

## **Curriculum 2.0? Changes in Information Science Education for a Web 2.0 World**

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### **Summary**

*This paper reports an international comparison of changes in library/information curricula, in response to the changing information environment in which graduates of such courses will work. It is based on five case-studies from Australia, Ireland, Lithuania, Slovenia and the United Kingdom. Specifically, it describes responses to changes: an increasing proportion of e-content; and the*

*impact of the communication and social networking features of Web 2.0. It examines both changes in curriculum content, and in methods of teaching and learning. The latter involves pedagogy adapting and changing in the same way as the professional environment, with a greater emphasis on e-learning, and use of Web 2.0 tools. Students therefore learn about the issues by making use of the tools and systems in their studies.*

**Key words:** LIS curriculum development, Web 2.0, e-learning, information society, collaboration

### **Introduction**

The development of the collection of tools, techniques and approaches which are treated together under the general heading of 'Web 2.0' is increasingly entering the consciousness of library and information specialists worldwide. Whether these developments threaten traditional library / information services, or whether they provide new opportunities and capabilities, is a matter for debate, but it is certain that the library / information world must be aware of them. One way in which this will happen is for these topics to impact the library / information studies curriculum; both as subjects to be taught, and as tools for teaching. How this may best be done - given the wide variety of such tools, their rapid development, and the relative lack of expertise in their use among many library / information educators - is far from obvious.

The five contributions to this paper present a 'snapshot' of ways in which this issue is being addressed in universities worldwide; from Australia, Ireland, Lithuania, Slovenia and the United Kingdom. The contributors present their views in their own style, without any imposed template or format, so that local concerns and perspectives can clearly emerge. The concluding section brings out some general issues and findings.

### **1. Australia**

Reflecting on my experience as an LIS educator has meant working at the level of the LIS specialist programs as well as at the level of Faculty wide "core subjects." I will describe briefly two examples to demonstrate my approach. In both instances, students are working with these tools and being asked to critically reflect on the efficacy of the tools in use in various contexts.

A Faculty-wide subject (Communication and Information Environments)

This subject is part of the common first semester curriculum for the approximately 600 first-year undergraduates enrolled in one of the BA in Communication degrees offered in our Faculty. As a Faculty of Humanities and Social Sciences, the specialties include journalism, public communication, media arts production, creative writing, cultural studies, social inquiry as well as information management.

As a foundation course for the undergraduate program, it is essential that students not only study communication and information environments, but that they learn to develop critical capacities involving discussion forums, blogs and collaborative online tools. Thus, as part of my redesign of the subject, I decided to make fuller use of collaborative online tools like small group blogs within our syllabus this past year. Doing so involved shaping class activities, work between classes as well as a major assignment around the use of these blogs.

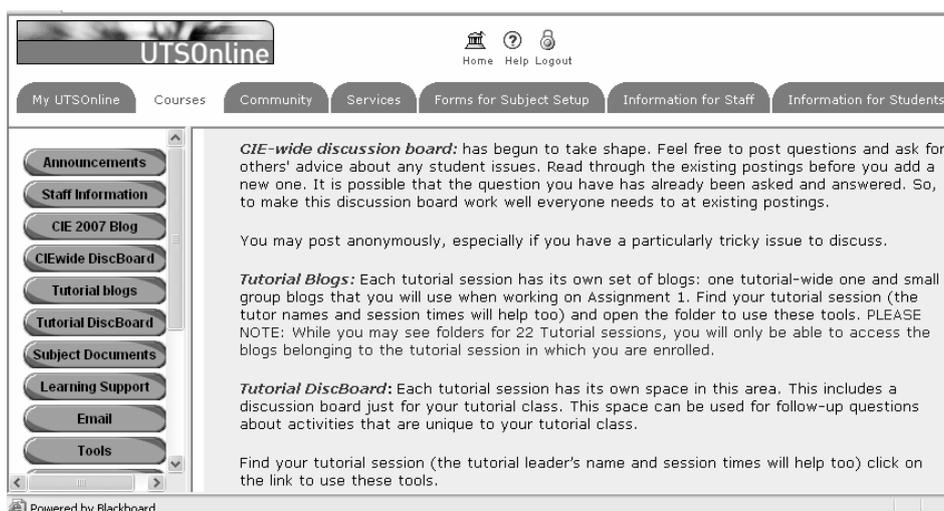


Figure 1 shows the three levels of blogging zones created within the online course site – class-wide, tutorial wide (e.g.: each of the 22 tutorials had a zone) and group wise (e.g.: each tutorial class had four or five small groups who worked weekly in their group blog).

