Development of an Internet site evaluation tool for use by information management students.

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ABSTRACT

QUT School of Information Systems carried out a project in association with Griffith University and QUT libraries. The project involved the identification and evaluation of electronic and print resources. These were described within the framework of UKOLN ROADS (Resource Organisation And Discovery in Subject-based services) software. They are being made available via the libraries' Web sites as *Infoquest* subject guides.

A group of students completing the graduate library and information studies course at QUT, undertook the resource discovery role as part of their professional practice, working in conjunction with professional librarians. Students were each allocated specific subject areas. Their tasks were to review current Internet guidance for the subject area, undertake resource discovery, evaluate the material found according to standard evaluation guidelines, and report the material for incorporation into a Web site. Twenty five students participated in the project. They were involved in 24 different subjects areas supervised by 12 different librarians from the 2 universities. Subject areas ranged widely and included Japanese studies, environmental engineering, forensic sciences and ethics. Email surveys of all students were performed before and after the exercise, and we also independently conducted small focus groups of staff and students. We report on the student participation with respect to improved Internet and library skills, and understanding of resource evaluation. This has had many positive outcomes such as professional experience, shared workload, recourse to library subject experts, and cooperation between faculty and libraries.

As an outcome of the project, we are developing an instrument that consolidates the experience gained from the exercise along with material from established guides to Internet site evaluation. We are reviewing criteria for site evaluation, and comparing these with evaluation criteria for databases and for printed publications. We are developing a guide that provides a structured approach to site evaluation. It will be available through the Faculty's Web-based Integrated Learning Environment to be used by both information technology and library studies students as they undertake comparison of sites located by search engines. The guide provides a categorised approach to site evaluation that takes into account features such as functionality, organisation, accessibility, content, level and range.

The guide also is to provide support for carrying out metainformation creation exercises when constructing Web pages. These description, classification and indexing exercises are carried out with reference to evolving standards such as Dublin Core and the AGLS (Australian Government Locator Service). Therefore the instrument includes connection to software for supporting creation of metainformation content.

Introduction

InfoQuest (1998) is a project initiated by the Libraries at QUT and Griffith Universities. It involves the development of an Internet Web subject resource gateway to specified subject areas of interest to the respective faculties. The interface, such as that shown in Figure 1, provides pointers to freely available or library subscription Internet resources, databases and electronic journals, as well as selected print resources available within the respective libraries.

The gateway is created and maintained using *ROADS* (ROADS, 1997) software. *ROADS* is a set of software tools and standards designed to provide customised information gateways to Internet resources such as Web sites, interactive services, file transfer sites, and mailing lists. Resource

descriptions are maintained in a database that may also be classified according to a standard classification scheme, thus improving resource discovery.

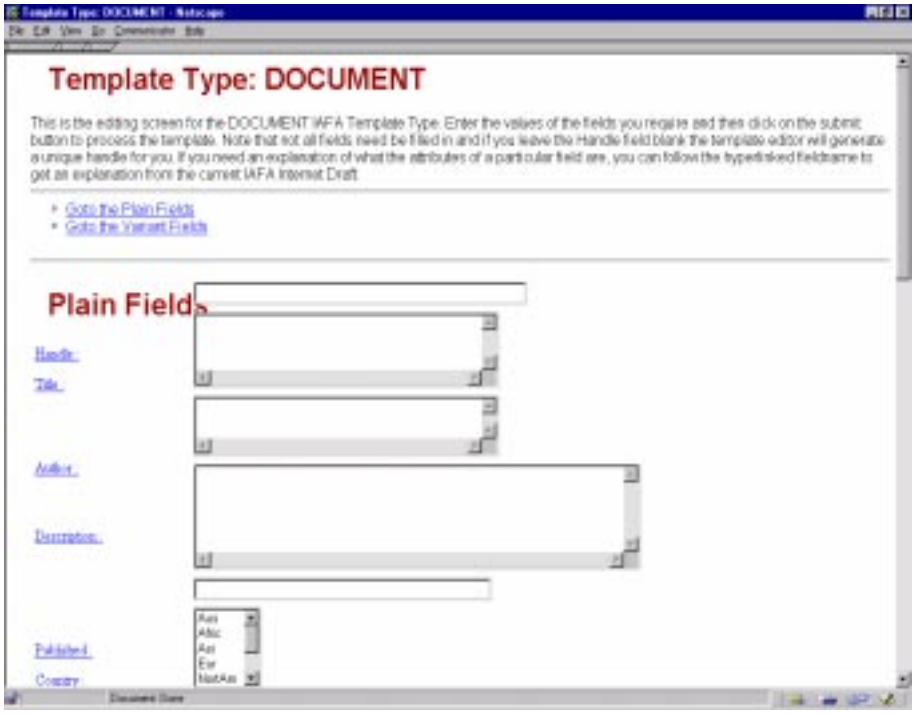
Figure 1: The Griffith University InfoQuest subject gateway browse page

