

Library 2.0, Libraries and Library School

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Abstract

With the widespread embracement of Web 2.0 technologies, pervasiveness of handheld devices, and the advent of Library 2.0, libraries have to grapple and manage the changing use patterns and expectations of its varied clientele. How do librarians, new and old be trained and be prepared for the new age libraries, where the demarcations between the physical and digital library spaces and services are not as clear as before, where library customers demand for services that they can get using their handheld gadgets round the clock, from anywhere in the world, and where the roles of librarians and libraries, customers of libraries, internet and internet content producers and service providers are becoming less clear than ever before?

This paper explores these challenges from the point of libraries and library schools, and examines whether these entities, locally in Singapore and overseas, have been able to meet the needs of its users and its clientele, as well as employers of LIS graduates. It reviews Web 2.0 and Library 2.0 developments and provide examples of how these technologies have been embraced by libraries around the world. It subsequently examines how library schools have addressed this important aspect of education to date. It is found that little have done so far by library schools, particularly in U.S., to embrace Library 2.0 education. It is proposed that a framework for Web 2.0 analysis can be used as the basis to plan for such education. Through an “awareness-knowledge-experimentation-immersion” educational paradigm, a number of suggestions of how this can be incorporated into the existing M.Sc. (Information Studies) programme are proposed. This includes content development in a number of related subjects; engaging students through professional seminars; setting assignments for further study and research; exposing and immersing students in Library 2.0 application interactions like wikis, blogs, social networking sites and RSS, as part of the tools in teacher-student engagements; and introducing a component of professional internship in industry.

Introduction

For the past few years, Web 2.0 and Library 2.0 are common buzzwords that are seen and discussed in librarians’ blogs, at library conferences, in professional journals and at meetings. Are these buzzwords just a fad or are they becoming essential and key features of the library’s services?

This paper discuss the impact of Web 2.0 on the information landscape, the impact of Library 2.0 on libraries and why there is a need to embrace Web 2.0 and Library 2.0. It highlights some example of applications of Web2.0 technologies in the libraries and discusses library schools' responses in educating information professionals to meet the needs of these emerging new age libraries.

Web 2.0 and Changes in the Information Landscape

The concept of "Web 2.0" originated at a conference brainstorming session between O'Reilly and MediaLive International. Dale Dougherty, web pioneer and O'Reilly VP, noted that far from having "crashed", the web was more important than ever, with exciting new applications and sites popping up with surprising regularity (O'Reilly, 2005a). They observed that companies that survived have several characteristics in common. They are collaborative in nature and there is blurring of lines between content creation and consumption.

Tim O'Reilly defines Web 2.0 as follows:

Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an "architecture of participation," and going beyond the page metaphor of Web 1.0 to deliver rich user experiences. (O'Reilly, 2005b)

Since its debut in 2004, the Web 2.0 phenomenon has made a significant impact on the information landscape.

According to Miller (Miller, 2005),

- Web 2.0 has brought about “a **freeing of data**, allowing it to be exposed, discovered and manipulated in a variety of ways”.
- Web 2.0 is **participative**. Unlike the traditional web, which is one-sided from the content provider to the user, web 2.0 allows the users to share information and personal views and reviews.
- Web 2.0 applications are **modular**, with developers and users able to pick and choose from a set of interoperating components in order to build something that meets their needs.
- Web 2.0 is about **communication** and **facilitating community**.
- Web 2.0 is about **remix**. Increasingly, we can unambiguously reference and call upon the service, document or snippet that we require, incorporating it into something new that is both ours and the original contributors'.
- Web 2.0 is **smart**. Applications will be able to use knowledge of us, where we have been and what we are doing to deliver services that meet our needs.

- Web 2.0 opens up **the Long Tail** making it increasingly cost-effective to service the interests of large numbers of relatively small groups of individuals and to enable them to benefit from key pieces of the platform while fulfilling their own needs.
- Web 2.0 is built upon **Trust**, whether that is trust placed in individuals, in assertions, or in the uses and reuses of data.

