Diffusion of innovation: Web 2.0

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Over the past ten years the Internet has transitioned from Web 1.0, which was primarily a place to search and download information, to a virtual place where people can interact with each other to collaborate and build communities of practice around topics of shared interest. These changes were made possible by the development of social software tools such as wikis, blogs, podcasts and discussion forums that can harness the collective intelligence of the users (O'Reilly, 2005) thus the transition to Web 2.0 occurred.

The steady diffusion of innovation using Web 2.0 tools by sectors such as business, education and politics has not been shared by healthcare but this is now changing (Kamel Boulos & Wheeler, 2007; McLean, Richards & Wardman, 2007; Seeman, 2008). Hamilton and Penman (in press) identify several factors that may explain the slow uptake of online "social software" tools by healthcare practitioners, including:

1. The healthcare workplace culture values direct client contact (McCluskey & Cusick, 2002) in preference to time spent on professional development.
2. Many health care settings limit access to computers and the Internet at work (McCluskey, 2003; Schaper & Pervan, 2007).
3. Ongoing professional development is seen as a personal responsibility (Jantzen, 2008), not the employer's responsibility (Townsend, Sheffield, Stadnyk & Beagan, 2006).
4. Confidentiality, professionalism and self-protectionism concern healthcare practitioners and may lead them to be sceptical about using Web 2.0 tools in practice (Baerlocher & Detsky, 2008).

The Internet has become a virtual place for information sharing and knowledge transfer beyond traditional methods such as books and journals. Web 2.0, with its capacity to connect students, practitioners, researchers and the public, is in a unique position to connect day to day questions with formal research and can assist healthcare practitioners to develop knowledge from multiple perspectives (Gwozdek, Klausner & Kerschbaum, 2008; Lowry, Curtis & Lowry, 2004). Although healthcare is behind other sectors in adopting Web 2.0 tools for practice, best practice models are emerging (Kamel Boulos & Wheeler, 2007; Seeman, 2008) with early adopters of online technology across all healthcare professions identifying the importance of Web 2.0 in the future of healthcare education and practice (Hamilton & Penman, in press). Pioneers are advocating for the utilisation of Web 2.0 tools such as wikis, blogs and podcasts created for and by healthcare practitioners (Barsky & Giustini, 2008; Kamel Boulos & Wheeler, 2007; McLean et al; Potts, 2006; Schembri, 2008).

Reliability of online information

Many practitioners have limited access to accepted sources of information such as a university library, therefore a growing number are turning to Internet resources to investigate practice-based questions. Concerns surrounding the trustworthiness of online information in blogs, wikis and podcasts have lead to the creation of guidelines for ethical development of online healthcare resources (Letendre, 2008). Examples of such guidelines include Healthcare Blogger Code of Ethics (Figure 1) and the HONcode (Figure 2).

Creating a code for ethical conduct online addresses some of the concerns that healthcare practitioners have around trustworthiness and professionalism. However, scepticism is healthy and all consumers of online healthcare information and evidence need to consider the source of information they plan to use. If using information from a wiki or a blog it is wise to check if they have been approved to display either of these logos on their site. Other indicators of trustworthiness include citing sources of information. Information obtained from blogs, wikis, or podcasts that do not identify their sources of information need to be considered as one person or group's opinion only and not peer-reviewed in the formal sense. Rigorous debate is now occurring among supporters of Web 2.0 who state that blogs and wikis that encourage open comment and review are in fact subject to peer-review.

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Applying Web 2.0 tools in healthcare education

Healthcare educators and professionals are discovering, exploring and using the freely available Web 2.0 tools in order to find, store, share, create and promote healthcare information (Seeman, 2008). Web 2.0 tools are summarized in the Web 2.0 tools summary table (Table 1) below.

Wikis for community projects

A wiki is a collection of linked web pages that are able to be contributed to, edited or updated by its users (Kamel Boulos & Wheeler, 2007). Wiki means "hurry" in the Hawaiian language (McLean et al., 2007) and is an example of software that facilitates collaborative writing. Wikis can include text, pictures, video, audio, links to its own wiki pages, Internet links, RSS feeds and the list grows as technology advances. The

