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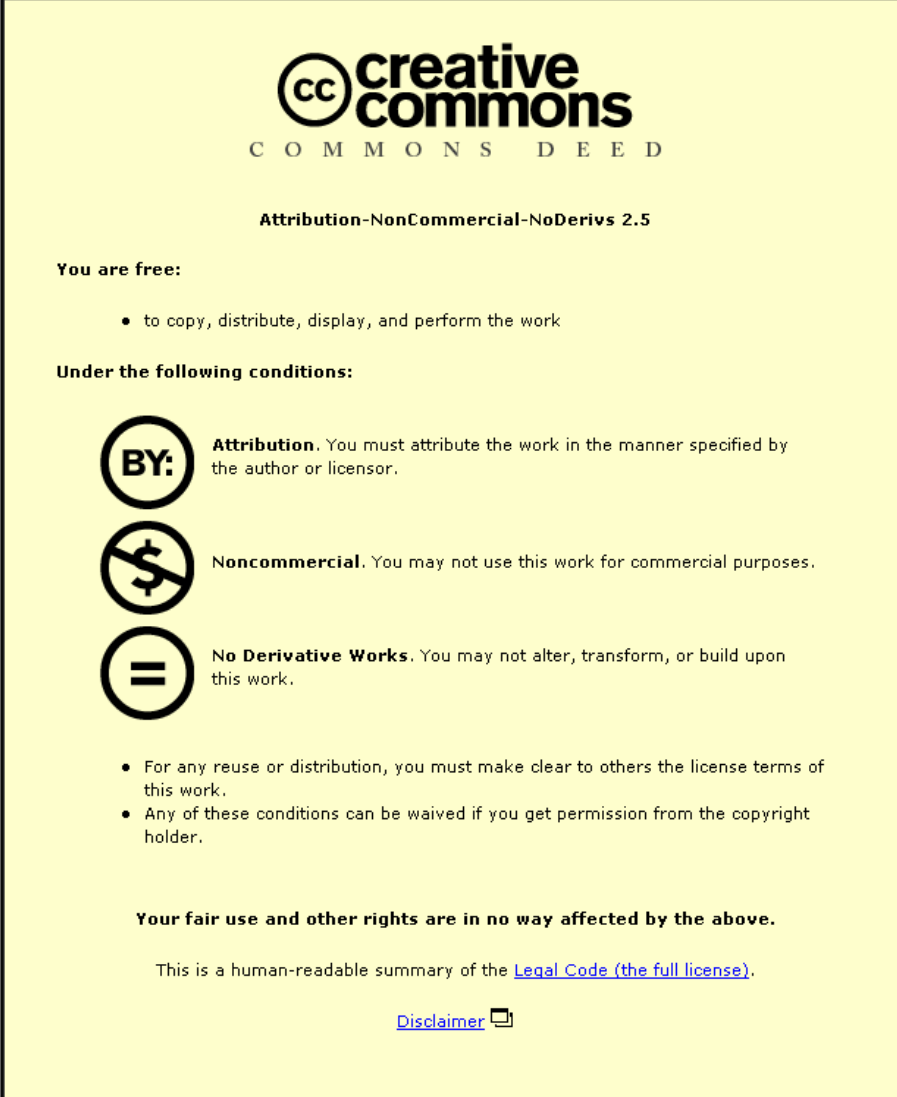
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Case Study

A critical analysis of the INFORMS project at Loughborough University

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Abstract

The paper presents a critical analysis of Loughborough University's experience of INFORMS, a JISC funded project that builds on the earlier work of INHALE. Key aims of the project are:

- to enhance students information literacy skills by embedding electronic database tutorials via local Virtual Learning Environments (VLE) into the academic curriculum.
- to transfer the project tools originally created by Huddersfield to the learning environments at the partner sites of Loughborough and Oxford universities.
- to establish students' searching behaviour and measure the level of literacy skills prior to using the tutorials and again afterwards.

A small team at Loughborough customised existing tutorials and developed new ones to support the subject areas of business, civil engineering and sport & exercise science. Student feedback was sought regarding tutorial content and the learning experience.