Impact of Library 2.0 on Libraries and the Need to Learn about Emerging Technologies

The Web 2.0 has revolutionised the way content is created and the way users access, use and contribute information. Libraries are increasingly adopting Web 2.0 technologies to design services that allow them to reach users in the virtual space that they could not reach before. This allows librarians to target a segment of users in the population who will never visit the library to use their services, no matter how hard they try. A large part of this population belongs to the generation that grew up with Internet and they are often known as the digital natives.

Rainie (2006) describes six realities of the digital natives as follows:

- Media and gadgets are common throughout everyday life
- They enjoy media and carry on communications anywhere they wish with the new gadgets available to them
- Internet is at the center of this change
- Multitasking is the way of life
- An ordinary citizen has a greater opportunity to be a publisher, moviemaker, artist, song creator and storyteller
- Everything will change even more in the coming years; we can expect more computing power, communication power and storage power.

The digital natives would want to create, remix and share content, they would expect to be able to access information whenever, wherever they are. They expect to be able to gather and share information in a multiple of devices. There is also trust in the community they share the information with.

Coupled with the spread of affordable laptops or PCs, proliferation of handheld digital devices and affordable internet access, Web 2.0 tools have enabled libraries to create new services for the non-users of libraries that were not possible before.

The application of Web 2.0 technologies to libraries resulted in the coining of the term “Library 2.0” by Michael Casey in his LibraryCrunch blog (Casey, 2006).

Maness (2006) further defined “Library 2.0” as “the application of interactive collaborative, and multimedia web-based technologies to web-based library services and collections.”

As the community change, libraries must not only change with them, they must allow users to change the library. It should constantly seek new ways to allow communities to seek, find and utilise information. Thus, there is a necessity to understand the concept of Library 2.0 and the opportunities it creates for libraries to provide content and services to their communities of users.

Maness (2006) highlights that there is paradigm shift for librarianship as Library 2.0 demands libraries to focus less on secured inventory systems and more on collaborative discovery systems. Increasingly, librarians will need to play a facilitation role to allow users to interact and create content for themselves. Library 2.0 where sharing is the norm, recognises that the users utilises information as a community rather than individual.

Librarians need to understand the wisdom of the clients and their changing roles. With Library 2.0, the creation and delivery of content is not primarily done solely by the librarians. Web 2.0 technologies allow the user communities to participate in the creation of the content together with librarians.

The appearance of blogs and wikis has enormous implications for libraries. Increasingly, blogs are becoming another form of publications and libraries need to look into ways to include them in their collection development and archival. Librarians will need to re-think the notions of being “authoritative” and “reliable”.

Social networks such as MySpace, Facebook, and Ning have open up new ways of users to connect to each other, engage in discussion and share content dynamically with other users. In the past year, there has been a sharp increase in the number of such sites with huge number of users. Libraries can make use of these opportunities to be present in such spaces and make connections with their users to answer their questions. Maness (2006) suggests that the face of the library’s web-presence in the future may look very much like a social network interface.

Tagging and social bookmarking have become common activities in websites such as Flickr and Del.ious.us. Tagging and social bookmarking tools help librarians bridge the gap between the library's need to offer authoritative, well-organised information and their patrons' web experience (Rethlefsen, 2007). Web 2.0 tools can allow the users to search both standardised and user-tagged subjects, whichever makes most sense.

Application of Web 2.0 in Libraries

Web 2.0 is now widely adopted in many libraries in one form or another. The following sections highlight some example of these applications in these new age libraries.

Libraries are increasingly enhancing their website by introducing Web 2.0 features. One such library that undertook a major project to re-shape its website and incorporating blogs and Wikis can be found in the University of Houston. The incorporation of these features has allowed the website to be more flexible and adaptable. With the adoption of these tools, staff is better able to update the content of the website instead of just relying on the website master.

Casey (2007) envisioned that the next version of the Library catalogue or OPAC will have to include many of the attributes that comprise the definition of Web 2.0. Key requirements include user participation, customisation, maximum usability, and greatly enhanced discovery. For example, the Hennepin County Public library has improved their catalogue by giving their customers the ability to write reviews on items in the catalogue. North Carolina State University Libraries has used faceted metadata search to interact with their ILM system. This provides users

with the navigational capability to link to alternative sources of information base on attributes of the search results.

