Developing Students' Information and Research Skills via Blackboard

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DEVELOPING STUDENTS’ INFORMATION AND RESEARCH SKILLS VIA BLACKBOARD

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ABSTRACT

This paper summarizes work undertaken at De Montfort University (Leicester, UK) to develop students’ information and research skills using the Blackboard Virtual Learning Environment. It outlines how a traditionally delivered and assessed program was reviewed and revised in order to produce a blended learning experience for students.

The librarians involved undertook this project with students from the Faculty of Health and Life Sciences during March/April 2005, teaching two groups in parallel—one group using Blackboard and another using the traditional teaching method. Both groups were given a diagnostic evaluation to gauge their confidence levels with both information skills and using Blackboard, and to obtain their perceptions of their experiences. Both groups underwent a formal summative assessment with one group using Blackboard and the control group having a paper-based assignment.

The Blackboard sessions were very popular with students and this method of teaching has subsequently been extended to other modules within the university. Students appeared to be more motivated and appreciated the constant availability of the learning materials. This project was the first example within the university of students undertaking a formal online assessment using Blackboard, and the librarians received a Curriculum Development and Innovation Award. The work was subsequently disseminated within the university, where it was well received.

INTRODUCTION

This is a report on an information skills project that was conducted at the Kimberlin Library, De Montfort University (Leicester). De Montfort University is commonly classified as a “new” university, being one of the many former polytechnics that received university status as part of the 1992 Further and Higher Education Act in the United Kingdom. It is equivalent to a four-year college in the United States and has an ever-growing graduate and research population. At the time that the project was undertaken, De Montfort University had approximately 19,000
students, 1600 academic staff and six faculties. Librarians are active in teaching information and research skills across all of the faculties.

During early 2005, De Montfort University Library Services developed an Information Literacy Framework. The Framework has seven learning outcomes, with a range of skills associated with each outcome, and is based on the British Society of College, National and University Libraries “Seven Pillars” model (SCONUL, 1999). The Framework is predicated on the definition of information literacy provided by the British professional library association, the Chartered Institute of Library and Information Professionals: “Information literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner” (CILIP, 2004).

The Blackboard course management software was purchased by the university in 2003 with initial training being delivered to a core group, which included one of the authors of this manuscript. The university planned a phased implementation of Blackboard as a virtual learning environment, beginning in the academic year 2004/2005 and continuing until 2007, with a range of achievement targets.

BACKGROUND

For several years, Library Services staff at De Montfort University have worked closely with the Faculty of Health and Life Sciences on Professional Skills courses. The Library contributes four 1-hour sessions, with an assessed exercise that is 7% of the course mark, to enable the students to develop information handling skills. Up until March 2005, the format for these sessions was:

1. Tackling an assignment—emphasis on using the catalog
2. Using databases to find journal articles
3. Using the Internet for research
4. Creating reference lists and bibliographies

In 2005, the authors developed a Blackboard version of this course that was delivered during March and April, on either side of the Easter break. The Blackboard module was delivered to Biomedical and Forensic Sciences students taking the Professional Skills course (CHEM1061). During the same weeks, a control group (Pharmaceutical and Cosmetic Science – PHCO1312) was taught using the traditional method of teaching. Both cohorts undertook an assessment at the conclusion of the library sessions.

WHY CHANGE?

The University was in its first full year of Blackboard implementation, and this was a method of learning that Library Services felt they should embrace. It was known that Blackboard had already been used to good effect to deliver information literacy instruction in the United States. Fortunately, the students taking this course were already familiar with Blackboard, although they had never previously undertaken an online assessment. It was felt that the use of Blackboard would give the opportunity to get students more involved, moving away from the “chalk and talk” approach. The literature suggests that course management software such as Blackboard is more suited to the learning style of students in the 21st century, and capitalizes on their enthusiasm for technology (Costello et al, 2004), providing:

- Information at the “point of need”
- Small learning chunks
- A more personalized learning experience
- An active, kinesthetic learning environment.

The use of Blackboard presented a chance to maintain much of the previous content but to radically change the format. It also generated a review of the learning outcomes, ensuring that the assessment reflected these, and that they tested the students’ knowledge and understanding. This provided the first opportunity to utilize the learning outcomes from the new Information Literacy Framework, which was in its first draft at this time. The outcomes that were developed for this course were:

- Locate information within the Library using...
OPAC and Web pages
- Understand the concept of keywords and use appropriate terms to find information on a topic
- Recognize the main processes of locating and accessing information (including the use of reference material, journals, abstracts and indexes, and the Internet)
- Create a bibliography using correct citation methods.