Information literacy at Loughborough University

At Loughborough University Library information literacy is commonly known as Information Skills Training (IST) and covers good practice in developing literature searching strategies, searching of databases, evaluative skills and citation & creation of bibliographies.

In 2001/02 the Library delivered 254 hours of IST to 7,292 participants. 18% of the IST was delivered as part of the general IST schedules known as Lunchtime in the Library (LitL) and Database of the Month (DotM). LitL and DotM run all year round and are open to all members of the University. The sessions are advertised a week in advance of delivery and attendance averages 15 participants per session. The target audience is students who do not receive IST formally within their studies. LitL and DotM are particularly popular with international students.

64% of the IST delivered during 2001/2002 was customised courses run for specific departmental cohorts. The majority of the customised courses is delivered in October and November. The Academic Librarians have different teaching styles and loads, as not all departments take up the offer of customised IST. A large percentage of the customised IST is delivered to small groups of taught postgraduates and comprises a lecture, demonstration and a practical element. By contrast, delivery to undergraduates is often in the form of large group teaching without hands on activities.

The Library was concerned that not all students had the opportunity to attend IST sessions and wished to find alternative ways of enhancing information literacy skills within the University. It was felt that self-paced online tutorials would allow greater access to training materials for students at time of need. A review of existing electronic information literacy packages being

used by UK HE libraries was carried out by a small group of Loughborough Library staff and published on the LTSN Centre for Information and Computing Sciences web site). The review found that the contents of most of the packages were of good quality, however, only a small number was truly interactive or followed good e-learning practice (Stubblings & Brine 2003). After much discussion it was agreed that the Library would attempt to write its own information literacy package. It was therefore pleasing to be approached by Huddersfield University to take part in INFORMS (INFORMation Skills project) funded by JISC under 07/02 Linking Digital Libraries with Virtual Learning Environments programme (DiVLE).

Perceived benefits of e-learning at Loughborough

The University is encouraging students to become independent and life-long learners. To assist this process the University is developing students study skills and several years ago introduced a Virtual Learning Environment (VLE) called Learn. Therefore if the Library introduced electronic learning packages delivered via Learn it would be reflecting current University practice, as well as providing an alternative to traditional study patterns.

E-learning can include “different voices”, activities and material that supports different learning styles (Brown & Gibbs 1996). It can also encourage reflection and ongoing informal assessment. E-learning can be used by students in both a formal and informal setting. It is hoped that the tutorials can be utilised by Library and academic staff in time-tabled sessions, but also by students in their own time, both on and off campus. This is particularly beneficial for Loughborough’s distance learners who often do not receive or are unable to attend timetabled sessions with the Library. Finally, the tutorials can be used as a revision tool at time of need.

Project genesis and aims

INFORMS has grown from a previous project, INHALE (Information for Nursing and Health in a Learning Environment). INHALE was a JISC project funded under the 5/99 Learning and Teaching programme. It concentrated on developing electronic tutorials for freely available web-based health resources. The project created not only tutorials, but software tools that allowed the easy creation of electronic tutorials. The partners in the INHALE Project were Huddersfield, University of Central Lancashire and Leeds Metropolitan University.

The INFORMS project has brought together three different universities: the University of Huddersfield, University of Oxford and Loughborough University. The partners were chosen because of their diverse nature in terms of age, number of campuses, delivery of teaching and type of VLE. The INFORMS tutorials would cover a range of subscription and freely available resources across six new subject areas. Loughborough would create tutorials for business, civil engineering and sports science. Whilst Oxford would concentrate on English, social science and medicine.

The INFORMS project aims to:

1. Test whether the INHALE project tools could be successfully exploited by other institutions and within the technical confines of other learning environments.
2. Establish students’ searching behaviour and measure the level of literacy skills prior to using the tutorials and again afterwards.
3. Enhance the information literacy skills of both staff and students and raise awareness of electronic resources other than Google!
4. Enhance the pedagogical skills of Library staff.

