Using Technology to Prevent Plagiarism: Skilling the Students

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Abstract

Helping students to engage in sessions focussing on plagiarism and therefore learn about the concept can be challenging. The advent of new technologies used in educational contexts may help in facilitating such engagement. This study details a small project which sought to use three technologies in an attempt to help students learn about plagiarism and to gain insights into student understandings of plagiarism. The technologies used were a student response system, a social network and online quizzes delivered via a virtual learning environment. The project outcomes suggest that students arrive at university with a variety of understandings of plagiarism and that the success of the technologies used in plagiarism education largely depends on how the activities are integrated in the curriculum.

Introduction

Universities claim to take plagiarism seriously; a claim supported by how difficult it is to find a university that does not have a definition of plagiarism in its student handbooks. Such handbooks will also contain strong warnings as to the consequences of committing plagiarism and the procedures followed when an accusation of plagiarism takes place. It therefore seems somewhat surprising that these institutions do not always ensure that similarly robust procedures are followed when helping students understand how to avoid plagiarism. This concern has been raised by Macdonald and Carroll (2006, 233) who point out that institutional responses to plagiarism have mainly been 'through detection and punishment'. They propose a holistic approach to tackling plagiarism and stress the importance of learning as part of this approach, placing emphasis on formative assessment.

However, as with most learning it is unlikely to be an exact science; what is taught does not equal what is learned. This is compounded by the fact that students studying at HE institutions are likely to have a range of understandings of plagiarism (Carroll, 2008) acquired from prior experiences with the likelihood that many students will have their previously acceptable writing practices deemed unacceptable (Sinclair 2006) and punishable (Ryan and Hellmundt 2003). This range of student understandings results in a variety of student needs and inevitably, therefore, demands a differentiated approach to teaching and learning; one that incorporates multiple representations of and opportunities to access the required knowledge.

Therefore, as well as a general holistic approach to addressing the issues of plagiarism, a holistic approach at the level of learning seems appropriate. This paper discusses an attempt to develop a holistic approach within the context of learning about plagiarism which aims to help students gain an understanding of plagiarism using technology. 'Using technology to prevent plagiarism: skilling the students' was a small scale project in the Business School at the University of Huddersfield, which used various technologies in an attempt to engage students in the topic of plagiarism. The paper will in turn, provide a discussion underpinning the use of each technology and then report on the evidence of its use in the project. The

technologies included the use of a student response system (SRS) used in lecture theatres, social networking and quizzes provided via a Virtual Learning Environment (VLE).

Literature Review

Background literature relating to each of the three technologies used during the project is now discussed.

Student Response Systems

The lecture is generally seen in terms of a lecturer providing 'a monologue to a large group of students'. (Bach et al., 2007: 124). While lectures continue to be popular, their efficiency as a tool for learning has long been questioned (Bach et al., 2007: 124) with a number of disadvantages being identified. Ioannou and Artino Jr (2008: 3) report on the difficulties the mass lecture can cause with a 'lack of classroom interactivity and inadequate opportunities for feedback' while Phillips (2005) points to a lack of engagement and the use of lectures as a means of transmitting information to 'passive recipients of knowledge'. Despite recognition of the limitations associated with large classes, class sizes at universities are rising and those participating have increasingly varied learning needs (Alberts et al., 2007).

As a response to the pedagogic disadvantages of traditional large lectures one solution which has been adopted by a number of institutions is the SRS. This form of technology employs 'Who wants to be a millionaire?' style voting pads allowing students to respond en mass to questions posed by the lecturer. In large lectures requiring student to respond to questions, Elliott (2005) explains that students may be reluctant to participate for a number of reasons. Firstly, social loafing can occur when students feel that others will take on the responsibility of responding to questions or that they can follow the crowd and respond along with the majority of the group. A further reason mentioned by Elliott (2005) for student reluctance to participate in lectures is free-riding which occurs when students resist participation, safe in the knowledge that others will provide the relevant answers. Elliott (2005) mentions two fear related causes for reluctance to participate in lectures; evaluation apprehension occurs when participants worry about the reaction their answers will have from others present and social anxiety relates to the fear of speaking in public. All of these reasons for student reluctance to participate in large lectures could apply to any subject. Therefore a topic as problematic as plagiarism is likely to cause students to be even more reluctant to participate.

