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An evaluation of the use of guides at the side web-based learning activities to equip students in Health Sciences and Nursing with information literacy skills

The Open University offers a range of health related programmes, including the pre-registration nursing diploma and a foundation degree in health and paramedic sciences. It is a requirement for students on these courses that they develop skills in finding, accessing and reviewing information. Library staff work with academics to embed activities into these courses that will assist students in developing these skills.

To overcome the necessity of providing extensive instructions in print with students having to shift constantly from print to screen the decision was taken to develop a series of guide at the side activities where the instructions appear in the 'instruction pane' on the left-hand side of the screen with the website or database that the students have to use on the right-hand side in the 'database pane'.

Surveys of students on two first-level courses on how effective and enjoyable they found this method of learning were carried out. These courses are compulsory in the pre-registration nursing diploma and in the foundation degree in health and paramedic sciences. Results show that the majority of students found this method of teaching effective and enjoyable.

Interactive; online tutorials; information literacy

Introduction

The Open University (OU) is the only UK university dedicated to distance learning. The OU's style of teaching is called supported open learning. Open learning means students learn in their own time reading course materials, working on course activities, writing assignments and, increasingly, working with other students. Supported means support from a tutor, student services staff in the regional centres as well as from centralized areas, for example the Library.

The OU offers a range of health related awards including the pre-registration nursing diploma, offered by the Faculty of Health and Social Care, and foundation degrees in health and paramedic sciences, offered by the

Faculty of Science. All the courses making up these awards are essentially print based with the majority of teaching being provided through printed course materials. The relevant QAA subject benchmarking statements and professional standards alongside the OU's Learning and Teaching Strategy mean that it is a requirement for students studying for these awards to develop skills in finding, accessing and reviewing information i.e. information literacy (IL) skills.

Strategies for development of IL skills were agreed with both award committees requiring development of IL skills from level 1. Surveys commissioned by the Faculty of Health and Social Care have indicated that a significant percentage of their students are likely to have low levels of ICT skills and experience when entering a programme of study. Results from a Science Faculty course U205 (Health and disease), whose student profile was thought to resemble the target group for the health and paramedic science degrees, showed similar low levels of ICT skills. Based on this information both award teams were insistent that all online activities designed for the first level courses, SDK125 (Introducing health sciences: a case study approach) in the health sciences award and KYN107 (Introducing professional practice and knowledge) in the nursing award, should assume a low level of student ICT skills and should introduce the basic elements of computer usage starting from the very basics.

Library staff worked with academics and media development colleagues in the University's Learning and Teaching Solutions (LTS) Unit to develop online IL activities that would interest and engage students by embedding them into the context of the two courses.

Identifying the appropriate method for delivering the skills teaching

As stated earlier both SDK125 and KYN107 are essentially print based courses. However it was felt that to provide detailed and explicit print based instructions to guide the students through online activities which required students to find and access specific online resources would:-

- result in an extensive use of printed material because of the numerous screen shots needed to steer the student through the processes involved
- result in having to send updates to students as interfaces and resources changed, not only over the life of a course, but during the presentation of a course
- result in students having to grapple with extensive written information whilst attempting a fairly complex task on screen. It was thought that the process of constantly shifting from print to screen could be both confusing and tiring.

A literature review, together with an assessment of methods currently used within the University for delivering detailed web-based instructions online, were used to identify an appropriate method for delivering these activities. Methods identified were assessed against the following criteria:-

1. Evidence of effective learning. The activities ideally needed to be engaging to a variety of learning styles and learner ability levels with a significant level of interactivity.

