policies have been implemented to be punitive rather than for enhancing the students' academic well-being. These policies are responsible for breaches of assessment regulations and have been rigorously adopted by Universities and HEIs. Significantly, the quality assurance agency (QAA) has forced Universities and HEIs to have effective measures set in place that deal with breaches in assessment regulations most commonly dealing with offences relating to plagiarism. Student academic breaches including plagiarism in addition to collusion and cheating are unfortunate but form a part in parcel aspect of student academic existence. Plagiarism is not a new notion and its foundations are steeped in the historical quagmire as one the unpleasant issues associated with higher education. With the advent of England passing its first copyright law in 1710, followed by congress passing the first United States copyright law in 1790, anecdotal evidence suggests that by the 1890s plagiarism was endemic in many colleges and universities. Universities and HEIs have implemented various policies based on the guidelines adopted from the QAA (QAA, 2006) and take enormous strides in informing students of transgressions and the various penalties that can be endowed onto the students if they are caught plagiarising. The policies have been designed with a clinical mind-set and deal with plagiarism whether it has been done on purpose or accidentally; but not to judge plagiarism as poor academic practice.

Although plagiarism has been commonplace in non-science based subjects, traditional science based subjects such as those in biosciences that rely heavily on laboratory experimentation have also been exposed to the culture of academic dishonesty. Laboratory experimentation underpins all scientific knowledge and laboratories can be active places of learning. Indeed, to help students to get to know scientific enquiry is frequently stated as the main aim of laboratory

work (Gott and Duggan, 2007). However, laboratory classes frequently polarise learning amongst students whereby the less able students will tend to 'piggy back' onto the more able ones. In addition, frequently in laboratory classes students work in small groups or pairs and it is often not made clear if the practical assignment needs to be completed individually. These factors can foster a climate of collusion and plagiarism. There are pedagogical strategies described by Bloom (1956) and Biggs (1999) that initiate cognitive exploration and motivation that attempt to reinforce student engagement thereby reducing the likelihood of plagiarism. For example, motivation amongst students was recognised by Louden (1991) and Kolb (1984) who proposed that assessment best supports learning when the importance of intrinsic motivation amongst the students is recognised. Here it could be argued that the work-shop format is an ineffectual mode of delivery and may encourage plagiarism and collusion. Indeed, Jones (2007) has challenged the traditional didactic lecture-based workshop as an educational communication tool. It is therefore possible that the design of the workshop and its assessment may foster a climate of plagiarism or collusion. Although the lecture is the mainstay of most undergraduate bioscience courses, it is thought that it favours a non-participatory approach to learning (Ellington and Earl, 1996). More frequently, laboratory workshops have been used primarily as an information delivery tool. This ideology is supported in the study by Sutherland and Badger (2004) who have shown that lecturers often perceive the function of a workshop as an information delivery tool. By 'filling,' the students up with information, the learning of the students is detached from reality and goes in line with the 'blank slate,' paradigm as proposed by Pinker (2002). The 'blank slate,' of learning is robustly opposed by the education philosophies of Rousseau and Pestalozzi (Cubberley, 2005) and Freire (Freire, 1970) in that it promotes surface learning rather than deeper critical thinking and may encourage the students to engage in plagiarism or other type of academic dishonesty.

Vygotsky (1978) proposed that teaching must be a responsive endeavour and teaching occurs when 'assistance,' is offered. This style of teaching is emphasised by the need for positive reinforcement as an essential motivator for learning. One way to positively reinforce learning is by changing the assessment. Positive reinforcement for biosciences students has been extrapolated to assessments in undergraduate biosciences. For example, a change in examination based assessment to assessing by coursework may allow students to engage and take more responsibility for their own learning. In this way the change in assessment can be constructively aligned to fulfil all the learning outcomes geared towards not only the subject specific skills for biosciences but also to incorporate the equally important generic skills. Constructively aligning assessment to learning outcomes is enshrined in Vygotskian approaches to teaching and learning. A prominent alluring feature of Vygotsky's work (Vygotsky, 1978) is that teaching is thought to be an intervention in cognitive development. This paradigm was developed into Vygotsky's 'zone of proximal development,' and is the difference of what a student can do by themselves' or what they can do with assistance. The later part of the sentence (what students can do with assistance) is where our roles as reflective practitioners are the most important. It could be reasoned that students use different sources to assist in their learning without realising that they are committing an academic offence and is rather poor academic practice. However, it is difficult to adopt all aspects of Vygotsky's paradigm into constructively aligning the assessment to learning outcomes in undergraduate bioscience programmes because Vygotsky's work has strong foundations in social constructivism. The social constructivism theory is contradictory to the positivist paradigm of science. Social constructivism postulates that knowledge is interpretive and each student can bring in something, whilst teaching science, in particular, biosciences is more to do with specific factual information. Factual information is often crystallised from primary sources such as text books and the Internet in which students are less inclined to interpret in their own words. Several elements of Vygotsky's original work have been developed into new and diverse themes in an attempt to foster group discussions and rely less on factual information. One educational paradigm

that could lower the tendency to rely on factual information is 'scaffolding.' The scaffolding paradigm (Wood *et al.*, 1976) assists the students to reach the skills and knowledge specified in the learning outcomes without relying on factual information. This is usually achieved by group activities that prompt discussions and fosters engagement. Scaffolding learners can contribute to gradually increase the students' skills and confidence in their own knowledge. Scaffolding can be further developed into reciprocal teaching. Originally proposed by Palincsar and Brown (1984), reciprocal teaching provides opportunities for students to learn and monitor their own learning and thinking without focusing on factual information. This type of teaching is thought to play a key role in student cognitive development during their progression as they move from spectator to performer, which avoids the traditional 'wait and see,' approach.