Research has shown that making activity assessable in some way is a great motivator when it comes to online tools such as the ones we would be using in class. Equally, e-learning research also invites caution about the risk of overloading students and crowding curriculum with online elements that do not add value with regards to the learning outcomes and desired graduate attributes. In the case of this particular subject, the link was an easy one to make: learning to think critically about the merits and flaws of various forms of online and face-to-face communication pathways available to these students was explicitly related to the desired attributes of communications graduates. It was also an essential factor to be considered in terms of the actual content of the subject. Through this approach, teaching issues about contemporary communication and information environments including what we now label Web2.0 is a central focus of this subject. Thus, Web2.0 technologies are both sites of learning and tools for learning.

**An LIS specialist subject (Social Informatics)**

In a second subject (Social Informatics; 60 students in core undergrad for LIS students; elective for postgraduate LIS and rest of Faculty) the focus of weekly class activities centres on discussions about emerging technologies and theoretical frameworks associated with Social Informatics that help us to understand and interrogate the way such e-techs may be used in society. It builds on the first example – taking both the content and the use of e-tools in class further by using blogs, wikis, virtual classroom tools, IM/real time chat and podcasts.

Once again, as in the first example, it is imperative for students looking at these themes theoretically to make active use of such tools. Their first-hand experience can then be used to clarify theoretical issues.

In this subject, the students create digital scrapbooks that categorise and analyse reading they are doing on the theme. Many students create blogs (individual) to deliver their scrapbooks and to reflect on the many "texts" (ranging from traditional academic works through to popular literature and music, advertisements and TV programs as well as blogs, rssfeeds and e-zines) they collect as part of their knowledge artefact. They analyse this material in terms of the bidirectional influences of society and information & communication technologies, such as that discussed in class and identified in their reading.

Use of Web2.0 tools goes further in this subject than in the first example – and it does so deliberately as part of a progressive approach to the lesson they need to learn about multimodal collaboration and work. We discuss ways to represent the ideas they wish to communicate and relate their experience of creating digital scrapbooks with the work of creating a catalogue for a museum exhibition. Discussion in class and analysis in the assignment relates this work to issues of knowledge access and organization, helping the students to examine the implications of Web2.0 worlds and uses for enabling all 'users' to effectively become knowledge producers.

Blogs may be used for individual scrapbooks, but the main focus in this second subject is online collaboratories of small groups (4-6 students) who must take responsibility for a 2 week online discussion around their chosen e-technology. For this purpose, wikis are created at two levels:

1. Student teams each get a private work zone assigned in the online content management system. It includes live chat, file sharing and a wiki site where they prepare a wiki that serves as the central site for discussion with their class colleagues around their e-tech.
2. As part of a small team, they have responsibility for facilitating discussion about their e-tech topic and summarizing/weaving the activity in their wiki for the rest of their tutorial class. As part of this Moderating Team, students work together to plan, facilitate, monitor and synthesise the two-week discussion in their tutorial's Blog for that particular emerging technology.