2. Use with a range of browsers and operating systems. The OU supports students using a range of browsers and operating systems and they may be working behind firewalls and with pop-up blockers enabled etc. These variables can all have an impact on how activities look to the student and how some of the functionality works.
3. Accessibility. The activities should be accessible to all students including those with visual disabilities. The chosen method should not disadvantage students who use dial-up modems to access the internet.
4. Ease of reuse of activities. The OU Learning and Teaching Strategy (2004) recommends the development of high quality learning materials that can easily be reused or re-versioned.
5. Ease of updating. The activities would be guiding students in searching third party resources where interfaces might change with little notice so ease of updating was important.
6. The materials should be on brand, conforming to University guidelines for ensuring that students experience a consistent look and feel across all OU websites and online materials.

Only two methods were identified that fulfilled a number of these criteria – animated demonstrations using screen capture software and guide at the side split screen activities. These are discussed more fully below.

Animated demonstrations using screen capture software

Screen capture software aims to simulate a video recording by taking a series of still images and incorporating on screen moves. Audio tracks can also be

added. Two frequently cited packages are Camtasia and Captivate. There are a number of case studies reported in the literature on the use of screen capture software. Crofts and Hunter (n.pgn) used screen capture software to enhance student learning of a computerised accounting information system. They argued that using this type of technology had the advantage of supporting the three main learning styles visual, auditory and kinaesthetic identified by Donna Rogers (22). They also recommend it as appealing

'to Prensky's (2002) description of the needs of today's student for graphics in preference to text, allowing students to easily visualize the processes that are being demonstrated and construct their own mental models (Phillips, 1997)'.

Unfortunately the paper only outlines the first stage of their study before the tutorials had been rolled out and student evaluation undertaken.

Xiao, Pietraszewski and Goodwin (367) argue that a cognitive load theory can be used to explain the success of screenshot video demonstrations. They report on the work of Sweller and Chandler which showed that where learners are required to split their attention between different information sources the cognitive load may be increased. Tempelman-Kluit (365) compared two versions of a library tutorial, an HTML tutorial and a streaming audio and video tutorial, and analysed them against several multimedia learning theories concluding that the latter version was more effective as a teaching tool.

However there were a number of concerns voiced by the teams in using this type of software. Their main concern was the lack of interactivity in these animations which it was felt was particularly important when teaching

students how to search specific resources. It was considered essential that students engage with the learning materials to practice their skills (criteria 1 above). Dewald (n.pag) quotes Brandon Hall author of the Web-based Training Cookbook, 'interactivity makes the difference between a program that simply present information, and one that actually trains the user'.

A further concern was that this method of delivery would not be flexible enough to encourage novices whilst not boring advanced learners (criteria 1). Lawless and Brown (118-121) make a strong case for the negative impact of a very controlled environment on experienced learners. The hierarchical navigation of screen capture software that allows only minimal choice by the learner was therefore a concern for the teams. The Library had previous experience of using Captivate software to create online tutorials which had highlighted significant problems in adding auditory commentary tracks to the recordings to improve accessibility (criteria 3). These included the time involved in adding the tracks initially and the difficulty in updating these when content changed. There had also been very significant problems in branding the tutorial to meet the new OU corporate branding guidelines (criteria 6).

Guide at the side' split screen activities

In 'Guide at the side' activities instructions on screen appear on the left in the 'instruction window' with the actual live websites which the students were being required to search on the right in the 'database window'. In the UK a series of these activities were created as part of the JISC-funded INHALE and INFORMS project at the University of Huddersfield. Anecdotal evidence

indicates that students find this approach effective and enjoyable. 'Students feedback on Informs used within our skills module tells us that their understanding and use of e-resources has improved as a result of our Informs tutorials. More importantly, they are telling us that their marks are also improving!' 'Students in classes always comment on how they enjoy using it to learn by doing rather than being shown.' (Charnock 44).

Although Diana Massam (n.pag) reports that over 200 higher and further education institutions are now using Informs, only one case study was found in the literature. The paper by Ginny Franklin and Ruth Stubbings (n.pag) focuses on how the tutorials were constructed but there is little feedback on how effective the students found the tutorials. The teams writing the courses at the OU thought these types of activity would help engage the student in the learning process as they required considerable interaction on the part of the student (criteria 1). The proposed activities would essentially be hierarchical, or step-by-step. However this was considered useful for users with very little knowledge as they would feel supported in the activities but students with higher level of skills could easily adopt a more serendipitous approach to searching, 'the sort of learning by doing approach' described by Brumfield (368).