Despite, these models providing frame-works to adopt different teaching strategies for constructively aligning assessment that may lower the incidence of plagiarism and collusion, the extensive use of the Internet as a primary source of learning materials has obfuscated the issue of students perception of plagiarism. Learning and assessment tasks in undergraduate biosciences progress from a theoretical underpinning to a student's ability to think critically. Students commonly follow a structure to the learning processes. Emphasis shifts from 'knowing that,' to a 'knowing how' and is modelled on Piagetian inspired pedagogy that emphasises a learner-centred approach (Piaget, 1975). Teaching in undergraduate biosciences follows Piagetian philosophy because the students build upon their own knowledge, progress further and apply the relevant theoretical principles. However, the extensive use of the Internet has allowed Biosciences students to easily regurgitate facts and incorporate these into their assessment thereby eroding the basic tenets of Piagetian philosophy.

One of the mainstays to detect and identify student plagiarism has been the development of anti-plagiarism software, however, this type of software does not detect plagiarism rather the educator needs to make that judgement anti-plagiarism software has been incorporated by many Universities and HEIs. This software detects similarity but does nothing to assist the students with citation and referencing that Universities use to define plagiarism. With the advent of software such as Plagiserve, Moss and Turnitin, there are several tools available that can detect this similarity.. In particular, Turnitin has now been adopted widely by the majority of Universities and HEIs in the United Kingdom. Although, Ledwith and Risquez (2008) have used Turnitin to assess student assignments for plagiarism, there are at present few studies (Badge *et al.*, 2007; Rolfe, 2010) on the usefulness of Turnitin as a plagiarism detection tool in undergraduate Biosciences, particularly for final year students. Frequently, Universities and HEIs have used Turnitin as a plagiarism detection tool without providing empirical data to whether the students find it useful. However, in isolation Turnitin does not identify plagiarism but rather compares the content of the students' assessment, which has been uploaded onto the Turnitin website and matches it to content on the Internet and to other previously submitted students' work resulting in a similarity/originality score. Although being widely adopted, the potential of Turnitin as a learning tool and its usefulness in enhancing teaching has become the subject of fierce debate. Some studies have suggested that plagiarism can be represented as poor academic practice; students lack of training in citing sources properly rather than academic misconduct (Wheeler, 2009). Zwagerman (2008) has suggested that implementation of plagiarism software foster a climate of fear amongst students. In addition, Sutherland-Smith and Carr (2005) have reinforced the notion that educators often view Turnitin as purely a tool for castigation whilst Jenson and De Castell (2004) argue that there are organisational motivations for the implementation of Turnitin (UK). This could suggest that the pursuit of technology reliant on anti-plagiarism software is driven by pressures from the QAA. Despite these studies questioning its usefulness, Turnitin is likely to remain an important part of the academic environment. The use of Turnitin is as widespread as ever in Biosciences because

of the increase in the 'copy and paste' culture that allows plagiarism of factual information from the Internet for a wide variety of undergraduate Biosciences assessment.

At present there are few studies that provides accurate measures on student plagiarism in undergraduate Biosciences (Badge *et al.*, 2007; Rolfe, 2010). It is apparent that with the development of the Internet, plagiarism has become a real problem for undergraduate programmes in Biosciences. When trying to measure the extent of plagiarism, it is important to identify the perpetrator and whether they fit into a particular student demographic. Whether these are first year undergraduates who are inexperienced in academic writing to students that are in the latter stages of their academic career. Notably to identify the perceptions of final year Bioscience students in plagiarism and collusion would be useful as many of these students would already be aware of the assessment regulations relating to plagiarism and collusion. One important cohort that seems particularly susceptible to the pitfalls of plagiarism and collusion are International students in which English is their second language. Walker (1998) has suggested that these students may be more likely to plagiarise assessments and suggest that cultural issues and pressures of staying in a different environment may be some of the causes of this although the cultural 'excuse' has been disputed by others (Wheeler, 2009). In the past decade, students that enter the University environment are from a wide range of academic backgrounds. At the University of East London (UEL), the diversity of the large student population in Biosciences is represented by students of different age groups, social background, ethnicity and nationality. However, the current assessment regulations that penalise students for plagiarism do not take into account the pre-university experiences and how this may affect the students' perceptions of plagiarism and collusion.

With respect to this discussion, this manuscript explores the perceptions of undergraduate Biosciences students at UEL on plagiarism and collusion. In particular, this study investigates the usefulness of Turnitin (UK) software on a group of final year Pharmacology students. This study is important as currently there is a conspicuous gap that exists in pedagogical research on the usefulness of Turnitin (UK) and what students believe constitutes plagiarism and collusion in undergraduate Biosciences. The goal of this study was therefore to fill in this gap by providing a research questionnaire that addresses the following research questions:

- Research Question 1: What do undergraduate biosciences students perceive as plagiarism and collusion?
- Research Question 2: Is there any correlation between student demographic data and the perception of plagiarism and collusion in Undergraduate Biosciences?
- Research Question 3: Does the type of assessment given to final year undergraduate Bioscience students increase the likelihood of plagiarism and collusion?
- Research Question 4: Is Turnitin (UK) a useful plagiarism deterrent amongst final year Bioscience students?

Methodology

This research study was conducted according to the appropriate ethical guidelines from University of East London (UEL). The participants were final year students studying either for the single honours or combined Pharmacology programme from School of Health and Biosciences, UEL and the research questionnaire was entirely voluntary. The University of East London raises awareness of issues of academic integrity including plagiarism through a number of sources including student handbooks, the virtual learning environment and publicity events. More specifically the stance of the University is that Turnitin is primarily a learning tool made available to all students by way of the virtual learning environment, to encourage them

to use it to improve their referencing skills. The authors are aware that while students have access to an online guide to the use of Turnitin (UK) this has not been part of the timetabled syllabus for Pharmacology students. For example, as part of their final year double module project, students were required to submit a Turnitin (UK) report with their final submission. Students had no formalised prior training on how to submit their project reports and were essentially left to their own devices in interpreting the originality/similarity index. If the originality/similarity index was 'high', students were aware that the project report should be modified and resubmitted via Turnitin (UK).