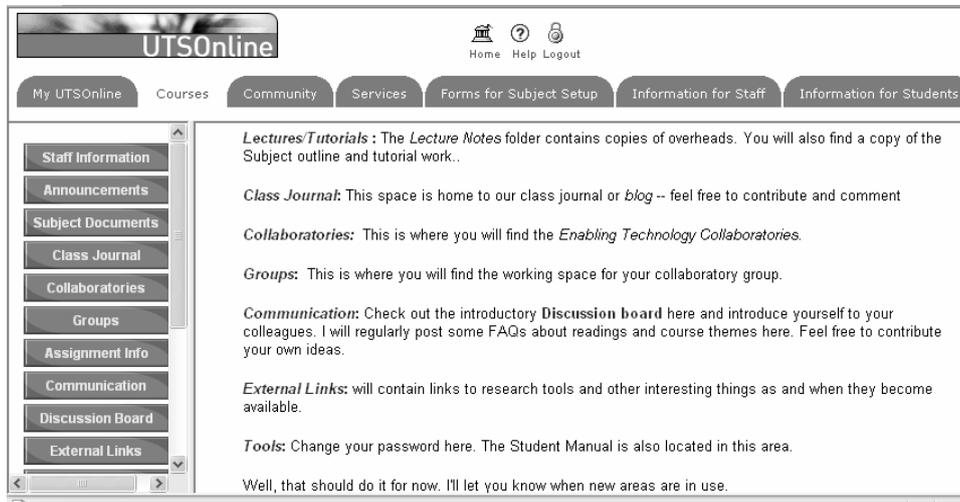


Figure 2 shows the layers in this subject.

Each team has a personal online work zone (e.g.: private discussion space, file exchange, wiki page) that can be used for group-only communication and behind-the-scenes work. Teams are also encouraged to meet in person as required. Students are expected to take active part in each of the emerging technology collaboratories in operation for any given week. They cycle fortnightly in each tutorial so that students are able to focus on one theme at a time.

Students are encouraged to bring their online chats into the classroom (that is, lessons learned, themes covered). A major assessment item involves them preparing a critical reflection of the collaboratory experience (at all levels and in all roles). They look at the benefits and drawbacks of face-to-face and online communication for workplace and social activities. Furthermore, a final assignment (critical evaluation of one of the emerging technologies under discussion) draws on the wikis constructed in the process of working through the student-moderated discussions. The online work also forms the starting point for lecture discussions in second half of semester (along with the class-wide blog that encourages the sharing of ideas on the subject's themes).

## 2. Ireland

Web 2.0 refers to a second generation of web-based applications and services and in particular the use of the web as a platform for user-generated content and web-based communities. Komito describes the "rubric of Web 2.0" as consisting of "user-generated content, dynamic web publishing and online social groups" (Komito, 2007: 85). Associated technologies include: blogs, social networking sites, wikis, mashups, podcasts, RSS feeds, shared bookmarks and image sites. Web 2.0 is intrinsically linked to the 'semantic web'.

Web 2.0 encompasses a variety of different meanings that include an increased emphasis on user generated content, data and content sharing and collaborative effort, together with the use of various kinds of social software, new ways of interacting with web-based applications, and the use of the web as a platform for generating, re-purposing and consuming content. (Franklin & van Harmelen, 2007: 4)

Around the world LIS curricula increasingly recognise the importance of Web 2.0. There are three main facets to teaching and learning activities that relate to Web 2.0:

- The technological developments
- The social uses / impacts
- Implications for the field and the profession

There are a small number of specific modules that deal with Web 2.0, but more commonly aspects of Web 2.0 are included as a part of existing modules.

Of the modules offered by the UCD School of Information and Library Studies, three in particular include aspects of Web 2.0 in their curricula. Of these two are offered at Level 3 (and taken by mainly students in the third and final year of a primary degree, and also by a small number of postgraduate students on the Graduate Diploma and Masters in LIS) and one at Level 4 (for postgraduate students enrolled in either the Graduate Diploma in LIS or the Masters in LIS).

The two Level 3 modules, IS30010: 'Weaving the Web: The Internet and Society', and IS30070: 'Cybersociety? Technology, Culture, and Communication', examine current developments in Web 2.0 and students taking these modules develop an understanding of the transition from the Internet to Web 2.0. 'Weaving the Web' focuses more on the technological changes that are enabling greater interconnectivity, and the 'Cybersociety' module is more concerned with the social impact of online communities and use of social technologies.

In the Level 4 module, IS40080: 'Information and Society', the emphasis is more towards Web 2.0 from the perspective of library and information professionals. The impacts of Web 2.0 on information provision are examined in a critical way and students are encouraged to explore and debate the implications of Web 2.0 in relation to library and information work.

The use of Web 2.0 tools in teaching is still in its infancy, although it is likely that LIS educators are among early adapters in this respect.

It has been common practice for some years to make use of virtual learning environments (VLE) in university teaching and in the UCD School of Information and Library Studies all taught modules make some use of a VLE, although the extent to which the VLE is utilised, and how it is utilised varies from module to module. The main VLE used in the teaching and learning activities of the UCD School of Information and Library Studies is Blackboard.