The resource descriptions can be created and maintained from WWW forms such as that shown in Figure 2. The software uses the information in the database to build a set of WWW pages allowing the information in the database to be browsed, with each resource described and organised under subject headings according to its classification information. Browsing and search pages may be configured for both appearance and functionality, so that gateway controllers can personalise identity of a service and what it offers its users. A user of one ROADS based information gateway is able to search other ROADS based information gateways from a single search form because of compatible metadata structure. In this way ROADS can form the basis of a distributed database of resource descriptions.

The collaboration between the Universities has the advantages of sharing workload, ability to draw upon subject expertise from each institution, development of closer ties between staff, and the provision of an enhanced service from each institution's library.

With the cooperation of the libraries, we enabled student participation in the project as an optional part of their Professional Practice subject. We anticipated that participants would experience a small taste of one aspect of work experience. Additionally, we felt that they would be able to improve their resource discovery skills, improve their ability to evaluate information resources, improve their professional project participation skills, and enable the libraries to obtain a student perspective on the endeavour. Furthermore, participation in the project contributed to a flexible learning environment for the postgraduate students.

Figure 2: A ROADS interface



All students who took part in the exercise had in prior coursework been introduced to resource discovery on the Internet and to information retrieval from digital databases. They had also been introduced to approaches for evaluation of Internet sites. During the course of the project they were made aware of additional approaches to evaluation. As a consequence of our referring to a range of evaluation approaches, we decided that it would be of benefit to all students going through courses to have access to an evaluation instrument that consolidates evaluation material from different sources, and provides some self-instruction and guidance.

In what follows we summarise the results of the Infoquest project, and describe the development of the evaluation tool that is being developed and maintained for student use.

Review of approaches to evaluation

The Internet is often criticised for the quality of its information resources, and more particularly for the difficulty of identifying effective resources within the 'infoglut'. Various mechanisms are available for endeavouring to assist resource discovery. Most notable is the variety of search engines with their varying capacities for locating material (Notess, 1999; Schwartz, 1998, Sullivan 1996). Many of these engines include ranking facilities, and increasing attention is being given to the incorporation of metadata to assist the discrimination capacity of the engines (National Archives of Australia, 1999).

However, the old 'garbage in garbage out' aphorism is as pertinent on the Internet as anywhere, so any attempts to improve information quality at sites can only benefit retrieval. The many ways of improving the quality at sites include effective page construction following HCI principles, ongoing maintenance of sites, and inclusion of metadata. Ideally, design approaches are evaluated in association with user needs analysis (Corry, Frick, & Hansen, 1997), or user reaction to pages along with more in depth looks at a Web site's purpose, identification, authority, layout and

design, links, and content (Sowards, 1997). Many examples of guidelines and standards for creating quality resources have been brought together by Ciolek and Goltz (1996).

One approach to assisting users to identify useful sites is by providing interface sites or information gateways that act as evaluated interfaces to focused subject areas (Morgan, 1998; ROADS, 1997). It is this approach that is being used by the libraries to produce their Infoquest pages.

We wished to complement this by developing an instrument that gives guidance in evaluation of resources that have been created. We therefore draw upon design guidance principles such as those mentioned above. However, we concentrate more on consolidation and exemplification of evaluation criteria that have been itemised in a number of ways (Alexander & Tate, 1996; Kapoun, 1998; Smith, 1999; Tweddle, Avis, Wright & Walker, 1998; Wilkinson, 1997).

In this respect we have endeavoured to extend the work of tutorial sites that explain the different attributes, using different approaches to categorisation of criteria such as, *content, form* and *process* (Worsfold, Hiom & Peereboom, 1998), or *relevance, purpose, authority, publisher, content, accuracy, coverage, currency, recognitions* (Ohio State University Libraries, 1997).

The Infoquest application

Twenty five students participated in the project. They were involved in 24 different subjects areas supervised by 12 different librarians from the 2 universities. Subject areas ranged widely and included Japanese studies, environmental engineering, forensic sciences and ethics.

Email surveys of all students were undertaken before and after the exercise, and we also undertook small focus group sessions.