Implementation

The decision was taken by both course teams to use the guide-by-the-side technology. At the time of development accessibility was still being addressed by the Informs development team (Massam n.pag) so the software was developed in-house so that accessibility and issues of use on multiple

browsers and operating systems etc. could be fully resolved. The media development team had had previous experience of this approach in the development of Safari (<http://www.open.ac.uk/safari>) where issues of accessibility and operation with multiple browsers and operating systems had been investigated and resolved. As part of the development process it was also hoped that templates could be developed which would allow for ease of re-use of activities and easy uploading to Moodle, the University's Virtual Learning Environment (VLE).

As with the Informs model the 'instruction window' is sub-divided into a series of pages which guide the student through the activity with explanations about what they are doing. The instructions use small images as well as text where appropriate, which often has the added benefit of reducing the number of words required for explanations (see Figure 1).

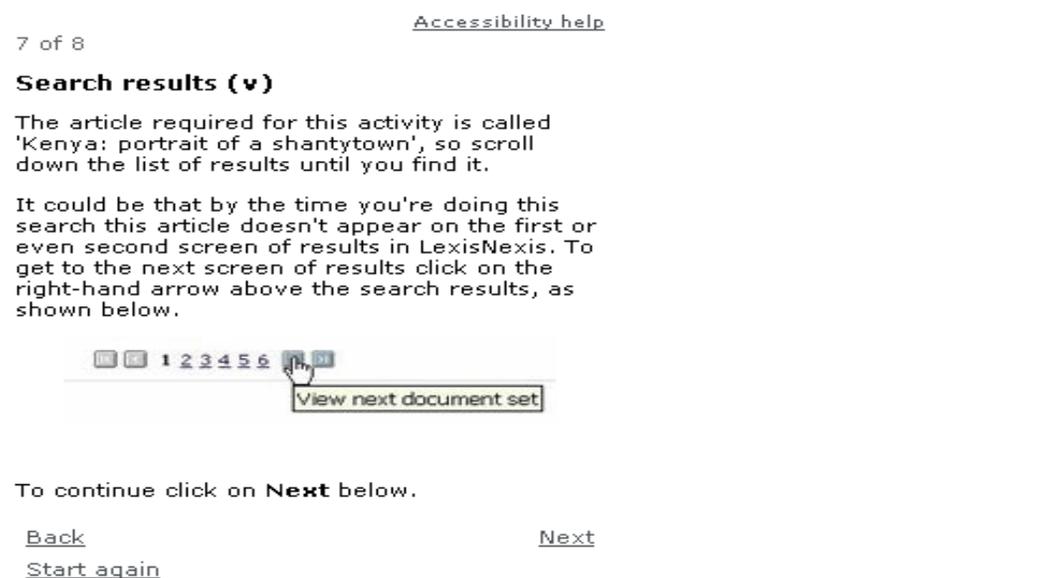


FIGURE 1 Detail of one of the pages of instruction showing the use of a small image

The course team considered it to be important that a number of “escape routes” were provided for students who became lost whilst working through the activity. The dynamic nature of the databases being used meant that organising these proved difficult. A link was added to all the pages in the ‘instruction window’ to “start again”. This link took the student right back to the beginning of the activity instructions and returned the ‘database window’ to the starting screen (see Figure 2).