"The Blackboard Virtual Learning Environment (VLE) is used to provide elearning services to staff and students. It allows lecturers to share course materials, post announcements for students, and run quizzes and surveys. Blackboard

also includes a Virtual Classroom facility, discussion forums and various other course tools.” (<http://www.ucd.ie/itservices/staffit/elearning/>)

However, VLE’s such as Blackboard are not generally true examples of Web 2.0 tools. Innovations in this area would include use of Second Life for teaching and learning activities, and alternative tools such as Moodle. Both of which are currently being considered by the School, as is podcasting.

One other area in which Web 2.0 is anticipated in having an increasing impact in the School’s teaching and learning activities is in assessment of student work, for example the use of social software in group projects.

There is also research expertise among staff in the UCD School of Information and Library Studies in relation to Web 2.0 (in terms of technological developments and programming and social dimensions), and at present two postgraduate students are working on doctoral theses in the areas of applying Web 2.0 technologies to collaborative learning environments, and the use of ICTs (including Web 2.0) by a geographical, proximate suburban community in Ireland.

### **3. Lithuania**

The Librarianship and Information Science Institute is a part of the Faculty of Communication of Vilnius University (VUFC). VUFC is the leading Higher Education establishment working for the broad field of information and communication professions in Lithuania. Established in 1991, VUFC is led by an integrated approach towards information and communication, looking at libraries, museums, archives, media, publishing enterprises, information agencies and information businesses as parts of the information infrastructure of the society. Currently, VUFC offers five BA and ten MA study programs, has 40 FTE employees, ca. 1200 BA and MA students and 26 PhD students.

In the LIS Institute of Vilnius University teaching about Web 2.0 is currently integrated into the Internet Communication course for second course LIS students. This course can also be freely taken by any student of other programs of Communication Faculty of Vilnius University.

The format of the course has been developed in the light of the social networking site 43 Things [<http://www.43things.com>], where users create accounts and then share lists of goals and hopes. The content of the course has been adopted from the Learning 2.0 program, originally created by Helene Blowers at the Public Library of Charlotte & Mecklenberg County [<http://plcmc.org>] Also the experience of other libraries, running the 23 Things program (Yarra Plenty Regional Library [[http://www.yprl.vic.gov.au/Learning\\_2.0/index.htm](http://www.yprl.vic.gov.au/Learning_2.0/index.htm)], Marylande public library [<http://www.marylandlibrarieslearning2about.blogspot.com>], etc.), has been explored.

The 23 hours length on-line course is based on the Moodle virtual learning environment. It consists of 10 training modules, each exploring the particular Web 2.0 tool. The course begins with the introduction to this new concept of the Wide World Web. After an introduction to Web 2.0 philosophy, students are in-

vited to take part in learning journey through Web 2.0 tools, where they learn about blogs, wikis, Flickr, YouTube, webcasting, podcasting, RSS, Del.icio.us, Library Thing and Library 2.0 concept. The course is a self-discovery program which encourages students to take control of their own learning through exploration and play. Students are encouraged to work together and share with each other their discoveries, techniques and "how to's" both in-person and through discussion forums.

As the course is a part of formal LIS education, it was not possible to give the full ownership to the learning process to the students. Their learning process is supervised by the tutor, who is monitoring, consulting and assessing learning process of students. The final assessment of each student is generated from the assessment results of each module.

Year 2007/2008 are considered as piloting of the course. After the piloting the program will be reviewed and modified according to the students' feedback. Also it is planned to transform the distance course into a Wiki web site, to allow free access to the course material to the Lithuanian libraries staff.

#### **4. Slovenia**

Since Web 2.0 refers to a perceived second generation of web-based communities and hosted services – such as social-networking sites, wikis and folksonomies – which aim to facilitate collaboration and sharing between users (O'Reilly, 2005), it seems important that LIS students, as future information professionals, are aware of these changes and innovations and that they know more about these than an average user to be able to cope in the tomorrow information world. In this context there are a few questions. One is, how to incorporate these themes into the curriculum. Due to the lack of common understanding as to what Web 2.0 actually is, a certain amount of scepticism and pragmatism is needed.