Questionnaires were brief and elicited responses on:

- library and Internet search skills before and after the exercise
- mechanisms for carrying out required tasks
- communication between librarians and students
- use of evaluation tools
- use made of authority control guidance
- worth of the learning experience

There were 23 responses to the first student survey and 19 to the second.

Focus groups followed the survey material with discussion in these same areas. These groups were carried out independently with students and with supervising staff.

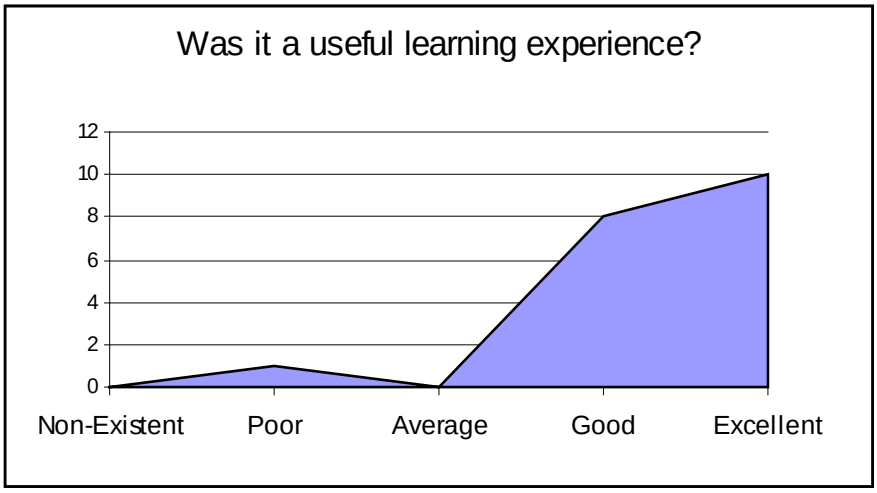
The first survey established that one third of the students elected to work in a subject area that gave them a correspondence with their first degree. This produced some sound subject expertise for the InfoQuest work. (Table 1)

Most respondents to the second survey considered the exercise to be a useful learning experience (4.4 on 1-5 scale with 5 representing very useful) (Figure 3).

Table 1: Correspondence with first degree

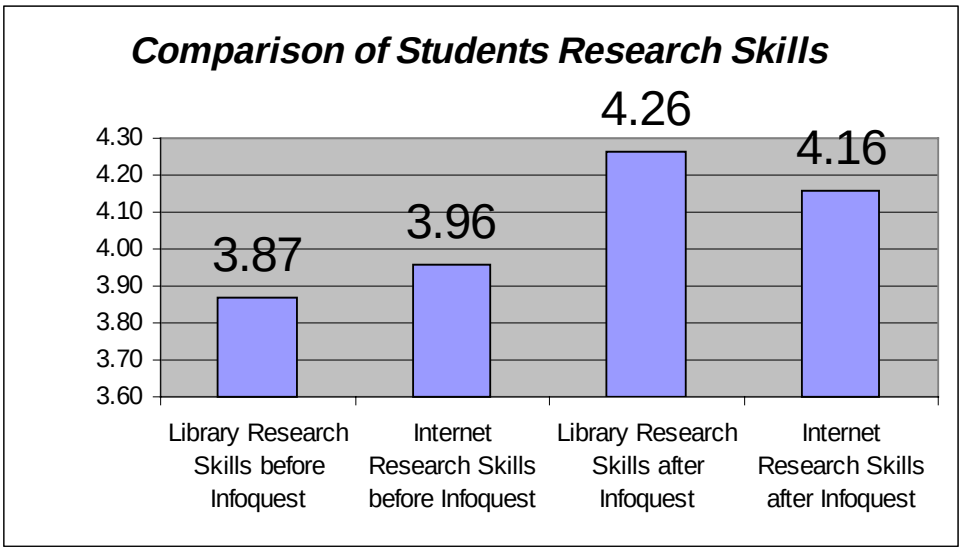
1st degree	InfoQuest subject
Religion	Religion
Chemistry	Chemistry
IT/Law	Justice Studies
Modern Asian Studies	Japanese Politics, Modern History and Business
Biology (including biochemistry)	Biochemistry
Medical Science	Forensic Science
Psychology/ English Literature	Library Profession
Liberal Arts	Library Operations
Psychology	Library Technical Services
Fine Art	Digital libraries
Education: Science/Maths	Radiation therapies
Australian Studies: Literature, Sociology, Culture	Ethics
Chinese Studies	Engineering - Environmental
English/History/ Journalism	Communication (Business) Telecommuting etc.
Screen Production	Philosophy
Food Technology	Sustainable Development
Journalism/English	Nursing
Japanese/Psychology	Asian studies: Chinese & Japanese
English/Art History	Arts/Music/Performing Arts
Journalism/Law	Information Issues: Copyright & FOI
French/Japanese	Information Issues: Censorship, Ethics