Students were given a comprehensive project information sheet and those that opted to take part in the study were given the research questionnaire. To answer the four research questions, the questionnaire was devised that contained 23 multiple choice questions (Appendix 1) and the student's level of agreement to the questions was measured using a Likert scale from one indicating 'I strongly disagree', to 5 meaning 'I strongly agree'. The questions within the research questionnaire were split into three parts. The first section dealt with student's perception of plagiarism and collusion, the second section focused the type of assessment and the third section was what students thought of using Turnitin (UK) as a plagiarism deterrent in undergraduate Biosciences. Students were also asked to provide demographic data. Out of the 20 students who were given the project information sheet, 17 participated in the research questionnaire. Students were given 20 minutes to complete the research questionnaire individually during a lecture session. The results from the qualitative research questionnaire were analysed using Microsoft Excel.

Results

The results of the 17 completed questionnaires are collated in Table 1. In the analysis of the data it has been assumed that for a given statement an average score of greater than 3 (where 3 corresponds to neither agree nor disagree on the Likert scale) represents overall agreement with the statement.

Research Question 1

What do undergraduate biosciences students perceive as plagiarism and collusion?

The 11 questions contained in Section A of the questionnaire were designed to gauge student's understanding and ethical perception of plagiarism and collusion. Reassuringly the majority of students, 89%, agreed or strongly agreed with the statement "I understand what plagiarism is". Despite this agreement all students either agreed or strongly agreed with statement G that there should be a tutorial session at the start of the course on plagiarism and how to avoid it. The reason for this could be related to statement H which probes whether the students can differentiate between plagiarism and collusion. It does appear that the majority of students (65%) are confused about the difference between plagiarism and collusion, shown by a mean rank score of 3.65 for statement H. The majority of students (59%) also agree or strongly agree that they are not provided with enough information to avoid plagiarism in their assignments. The overall agreement to this statement however is weak and does not seem to be as important to students as a tutorial on the subject in which of all the students that participated in the research questionnaire agreed or strongly agreed that a tutorial explaining what plagiarism is and how it can be avoided would be of substantial benefit to them. The majority of the students questioned agreed that plagiarism was cheating as well as ethically and morally wrong. However fewer students felt that plagiarism was cheating (Statement A, mean rank score 3.88) than being ethically and morally wrong (Statement B, mean rank score 4.06). Nine students scored these two questions identically indicating that there is little distinction between the two. Plagiarism is usually considered in the context of coursework assignments; however it is equally possible for students to memorise information sources for use in written examinations, indeed perhaps

plagiarism is less likely to be detected in such a context. When asked whether plagiarism does help them to learn and understand the content for written examinations (statement D) students disagree (mean rank score 2.53), with only one student agreeing to the statement.

Table 1 Results of research questionnaire administered to investigate the students perception of plagiarism, assessment and Turnitin.

Scale items	Percentage Response					Score	
	1	2	3	4	5	Mean	SD
Section A							
A. Plagiarism is defined as cheating	0	12	12	53	24	3.88	0.93
B. Plagiarism is ethically and morally wrong	0	6	6	65	24	4.06	0.75
C. I understand what plagiarism is	0	0	12	71	18	4.06	0.56
D. Plagiarism helps me to learn and understand the content for the written examinations	6	41	47	6	0	2.53	0.72
E. Plagiarism does not help me to learn	0	29	35	12	24	3.29	1.16
F. I am not provided with enough information to avoid plagiarism in my assessments	0	29	12	47	12	3.41	1.06
G. It would be useful to have a tutorial session in the beginning of the course to explain what plagiarism is and how to avoid it	0	0	0	53	47	4.47	0.51
H. I am confused in the understanding between plagiarism and collusion	0	18	18	47	18	3.65	1.00
I. I have knowingly plagiarised or colluded on an assessment	12	29	41	18	0	2.65	0.93
J. I may have unknowingly plagiarised or colluded on an assessment	0	0	47	47	6	3.59	0.62
K. Other students on my course have plagiarised or colluded on an assessment	0	0	76	12	12	3.35	0.70
Section B							
A. The assessments that I am given encourages plagiarism	6	35	35	18	6	2.82	1.01
B. I might plagiarise work if I didn't understand the assessment	12	24	29	35	0	2.88	1.05
C. The amount of work given for assessment encourages plagiarism	12	24	24	29	12	3.06	1.25
D. Plagiarism helps me to remember formulae for examinations	6	53	24	18	0	2.53	0.87
E. Does the statement 'Undergraduate pharmacology is great and opens up many avenues for a wide range of careers' require a citation?	12	41	18	29	0	2.65	1.06
F. Does the statement 'Undergraduate Bioscience departments have a problem with students plagiarising work' require a citation?	0	47	12	41	0	2.94	0.97
Section C							
A. Turnitin (UK) is easy to use	18	41	24	18	0	2.41	1.00
B. Turnitin (UK) helps me to understand and avoid plagiarism in submitted work	24	29	12	29	6	2.65	1.32
C. Turnitin (UK) deters plagiarism by the risk of being caught	6	18	24	47	6	3.29	1.05
D. Turnitin (UK) is a useful learning tool	24	29	29	12	6	2.47	1.18
E. Turnitin (UK) does not tell students how to avoid plagiarism	0	0	24	65	12	3.88	0.60
F. There should be some other way to check for plagiarism as too much emphasis is placed on a high Turnitin (UK) return score.	0	0	0	65	35	4.35	0.49

When considering the wider application of plagiarism to learning the students were split approximately evenly between agreeing (36%) being neutral (35%) and being in disagreement (29%) to statement E that plagiarism did not help them to learn. The students against plagiarism helping learning tended to strongly agree whilst none of those against strongly disagreed to the statement.