The use of a SRS can help to overcome some of the problems with student participation in large groups. Students cannot follow the responses of others or have their responses revealed to others since voting is anonymous, meaning the shy or insecure are encouraged to respond (Ewing 2006). Furthermore, while participants may choose to answer randomly, they can be encouraged to respond knowing that the lecturer may wait until all have responded before revealing any answers. Further advantages of SRSs in lectures are that they increase the level of enjoyment (Beekes 2006; Ewing 2006; Ioannou and Artino Jr 2008) and

engagement (Nicol and Boyle 2003; Beekes 2006) and facilitate the rapid exchange of information (Ewing 2006) with Nicol and Boyle (2003) and Ioannou and Artino Jr (2008) highlighting the advantages of the speed with which feedback can be provided on student responses. Nicol and Boyle (2003) also mention that a further benefit to the lecturer is that a record of concepts that regularly cause difficulty can be created.

While there are clear advantages attached to the use of SRSs in large lectures, Kenwright (2009) warns of time constraints related to learning to use the system, planning and designing sessions for the use of a SRS and in setting up the system for use in the lecture.

In the context of using SRS technology to help students learn about plagiarism, Bombaro (2007) has reported on its use with new students. She found that the way in which academic honesty was being addressed with first year students was inconsistent and that her institution's administration sought to provide 'clear and consistent information about academic expectations and standards' (Bombaro 2007, 298). As a result she designed a session in which students responded via a SRS to questions and scenarios about plagiarism. She reports that based on the responses in the sessions the students seemed 'better informed about academic honesty' (Bombaro 2007, 308).

Web 2.0 – social networking

When Tim Berners-Lee conceived the Internet he imagined a creative space to which users would actively contribute (Tim Berners-Lee 1999). In its early incarnation it was this sort of space, though this was followed by a period when we looked to the Internet as a source of information only. With the advent of web 2.0 technologies that support collaboration, user-generated content and communication, we are now in an era when its use is essentially and determinedly social.

Facebook and MySpace are popular examples of a trend in sharing, creating and writing online. Young people particularly, but not exclusively, are engaging with this technology and making the generation of content a normal and daily aspect of their lives on line. It is this ease and willingness to participate and essentially to write that holds potential value to those in education. If students are creating communities of practice online in their social lives by using these technologies for entertainment and, informally, to discuss their education (JISC 2008) can we as educators harness that energy to facilitate communities for learning?

> 'Social networking sites not only attract people but also hold their attention, impel them to contribute, and bring them back time and again – all desirable qualities for educational materials' (New Media Consortium 2007, 12).

JISC (2008) suggests that students are making the move from social use to educational use, albeit in an informal way, with students reporting that they use this technology to talk to peers about their work and, further to this, acknowledging that

they see the potential for social networks to enhance their learning. New Media Consortium (2007) predicted that education would be exploring ways in which such technology can be utilized to benefit learners. Despite these assertions more progress is necessary with only 25% of students reporting that they felt that their tutors were encouraging them to use social software in their learning (JISC 2008) and little pedagogical research available (Anderson 2007).

The advantages of this technology for education extend beyond their popularity amongst young people. They are for the most part free (for those with access to the Internet) and easy to use. They provide a quick and simple way by which to publish multi-media, allowing learners to communicate, share, collaborate and compare, giving 'students a valuable perspective on their own abilities and inspire them to try new ideas or technologies' (New Media Consortium 2007, 9-10). For education the challenge is to move students from social activity to social learning activity while maintaining sound pedagogical rigour.

Benefits of learning communities: learning through sharing and discussion

The social aspects of Web 2.0 technologies lend themselves to a constructivist pedagogical approach as they facilitate interaction, sharing, collaboration and 'foster a sense of community' (Boulos and Wheeler 2007, 3). A sense of belonging is important for learners as it can engender a shared community of practice.

Face to face teaching allows this sense of community and the opportunities for collaboration and active learning to be built into the curriculum. However, it could be argued that there are circumstances where all students, even those who are full-time campus–based, can experience isolation (Boulos and Wheeler 2007). Where this is the case the opportunity to become a part of a learning community, be that an online one, can have motivational benefits for learners (Boulos and Wheeler 2007; Zhoa and Kuh 2004).