Figure 3: Students perceptions of the learning experience



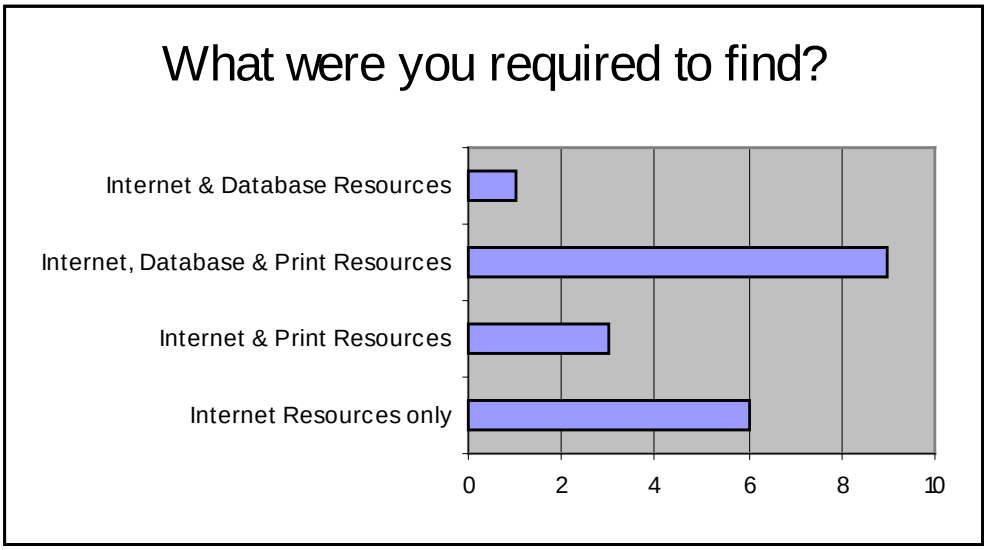
Students ranked their library research skills at 3.87 (1-5 scale, with 5 representing excellent) coming into the project, and 4.26 at the conclusion. The students perceived that they have improved in their library research abilities. It was noted however, as one student pointed out in relation to the scale, 'average' for a librarian might be regarded as 'good' for a student. Similarly, students' rating of their Internet research skills increased slightly from 3.96 to 4.16. (Figure 4).

Figure 4: Comparative tabulation of research skills before and after participation



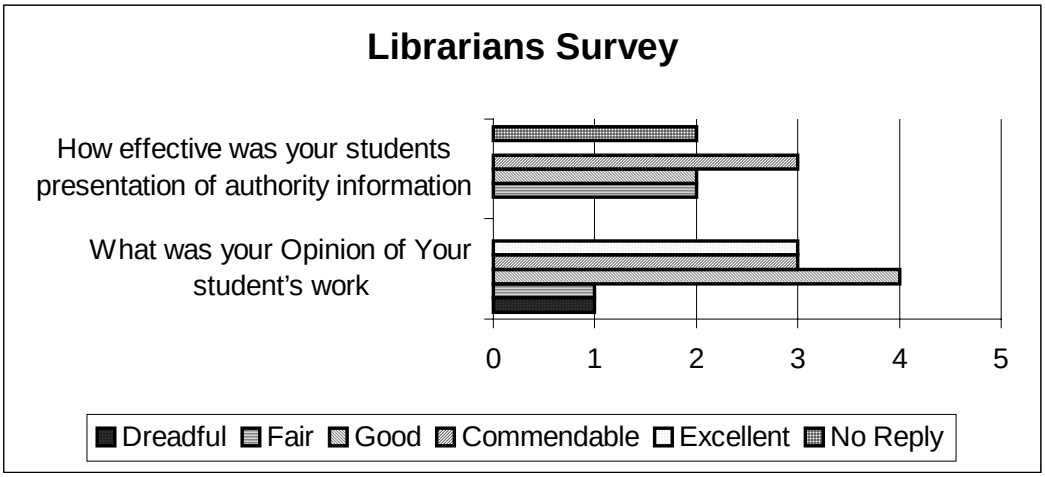
A uniform approach to resource coverage was not required by the librarians. For example only 10 of 19 student respondents were expected to report database resources, and 12 of 19 to report print resources. All were required to report Internet resources (Figure 5).