Finally students were asked about their personal experience of plagiarism or collusion, both individually and cohort wide. The mean rank score of 2.65 to statement I, "I have knowingly plagiarised or colluded on an assignment" shows an overall disagreement to having colluded or plagiarised assignments. This was different to statement B that plagiarism is ethically and morally wrong (mean rank score 4.06) and is borne out by the fact that only 18% of students admitted to having knowingly plagiarised or colluded and 41% denied committing one of these offences. Curiously this left 41% who neither agreed nor disagreed. Whether students were wary of incriminating themselves in a rather small sample or perhaps felt they had teetered on the edge of these offenses and while not being totally comfortable with denying it neither did they feel they should admit it. When it came to having unknowingly plagiarised or colluded as probed in statement J no students were confident enough to disagree to an unknowing breach of the rules. However, approximately half (47%) took a neutral stance with the remaining 53% agreeing that they may have colluded or plagiarised unknowingly. It seems notable that 5 out of 7 students who disagreed or strongly disagreed to having knowingly plagiarised nevertheless agreed that they may have unknowingly committed an offence. In contrast those who neither agreed nor disagreed to having knowingly plagiarised tended to select the same option regarding unknowingly plagiarising or colluding. When considering the student cohort as a whole students at least suspect that plagiarism or collusion occurs. A mean rank score of 3.35 to statement K "Other students on my course have plagiarised or colluded on an assessment" shows a weak but overall agreement. Thus there is a difference between student's personal involvement in plagiarism and collusion (statement I, mean rank score 2.65) and their perception of their cohorts involvement (statement K). No student contradicted statement K (i.e. none scored this statement less than 3 on the Likert scale). Perhaps unsurprisingly those students who agreed they had plagiarised also agreed or strongly agreed that other students had plagiarised or colluded too. Conversely only one student who disagreed to having plagiarised agreed to the fact that other students would commit these offences. The vast majority of students (76%) preferred to neither agree nor disagree to statement K.

Research Question 2

Is there any correlation between student demographic data and the perception of plagiarism and collusion in Undergraduate Biosciences?

The University of East London has a diverse student demographic. The students were asked to include information regarding their sex, age and ethnic background on the research questionnaires. The test group was comprised of 8 males and 9 females. Ages ranged from 21 to 34 with 11 students in the 21-25 age range and 6 over 26 years of age. The ethnic backgrounds of the students surveyed were 8 black students (5 African, 1 Caribbean, 1 British & 1 other), 4 Asian (1 Indian, 1 Pakistani, 2 other) and 4 white (British 1, European 1, Unspecified 2). One student declined to state their ethnicity and was excluded from the analysis. The average response scores to the questions in Section A of the questionnaire based on ethnicity, sex and age are collated in Figure 1.