Another question is, of course, how to use the emerging technologies and means of communications in the teaching process itself. It seems that in this part higher education has been more successful by setting up web learning materials, e-learning environments, etc., on which Web 2.0 facilities may be built. Here we will present some thoughts connected with e-learning, as well as experiences and prospects of e-learning at the Department of LIS at the Faculty of Arts, University of Ljubljana.

#### **E-learning**

As argued by many, among them Krevs (2007), e-learning can be seen as use of technology for reaching pedagogical goals. There are a number of benefits we can achieve through e-learning, e.g. better knowledge, better e-literacy, control over study materials, more independent and current student engagement, independence of time/place, easier student and teacher mobility. It offers potential benefits for teachers, students, institution (faculty, university), society. Studies

(e.g. Mullen and Tallent-Runnel, 2006) show that e-learning environment has great influence on student perceptions of the learning process, their teachers and tutors, and in addition also influences their motivation, satisfaction and learning. Donnert (2004) has presented both, positive and negative perceptions of students regarding e-learning. These are summarized in Table 1.

Table 1: Positive and negative student perceptions of on-line learning (Donert, 2004)

Top five negative aspects	Top five positive aspects
Technical problems (21%)	Flexibility (89%)
Isolation (18%)	Can interact with peers (27%)
Lack of support (16%)	Access to resources (21%)
Lack of other student interaction (14%)	Effective mode of learning (17%)
Too few face-to-face opportunities (14%)	Can interact with tutors (16%)

The learning is or should be a creative process and key factor is the level of engagement of the learner. With the use of technology this is made very different from the traditional ways of teaching and learning through better accessibility, easier time management, incorporation of individual differences. Lavrič (2006) argues that through e-learning we can achieve integration of the three pedagogical approaches (Figure 3).

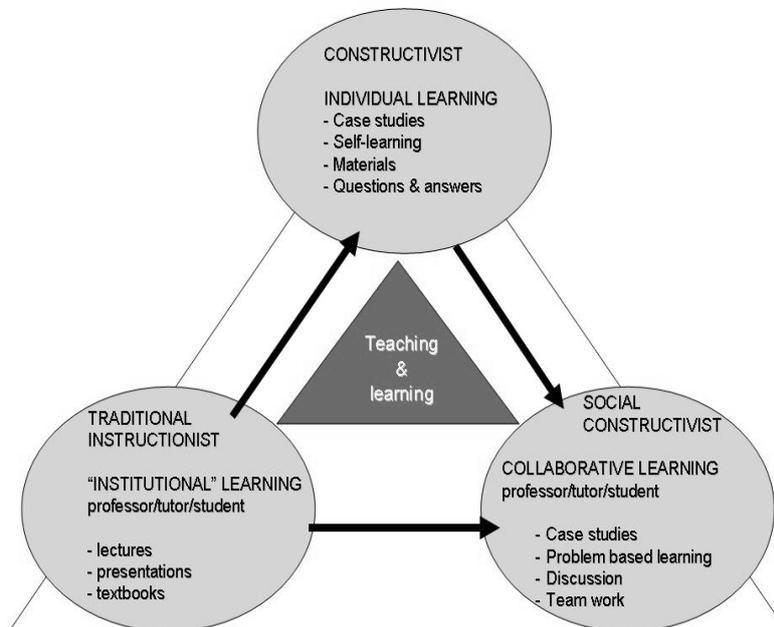


Figure 3: Integration of three pedagogical approaches (Lavrič, 2006)

Krevs (2007) has presented many different aspects of e-learning. The reasons for using e-learning, which can be also seen as possibilities which it offers:

- Better use of teacher's and student's time, greater freedom for planning
- More student activity, greater responsibility of students in the learning process
- More independent and current student engagement
- Better overview over the teaching/learning material
- Different forms of learning, of materials (dictionaries, glossaries, quizzes, AV materials, ...)
- Direct student engagement ("the growing classroom")
- Different ways of communication with and among students (contact hours, forums, blogs)

E-learning doesn't guarantee that we will achieve all these, but can effectively help in doing so.

Requirements for the use of e-learning technologies for teachers:

- Knowledge and skills for preparation of e-materials and e-classrooms
- Attention to planning student involvement, their assignments, means of communication, knowledge assessment methods, grading (e.g. portfolio?)