INFORMS at Loughborough

At Loughborough University the Academic Services Manager directed the project and a part time project officer was hired to move the project forward. The main tasks of the project officer were to assist in the revision of the project tools developed by the INHALE project to meet local needs, develop database tutorials and embed them into Learn. At the University of Oxford, Library staff undertook the development of database tutorials in addition to their normal duties.

Senior management at Loughborough University had already agreed that three academic departments would assist in piloting the tutorials. The project manager approached the three departments to discuss into which modules the material would be embedded. It was agreed to embed the tutorials into first year undergraduate modules in the School of Sport & Exercise Sciences and the Business School. These modules are general 'how to conduct research' type modules for which the Library has traditionally provided information skills training. In the case of Civil & Building Engineering the tutorials were embedded into a more specialised project type module aimed at third year and selected final year students.

During the discussions with the academic departments notes were kept of the number of students, content of module and learning outcomes required from the Library's training sessions. These notes were recorded using the INHALE project module start up record. This form allows librarians to record discussions that have taken place with academics about the introduction of information literacy skills into modules.

Creation of INFORMS tutorials

Within three months 20 database tutorials had been written to support the Business School, Department of Civil Engineering and the School of Sport & Exercise Sciences. Loughborough project staff found the creation of tutorials using the database tutorial writer very straightforward. The writer is a browser-based form which utilises simple customised html tags.