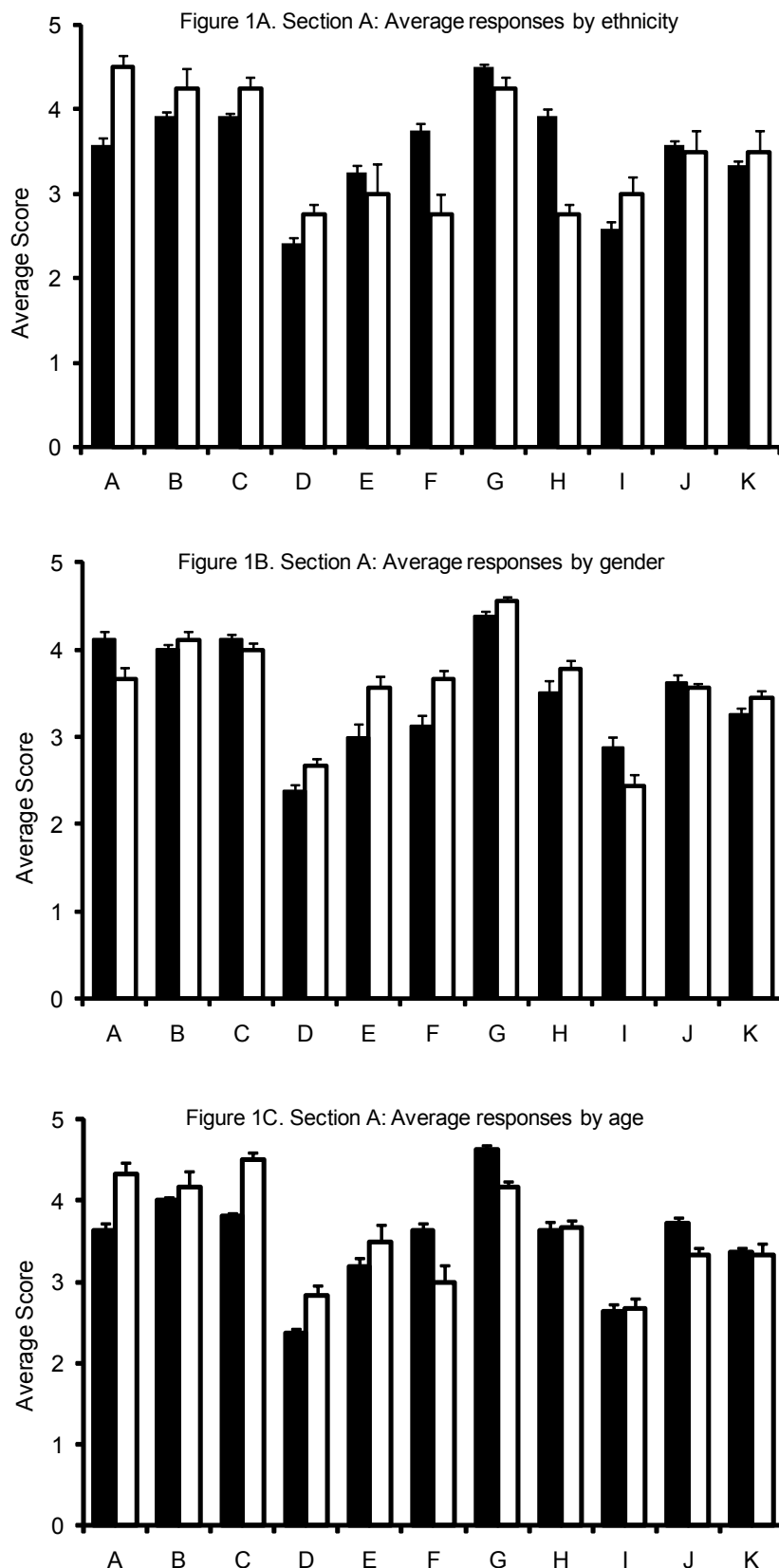


Figure 1 Correlation between student demographic data and the perception of plagiarism and collusion in final year undergraduate Biosciences. Average responses (mean rank scores) are represented for section A, grouped for ethnicity (A), gender (B) and age (C). Results are presented as \pm SEM ($n=17$).

For simplicity Figure 1a shows a comparison of average scores for white European and black Asian minority ethnic (black and Asian combined - BAME). The only statements to have average scores that diverge by more than 0.5 are A, F and H. Respectively these suggest that white European students are more likely to agree that plagiarism is cheating, but less likely to agree that they are not provided with enough information to avoid plagiarism in assignments and finally BAME students are more likely to agree that they are confused between plagiarism and collusion. Statement H (section A) indicated the white European students were more confident in differentiating collusion and plagiarism. In terms of the average responses for gender, there was no clear difference between the statements for section A (Figure 1b). When gauging the perception of plagiarism and collusion by age group (Figure 1c), there was a difference in the average Likert scales for statement C (section A) "I understand what plagiarism is," between the different age groups; 21-25 and 26-34 (average responses 3.82 and 4.50 respectively). This data perhaps might suggest that the mature students are more secure in their understanding of plagiarism. Caution is needed in this interpretation in light of the $n=8$ and $n=9$ respectively for the age groups. Other than that the only statement that was different between the age groups was statement E (section C) "Turnitin (UK) does not tell students how to avoid plagiarism." This demonstrated a clear difference between the two age groups wherein younger students agreed more strongly with the statement (mean rank 4.18) compared to the more neutral older students (mean rank 3.33).

Research Question 3

Does the type of assessment given to final year undergraduate Bioscience students increase the likelihood of plagiarism and collusion?

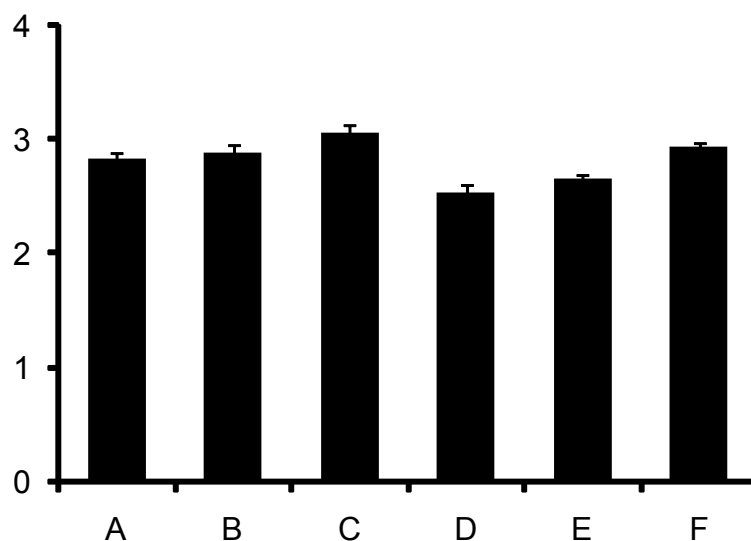


Figure 2 Correlation between type of assessment given to final year undergraduate Bioscience students and the likelihood of plagiarism and collusion. Average responses (mean rank scores) are shown for section B of the research questionnaire. Results are presented as \pm SEM ($n=17$).

The result of the research questionnaire addressing the students' perception of the type of assessment to plagiarism is shown in Figure 2. The mean rank score of 2.82 to statement A, "The assessments that I am given encourages plagiarism," demonstrates a tendency to disagree (3 is neutral) to the type of assessment and the incidence of plagiarism occurring. Furthermore, although 36% of the students disagreed to the statement "I might plagiarise work if I didn't understand the assessment," a near identical number of students (35%) agreed that they would plagiarise work if they did not understand the assessment indicating that a cohort of the student population may plagiarise their assessment if they were unable to understand

it. When it came for students to assess whether the amount of work pertaining to assessment encourages plagiarism the responses were fairly evenly spread within the Likert scale (mean = 3.03, SD = 1.25). Whilst, 24% of the students neither agreed nor disagreed to the statement, there was an approximately equal number of students who strongly agreed/agreed (36%) and strongly disagreed/disagreed (41%). Overall, there was no significant difference in the average Likert scale amongst the statements “I might plagiarise work if I didn’t understand the assessment (2.88),” and “The amount of work given for assessment encourages plagiarism (3.06).” The average Likert score of 2.53 demonstrates a tendency to disagree (59%) with statement D “Plagiarism helps me to remember formulae for examinations.” Interestingly, a certain cohort of the student population was unsure whether plagiarism helps them to remember formulae for examinations and was in stark contrast to 18% agreeing that it does help them to learn formulae for examinations. Finally, there was no obvious difference between responses to statements E (2.65) and F (2.94) in section B. Curiously, for statement F, a similar number of students disagreed (47%) and agreed (41%). The mean rank score for this statement was 2.94, suggesting that the students were unsure whether this statement did indeed require a citation.