In 2006 the University of Brighton launched its social network, Elgg. This whole institution facility with 36,000 users is described by the university as being 'particularly helpful at fostering a sense of community across the split campus' (Franklin and Harmelen 2007, 11). The system is used both informally by students and staff to make connections, share learning and research and formally within teaching to deliver courses in much the same way as a VLE. The advantages of the Elgg in this respect are seen as being the greater interactivity it allows as materials can be shared in multiple formats and from other platforms. Other benefits reported are the support to students that the system facilitates, where students sharing issues relating to de-motivation have been addressed by fellow students or student services (Franklin and Harmelen 2007).

Bradford University's social network is part of a larger resource that aims to support the student in the transition from school/college to university. The social network is powered by an open source tool Ning and allows students to make contact with each other prior to enrolment. 'The most important feature of the site is the ability for students to meet other students at the University in a safe environment where, unlike

other social networks such as Facebook, everyone is part of the same community' (Currant and Keenan 2009). Indeed feedback from students seems to support this view with students citing the opportunity to "meet", albeit virtually, prior to enrolment and the subsequent recognition of and by others at enrolment as significantly reducing anxiety (Currant and Keenan 2009).

Virtual Learning Environments

Virtual learning environments are often advocated as ideal experiential learning spaces as they allow students to learn collaboratively and develop 'interpersonal and communication skills, social learning skills, self and group evaluation skills, reflection skills, and self-directed learning skills' (Dabbagh 2007, 222). As environments that can be accessed independently they also allow students to manage their own learning through decisions about pace, time and task order. Further to this, the quiz tools within VLEs can be an effective way to provide instantaneous feedback enabling students to develop skills, knowledge and awareness. As Chirwa (2008) states, 'automated assessment is one of the main benefits provided by utilising VLEs, and has made them appealing to many educators'. Their popularity would seem to extend to the student body also, giving support to their value in terms of their ability to provide immediate feedback (Peat and Franklin 2002).

Despite these apparent benefits research suggests that students may not utilise VLEs effectively for a number of reasons: time management may be an issue in an environment that demands high levels of self-directed learning (Hiltz, 1997); students often print materials rather than taking advantage of the interactivity facilitated by the computer (Crook, 1997; Ward and Newlands, 1998). Full advantage of the benefits afforded by VLEs only appears to be made by students where their use is explicitly scaffolded (Beasley and Smyth 2004). It would seem therefore that the design of VLE courses must account for student motivation and different learning needs and strategies.

Method

The Academic Skills Team in the Business School at the University of Huddersfield had, for a number of years, delivered sessions on referencing and avoiding plagiarism. These sessions were invariably delivered in workshop settings either as stand-alone drop-ins or as guest lecture slots on the students' timetables. They included participant questioning, small group discussion and feedback. The classes were generally well received but participation and engagement were often poor. It seemed that the types of phenomena reported in the literature which cause 'bolt-on' study skills classes to have poor attendance (Wingate 2006) and which prevent high participation in mass lectures may have been present.

In order to address this issue of low participation a more individualised approach was sought that utilized technology to enable differentiated learning which addressed the needs of a varied cohort. The project aims, therefore, were to assess the students' understanding of referencing and plagiarism and to develop a range of teaching and

learning materials to address the learning needs identified. The following objectives were derived:

- To implement interactive teaching and learning sessions using voting pads to address the needs of students in terms of referencing skills acquisition.
- To conduct a formative assessment of the students' referencing skills during sessions utilising voting pads.
- To implement a blackboard course that includes multi-media learning objects and formative assessment tools that address the individual referencing skills needs of the students.
- To facilitate a student-led learning community focussed on the issue of referencing and plagiarism.
- To record and assess students' understanding and perceptions of referencing and plagiarism using social network profile questions.

The technologies to be used were SRS (Quizdom), VLE (Blackboard) and Social networking (Ning). The SRS was introduced by adapting a lecture on plagiarism so that the students were able to respond to questions using the SRS, whereas previously the groups had been asked to respond by raising hands. It was hoped that the use of the SRS would overcome some of the obstacles to student participation mentioned above. This session was delivered to students at all levels across the school throughout the first term, however, for the purposes of this paper only data gathered from first year cohorts is used. A Blackboard course, entitled Academic Matters, was created which included links to supporting material as well as two interactive quizzes that were designed to generate instant feedback. A social network also entitled, Academic Matters, the sole focus of which was plagiarism and referencing was created using what was then a free on-line tool, Ning (www.ning.com). The site aimed to provide a student-centred and owned space where learners could share understandings, attitudes and experiences of plagiarism. It was initially populated with messages from the Learning Development Group tutors along with their photos. Videos and links to newspaper articles reporting incidences of plagiarism both in popular culture and business were also added along with questions to stimulate discussion. It was hoped in doing this students would begin to appreciate that plagiarism is an issue that has real world relevance outside of academia.