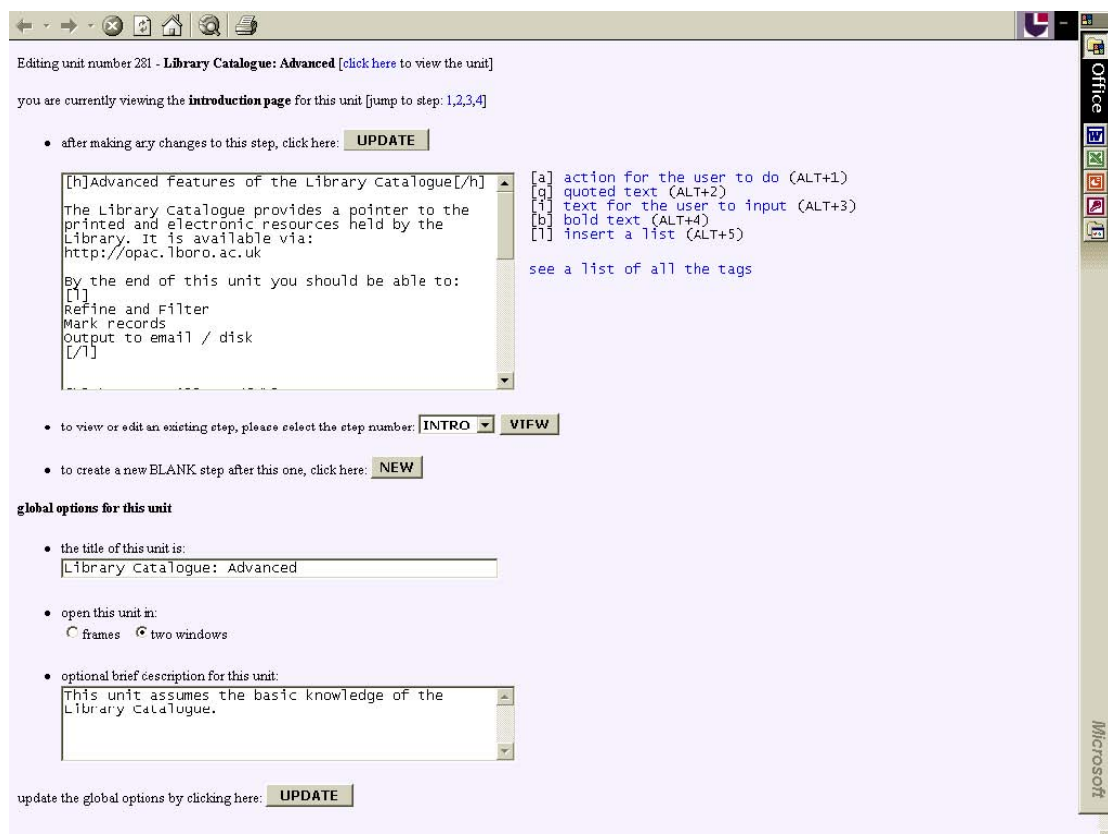


Fig. 1 Tutorial writer input screen

The one negative aspect of the tutorial writer was that it opened several windows. This occasionally caused confusion and loss of data when a window was accidentally closed without the "Update" button being pressed. The new version of the software (due early June) will overcome this problem. Another frustration arose from the lack of navigation options in the finished tutorial; students would pursue a mainly linear path through the tutorial without the ability to decide a route for themselves. In addition, the quiz facility offered one style of question and answer. The new version of the software will address these issues by allowing the creation of a table of contents and introducing the option of multiple choice questions. This is a long-awaited and very welcome development.

Huddersfield develops not only the tutorial writer but also maintains a central database of all the tutorials written by the INHALE and INFORMS partners. Agreement amongst the consortium is that other institutions can copy and customise existing units and although Loughborough has not done this yet, it is something that will be considered for future tutorials. The new software code will generate an audit trail so that the originator is acknowledged and copying and editing by others is itemised.

Once the tutorials were created they were checked and tested by Library staff. The project team made amendments as appropriate following this feedback. This quality control procedure was critical to the success of the learning process.

Loughborough's INFORMS tutorials

The tutorials at Loughborough are subject-specific and aimed at undergraduates. Attempts were made to ensure that they were:

- well sign posted so that students know where they are at all times in the package (Rowntree 1990)
- clear about the learning outcomes and duration (Dewald 1999)
- interactive (quizzes, live searches etc.) (Joint et. al. 2001)
- informally assessed.

Both the INHALE and INFORMS project have aspired to SENDA compliance.

The finished tutorial comprises a series of steps. These display in two parts; the author has the option to use either two frames or two windows. Whichever option is selected, the student will see a "Guide at the Side" on the left hand side of the screen with the live resource in the right hand frame/window. The Guide at the Side contains instructions, questions and tips which the student can pursue based on the context of the resource displayed in the right hand frame/window. This means that the INFORMS tutorials have a high degree of interactivity.

The Loughborough units follow a similar 'style' having an introduction followed by a presentation of select features pertinent to the resource, such as combining keyword searches, marking and emailing results, saving searches, checking for full text availability. The introduction comprises a brief description of the resource highlighting key features of coverage, access arrangements, learning outcomes of the unit and duration of unit.