Several libraries have used the Wiki tool in the provision of services. At the National Library of Singapore (NLS), a wiki-like platform created for the librarians to work collaboratively and concurrently on providing answers to the users' enquiries. This allows any staff to tap on the collective wisdom of the communities of subject librarians and provide quality answers to their queries. Besides using Wiki as a collaboration tool, some libraries have used it to create research guides, for example, the Ohio University created a Biz Wiki to assist business researchers with their research. The Biz Wiki contains a variety of content, including information about reference books, websites, research guides, how-to documents and more (Casey, 2007). An advantage of using the wiki to create the research guide is the ability to add and edit content easily and anywhere to keep it updated. The wiki also allows the librarian to determine which content are used most and this can influence the type of content to focus on.

The use of messaging such as twitter and SMS text messaging has enhance library services via handphones. The latter have also been incorporated into enquiry and reference services. Cellular phone usage (including SMS usage) is very high in Singapore. Singapore's cellular phone penetration rate for May 2007 stood at 109.1%. (The Infocomm Development Authority of Singapore, n.d.). Trends such as these suggest that SMS is an ideal way to reach out to a greater pool of potential users of our reference enquiry service. Adding the advantages of portability of the cellular phone and ease in using SMS, it becomes clear that SMS provides an alternative and potentially ideal mode of posting reference enquiries for users on the move, or who may not have the luxury of visiting the library due to their schedules. Against this backdrop, NLS launched the SMS Reference Service on 11 April 2006 as an additional convenient channel for users to pose questions. NLS has innovatively overcome the text limitation of 160 characters by delivering answers to complex enquiries through a URL link sent to the user's cellular phone. Upon opening up the URL link either through the cellular phone directly, or through a computer or PDA, the user would be able to view the full reply easily. This includes links to e-resources that are recommended to users asking the questions (Foo, Ng & Soh, 2008).

Libraries have also used Web 2.0 platform as a channel for collection development. For example, the National Library of Australia has used Flickr to expand their collection of pictures on Australia.

Social networking website provides great opportunities for Librarians to interact with their users as it places them in the digital social space of their users. The websites can be use effectively for outreach and promotion. Librarians can get first hand information about the users through interacting with them. They can then understand the behaviour of the users and design services to meet the needs of these users. Two libraries that have successfully used these social networking websites are the Hennepin County Library (HCPL) and the Public Library of Charlotte & Mecklenburg County (PLCMC). HCPL has embedded a search box in their MySpace profile to enable the users to access their collection while PLCMC features blog post as well as an embedded IM window.

Libraries are also tapping into social video such as video blogging and YouTube to create a presence at these sites. These are being used as marketing tools. One library that makes use of video blogging is the Arlington Heights Memorial Library. Videos of programmes and “What’s new” segments and interviews were posted at the site.

Podcast is now popularly used by libraries for book talk. Another prevalent use of podcast is for storytelling. For example, the Denver Public library offers podcasts of share nursery rhymes, fairy tales and children stories as recorded by the librarians. Some libraries have also used podcast to provide library instructions and information literacy programmes.

We have list some example of Web2.0 application in libraries, Libraries will have to decide on the application of Web2.0 technologies that best suits their environment and their customers. In order to embrace this technology, a logical first step would be for the library staff to learn more about the various Web2.0 technologies and best practices in libraries. There are already ready learning Web 2.0 courses available on the web. For example, the PLCMC has sponsored such a learning course and any library can adapt this free program for its use. Subsequently, new ideas to incorporating Web 2.0 technologies to provide new functions and services can emerge, evaluated and decided. Before embarking on adopting the technologies on a large scale, it is good practice and prudent to develop a prototype and build a proof of concept to test viability of the new function or service prior to a pilot and subsequent full implementation.

Library schools have an equally important role to play in this new environment. They can also help to equip new generations of librarians with competencies and skills to adopting and use Web 2.0 technologies through curriculum development and other initiatives.