In the approach suggested by the project a variety of ways of helping the students learn about plagiarism by exploiting communication technology were adopted. While established approaches were not dismissed, given a growing and more heterogeneous student population, which would be likely to display a variety of learning styles, then a range of opportunities were devised for the students to engage with the topic and to develop their understanding.

Pilot study

It was decided to focus on first year courses in order to work with as many students as possible who had no previous experience of plagiarism at university. The main collaborating group embedded the SRS lecture and VLE quizzes in a core module as part of a wider approach to helping students learn about plagiarism initiated from the start of term. The module began with the students submitting an essay on which they received formative feedback. For many of the students this meant that they were told that their writing might be considered to be plagiarism and that they would need to ensure that their writing was acceptable. Therefore when the students in this group attended the SRS lecture on plagiarism, they already had some recent experience of the topic. Following this lecture the students completed the two quizzes available via the VLE; the plagiarism quiz during the days that followed the lecture and the referencing quiz during the following week. These quizzes were the then followed by submission of a further short piece of writing of which one aim was to assess if there was any continuing evidence of students producing unacceptable writing.

This meant that both approaches could be piloted before being made available across the school in early November. The Ning social network had previously been used in other contexts and therefore this was offered across the School in early November without piloting.

Pilot study results and student evaluations

Following the pilot study with the first year group in 2008/09, quantitative data was collected in the form of a student evaluation questionnaire. This gave the students the opportunity to identify which of six aspects of the approach to plagiarism taken at the start of the course they felt added most and which least to their understanding of plagiarism. The interactive lecture and VLE quizzes were listed chronologically as the third, fourth and fifth elements in the list. This list is shown in Table 1 along with the student responses.

Table 1. Which activity added most/least to your understanding of plagiarism?

	Activity	Most	Least	Difference
1	Written feedback on essay	6	19	-13
2	Oral feedback on essay	4	14	-10
3	Interactive Lecture	22	9	+13
4	Plagiarism Quiz	32	6	+26
5	Referencing Quiz	10	12	-2
6	Feedback on report	4	18	-14
	Total	78	78	0

The responses indicated in Table 1 show that the Plagiarism Quiz carried out on the VLE seems to have made the greatest positive difference with 32 students identifying it as contributing the most to their understanding of plagiarism and just six students identifying it as having contributed the least. The second most useful activity indicated by the responses was the 'Interactive Lecture' which preceded the Plagiarism Quiz while the activity following the Plagiarism Quiz, the Referencing Quiz, also conducted via the VLE was the third most popular. This activity had a small negative difference with 12 students rating as least useful as opposed to 10 rating it as the most useful. It may be the case that by the time the Referencing Quiz was made available a large number of students already felt confident about their understanding of plagiarism and some might have been responding to the lower emphasis placed on plagiarism in this activity.

The questionnaire also asked the students about their prior awareness and understanding of plagiarism. When asked about prior knowledge of plagiarism of 81 responses 64 claimed awareness of plagiarism before arriving at university. However, informal investigation of these understandings in terms of what they were and how they were acquired varied greatly, supporting the view held by Carroll (2008) that students have a range of understandings of plagiarism. Of the 64 students who responded that they were aware of plagiarism prior to starting university all except for five said that their understanding had changed.

Roll Out

Following the initial pilot study in October 2008 the SRS lecture and VLE course were rolled out across the school. Students at all levels and across all courses experienced the SRS lecture, however, as previously stated this paper will focus on data gathered from first year undergraduate cohorts only. The VLE module was given prominence in students' blackboard course lists by appearing separately. The social network was embedded into the VLE module and invitation emails were sent out to all students (approximately 4300) across the school. The students were asked to answer profile questions on signing up and these were designed to gauge their understanding and perceptions of referencing and plagiarism.

Profile questions

The profiles questions were as follows:

> What aspect of your studies at university are you enjoying the most?
>
> What aspects of your studies at university do you like the least?
>
> Have you had any lectures or tutorials on the topic of plagiarism?
>
> Had you heard of referencing before coming to university?
>
> Rate how confident you are at referencing correctly (1=not at all confident, 2=slightly confident, 3=quite confident, 4=totally confident, 0=What's referencing?)