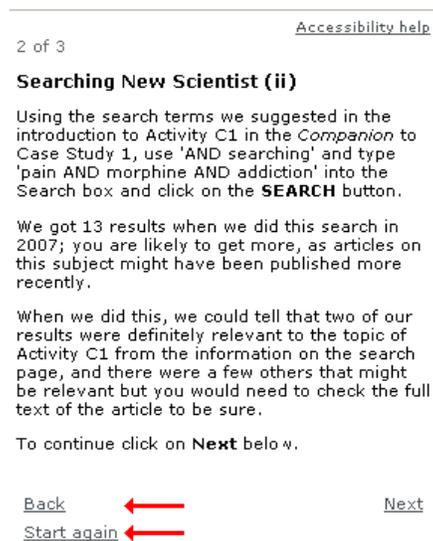


FIGURE 2 Detail of one of the pages of instruction with the ‘back’ and ‘start again’ links indicated by arrows for clarity

In addition a “back” link was added to all the pages in the ‘instruction window’; this moves both the ‘instruction window’ and the ‘database window’ back one step. In certain circumstances, e.g. when the previous page contained interim searches, more than one step back had to be taken in the ‘database window’ and so the ‘instruction window’ goes back to the relevant page of instructions (see Figure 2).

A number of iterations of design were required for each activity before an appropriate set of storyboards were developed for the web designer, a task

made more difficult because the two sections of the screen changed at different times. The web versions were then heavily tested to ensure that they worked as planned, the page breaks were in logical places within the instructions and that variations in performance on different browsers and operating system were minimised. The accessibility of the instructions was also tested and extra help for those students using screen readers was added.

In SDK125 the technique was used 4 times in the 36 week course:

1. In the course induction week to find an article from the Guardian using the Nexis UK database.
2. In week 1 to find an article from an African newspaper using the Nexis UK database.
3. In week 3 to search the United Nations database for information on the availability of clean water as part of a collaborative activity.
4. In week 7 to find an article from New Scientist on morphine and its uses for pain relief.

Each of these four online activities was only the online part of a larger exercise, and the instructions for the rest of the exercise were printed in the Course Companion for each case study. In addition printed instructions were provided for online activities 2-4 in the Course Companion as well. This allowed the students who needed it to develop their skills using the online instructions, but also gave more advanced students the option of not using them.

This approach of providing online instructions was used for the first online activities in the course, to give the students confidence working online

and to develop their basic ICT skills, and then for the rest of the course the instructions were only in the Course Companion. This did front-load the course with ICT skills, but they were all approached from the subject area of that section of the course and so were planned to be relevant to the course, as well as delivering skills development. The results of the first three of these activities also fed into the assessment of the course, and so students had to do them to achieve good marks in their first tutor marked assignment (TMA).

In KYN107 this approach was used twice.

1. In Module 1, (known as Block 1 to OU students) to find publications on the Department of Health website
2. In Module 3, (Block 3) to search the Nexis UK newspaper database to find articles on clostridium difficile or any other organism that was relevant to their practice.

Only online instructions were given to KYN107 students and the activities did not form part of any assessment.

Student feedback on the activities

The OU's Institute of Educational Technology (IET) surveyed 272 students on SDK125 in November 2007 when they would have been nearly 20% of the way into the course and most should have completed three of the four guide-at-the-side activities. The response rate for this survey was 33% (IET, 2007).

Two of the split screen activities which the students should have completed were the subject of specific questions in the survey:

- Do you think (this activity) was an enjoyable way to learn?
- Do you think (this activity) was an effective way to learn?
- Was it generally clear what you had to do....?

For the first split screen activity (Life in Kibera):-

- 78% of respondents found it an enjoyable way to learn
- 82% of respondents found it an effective way to learn

The third split screen activity (Access to clean water):-

- 72% of respondents found it an enjoyable way to learn
- 74% of respondents found it an effective way to learn

The students' perception of the clarity of the activities seemed to improve with familiarity:-

- 81% of respondents agreed that it was clear what to do in the Kibera 1 activity
- 85% of respondents agreed that it was clear what to do in the Access to clean water activity

A similar survey was carried out with the KYN107 students (Greaney n.pgn). 194 students were invited to participate in this survey of which 102 took part, a response rate of 53%. The relevant question in this survey was:-

- The guide at the side format used in the Department of Health activity (Block 1) and the Newspaper activity (Block 3) was an effective way to learn and relevant to my practice.