Requirements for the use of e-learning for students:

- Knowledge and skills for use of e-materials and e-classrooms
- Internet access
- Regular visits and steady rhythm of work in e-classrooms
- Strict meeting of deadlines

### **Faculty of Arts**

Previous experience in Slovenia which is rather sketchy, left to enthusiastic individuals (usually coming from the area of Computer Science or Informatics), and scattered across all levels of education, shows that commercial firms usually overestimate potential market, especially in public higher education, but that there are numerous good examples which as a rule stem from good teaching practices (Krevs, 2007). There are actually two approaches to introduction of e-learning: the low-budget, pedagogy driven way (bottom-up) which is less controlled, more spontaneous, and planned, systematic and institutionalized (up-bottom) which has more control and better organization. An ideal scenario should probably take both into account.

The introduction of these technologies at the Faculty of Arts had wide support, but there were also some warnings and concerns. People were mainly concerned with workload, problems with technology and support, lack of expertise, effect on current teaching/learning (Krevs, 2007). Such concerns are likely to appear with greater emphasis with greater introduction of Web 2.0 features.

At Faculty of Arts there have been mainly good experiences with the introduction of e-learning environment <http://e-ucenje.ff.uni-lj.si/> based on Moodle

(Krevs, 2007). Moodle is an open source software package which by now has over 200.000 registered users, over 30.000 registered sites in 75 languages in over 192 countries (Moodle statistics, 2007). It is designed to enable teachers create e-courses, offers a variety of interaction possibilities, and can be used both in small classes and in large universities. This allows ready inclusion of Web 2.0 facilities.

The process begun by firstly individual teachers using e-learning as guests on outside servers. Soon a special workgroup was formed which quickly set up a server and e-learning environment Moodle and proceeded with courses and workshops to introduce the concept to the faculty. Some pilot projects were set up (pilot e-classrooms, e-courses as support to usual teaching). The final stage were courses for students which were mainly prepared by individual departments. Statistics (Krevs, 2007) shows that by April 2007 there were over 100 e-classrooms (19 from departments of English and Library and Information Science, 12 from department of German, 9 from department of Asian Studies, 1 or 2 from other departments), 51 teachers, 1830 registered participants, 75% of participants visiting at least every 2 days, 60% every day, and around 10.000 per month, in total over 44000 visits and over 262000 lookups with average of 6 pages per visit. This good use is a solid basis for 'building in' Web 2.0 features.

### **Department of LIS**

It has been mentioned that the Department of LIS was one of the first at the faculty to start working with the e-learning environment by setting up a few pilot e-classrooms. The new Bologna study programme which started last year is entirely supported by Moodle. In practice this means that we do not have a lot of experience and can therefore speak mainly of prospects and goals. The faculty workgroup prepared a workshop to introduce Moodle to all the teachers and assistants in the department.

Students in the first year of Bologna study programme were immediately introduced to the environment. No survey has yet been made, but it seems that they did not have great difficulties in using it. They appreciated to have all the materials prepared in advance. They accepted the means of knowledge assessment and grading, e.g. portfolios, mostly respected deadlines for the assignments, and actively participated in other activities, e.g. forums. In the future, Web 2.0 facilities, e.g. blogs, will be included to support communication with the teachers as well as among students themselves.

Among the things which were well accepted both by students and teachers Krevs (2007) mentions appreciation of support to faculty and students, and of environment offering great variety of usage, enhanced student involvement, good possibilities of support to a relatively simple, permanent and qualitative process and last but not least actual added value to the teaching process. There were of course some problems, e.g. teachers were reluctant to become 'technicians' (a problem likely to increase as more 'advanced' Web 2.0 features are

added, high quality user interfaces were not well accepted, the belief that technology itself is already added value needed to be overcome, students complained that some teachers were putting up videorecordings of lectures as teaching materials, sometimes it was difficult to achieve spontaneous co-operation of students.

In perspective we can say that e-learning is an important measure of quality of institutions of higher education. It supports the 'battle' for students as well as for better knowledge of graduates. What we need at this point is integration of various scattered initiatives into a whole in a search for successful and efficient e-learning approaches. Web 2.0 approaches have the potential both to help and to hinder this.