Do you think that plagiarism is common or rare?

Do you think the university rules on plagiarism are fair?

Initially the site was private with students only able to join via the invitation email. This was seen as the safest option as only those invited to the network could see its content allowing privacy in a password protected environment. However, take up was limited with around 80 students enrolling. The decision was taken to make the site public in a bid to make it more accessible as it was recognised that the invitation by email only mechanism could constitute a barrier to participation (Currant 2009). Where a network is private and students are invited by email all they receive is a message containing a link, following this link takes them to a sign up form with no opportunity to view the site before committing to joining. Making the network public allows students to visit the site, but not contribute to it, and therefore make some evaluation of what they are signing up for prior to enrolment.

In response to research that suggests that student participation in online discussion forums is usually low unless there is explicit encouragement (Tolmie and Boyle 2000; Salmon 2002 in Beasley and Smyth 2004) a student cheerleader was employed to manage the site and stimulate discussion.

Findings and analysis

Using the Student Response System to engage the students in the topic of plagiarism

The SRS lecture took the students through a series of scenarios which required them to vote on whether they felt the scenario constituted a case of plagiarism or not, taking a similar approach to that adopted by Bombaro (2007). At the beginning and end of the sessions the students were presented with two statements: ‘I have never plagiarised’ and ‘I have plagiarised’ and asked to select the statement which was true for them.

The 109 first year students, who took part in the lecture following the roll out, had received no formal input on plagiarism previously at the university. A summary of the responses to the statements at the start and end of the lecture, shown in Table 2, suggests that the session had an impact on the understanding of plagiarism of many in the group. Out of the 109 students responding, 43 (39.4%) selected the statement ‘I have plagiarised’ at the beginning of the session, rising to 71 (65.1%) by the end. This suggests that the scenarios and questions used during the session had an impact on the understanding that the students had of plagiarism. No similar shift had been expressed by the students who had completed the same session during the pilot study, however, they had already received considerable input on the topic. The usefulness of the session was supported by comments made by many of the students. For example one student stated, ‘The quiz that we had during the lecture was really effective as we were given feedback straightaway and an explanation of

why this was [plagiarism]'. Another student emphasised the usefulness of being able to see different examples of plagiarism.

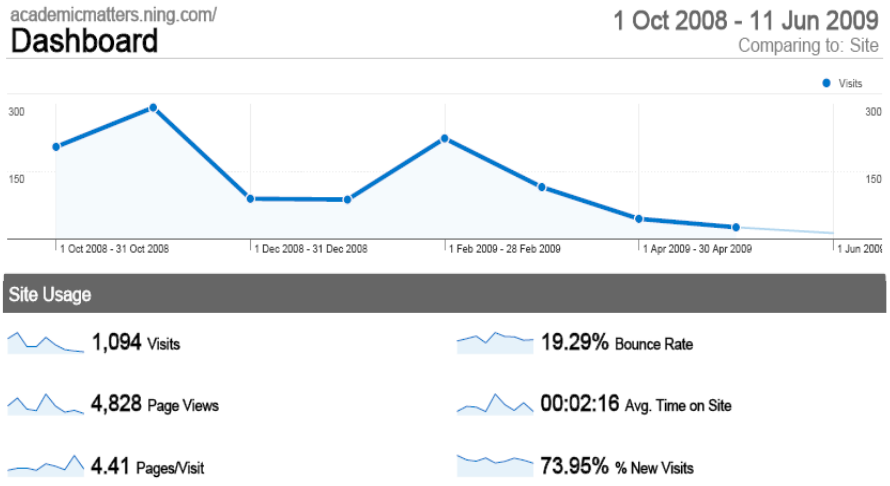
Table 2. Self admission of plagiarism at start and end of session by first year students receiving first plagiarism session

	Response at the end of the session		
Response at the start of the session	I have never plagiarised	I have plagiarised	Total
I have never plagiarised	25 (22.9%)	41 (37.6%)	66 (60.6%)
I have plagiarised	13 (11.9%)	30 (27.5%)	43 (39.4%)
Total	38 (34.9%)	71 (65.1%)	109 (100.0%)

Using a social network (Ning) to engage the students in the topic of plagiarism

By the end of the first year there were ninety-three members of the Academic Matters social network. There had been some use of the discussion forum and one member had added a video. The use of this resource is still limited and is yet to reach a critical mass. Figure 1 shows the number of visits to the social network over the academic year. There are surges of use at the points where the social network was first introduced via an emailed invitation to the students and where the student ambassador was first employed.