As an entire session needed to be devoted to the online assessment, citation referencing within the other three sessions was contextualized, which was felt to be a positive change. Added to all this was the very large incentive of reducing the time taken to mark student assessments!

MODULE CONTENT

The content of the Blackboard module was closely aligned with the content of the previously established sessions being delivered with the control group. The revised sessions were:

1. How to tackle an assignment—ensuring that students are able to recognize a need for information and are able to find books and reference material; Harvard book citation.
2. How to find journal articles—enabling students to construct strategies for finding articles both electronically and in print; Harvard journal citation.
3. Searching the Internet—equipping students with the skills to locate relevant Web sites and to compare and evaluate information obtained from different sources; citation of electronic sources.
4. Summative assessment within controlled, invigilated conditions.

The module took approximately eight weeks to put together, with one librarian focusing on the content of the sessions and another concentrating on the formal assessment. While special technical skills are not necessary to develop Blackboard content, the version used did not have the facility to change font or add color (subsequent versions of Blackboard have rectified this), so HTML was used to make the text display in a sans serif font and to use colored headings. For this project, the librarians had sole control of the module, as the rest of the faculty who taught on the Professional Skills course had not yet embraced Blackboard. The summative assessment was piloted with library assistants to smooth out any “teething problems.”

Students undertook a diagnostic evaluation in Session 1 to assess their information skills at that stage and their comfort levels within the electronic environment. (This was repeated at the end of Session 4.) The evaluation forms are shown in the appendices to this manuscript—Appendix 1 being the Session 1 evaluation, which took place in Week 24 of the semester, and Appendix 2 being the Session 4 evaluation, which took place in Week 30 of the semester. The control group (PHCO 1312) undertook the same diagnostic evaluation to facilitate comparative analyses. Within each of sessions 1-3, for the Blackboard module there were quizzes to provide formative assessment with feedback to enable students to improve before the final summative assessment and to become familiar with being tested online. This also allowed students to reflect upon their learning and to improve between sessions. It was felt that both types of assessment were important to enhance the overall learning experience. “Both formative and summative assessment provide opportunities for students to demonstrate learning outcomes, which is a good way to reinforce and deepen their learning” (Wareing, 2004, p.5).

COURSE DELIVERY

Each session was introduced by a brief lecture, then students were given the rest of the 50 minutes to work through the Blackboard content, following links to resources. The computers in the library instruction room were supplemented by laptops so that every student could be in charge of his or her own learning experience. The librarian was present throughout the whole session to provide advice and guidance. Students appeared to be more
engaged in the Blackboard sessions and were less eager to pack up their bags and leave before the end of the class!

The format for the summative assessment during the final session was strongly influenced by the experience of librarians at Coventry University (UK) who had implemented formal assessments under exam conditions using WebCT (Patalong, 2003). While this knowledge was invaluable, the students at De Montfort University did not appear to work out ways in which to cheat as quickly or effectively.

**BENEFITS OF ONLINE LEARNING**

The use of online course management software helped to change the “teaching and learning dynamic” (Garrison and Kanuka, 2004, p.97). The benefits of the Blackboard module included:

- The active learning style of Blackboard provided motivation for students. The students were following links to resources rather than trying to memorize a demo or keep their place on a printed handout.
- Students received ongoing skills support by being able to refer to online materials and formative assessments at any time.
- The varied learning, teaching and assessment diet allowed students to learn in their own time rather than being limited to class contact time. Students were also encouraged to contact librarians via e-mail between classes and to use the Discussion Board.
- The Blackboard course management software enabled learning to be assessed with the same level of detail whether it was diagnostic, formative or summative.

Other benefits to students were that:

- They received immediate feedback on formative assessments, both within and outside of class contact hours. The students clearly enjoyed the quizzes, comparing their marks with their peers and actually taking note of what should have been the correct answer to a question that they had gotten wrong. Many students even retook the quiz to achieve the perfect score. While the score did not count toward the module mark, this seemed to be a matter of pride with them!
- They received timely and relevant review of their work and summative assessment, thereby increasing motivation. Further feedback could be elicited by using the Discussion Board, or by an e-mail to the instructor, rather than waiting for the next class.
- Students who had missed sessions were able to catch up in their own time. (There was no perceived drop in attendance as a result of the sessions being available through Blackboard.)
- Citation referencing was contextualized and tested, with an emphasis on the dangers of plagiarism. A faculty member who taught the Biomedical and Forensic Sciences students (the Blackboard group) for another subject commented that they had come away from this course with an increased understanding of citation referencing that they had put to good use elsewhere.