Research Question 4

Is Turnitin a useful plagiarism deterrent amongst final year Bioscience students?

The results demonstrating whether Bioscience students find Turnitin (UK) a useful plagiarism deterrent is presented in Figure 3.

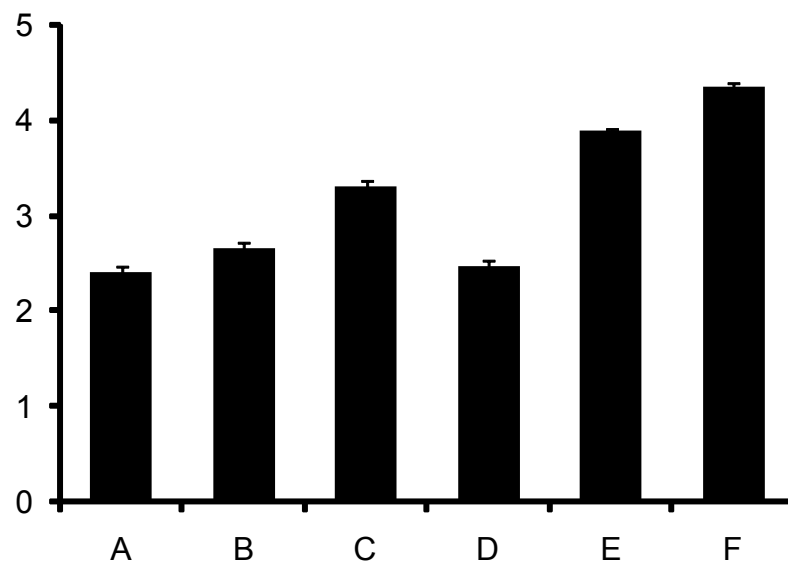


Figure 3 Perceptions of Turnitin (UK) as a plagiarism deterrent amongst final year undergraduate Bioscience students. Average responses (mean rank scores) are shown for section C of the research questionnaire. Results are presented as \pm SEM ($n=17$).

The results show that 59% of the students had indicated that Turnitin (UK) was not easy to use. This statement (statement A, section C) had an average score of 2.41. A proportion of the students (18%) did however agree that Turnitin (UK) was easy to use. In comparison, statement A (with a mean rank score of 2.41) was different to statement C (mean rank score 3.06) “Turnitin (UK) deters plagiarism by the risk of being caught.” These findings indicate that although the majority of the students agree that Turnitin (UK) deters plagiarism by the risk of being caught, these students also demonstrate that Turnitin (UK) was not user friendly. This perhaps indicates that from the student perspective the deterrent value is less than the inconvenience caused. It is intriguing to note that of students who admitted to plagiarism

(Section A, Statement I) and collusion two thirds disagreed that Turnitin (UK) was a deterrent, whilst the same proportion of students who denied plagiarism felt it was an effective deterrent. In addition, the results from statement B "Turnitin (UK) helps me to understand and avoid plagiarism in submitted work," suggested an overall disagreement (53%, mean rank score: 2.65) that Turnitin (UK) does actually enable students to avoid plagiarism in submitted work.

These statements are useful in gauging the perceptions of students using Turnitin (UK) in undergraduate Biosciences and raise an important question to whether the students actually benefit from using this type of anti-plagiarism software. To answer this question, 53% of the students strongly agreed/agreed that Turnitin (UK) was not a useful learning tool in comparison to 18% who agreed/strongly agreed. This is not surprising because students were not informed on how to use Turnitin (UK) as a useful learning tool. All they were told is that they needed to modify their submission if the originality score was too high. The average score of this statement D (section C) "Turnitin (UK) is a useful learning tool," was 2.47 and 29% of the students were perhaps not confident in themselves to indicate if Turnitin (UK) is actually a useful learning tool. The responses to statement D (section C) was in stark contrast to statement E "Turnitin (UK) does not tell students how to avoid plagiarism." Indeed, statement D (with a mean rank of 2.47) is considered qualitatively different to statement E (with a mean rank of 3.88) . Overall, statement E suggested that the majority (77%) of the students agreed that Turnitin (UK) does not help the students to avoid plagiarism. This follows onto one of the most striking findings from the study that all of the students agreed or strongly agreed to statement F (section C) "There should be some other way to check for plagiarism as too much emphasis is placed on a high Turnitin (UK) return score." The average score for statement F is 4.35 and is qualitatively different to the mean rank score of statement D (2.47) "Turnitin (UK) is a useful learning tool." These findings indicate that not only do the students perceive Turnitin (UK) to be an ineffectual learning tool but also clearly demonstrate a need for an alternative strategy to detect plagiarism.