Library Schools’ Response to Meet the Needs of New Age Libraries

The advent of the Internet, knowledge management, Web2.0 and Library2.0 through the 1990s and 2000s have indeed pose a significance challenge for library schools to keep pace with change and to ensure the education of information professionals be relevant and kept up to date and ensure maximum employability and effectiveness for the employers.

A study by one of the authors in 2001 paints a myriad of competencies and skill sets for information professionals as shown in Figure 1 (Hawamdeh and Foo, 2001). We note that all these competencies are still very much applicable and relevant today. In the context of Library 2.0, the emphasis has perhaps shifted more towards the segments of “Tools & Technology” and “Strategic Thinking and Analytical Skills” to be kept up-to-date of KM and IT tools (including Web 2.0 technologies) and the need to continue to create new ways to elicit information and knowledge (e.g. through social networking and collaborative OPACs) and value adding services, systems and products (e.g. through wiki-like collaborative and SMS reference services).

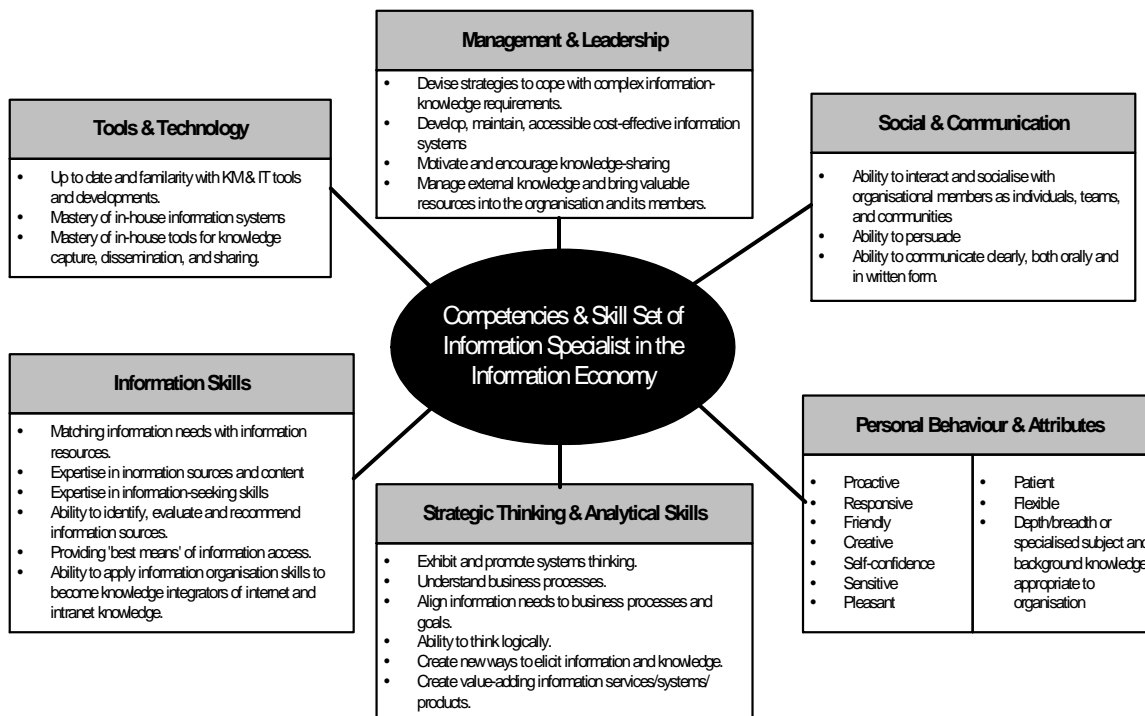


Figure 1. Competencies and skills set of information specialist in the information economy (Hawamdeh and Foo, 2001)

Likewise, the increasing established field of knowledge management study and research also created many opportunities and a need to reposition libraries (Foo, Chaudhry, Majid and Logan, 2002). Knowledge management also changed the mindset of the training of information professionals. This point to the paradigms of knowledge sharing, collaborative workgroups, social networking, etc., all of which are now better supported by Web 2.0 technologies that are increasingly and rapidly embraced in Library 2.0.