**SUMMATIVE ASSESSMENT**

The Blackboard assessment was undertaken in the fourth session under controlled, invigilated conditions. Each group’s assessment was made active for a specific time slot and was password protected. A pool of 60 questions was created, to test the learning outcomes, from which 12 were selected for each group. There was random generation of questions within each group.

The mean marks for the assessments were 53% for CHEM1061 and 65% for PHCO1312. This reflects the fact that the Blackboard assessment was more challenging and tested students’ knowledge and understanding of information skills. The PHCO1312 paper based assignment, while being an individual piece of work, could easily be completed by students working collaboratively, and did not necessarily test an individual student’s understanding. Both groups of students were able to use online resources in order to complete the assessment, but the
Blackboard group was under a time constraint. The mean mark for CHEM1061 was more in line with the mean mark for the whole course, whereas the mean mark for PHCO1312 was higher than the rest of the course assessments.

STUDENT REACTIONS

The Biomedical and Forensic Sciences students (CHEM1061) were very comfortable within the Blackboard environment and interacted well with the technology. This observation by the librarians was subsequently backed up by the student evaluations. Many students adopted the practice of having two windows open at once—one for Blackboard and one for the library Web pages—creating their own kind of “guide on the side.” Only one student posted something on the Discussion Board, but over 40 students read it. All students turned up for the assessment, even those who had not attended previous sessions.

The quiz at the end of each session proved to be very popular with the students, bringing out their competitive natures! The librarians also felt that the students engaged more by discussing their quiz answers and marks than they ever had with their responses to questions in class sessions.

The diagnostic evaluations that were completed in Session 1 (Week 24) and Session 4 (Week 30) showed that over 60% of the CHEM1061 students who responded “I’ll give it a try” when asked what they felt about learning within Blackboard in Session 1 later responded “Bring it on” in Session 4, when asked what they felt about more Blackboard learning. (See Table 1 showing the conversion rate between students’ responses in the first evaluation and the second evaluation. This particular question was only asked of the CHEM1061 Blackboard group.)

Ninety-two percent of the CHEM1061 students

<table>
<thead>
<tr>
<th>Percentage of students who responded:</th>
<th>CHEM1061</th>
<th>PHCO1312</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Can’t wait to start” in Session 1, then said “Bring it on” in Session 4</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>“I’ll give it a try” in Session 1, then said “They are really going to help” in Session 4</td>
<td>92%</td>
<td>78%</td>
</tr>
<tr>
<td>“Not looking forward to it” in Session 1, then said “They are really going to help” in Session 4</td>
<td>0%</td>
<td>67%</td>
</tr>
</tbody>
</table>

TABLE 1 – CURRENT FEELINGS TOWARDS LEARNING WITHIN BLACKBOARD

TABLE 2 – CURRENT FEELINGS TOWARDS LEARNING LIBRARY/INFORMATION SKILLS

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who responded “I’ll give it a try” when asked what they felt about learning information skills in Session 1 later responded “They are really going to help” when asked what they felt in Session 4. (See Table 2.)

Overall, across the two groups, 64% of students who were “quite confident” at using the DMU library to find information in Session 1 had become “confident” by the last session. This confidence level was greater among CHEM1061 students (69%) than it was with PHCO1312 students (58%). All of the CHEM1061 students who were “not confident” in Session 1 were “confident” by the last session. (See Table 3.)

It was not a major concern that an overall 21% of those students who had been “confident” in Session 1 did not admit to being still “confident” in Session 4. It has been found by many librarians, and reported in articles by Holman (2000) and Macklin (2001), that students’ initial confidence in their ability to use technology and the Internet often exceeds their real capability with regard to information skills.

Some individual comments received were:
“Found sessions very useful and they gave good, easy to find reference points.”
“The assessment on Blackboard was very user friendly and easy to understand.”
“The test was a good way of testing if we really knew about citation and how to use the internet and library for information.”
In addition, several students asked how long the content would be accessible to them, and were pleased to know that it would remain at least until the end of the academic year.