The results from this survey were:-

- 69% of respondents agreed that the Department of Health and newspaper activities were an effective way to learn and relevant to their practice
- A total of 10% disagreed with the statement and 4% of students did not undertake the activities.

Discussion

SDK125 student feedback was generally very positive although the 33% response rate means that this may not be a representative view from all students on the course. The majority of students found the activities to be an effective way to learn. The word 'effective' was not defined to students so it was assumed that, as the students were required to use the results of the two information searching activities in an assignment, they considered the activities were an effective way to learn if they were able to find the relevant information to complete the assignment. Although it had been anticipated that a significant percentage of students studying this course would be novice IT users in fact the survey showed that 74.2% felt they were very competent using computers and 83.1% very competent using the internet. Effective learning may therefore have taken place because the students were able to relate the new skills they were being taught, e.g. searching NexisUK, to their previous skills of searching the internet. This type of meaningful learning which occurs when learners relate new material to existing cognitive

structures and reorganise their understanding of concepts was proposed by Ausubel in 1968 (qtd in Dewald n.pgn).

The unexpectedly high level of IT and internet searching competency may also be one of the reasons why the majority of SDK125 students found the activities to be an enjoyable way to learn. It is also argued that this type of activity appeals to students with a range of preferred learning styles. Certainly those with either visual or tactical learning style preferences, as identified by Donna Rogers (22), are more likely to enjoy this type of activity.

Motivation is an important aspect of learning. Adult learners study for a variety of reasons (J.Rogers 27-38) which may be extrinsic i.e. outside the individual, or intrinsic i.e. reliant on the learner's interest in the topic. By requiring SDK125 students to do the activities to successfully complete their assignments learning may have been more effective by adding an additional extrinsic motivational factor. The percentage of students who agreed that the activities were an effective way to learn was lower in the KYN107 survey (69%). One reason for this may be that in KYN107 the activities were not assessed, which may mean that the students are less motivated to complete the activities successfully unless they could see the relevance to their practice. This view is supported by some of the open ended comments:-

“Yes, this was an effective way to learn and very relative to my practice. I hope to have more of this on the next courses”

“These activities give a good insight to what is happening in reality and gives greater knowledge [to apply within] placements”

For those who responded negatively the main issue in both courses was around workload. This is again demonstrated by open ended comments from the KYN107 survey:-

“It would have been more beneficial if there was more study time; I felt pressured at times and did not give much attention to newspaper articles. How ever I did look at issues regarding the NHS”

“Helped me a lot but I did spend longer than expected”

“Took me while to use but when got going it was easy to use and understand”

Workload is always an area of concern for students who are studying part-time. It is particularly difficult to plan workload when dealing with students with a wide range ICT skills. No students reported having problems with the accessibility of the activities or with significant problems with different browser options etc.

Since the initial work was carried out with these two courses media developers have been working to improve the ways in which the materials can be uploaded to the VLE, updated and reused or re-versioned. Library staff are now able to write activities into a template which can be uploaded straight into the VLE. This has proved particularly useful for re-versioning. For example an activity written for a social science course on citation searching in Web of

Science can be re-versioned for a science course by simply replacing the example citation used in the example.

The key feature about the successful development of these activities was the cross-team collaboration between the Library, LTS, and the course teams. All members of the team input their specialist knowledge and expertise, which improved the overall quality of the finished product.

Further research

It is interesting, that considering so many institutions are using this technology to deliver online library tutorials, that there isn't significant research showing the effectiveness of this software as a means of delivering online information literacy skills activities. We are considering investigating funding for further research into this area. Areas of interest include transferability of skills to other subject areas and interfaces and long term retention of skills learned.

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