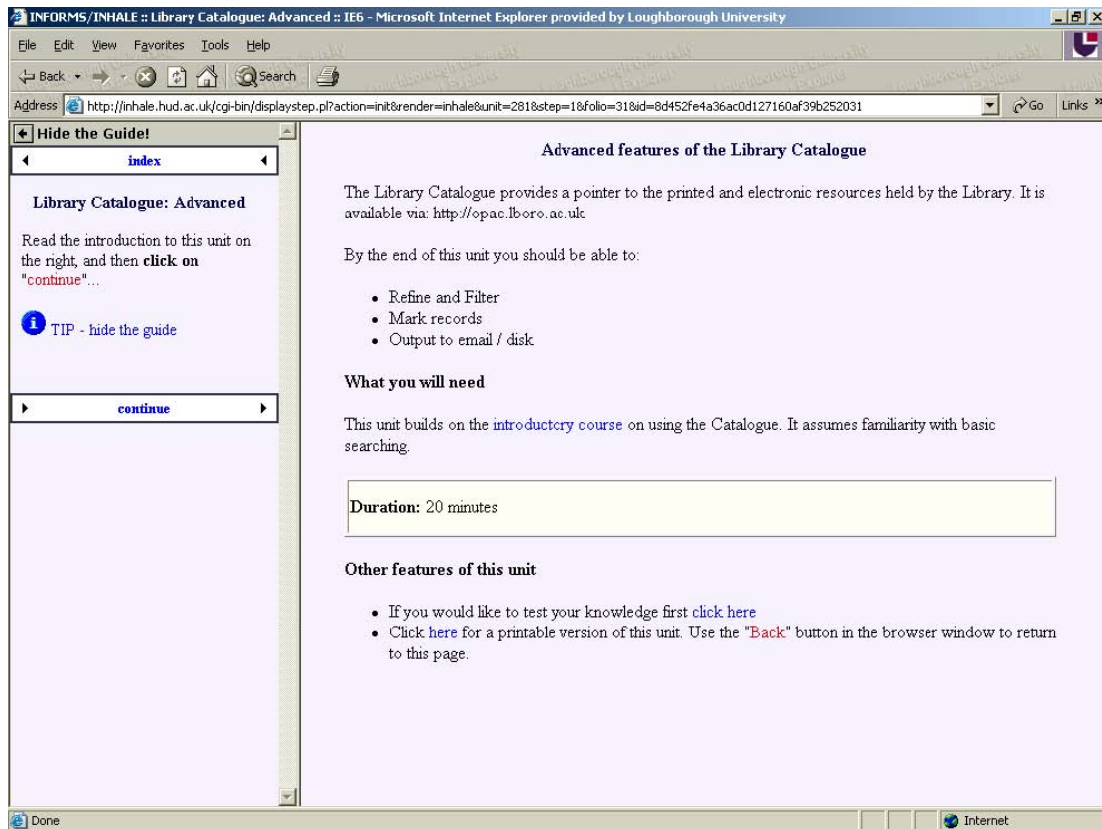


Fig. 2 Tutorial welcome screen (Advanced Library Catalogue tutorial)

Considerable thought has been given to using appropriate search examples. A combination of module specifications and examples of students project work from the previous year have been very useful for suggesting suitable search terms. Liaison with the academics also proved useful. The question and answer feature in the software has been used to highlight and reinforce resource features or to get students to find specific information from within their search results thus mimicking the actual information research process. The “tip” feature in the software has been used to explain processes in more detail (e.g. ‘why are we doing this’) or to act as an aide-memoire for students who required more hand-holding. At the end of units a link is made to the Library’s online enquiry service form where students can make comments or pose queries.