**BENEFITS TO THE UNIVERSITY**

Benefits to both library and academic staff were that:
- Marking took approximately 80% less time via Blackboard than with the traditional assessment.
- The Blackboard module would be easily transferable for use with other courses and faculties within the University, with or without assessment. (It has subsequently been used with Year 1 Pharmacy students and Year 1 Engineering students.)
- The Blackboard software did not necessitate a great deal of specialist technical training for librarians—many just attended one in-house content creation course and then were ready to work on developing modules.
- The module could easily be customized for use with part-time and distance learners and could be utilized by Associate Colleges. (These colleges are similar to American community colleges and are approved to teach the first two years of a four year degree program.)
- Use of the control group provided an interesting comparative analysis between Blackboard and traditional teaching.

At the time of this work, and for a good while afterwards, this project represented an innovative use of Blackboard at De Montfort University and exceeded the anticipated achievement targets. As previously stated, the university was in its first full year of Blackboard

**TABLE 3 – FINDING INFORMATION IN THE LIBRARY**

<table>
<thead>
<tr>
<th>Percentage of students who were:</th>
<th>CHEM1061</th>
<th>PHCO1312</th>
<th>OVERALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Confident” in Session 1 – still “confident” in Session 4</td>
<td>71%</td>
<td>86%</td>
<td>78%</td>
</tr>
<tr>
<td>“Quite confident” in Session 1 – “confident” in Session 4</td>
<td>69%</td>
<td>58%</td>
<td>64%</td>
</tr>
<tr>
<td>“Not confident” in Session 1 – “confident” in Session 4</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>
implementation and it was not expected that online assessment would be incorporated until the third year of operation. In May 2005, this work was awarded a Curriculum Development and Innovation Award as part of the Vice Chancellor’s suite of Teaching Excellence Awards.

Although the project demanded a great deal of work up-front, creating content and a different form of assessment, the delivery method allowed more time to respond to individual student needs in class. There was also more time to get to know students and their individual strengths and weaknesses. This appeared to make students feel more comfortable in asking questions and for assistance. According to the literature on blended learning, this is the essence of its success. Garrison and Kanuka (2004, p.98) found that a “teaching presence manages the environment and focuses and facilitates the learning experience.” This innovative delivery model empowered the students within their learning environment but did not take any control away from the librarian instructors.

FURTHER DEVELOPMENTS

The Biomedical Sciences students continued with a second year Professional Skills course (CHEM2060) during October/November 2005 for which Blackboard was also utilized. A similar format was adopted for the sessions:
- Introduced with a short lecture.
- Refresher on Year 1 sessions followed by more advanced content.
- Sessions 1–3 ending with a more challenging quiz.

The previous 1500-word report, which was the formal assessment, was replaced by three short essay questions on Blackboard which, again, were completed under controlled exam conditions in the fourth and final session. As the previous 1500-word report was also to test citation referencing skills, it was decided that a word-processed Harvard bibliography should be part of the assessment. This was allocated 40% of the total mark, for which the students had to correctly list two books, three journal articles and two Web sites on a set topic. They were given five weeks in which to complete this assignment. It was felt that these bibliographies were much improved, compared to those previously attached to reports, but there is only anecdotal evidence to support this.

Some comments received from the students on this course were:
- “Hands-on experience helped me learn and remember how to use the library and cite references.”
- “Good set up, if no lectures doubt if students would be bothered to complete library quizzes or read notes. Forces you to sit down and do it.”
- “Using Blackboard exercises is really useful as you can look at them again at a later date and it combines practical exercises with lecture material.”

The results of the project were disseminated within the university via reports to some of the Faculty Learning and Teaching Committees. The money received from the Curriculum Development and Innovation Award was put to good use funding lunches for a series of “E-learning Showcases.” Academic and learning support staff were invited to these showcases to view the Blackboard courses which had been developed by library staff. This generated a great deal of interest, not just for Blackboard, but also for information skills in general. The showcases also enabled Library Services to market other services and resources to support e-learning, such as e-journals, e-books, Reading Lists Online and databases.