## **5. United Kingdom**

The Department of Information Science at City University London teaches a variety of Masters level courses in various aspects of the library and information sciences. Two courses in the geographic information area may be followed in fully distance mode, with the students relying entirely on e-learning, while the greater majority of students follow a form of flexible learning, blending face-to-face attendance at the university with complementary e-learning.

The advent of Web 2.0 has led to much consideration as to which aspects of this phenomenon should be taught (content) and how they may be themselves used in teaching (methods). This presentation outlines both of these for City University's courses in Information Science and in Library and Information Studies, with the proviso that these are at an early stage, and we are very much feeling our way as to how best to proceed.

### **Content**

While the 'popular culture' instances of Web 2.0 have received a great deal of publicity, their long-term effects on the library/information profession are far from clear. We therefore wished to steer a middle course between avoiding the issues entirely, and making too much of them, when it is far from clear which will be of most long-term significance. We also wished to avoid creating any specific module or course devoted to 'Web 2'; rather we wanted to bring these matters into our existing course structures. Finally, we were aware that our students would typically be more aware of much of Web 2.0 than the academic staff; this calling for a careful way of presentation.

Web 2.0 issues are therefore appearing in many, if not most, modules of the library / information courses. The main issues covered are new forms of communication (blogs, RSS, wikis, podcasting and vidcasting, etc.), social networking (MySpace, YouTube, etc.), media sharing (YouTube, Flickr, etc.), and social tagging and folksonomy. The emphasis is on those aspects of these issues which affect the creation and communication of recorded information, and hence the work of the library / information specialist.

Some specific examples are:

- New communication media affecting the publication chain are covered in detail in a course on ‘Libraries and Publishing’
- Social tagging and folksonomies are covered, and compared with more conventional approaches in a course on knowledge organisation
- The advantages and disadvantages of wikis and other socially constructed knowledge resources are covered in a course on digital literacy
- Basic philosophical and societal issues resulting from the development of Web 2.0 are dealt with in courses on the foundations of the library and information sciences

Naturally, given the current interest in these topics, an increasing number of students are keen to undertake dissertation projects on Web 2.0 topics.

### **Means**

We are keen to use Web 2.0 facilities into our teaching for three reasons: they offer real advantages over other methods; they give students an insight into academic and professional use of these facilities; and they increase the credibility of our teaching, in what is sometime seen, wrongly, as an old-fashioned subject. However, we are aware of the need for care. Merely because it is easy to use Web 2.0 does not mean it is easy to use it well. And, as noted above, many students are very familiar with Web 2.0, and will not be impressed by an amateur or inappropriate approach.

Again, our approach has been to introduce Web 2.0 ‘organically’ into existing approaches. City University uses the WebCT / Blackboard e-learning system, which, though well-tried and robust, have a somewhat old-fashioned interface. We are, for the most part, introducing Web 2.0 facilities incrementally, to augment or replace equivalent but less effective, e-learning measures.

Specific examples include:

- Replacement of discussion board communication by blogs
- Use of wikis to gather student contributions, rather than attached files
- Use of podcasts of audio recordings of lectures, as a complement to text files

We have also adopted blogging as a way of conducting some academic administration, to replace email exchanges.

### **Conclusions**

From the rich and diverse insights given by these five case studies, we may distil some general principles. Such principles must always be qualified by local circumstances, and by the choice of which Web 2.0 tools and features to adopt, from the variety available.

‘Integration’ is a key concept. Web 2.0 provides both the content of learning, and the tools to promote learning itself. This gives a particularly strong, and de-

sirable, integration of theory and practice. It is also worthwhile to integrate teaching of these topics with related activities of research or consultancy in the teaching department, where such exist.

Students typically have a natural enthusiasm for these topics, and often greater expertise in some aspects than most teaching staff. If this enthusiasm can be harnessed, and students can learn for themselves and from each other, then the effects will be particularly positive. Similarly, the use of Web 2.0 facilities by academic staff themselves, for their own purposes, will enhance their understanding, and hence promote more credible teaching. Where academics are lacking in expertise and confidence, this must be built up gradually and sensitively.

The introduction of Web 2.0 into teaching is best done incrementally, starting with particular courses or topics, and expanding on the basis of knowledge gained. Given the investment of effort into the development of e-learning systems in many academic departments, it seems very sensible to use this as a platform for development of the Web 2.0 curriculum.

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