Figure 5: Resources that students were required to find for InfoQuest



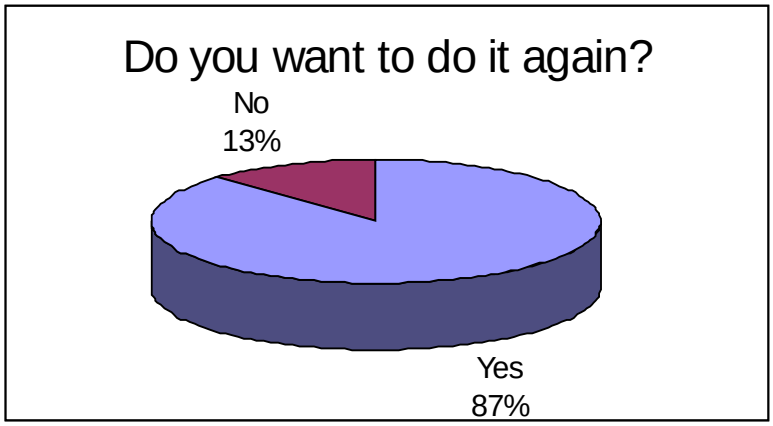
The supervisory Librarians ranked the student work skills and the authoritative work they received. (Authoritative work meaning the extent to which descriptive and subject information that was provided matched the standards being set for the project). The Librarians found the students work good with a ranking of 3.5 out of 5. (Where 1 was dreadful and 5 was excellent). The students' presentation of authority information was found to be fair only, at 1.83 out of 5 (Figure 6).

Figure 6: Presentation of authority information



Despite feeling that there was a lack of authority information provided by the students, the librarians were in general enthusiastic about the project and prepared to supervise further students (Figure 7).

Figure 7: Supervisory librarians experience



The evidence to date suggests it has been a valuable learning experience for the students and one they believe should continue in some form as part of their professional practice unit. The preliminary survey began with some positive comments. The preliminary survey also revealed an excellent overall response to the collaborative working arrangement in a professional setting. Comments from this survey included:

- *It's an excellent project. Gives students opportunity to expand knowledge and experience - good for resume...*
- *… extremely worthwhile exercise for library students*
- *… beneficial to use the subject knowledge of the librarian*

The only negative comment received in the preliminary survey was that the student felt:

- *longer time* [was] *needed.*

The second survey of the students confirmed the preliminary survey's anecdotal results. Comments from the second survey included:

- *I hope this cooperative effort with Griffith University continues - it gives students a taste of research for a definite goal, not just for the sake of an assignment...*
- *I enjoyed meeting with a librarian from another campus*
- *The best part was getting together with the whole group and discussing our thoughts and any problems we were having.*

Also confirmed was the overall lack of time to complete the project. Approximately half the students in the second survey made some comment about time difficulties. For example:

- *I think a lot of us were pressed for time*
- *The time demands of the GDLIS course are enormous and during semester I doubt that anyone has the time to devote to this project that I feel it deserves.*

From the teaching and learning perspective, the student's improvement of searching skills was encouraging. They rated their skills as better at the end of the project. This included not just Internet searching, but searching for other resources. The students believed that their evaluation abilities also improved. Their comments include:

- *It greatly helped my Internet searching and made me aware of sites I may not have encountered otherwise.*
- *It has also improved my Internet Search skills - particularly the evaluation of sites and made me aware of sites and tools I would not otherwise have been aware of*
- *I learnt a lot especially web evaluation skills*
- *One of the best parts…. learning how to find good resources no matter what my level of expertise in a subject area may be.*

Finally, the overall student response to the project was very positive after the second survey. Comments from the students included:

- *It was a great experience and I would recommend it be included for future LIS students in some form*
- *Overall a great project.*

From the librarians' perspective, despite some experiences with less than productive students, all librarians except one (who seemed to have a reasonably positive result from her student/s) wanted to repeat the exercise with another group in 1999. The librarians' comments included:

- *The best part was the association with students*
- *I think the idea is a good one*

To summarise, in the words of one of the students, it appears to have been *overall a great project.*

FAVORS: A Web evaluation instrument

Prior to and during the course of the project, students were advised about approaches to evaluating Internet sites, principally through existing references and guidance sites on the Internet. However, their use of these sites was not carried out in any formalised way.

We felt the need for having an instrument that draws upon existing evaluation criteria and consolidates them for students, both as a structured learning experience, and as a reference tool for site evaluation.

An instrument, from which pages are shown (Figures 8,9), has been developed since the student participation in the project came to an end, and for the benefit of subsequent students. It provides:

- A categorised approach to site evaluation, presently organised under FAVORS: functionality, authority, validation, obtainability, relevance, and substance
- Definitions of evaluation criteria within these categories presented in a stepwise manner
- Links to sites that exemplify criteria
- A tool that may be used in association with the teaching of subjects that include page evaluation and creation exercises.