Such rapid changes and the ever increasing demands on the information professional has placed a tall (and impossible?) order on education and training, and significantly challenged library schools education around the world to produce graduates who are relevant and can thrive in the Library 2.0 environment.

Not surprisingly, we find very limited literature of Web 2.0 and library school education, as this development is so new and recent. A recent preliminary study surveyed U.S. LIS (library and information science) schools to examine the degree of adoption of Web 2.0 courses these accredited schools (Aharony, 2008). The author posits that the expansion of curriculum and integrating a Web 2.0 course may improve the image of LIS and information studies, and cope with rapid changes in the information landscape, as well as serve to improve the position of LIS programmes in comparison with other competitive programmes of study and career options. The findings suggest that LIS schools in U.S. are not adequately prepared for the rapid changes in Web technology and use. Examination of 59 websites of LIS schools indicate that only 6 (10%)

taught Web 2.0 either as a subject or covered as issues based on Web 2.0 concepts. Of 12 LIS (20%) schools that responded to the email survey, 6 schools (50%) do not offer any courses that deal with Web 2.0. Of the remaining schools, one school does not offer any course on Web 2.0, while the remaining schools touch on issues related to Web 2.0 in various subjects. A similar study done on the author's own country, Israel, also points to a limited emphasis being given to adapting Web 2.0 technologies in LIS schools although this survey suggests that these students are more familiar with the use of wikis, blogs, social networks, Flickr and RSS in contrast to U.S. counterpart students.

LIS Education at the Wee Kim Wee School of Communication and Information

LIS education in Singapore is conducted by the Division of Information Studies in the Wee Kim Wee School of Communication and Information (WKWSCI) at Nanyang Technological University since 1994. The M.Sc. (Information Studies) is the Division's flagship programme that has an annual intake of about 100 full time and part students. It is the recognised *de facto* qualification for professional librarianship practice in Singapore. To date, it has graduated more 1,000 professionals for the information industry. The Division conducts two other related M.Sc. programmes. The MSc. (Knowledge Management) programme evolved from an existing concentration in the M.Sc. (Information Studies) programme in 2002, and a new M.Sc. (Information Systems) programme was introduced in 2005. More information of the development of these programmes and information science education in Singapore can be found in a paper by Foo (2006).

The 1994 programme has gone through four rounds of curriculum revision since its inception, the last in 2004. These revisions were necessary to meet the changing environment and needs of industry: pervasiveness of electronic information, knowledge management, and first wave of Internet and web technologies. Students in the programme can either elect the 11 subject coursework-only option or the 10 subject with dissertation option. The curriculum has 30 around subjects that are structured around through four areas of concentration for better focus and training: archival informatics, information management and systems, library and information science, and school media resource management.

The Division recognised that an even more broad-based interdisciplinary programme will be demanded in future. This was concluded through competitive analyses and regular global LIS educational trend watches that indicated that the industry now require hybrid digital librarians who have skills to cover areas of library and information science, digital media and technologies, information systems and knowledge management.

As such, market forces dictate the need for flexibility to allow students to tailor a curriculum of their choice to meet their needs, so that the traditional more structured curriculum will subsequently have to co-exist with a student customised one. The present M.Sc. (Information Studies) programme, has a cross listing of subjects in the curriculum with the other two M.Sc. programmes in Knowledge Management and Information Systems, as well as the Master of Mass Communication programme (also offered by WKWSCI) and the MBA programme offered by the Nanyang Business School in the university. This is an example of a seized opportunity to enhance the effectiveness of graduate education within the school and university. Students from

these programmes are allowed to opt and replace two subjects in the curriculum with two other subjects from these other programmes, thereby opening up their available choices for selection, specialisation and education.

The Division has launched another round of curriculum review of all the M.Sc. programmes in 2007 and we can expect Web 2.0 and Library 2.0 developments to be factored fully in the review. At present, many aspects of Web 2.0 concepts, know-how and issues are already been covered in a number of existing M.Sc. subjects across the various programmes. For information studies, these include Information Sources & Searching, Information Storage & Retrieval, Internet & Web Technologies, Client-Centred Information Services, Digital Libraries and Information Portals, and Web-Based Information Systems. For knowledge management, these include Knowledge Management Technologies, Internet Technologies & Applications, and Knowledge Sources and Retrieval. For information systems, these include Internet Programming, Enterprise Applications Development, and Managing Information Systems. Such offerings, even at the present moment, provides good opportunity for students' selection from different areas of "hard" and "soft" emphases across the disciplines of information science, management and information technology.