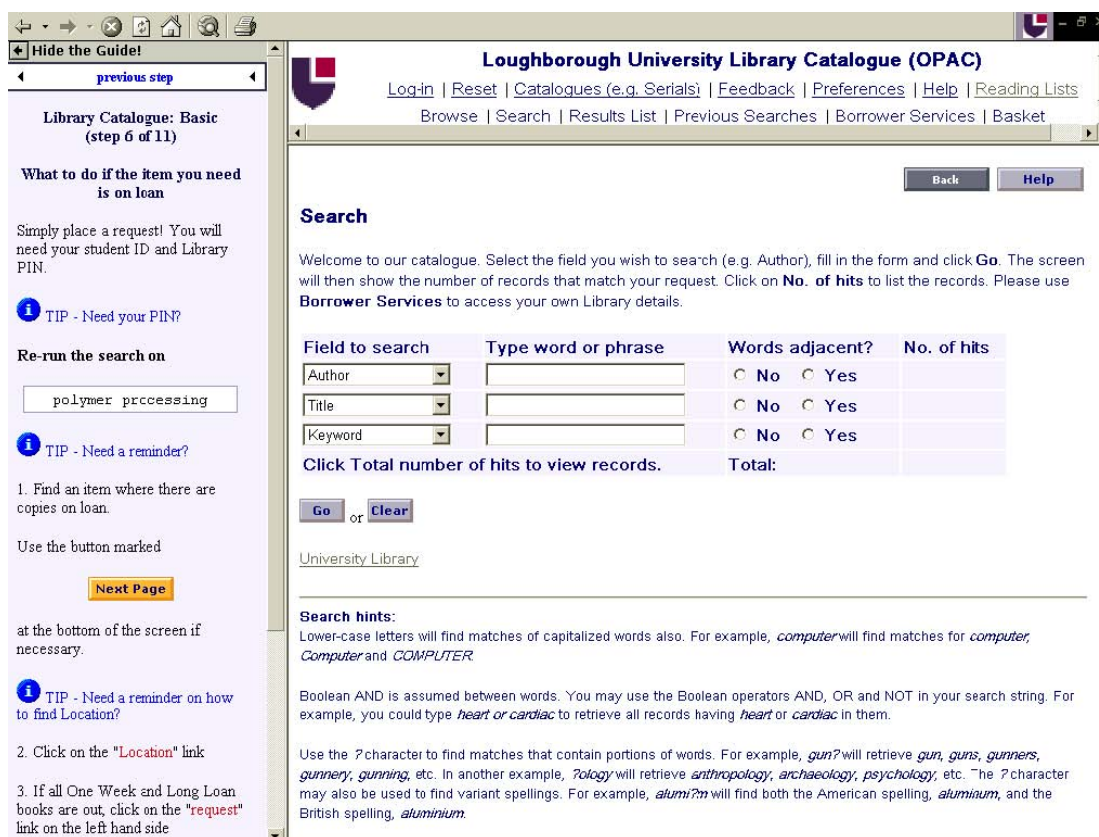


Fig. 3 Interactivity and help within a unit

Embedding the INFORMS tutorials on Learn

Placing the tutorials on Learn was facilitated by the fact the Library has a reasonable presence on Learn already. In particular there is substantial material to support the generic LitL and DotM courses and a growing quantity of material for customised courses. However, these tend to take the form of electronic versions of handouts and Powerpoint slides converted to HTML.

The project team created course pages on Learn to support the delivery of the tutorials to academic departments. The INHALE project developed an RTF parser that allows Microsoft Word documents links to be converted to HTML. To date the team has not used this to create web pages as it is more familiar and comfortable with Dreamweaver.

For each course page a standard 'design' was adopted. Appropriate logos appear at the top of the page including the INFORMS logo, the department's own image/logo and the University Library logo to illustrate that the course was prepared in close liaison with the Department. Each page presents learning outcomes explaining very succinctly why information literacy is important. A series of very short sections walk through the information gathering process from the basics to digging deeper.

A section on finding background information has links to the individual INFORMS tutorials for the Library Catalogue (both basic and advanced), the Reading List system and the Library's portal, MetaLib. The digging deeper section presents tutorials on more specialised and subject-specific resources for example, Mintel reports, LexisNexis, SPORTDiscus, COMPENDEX. The final section of the page presents tutorials on the appropriate RDN gateway.

Links to the lecturer's Learn page, to the Library's home page and to the INFORMS portfolio page for that department appear at the foot of the page. In turn, reciprocal links between the lecturer's and the Library's VLE pages reinforce the importance of information literacy.