At the top six levels of FAVORS, category aspects are briefly explained, so it may not be necessary for the student to move further into the criteria list. However, each criterion can be selected for an explanation, and samples of how to apply it are given. For example, in Figure 8, the category of *Functionality* is shown, with the list of criteria relating to the specific aspects of functionality given. Students simply select the specific aspects they wish explained.

Figure 8: Example page from a site evaluation guide category page level

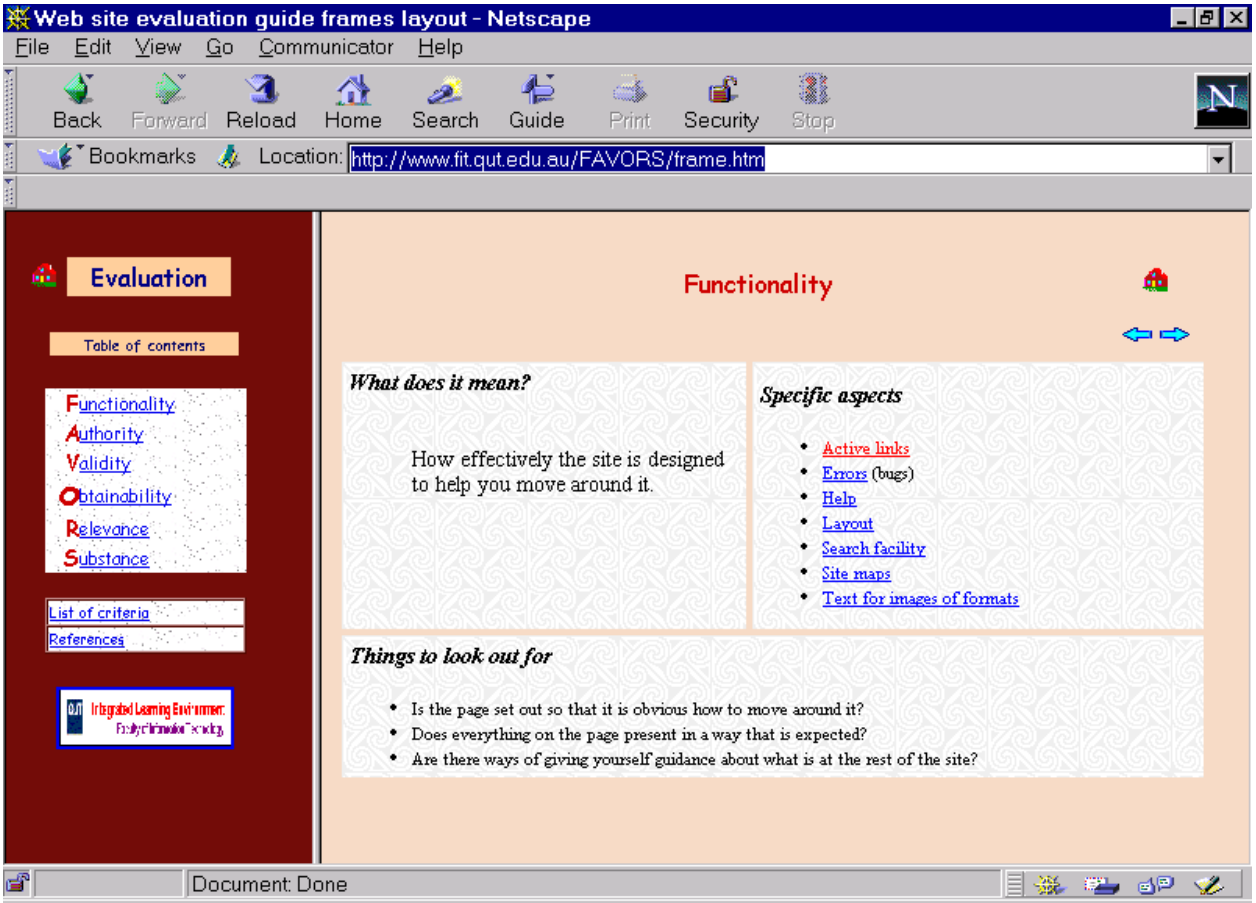
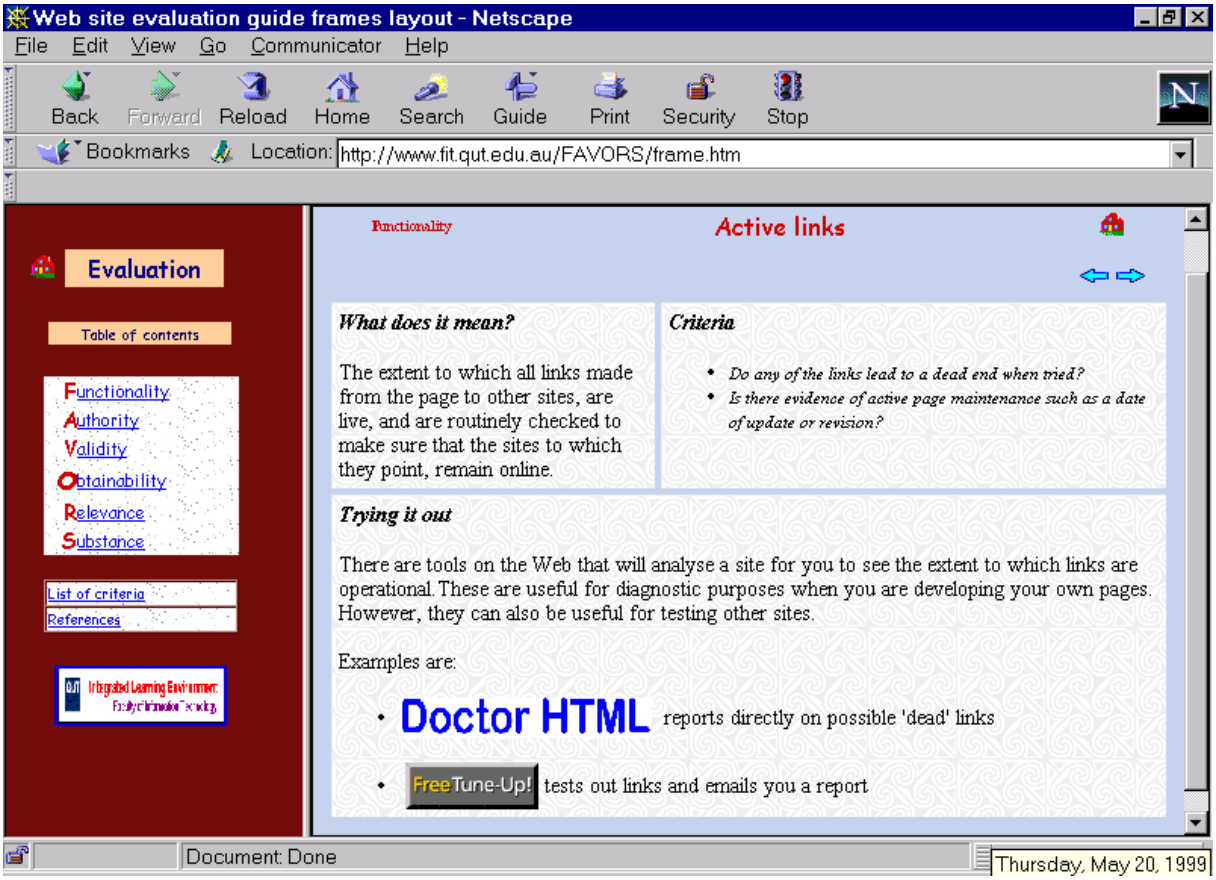