The question of how best to teach Web 2.0 and Library 2.0 remains to be addressed. Would an introduction of a dedicated Web 2.0/Library 2.0 subject be best, or are there alternative ways to teach this more effectively?

A clue to this question can perhaps be gleaned from a recent editorial by Anderson who proposed a framework for analysis of Web 2.0, which could also be used as a basis for Web 2.0 education (Anderson, 2007). The proposed framework suggests 3 aspects:

- (1) The "visible" surface consists of more mature social software application or services such as blogs, wikis, audio blogging (podcasting), media sharing services e.g. YouTube, Flickr), social networking services (e.g. MySpace, Facebook) and data "mash-up".
- (2) Six big ideas that power Web 2.0 which provides a theoretical framework to understand current developments and evaluate future ones. These ideas include (i) individual production and user-generated content, (ii) harness power of the crowd, (iii) data on an epic scale, (iv) architecture of participation, (v) network effects, and (vi) openness.
- (3) Web technologies and standards (such as XML, AJAX, Flash, etc.)

The proposed framework can be thought of creating awareness and understanding of Web 2.0/Library 2.0 applications, developing and discussing theoretical issues in relation to Web 2.0/Library 2.0, and knowledge and know-how of IT enablers (including technology, standards and interoperability) for making the transition to Web 2.0/Library 2.0. By mapping these requirements against the list of subjects offered in the existing M.Sc. curricula mentioned previously, we can see that many of these are already covered to varying levels of extent in the present subjects offered by the Division.

It is proposed that the best way to teach Web 2.0/Library 2.0 is not through an individual dedicated subject as seemingly suggested by Aharony. One possible suggestion is to consider the proposed chain of learning paradigm or journey:

Awareness → Knowledge → Experimentation → Immersion

Awareness of applications, theoretical and practical knowledge can be covered in one introductory or a series of related subjects. The first option is effectively a Web 2.0/Library 2.0 101 (basic and foundation) course which is likely to be insufficient to cover the breadth of this development. A series of related subjects which is what is being currently offered by the Division and most LIS schools around the world should help partition the content and emphasis into logical areas and help the student acquire the knowledge over a sustained period of time.

A course in the existing information studies curriculum “Professional Seminar” seems an appropriate place to introduce and discuss the theoretical aspects of the proposed framework. “Professional Seminar” is a series of seminars designed to provide an overview of the areas relating to the field of information studies. These seminars cover three main themes: professional practice, technological trends, and innovative industry applications. Speakers who are drawn, from industry and professional organisations can provide a stimulating environment for knowledge delivery, class discussion, debates and further study. The latter could be further developed into assignments, such as individual or group term papers, if necessary, to reinforce areas and stimulate further research and study.

In terms of further exposure and experimentation, the Division can enhance its use of the existing university eLearning environment, edveNTUure, to create blogs and wikis for participation and discussion in generic or subject specific areas. It can also consider making it compulsory for students in the class to register in one of the social networking sites as a means to cultivate student-to-student and teacher-to-student sharing, discussions, and engagement in social activities virtually beyond the classroom. Students must register for RSS feeds to ensure they have constant alerts and updates of relevant literature and readings for their subjects of study.

Such forms of Web 2.0/Library 2.0 exposure over a sustained period of time would help students develop awareness, skills, competencies and familiarity prior to joining the industry upon graduation. Another possibility that is currently being explored by the Division is to consider professional internship programmes with industry. Here, students have the opportunity to work with their future peers in various organisations, immerse in real life situations and have first-hand experience with live Library 2.0 and other initiatives. It gives them opportunities to contribute, to hone their skills, and makes learning even more meaningful upon their return to the university to complete the programme. From the organisation’s point of view, internship provides an opportunity to evaluate and recruit potential employees, boost additional manpower to supplement existing staff, elicit fresh ideas and perspective from students, and fulfilling their social responsibility by working with the Division to train future information professionals.