CONCLUSIONS

This was an extremely worthwhile project for Library Services, as it reaped many more benefits than were originally anticipated:
- It forced the librarians to seriously review the content of the information skills sessions and to ensure that learning outcomes were being met and effectively assessed.
- It provided a method of learning that motivated and appealed to many students, especially those who believe that if the information is online then it has to be good!
• It provided greater out-of-class support to students through the availability of teaching materials and formative feedback 24/7. Students who had missed sessions through illness or other valid reasons were able to catch-up easily.
• Once the content was created, it was easily transferable to other subject areas for customization. This also provided a consistency of materials and delivery which can both benefit the students and save time for overworked instruction librarians!
• It drastically reduced the amount of time that librarians needed to spend on marking assignments.
• It was a pioneer project within the university and, as such, increased academic staff awareness and expectations of what the library could do for them.

The use of Blackboard to develop students’ information and research skills seems to be a perfectly logical step forward, as the use of hypertext links allows students to explore the vast range of electronic resources within the context of their learning. This use of course management software appeals to students of the 21st century and complements their learning styles, as was also found by Costello et al. (2004). However, it was not felt that the Blackboard module should replace face-to-face teaching. This was a blended learning experience which worked well and appeared to meet the students’ needs. It gave the librarians more time within the class sessions to interact with the students and to provide support. Librarians at Deakin University in Australia came to the same conclusions about the blended learning experience. “The results of our research indicate that contact with and instruction by a librarian is desirable for the best learning outcomes and confidence in development of information literacy skills” (Churkovich and Oughred, 2002, p.34). This work undertaken at De Montfort University using Blackboard was deemed to be a successful project, which not only provided greater motivation for students, but also generated more faculty and staff interest in developing information literacy skills.

Thanks to Helen Howkins (Senior Information Assistant, Kimberlin Library) for her work on the evaluation and analysis of student feedback, marks and attendance (CHEM1061 and PHCO1312). Thanks to Michael Edwards (Senior Information Assistant, Kimberlin Library) for his work on the evaluation and analysis of student feedback (CHEM2060).

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REFERENCES


APPENDIX 1
Professional Skills module (CHEM 1061) self-evaluation (Week 24)

Student number: __________________

Which is your age group?
☐ 21 or under
☐ 22 – 39
☐ 40 or over

Did you attend a library induction session in Week 0?
☐ Yes
☐ No

Please tick ONE box to indicate your confidence level against each of the statements following.

- I find and reserve books using OPAC.
  ☐ Confident
  ☐ Quite confident
  ☐ Not confident

- I am able to search databases in order to track down relevant journal articles.
  ☐ Confident
  ☐ Quite confident
  ☐ Not confident

- I know how to evaluate information from the Internet to assess whether it is reliable or not.
  ☐ Confident
  ☐ Quite confident
  ☐ Not confident

- I know how to cite references I have used in my work.
  ☐ Confident
  ☐ Quite confident
  ☐ Not confident

- I know how to compile reference lists and/or bibliographies.
  ☐ Confident
  ☐ Quite confident
  ☐ Not confident

- I am able to find things without having to ask a member of the library staff for help.
  ☐ Confident
  ☐ Quite confident
  ☐ Not confident

My current feelings towards learning library/information skills are:
  ☐ Can’t wait to start
  ☐ I’ll give it a try
  ☐ Not looking forward to it

My current confidence level with Blackboard is:
  ☐ Confident
  ☐ Quite confident
  ☐ Not confident
My current feelings towards learning within Blackboard are:
- Can’t wait to start
- I’ll give it a try
- Not looking forward to it

APPENDIX 2
Professional Skills module (CHEM 1061)
self-evaluation (Week 30)

Student number:__________________

Please tick ONE box to indicate your confidence level against each of the statements following.

I can use the DMU library to find information.
- Confident
- Quite confident
- Not confident

I find and reserve books using OPAC.
- Confident
- Quite confident
- Not confident

I am able to search databases in order to track down relevant journal articles.
- Confident
- Quite confident
- Not confident

I know how to evaluate information from the Internet to assess whether it is reliable or not.
- Confident
- Quite confident
- Not confident

I know how to cite references I have used in my work.
- Confident
- Quite confident
- Not confident

I know how to compile reference lists and/or bibliographies.
- Confident
- Quite confident
- Not confident

I am able to find things without having to ask a member of the library staff for help.
- Confident
- Quite confident
- Not confident

My current feelings about having learnt some library/information skills are:
- They are really going to help
- They’re okay
- Waste of time

My current confidence level with Blackboard is:
- Confident
- Quite confident
- Not confident

My current feelings towards doing more learning within Blackboard are:
- Bring it on
- I’ll do it if I have to
- I really don’t like it

Any other comments:__________________