Figure 9 displays what the student would see if they selected the criterion *Active Links* within the *Functionality* category. Each criterion is explained in this manner, with the category clearly displayed within the frame, the heading for the criteria displayed, and the example sites given.

Figure 9: Example page from site evaluation guide criterion page level



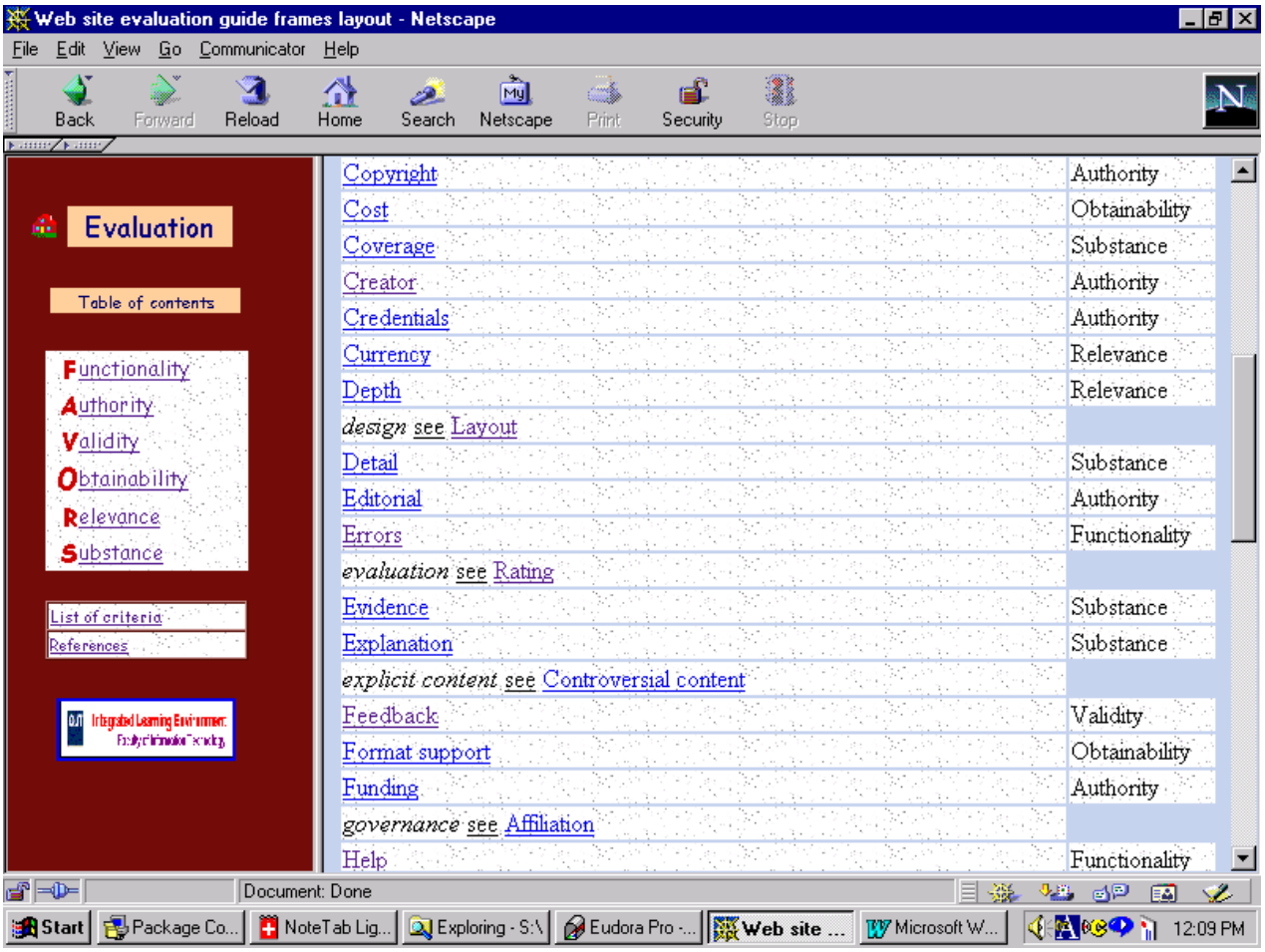
As a further example, within the category *Validity*, we include referring links, that is the extent to which other sites refer to the site in question. This is suggesting that much like citation indexing, and the principles of citing someone in print, we can use this approach and check who has cited the WebSite.

The evaluation criteria exemplified at present are all also listed on a separate page for alternative entry. An extract is shown in Figure 10, which also shows the correspondence between a criterion and the category into which we have placed it. It is therefore possible to search the site alphabetically by the list of criteria. While being fairly stable, the list remains under development as we evaluate class use of the site.

FAVORS also provides support for carrying out metainformation creation exercises when constructing WebPages. These description classification and indexing exercises are carried out with reference to evolving standards. Students may also choose to refer to the large list of references used when this material was drawn together and look at how others have approached Internet Site evaluations.

We have begun to use the site with classes for teaching purposes, but our evaluation of its use will not be completed until later in the year.

Figure 10: Extract from list of criteria indicating their functional area.



Conclusion

The collaborative work with the Library proved to be successful both as collaboration, and as a learning experience for the students. The work was chosen as an exemplar for presentation at a QUT senior staff meeting, and was well received.

Utilisation of the approach within our teaching will continue as follows:

- An extension of student participation in Infoquest within student professional practice subject in association with the Library
- Use of the evaluation tool for application with introductory information management subjects, and subsequently for other subjects that wish to use it for teaching purposes.

We believe the project has also potential for further collaborative benefits. The evaluation tool will provide valuable cross-faculty flexible delivery options, and should provide a useful adjunct for a 'technical literacy' project that is underway at QUT. It will provide all future students with a tool that helps them to locate, retrieve, evaluate and organize Internet resources.

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