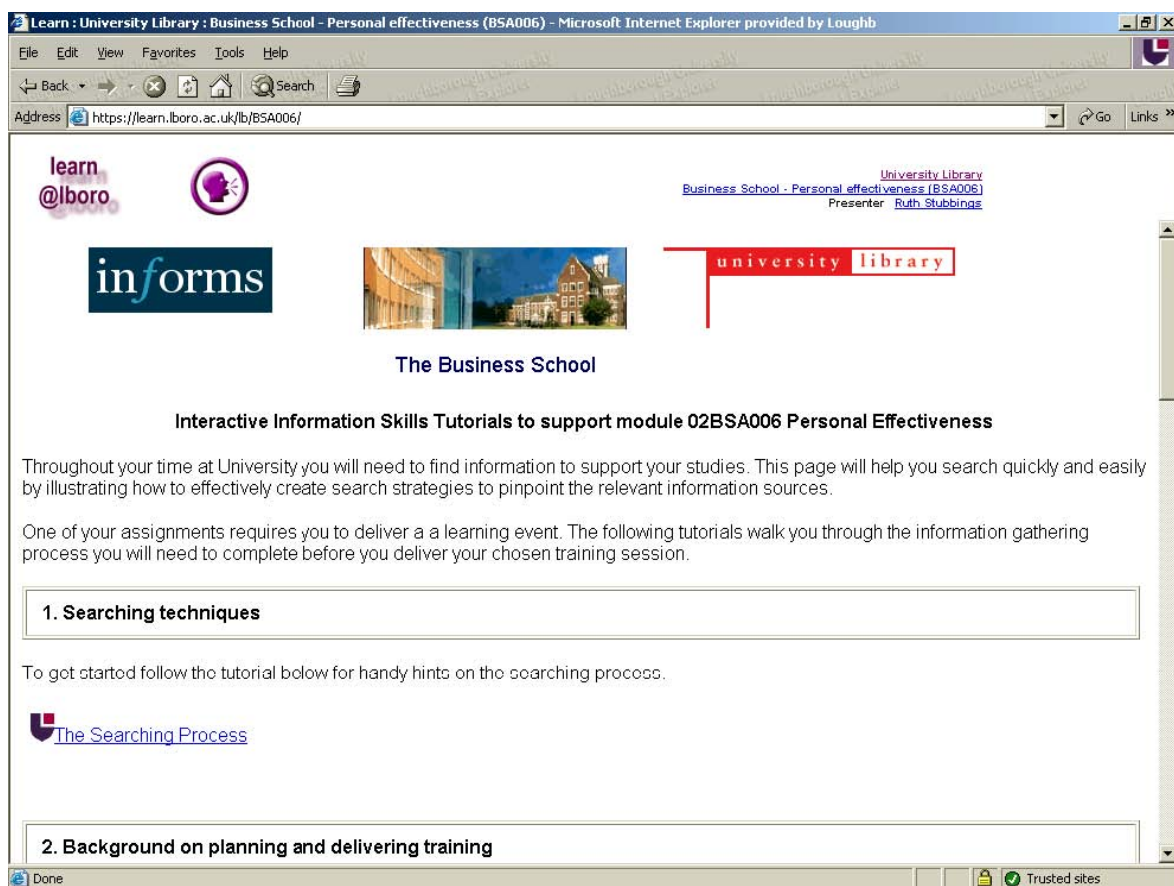


Fig. 4 Screen shot of the top half of the Learn page that supports the Business School

How the INFORMS tutorials were used

The tutorials were embedded into the following modules: 02BSA006 Personal Effectiveness; 02PEA003 Research Methods and 02CVC008 Construction IT. They were used in the three modules in slightly different ways.

Due to timetable pressures the project team was restricted to a one hour lecture to 300 first year Business School students. The lecture covered general information searching techniques and included a demonstration of one of the INFORMS units. All the Business School students had been set the same assignment, which involved them finding information, undertaking a group presentation and writing a report. Both the lecture and Learn page walked the students through the process of finding information that they needed for the assignment. The students were expected to use the units in their own time and the Business School lecturer requested the students use at least three of the tutorials. It is pleasing to note from the web logs that a reasonable percentage of students used the tutorials in their own time.

A lecture on finding information was delivered to 200 first year Sport & Exercise Sciences students. A week later timetabled practical sessions were held during which students used the tutorials. The cohort was divided into 4 groups of 50 students; groups 1 and 2 used the tutorials during an hour-long practical session followed a week later by groups 3 and 4. The sports science students did not have a specific assignment for the module and examples from other modules were used. The Learn page created by the project team demonstrated the process involved in finding information and linked to the appropriate INFORMS unit. Web logs show that the Sport sciences INFORMS tutorials mainly used the tutorials during the time tabled sessions, but a small percentage worked through the tutorials outside of these times.

The use of the tutorials by Sports Science students was severely hampered by two main

obstacles. In the first instance the petulant attitude of the students. In the second instance the poor performance of the server hosting the tutorials. It appeared that until this session with the Sports Science students the server had not been simultaneously accessed by a large number of users; it simply could not cope with demand. Steps took in excess of 3 minutes to load. This certainly exacerbated the students attitude problems. The project's web developer invested a great deal of effort to overcome the problem. For example the software code was changed to incorporate static html rather than generating pages on the fly. However, this workaround was not sufficient and slow download speeds were still encountered with groups 3 and 4. It was clear that the Huddersfield server was inadequate for the task. The Loughborough team felt the argument for local hosting was increasingly convincing.