Conclusion

Web 2.0 and Library 2.0 is yet another wave of rapid development driven by user-centred change that revolutionise and evolves libraries to deliver a new range of functions and services to meet the varying and new demands of its web savvy users. Library 2.0 encourages constant and purposeful change, engages users in the creation of physical and virtual products and services

that are being constantly evaluated through feedback, contribution and conversations. Many libraries around the world have embraced these changes quickly and we now witness a proliferation of new services and functionalities that are unheard of three years ago.

Nonetheless, library schools in general, have not kept pace with these changes – they have been slow to react and update their curriculum. There is a need for library schools to act promptly to ensure the gap is closed quickly so that their graduates remain relevant to industry. A number of ways to incorporate Web 2.0 and Library 2.0 education is proposed. We should expect to see a quick response by forward-looking library schools to review and adjust their programme and integrate this aspect of education in the near future.

References

- Aharony, N. (2008). Web 2.0 in U.S. LIS schools: Are they missing the boat? *Ariadne*, 54, January. Accessed April 22 2008, from <http://www.ariadne.ac.uk/issue54/aharony/>.
- Anderson, P. (2007). All that glitters is not gold: Web 2.0 and the librarian. *Journal of Librarianship and Information Science*, 39(4), 195-198.
- Casey, M. (2006). LibraryCrunch: Bringing you a Library 2.0 perspective. Accessed April 13 2008, from <http://www.librarycrunch.com/>.
- Casey, M. (2007). "Looking toward Catalog 2.0" in *Library 2.0 and beyond: Innovative technologies and tomorrow's user*. London, Libraries Unlimited.
- Foo, S. (2006). Developments in information science education at the School of Communication and Information, Nanyang Technological University, Singapore. *Proc. of 2006 Annual Symposium of Research Center for Knowledge Communities: New directions for information science education in the networked information society*, University of Tsukuba, Tsukuba, Ibaraki, Japan, March 9, 30-36.
- Foo, S., Chaudhry, A.S., Majid, S.M., & Logan, E. (2002). Academic libraries in transition: Challenges ahead. *Proc. World Library Summit, Keynote address: Academic Library Seminar*, National Library Board, Singapore, April 22-26.
- Foo, S., Ng, H., & Soh, A. (2008). Going virtual for enhance experience: A case study of National Library of Singapore, *Proc. VALA 2008 14th Biennial Conference*, Melbourne, Australia, February 5-7, Accessed April 22 2008, from http://www.valaconf.org.au/vala2008/papers2008/151_Foo_Keynote_Final.pdf.
- Hawamdeh, S., & Foo, S. (2001). Information professionals in the information age: Vital skills and competencies. *Proc. International Conference for Library and Information Science Educators in the Asia Pacific Region (ICLISE 2001)*, Kuala Lumpur, Malaysia, June 11-12.

Maness, J. M. (2006) Library 2.0 Theory: Web 2.0 and its implication for libraries. Accessed April 13 2008, from <http://www.webology.ir/2006/v3n2/a25.html>.

Miller, P. (2005). Web 2.0: Building the New Library, Accessed April 13 2008, from <http://www.ariadne.ac.uk/issue45/miller/>.

O'Reilly, T. (2005a). What is Web 2.0? Retrieved April 13 2008, from <http://www.oreilynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html#mememap>.

O'Reilly, T. (2005). Web 2.0: Compact definition. Accessed April 13 2008, from <http://radar.oreilly.com/archives/2005/10/web-20-compact-definition.html>.

Rainie, L. (2006). "Digital Natives: How today's youth are different from their 'digital immigrant' elders and what they meant for libraries" Presentation for Metro-New York Library /council, October 27, 2006. Accessed April 13 2008, from http://www.pewinternet.org/PPF/r/71/presentation_display.asp.

Rethlefsen, M.L. (2007). Tags help make libraries Del.icio.us: social bookmarking and tagging. Accessed April 13 2008, from <http://www.libraryjournal.com/article/CA6476403.html>.