Discussion

Whilst the data obtained in this study raises some very interesting points for the bioscience community, it should be accentuated that this is a pilot study with a very small sample size and such the findings in the present study need to be interpreted cautiously. In evaluating what do Bioscience undergraduate students perceive to be plagiarism and collusion it was found that the vast majority understood what plagiarism is but would actually benefit from a tutorial on the subject to perhaps find an effective way on how to avoid plagiarism in the first place. The data also demonstrated that undergraduate Bioscience students were confused in distinguishing between plagiarism and collusion and suggests a need for the reinforcement of the explanations of these terms. Interestingly, the data suggests that although the majority of the students questioned agreed that plagiarism was cheating as well as ethically and morally wrong fewer students felt that plagiarism could be defined as cheating. The reasons why Biosciences students cheat and why they believe that plagiarism is not defined as cheating is rather nebulous. Whether it is the desire to get good grades or time pressure perhaps the term 'cheating' needs to be explicitly defined to students in the context of plagiarism and collusion. Indeed, a previous study has suggested that plagiarism and collusion and how they relate to the more generic term of 'cheating' needs to be addressed by educators of Bioscience students (Dawson and Overfield, 2006).

When the data was broken down into BAME, gender and age only a few discernable differences could be demonstrated and this is was largely due to the limitations of the sample size. Average Likert scale scores suggested that there was a difference that white European students were more confident in differentiating collusion and plagiarism in comparison to BAME students. However, it should be reiterated that due to the small number of the student population that

was analysed in this pilot study, this result should be treated with circumspect and may not be representative of the entire student body. Further research encompassing a much larger student cohort would be necessary to explore if white European students are indeed more confident in distinguishing between plagiarism and collusion in comparison to their BAME counterparts. Similarly, amongst the genders average Likert scale scores suggested a qualitative difference between the amount of work given and the incidence of plagiarism. Other than this, there was no clear qualitative difference based on gender that could be demonstrated. These findings are in agreement with a recent observation reported by Walker (2010). Undergraduate students from UEL belong to a diverse multi-cultural student population exhibiting diverse age groups. Students belonging to Biosciences are no exception and in terms of the two age groups, the responses to their 'understanding of plagiarism' and 'Turnitin (UK) not being helpful in avoiding plagiarism' were significantly different amongst the two age groups. Presumably the additional maturity and life experience of students in the 26-34 age range enable them to understand plagiarism with more confidence than their younger course mates. While neither age range feels that Turnitin (UK) is helpful in avoiding plagiarism it is the younger students who feel they benefit least from it.

The results of the questionnaire that examines the relationship between assessment and plagiarism (section B) scored an average of score of approximately three (neutral) on the Likert scale. This indicated that the majority of the students could neither agree nor disagree to the statements given in section B and suggests that a link could not be established if whether the type of assessment and the amount of work attributed to it manifests as higher incidences of plagiarism. Considering the presence of coursework assessments on most modules of the BSc Pharmacology degree at UEL it is interesting to contrast this with the earlier study of Ashworth *et al.* (1997) in which coursework assignments were seen by students as being more conducive to plagiarism and collusion than invigilated exams. This is further exemplified by the results obtained for the two statements in section B:

- E. Does the statement 'Undergraduate pharmacology is great and opens up many avenues for a wide range of careers' require a citation?
- F. Does the statement 'Undergraduate Bioscience departments have a problem with students plagiarising work' require a citation?

Both of these statements had similar scores on the Likert scale (2.65 for E and 2.94 for F), which indicated a tendency to disagree between the two statements. Statement E is an opinion and therefore does not require a citation but statement F is fact and does require a reference. Students in the 26-34 age bracket appear to recognise statement E as an opinion and consequently score it lower than their younger counterparts (mean score 2.16 to 2.91), but equally fail to recognise that statement F requires a citation. These findings could suggest that Bioscience students in Pharmacology are unable to discriminate what text requires appropriate citation in scientific literature. Rationally, this would not be a case of plagiarism but rather poor academic practice.

Section C of the research questionnaire attempts to fill in the gap that exists in the plagiarism literature by providing data on the effectiveness of Turnitin (UK) as a plagiarism deterrent amongst final year undergraduate Bioscience students.' Although a pilot study, there are some prominent observations from this section of the research questionnaire and these can be summarised below:

- a) The majority of the students did not find Turnitin (UK) easy to use.
- b) The majority of the students did not regard Turnitin (UK) as a useful learning tool.
- c) Turnitin (UK) does not tell students how to avoid plagiarism.

- d) All students agreed that there should be some other alternative to Turnitin (UK) to detect plagiarism.

The observations above suggest a panopticistic perception of Turnitin (UK) amongst the final year Bioscience students' learning and might support the notion that these students do not perceive Turnitin (UK) as a comprehensive deterrent to student plagiarism. The reason for this could be attributed to the lack of students' prior training in using Turnitin (UK). All students at UEL have access to online training materials on the use of Turnitin and the university's policy is that its usage is primarily for the students' benefit. However students were not shown how to submit drafts of their work and use it as a formative learning tool neither were the other different stages of the Turnitin (UK) writing cycle utilised. Thus, although Turnitin (UK) is widely used at UEL and is coupled with widespread publicity about plagiarism and collusion, the results in this pilot study could suggest that without prior training in using Turnitin (UK) final year Pharmacology students find it of limited use. This is clearly in contrast to Rolfe (2010) who demonstrated that a guided formative use of Turnitin (UK) enhanced the students' experience with the software. In addition, rapid development of the Internet 'copy and paste' culture could make the temptation to plagiarise exceedingly difficult to resist resulting in higher originality scores detected via Turnitin (UK). Students are also in need of reassurance that academic staff do not make a judgment based solely on the originality score returned by Turnitin (UK), but that there is a process in which Turnitin (UK) can play a role but is not the be all and end all.