Figure 1. Google Analytics report showing *Academic Matters* usage academic year 2008/09



Note: data collected and output generated using Google Analytics

The Ning was used to promote student to student discussion of the issue of plagiarism and included profile questions on sign up. These questions aimed to gauge student understanding of and attitudes to plagiarism (see Table 3).

Table 3 Results of Ning profile questions (total 65 respondents)

Never heard of plagiarism before coming to university	15
plagiarism is common at university	43
plagiarism is rare at university	14
other	6
the plagiarism rules at university are fair	46
the plagiarism rules at university are unfair	6
other	12

Table 3 shows that there were a total of sixty-five responses to the profile questions. Of those sixty-five, fifteen said that they had not heard of plagiarism before coming to university. Forty-three said that they felt that plagiarism was common at university. Fourteen said they felt that plagiarism was rare, with six being undecided in this regard. Forty-six students said that they felt the university plagiarism rules were fair, six said they felt they were unfair and twelve decline to say either way.

Student comments suggest that although they felt that plagiarism was common they thought that more often than not this was due to lack of understanding and skills rather than determined intention:

> ‘I think it is common, but a lot of the time it is because people don’t really know how to reference properly.’

> ‘Common – although much of it is unintended and not malicious.’

Similarly the following student comments in relation to whether the university's plagiarism rules are fair or unfair, seem to suggest that plagiarism is often unintentional and that there is a, perhaps, a gap in relation to knowledge and skills in this area:

> ‘IF YOU HAVE BEEN EDUCATED ENOUGH ABOUT IT FIRST.’

Further, to this that the gap is perhaps not being adequately addressed:

> ‘No. They don’t recognise the responsibilities of all parties to actively seek and offer support.’

Another comment seems to suggest that the rules stifle collaborative working:

> ‘No, because it prevents team work and communicating’.

Finally, this comment exemplifies those students who regard the plagiarism rules as fair and feel able to operate effectively within them:

> 'It is fair coz student have to give their own views [rather] than copying.'

Using the VLE to engage the students in the topic of plagiarism

Following roll out across the school the VLE course was accessed a total of 2334 times between 1 October 2008 and 13 May 2009. The quizzes both focussed on referencing and plagiarism. The first quiz was entitled 'The Referencing Competency Quiz' and was accessed by 196 students, with 64 completing the whole quiz. The other quiz, entitled 'The Plagiarism Quiz', was accessed by 46 students and was completed by 13.

As mentioned earlier the VLE quizzes, particularly the 'Plagiarism Quiz' scored highly in evaluations during the pilot study as having has an impact on developing students' understanding of plagiarism. The following student comment illustrates this positive reaction:

> 'Throughout my college years I had never done any kind of referencing so I was unsure of how to reference even though majority of help on referencing was provided … I was unable to grasp the concept of Harvard referencing until I did the online test on referencing and plagiarism. I found the concept of multiple choice on plagiarism highly effective for me …'.

Discussion

This project attempted to incorporate a number of learning technologies into an approach aimed at helping students entering university learn about plagiarism. The three examples chosen were those that required the greatest investment of time from the tutors in terms of designing and developing the materials.

The sessions involving the SRS seemed to impact greatly on those who had had no tuition on plagiarism at university prior to the session. However, it proved generally popular with students who were taking the session as part of the pilot study.

Despite these advantages the time factors mentioned by Kenwright (2009) were relevant. The development of the sessions required considerable time investment and first involved two hours of training for each tutor before it was possible to think about designing the actual session. Another consideration is the time needed to first distribute and then collect the voting pads at the end of the session. An hour can therefore prove to be a rush and 90 minutes is a more comfortable time allowing for more detailed feedback and group discussion. Despite these considerations the advantages of engaging the students enabling them to discuss and think about the topic as well as the immediacy of the feedback outweigh the drawbacks.