The lecture for the final year Civil & Building Engineering students was followed immediately by a two hour practical session during which time they used the INFORMS tutorials. These students were required to find information for their Final Year projects. As per Sports science, the Learn page demonstrated this process. Web logs show that the Civil INFORMS tutorials were used both on the day and then several times afterwards. This is pleasing as it shows students were returning to the tutorials.

Tutorial usage data

Tutorials usage, including progress through a unit and which steps were repeated are available from the web logs. The logs display figures for hits (the number of times a step was loaded), the number of users (calculated by the number of browser sessions) and an average (calculated by hits divided by users). The logs also deliver some interesting data such as day, time and place of access. Unfortunately the logs did not allow us to determine how many tutorials an individual student accessed. This might have been achieved by forcing the students to log on individually to each tutorial but would have added an extra barrier and we were unhappy to do this. The logs show that the tutorials were mainly used on-campus during the day, Monday to Friday. However, there were occasions where they were used off-campus, or at night time and weekends. Sadly the logs showed that half the students did not complete the tutorials they had started.

Information literacy levels of students and academic staff

Questionnaires first used by the INHALE project were used by INFORMS to determine the information seeking behaviour of staff and students within the University. The questionnaires were loosely customised to place them in a Loughborough context e.g. the list of electronic resources was tailored appropriate to the department's subject area and some wording was changed. This ensured that comparisons could be made between the INHALE and INFORMS projects, thus giving a wider picture of student searching behaviour.

A baseline questionnaire was distributed across the three departments (to all staff and students). This provided a flavour of the literacy level across the wider community. The results of the survey closely reflect other projects such as IMPEL (1998) and Justeis (2001). For example students turn to the Internet first for information and very few have used let alone heard of the subject gateways. The results of the baseline questionnaire imply flaws in the questionnaire design. For example there is some repetition of information sought. Further, some questions were too open which lead either to misinterpretation by respondents or to responses which were too ambiguous to be meaningful. In retrospect the project teams at each of the partner sites should have invested much more time at the revision stage to ensure that the 'correct' data would be collected. For example by using more guided response options.

The specific cohorts of students participating in the project were asked to complete two questionnaires, one prior to training and one afterwards. The aim of the pre-test questionnaire

was to ascertain students' views on their own searching skills and where they looked for information to support their studies. The post-test questionnaire was designed to ascertain whether the students' searching behaviour had changed after using the INFORMS tutorials. The Business School and the Sport & Exercise Sciences pre-test questionnaires were distributed by Library staff at the beginning of the timetabled lecture. The post-test questionnaires were handed out by the lecturers several weeks later, thus allowing the students ample opportunity to use the tutorials in their own time. The Civil & Building Engineering pre and post-test questionnaires were distributed by Library staff in the timetabled session, immediately prior to the lecture and immediately after the hands on workshop respectively. It is not yet possible to report on the outcome of these questionnaires as the data is not yet available for analysis.

In summary

At the time of writing the INFORMS project has achieved 2 of the 4 aims outlined at the beginning of this paper. Namely the testing of the INHALE project tools and enhancing the pedagogical skills of librarians. By the end of July the project team will know whether it has been successful in establishing students' searching behaviour and enhancing the information literacy skills of both staff and students.

The future

The project enhanced the pedagogic skills of two Academic Librarians. The next goal is to extend and enhance the pedagogic knowledge of the other Academic Librarians and to share best practice both internally and externally. Loughborough Academic Librarians will be encouraged to create units to support their own departments and to use the success of the project as a springboard for getting information skills training embedded into modules.

As new technical features become available during the lifetime of the project it is the project team's intention to fully exploit the new developments. Tutorials already written as part of the project will be enhanced in line with these developments and incorporating lessons learned post creation.

The two project team members will continue to investigate how the tutorials can be exploited post project. For example entering into discussion with other University stakeholders. An obvious first approach is to the Learning and Teaching Development department to investigate how the tutorials can link to existing key skills material and future Professional Development Plans (PDP) of students.

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