Conclusions

Although the student cohort used in this study was small, it did not detract from our overall objective to evaluate the perceptions of final year undergraduate Pharmacology students in plagiarism and collusion. Our findings in this pilot study have raised some very interesting points of views and perceptions about plagiarism and the use of Turnitin (UK), which would be of interest to the bioscience community. To further develop this study, the next step would be to revise the research questionnaire and present it to a much larger sample size by giving it to students in year one of their undergraduate Biosciences programme. This would be to ascertain whether there would be any changes in the perceptions of plagiarism and collusion within students early on in their academic career. It would be important to test this as more student numbers from diverse cultural backgrounds than ever are entering into the University academic environment. In this pilot study we do not claim that these findings can be widely generalised due to many factors, not least the diversity of academic cultures and learning environments. Students in different educational settings are likely to have different views on plagiarism, collusion and Turnitin. Nevertheless, it is hoped that the observations albeit from a small sample size in this pilot study can provide other researchers with important data that may assist in future research within the bioscience community.

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References

- Ahluwalia, J. (2009) Teaching a Dyslexic Student: A Personal View how Critical Incident Analysis can be used as an Effective Pedagogical Tool in Undergraduate Biosciences. *Bioscience Education*, **14**-4.
- Ashworth, P., Bannister, P., and Thorne, P. (1997) Guilty in whose eyes? University students' perceptions of cheating and plagiarism in academic work and assessment. *Studies in Higher Education*, **22** (2), 187–203

- Badge, L. J., Cann, J., A., and Scott, J. (2007) To cheat or not to cheat? A trial of the JISC plagiarism detection service with biological sciences students. *Assessment and Evaluation in Higher Education*, **32** (4) 1–7
- Biggs, J. (1999) *Teaching for quality learning at university: what the student does*. Buckingham: Open University Press.
- Bloom, B. S. (1956) *Taxonomy of Educational Objectives: The Classification of Educational Goals*; pp. 201-207. Susan Fauer Company, Inc.
- Cubberley, E. P. (2005) *The History of Education*. Available online through Project Gutenberg at: www.gutenberg.org/ebooks/7521 (accessed 3rd July 2010)
- Dawson, M. M., and Overfield, A. J. (2006) Plagiarism: Do students know what it is? *Bioscience Education E-Journal* **8**-1 available at www.bioscience.heacademy.ac.uk/journal/vol8/beej-8-1.aspx (accessed 3 July 2010)
- Ellington, H., and Earl, S. (1996) *How to plan and deliver lectures. A course booklet for the Postgraduate Certificate in Tertiary-Level Teaching* (Aberdeen, The Robert Gordon University). Available online at: www.nalanda.nitc.ac.in/misc/general/ciced/Ch05.html (accessed 16 June 2010)
- Freire, P. (1970) *Pedagogy of the oppressed* (New York, Continuum Publishing Company). Chapter 2 available at www.marxists.org/subject/education/index.htm (accessed 3rd July 2010)
- Gott, R., and Duggan, S. (2007) A framework for practical work in science and scientific literacy through argumentation. *Research in Science & Technological Education*, **25** (3) 271–291
- Jenson, J., and De Castell, S. (2004) ‘Turn it in’: Technological challenges to academic ethics. *Education, Communication and Information* **4**, (2–3) 311–30
- Jones, E. S. (2007) Reflections on the lecture: outmoded medium or instrument of inspiration? *Journal of Further and Higher Education*, **31** (4) 397–406, available at <http://www.informaworld.com/smpp/section?content=a782969406&fulltext=713240928> (accessed 3 July 2010)
- Kolb, D. (1984) *Experiential Learning; experience as the source of learning and development*. Englewood Cliffs, Prentice Hall
- Ledwith, A., and Riskey, A. 2008. Using anti-plagiarism software to promote academic honesty in the context of peer reviewed assignments. *Studies in Higher Education* **33** (4) 371–84
- Louden, W. (1991). *Understanding Teaching: Continuity and Change in Teachers’ Knowledge*. London, Cassell
- Palincsar, A. S., and Brown, A. (1984) Reciprocal Teaching of Comprehension-Fostering and Comprehension Monitoring Activities. *Cognition and Instruction*, **1** 117-175
- Piaget, J. (1975) *The development of thought: equilibration of cognitive structure*. New York, Viking Press
- Pinker, S. (2002) *The blank slate*. Penguin Books, London
- Quality Assurance Agency. September (2006) *Code of practice for the assurance of academic quality and standards in higher education*, Section 6: assessment of students. Available at www.qaa.ac.uk/academicinfrastructure/codeOfPractice/section6/default.asp#p15 (Accessed June 2010)
- Rolfe, V. (2010) Can Turnitin be used to provide instant formative feedback? *British Journal of Educational Technology*, doi: 10.1111/j.1467-8535.2010.01091
- Sutherland, P., and Badger, R. (2004) Lecturers’ perceptions of lectures, *Journal of Further and Higher Education*, **28**, 277–289
- Sutherland-Smith, W., and Carr, D. (2005) Turnitin.com: Teachers’ perspectives of anti-plagiarism software in raising issues of educational integrity. *Journal of University Teaching and Learning Practice* **3**, (1b) 94–101
- Vygotsky, L. S. (1978) *Mind in society: the development of psychological processes*. Cambridge: Harvard University Press
- Walker, J. (1998) Student plagiarism in universities: What are we doing about it? *Higher Education Research and Development* **17**, (1) 89–106

- Walker, J. (2010) Measuring plagiarism; researching what students do, not what they say they do. *Studies in Higher Education* **35**, (1) 41–59
- Wheeler, G. (2009) Plagiarism in the Japanese universities: Truly a cultural matter? *Journal of Second Language Writing*, **18**, (1) 17–29
- Wood, D., Bruner, J.S., and Ross, G. (1976) The role of tutoring in problem solving, *Journal of Child Psychology and Psychiatry*, **17** 89–100
- Zwagerman, S. (2008) The Scarlet P: Plagiarism, panopticism, and the rhetoric of academic integrity. *College Composition and Communication* **59** (4) 676–710