The general curiosity about the Blackboard course seems to be high with 2334 visits and 242 students accessing the quizzes. The quizzes score well in student

evaluations and therefore seem to have had a positive impact on developing skills and understanding. The creation of the quizzes was time intensive initially but once done can be rolled over to subsequent academic years with perhaps only minor adjustments. It would appear that where the use of the blackboard courses is integrated into the curriculum and supported by tutor endorsement the initial curiosity about the course is much more likely to be converted into a commitment to complete the quizzes.

It is difficult to estimate the benefits for the students who visited the course without fully accessing the quizzes. They may have been satisfied by the links to other materials available and therefore have left without investigating further. Those who accessed the quizzes but did not complete them similarly could have done so because they felt they had gained what they needed or may have been disinterested. Investigating the perceptions of these students would prove interesting and could help to develop the blackboard course further.

Student take up of the social network was limited. Ninty-three students became members; however, despite the use of a student ambassador activity remained low. There are several reasons why this might be the case. Firstly, the roll out of the network did not take place until November, which was fairly late in the year. Students may already have established friendships and so did not feel the need to communicate via an online mechanism. The students may not have felt that the issue of plagiarism was relevant to them at that time. An advertising campaign was not used to promote the network instead the invitation email was relied upon to generate participation. Perhaps also, student reluctance to engage is located in a resistance to using a technology that they see as being purely social in an educational context (Tinker, Byrne and Cattermole 2010).

The social network profile questions and the SRS data give us a valuable insight into students' perceptions of plagiarism. Although 66.15% of respondents to the social network profile questions felt that plagiarism was common, students' comments seem to suggest that this was a result of lack of awareness rather than malicious intent.

This would seem to concur with the results from the SRS questions. Here the significant shift from a belief that they had never plagiarised, to a realisation that they had in cohorts for whom the session represented their first taught session on the subject, perhaps shows a lack of awareness of the concept.

Further informal investigation into students' perceptions of what they understood about plagiarism also revealed a variety of understandings and practices, sometimes learned in prior educational experiences. This would point to a need to not only educate students about how to reference but why we reference and the role that secondary sources play in the production of an academic argument.

Plans for further development

Following, initial evaluations of the project plans for the future include a more systematic advertising the social network and VLE during induction and around the

campus on plasma screens and in student newsletters. It is also planned to work with tutors to encourage them to promote the network to their students. However, it is recognised that in order to accurately assess the network's value to students feedback needs to be gathered, however problems arise here in that it is often just as valuable to know why students do not use a resource as why they do and there are obvious difficulties in gathering such data.

Beasley and Smyth (2004) argue that multi-media learning objects are more effective where they can more closely replicate the real world and so future plans for the improvement of the VLE quizzes include using Microsoft's Captivate to enhance interaction and visual representation of the intended learning scenario.

Use of the SRS will be continued across the school in the How to Reference Session delivered to students via workshops and guest lecture slots. Additionally, their potential benefits will also be promoted to tutors during staff development sessions delivered as part of the Business School Teaching and Learning Seminar series.

Conclusion and recommendations

It would appear that students come to higher education with a range of understandings of what constitutes plagiarism and why we reference some of which stand at variance to the understandings and expectations of the academic community. Informal evidence would also seem to suggest that students also employ a variety of methods in the production of essays, some of them validated by previous successful educational experience, which result in plagiarism**.** It would seem that as educationalists plagiarism education is not just a matter of what students need to learn but what they need to unlearn and, at some level, an attitudinal shift.

It seems clear from the evidence of this scheme that a holistic approach to plagiarism education, recommended by Macdonald and Carroll (2006) is the best approach of ensuring the maximum number of students understand how plagiarism is seen by the university. A truly holistic approach will also consider what this means in terms of the use of technology and the evidence provided in this paper goes someway to supporting the idea that the topic needs to be dealt with in a variety of ways.

Despite this, a few students have commented that the approach as a whole seemed ‘over the top’ but even one student who made this comment conceded that he had become a much more confident writer as a result of the process.

Providing multiple representations of learning is undoubtedly sound pedagogical practice and a combination of materials that can be used in taught environments and which students can access alone in a variety of forms seems to allow for a range of learning preferences. However, where materials are integrated into the curriculum and supported by tutor activity student participation seems to be enhanced. There seems therefore to be a need to assess and reflect upon the balance between tutor and students led activity in any intervention that is designed to address a range of student needs.

Further, research aiming to investigate in more detail students' understanding of plagiarism and prior study and writing practices that can in some cases result in plagiarism would enhance the ability of academic teaching staff to design plagiarism education interventions.

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