Web 2.0 tool	Description	Tools to get started
Blog	A blog (or weblog) is a website where items are posted on a regular basis with the most recent posts at the top. Usually a blog is about a single topic or theme.	Blogger Wordpress
Collaborative writing	Collaborative writing tools facilitate editing and reviewing of a text document by multiple individuals either in real-time or asynchronously.	Google Documents Zoho Writer
Online scholarly databases	A freely-accessible Web search engine that indexes the full text of scholarly literature across an array of publishing formats and disciplines.	Pubmed BMJ Google Scholar
Multi User Virtual World	Virtual world where the user is represented by an avatar and can interact with other avatars in a 3D virtual environment.	Second Life (SL) Croquet Project
Personalized homepages	A personalized homepage lets you assemble all your favourite widgets such as notepages, feeds, social networks, email, videos and blogs on one fully-customizable page.	iGoogle myYahoo
Podcast	A podcast is a series of audio or video digital-media files which is distributed over the Internet by syndicated download (RSS), through Web feeds, to portable media players and personal computers.	CNET Podcast Central Podcast.com YouTube
Photosharing	Photosharing is the publishing or transfer of a user's digital photos online, thus enabling the user to share them with others (whether publicly or privately).	flickr Picasa
Social bookmarking	Users save links to web pages that they want to remember and/or share. These bookmarks are usually public, but can be saved privately or shared with specified people or groups.	Delicious CiteULike
Syndication (RSS) feeds	You can subscribe to syndicated web feeds so that the Internet updates you, you don't have to remember to check for updates for your favourite blogs or websites.	Google Reader MedReader Bloglines
Social network sites	Online communities of people who share interests and activities, or who are interested in exploring the interests and activities of others.	Facebook MySpace Bebo Ning
Voice over Internet Protocol (VoIP) & Synchronous Communications	VoIP services convert voice into a digital signal that travels over the Internet to a computer or a phone or another computer.	Google talk AOL Instasnt messaging Gizmo5
Wiki	A wiki is an interactive Web page designed to enable anyone who accesses it to contribute or modify content.	Mediawiki PBWiki Wikispaces

most well known wiki is Wikipedia, this is an open wiki which means it can be modified by anyone. Wikipedia is sometimes criticised in as being unreliable however a comparison made with the online Encyclopaedia Britannica showed the accuracy to be very similar (Giles, 2005, as cited in McLean, et al, 2007, p.175). Wikis can have different levels of access such as reader, writer, editor or administrator. An important feature is that wikis have a "history" tool which allows the administrators of a wiki to see who contributed what and when, and even "roll back" to previous versions of the wiki. This is useful if an unwelcome contribution (spamming) or accidental edit has been made. For a quick overview of how wikis work visit this link to watch a short video (http://www.commoncraft.com/video-wikis-plain-english).

Wikis are an example of a Web 2.0 tool that can be easily and effectively incorporated into healthcare practice. They are useful for tasks that require collaboration by a group of people, for example development of a community resource.

Diffusion of Innovation

The successful development of a community resource wiki would depict the process defined by Everett Rogers as diffusion of innovation (2003). Rogers explains that the key elements for successful diffusion of innovation include an idea (innovation), communication channels, time and a social system. The concept of using a wiki is still considered novel in healthcare however the diffusion of innovation to use a wiki to create an online community resource can be successful if the key elements identified by Rogers (2003) are in place when the project begins. These elements are:

- An idea: to create an specific, needed community resource;
- Communication channels: meetings, focus groups and the wiki;
- The social system: the stakeholders, the experts, the user-groups;
- Time: created through paid positions where the role can be to frame and develop the wiki and communicate with the key informants.

Conclusion

The diffusion of innovation through Web 2.0 tools such as wikis and blogs has not been as widely adopted in healthcare practice in comparison with sectors such as business, education and politics, however this is beginning to change. Web 2.0 tools have the capacity to connect students, practitioners, researchers and the public around shared topics of interest to develop and share knowledge from multiple perspectives and can be easily and effectively incorporated into healthcare practice. They are useful for tasks that require collaboration by a group of people, for example the development of an interactive community resource that can provide reliable information.

Editor's Note:

Watch for an upcoming paper in this column that describes the successful creation of an interactive community resource wiki by two students from the University of Alberta.

References

Baerlocher, M.O. & Detsky, A.S. (2008). Online medical blogging: Don't do it! CMAJ, 179(3), 292.

Barsky, E. & Giustini, D. (2008). Web 2.0 in Physical Therapy: A Practical Overview. Physiotherapy Canada, 60(3), 207-214.

Gwozdek, A. E., Klausner, C. P., & Kerschbaum, W. E. (2008). The utilization of Computer Mediated Communication for case study collaboration. Journal of Dental Hygiene, 82(1), 1-10.

Hamilton, A. & Penman, M. (In press). Using Web 2.0 tools to optimise fieldwork learning. In K. Stagnitti, A. Schoo. and D. Welch (Eds.). Clinical Placement and Fieldwork Education. Melbourne: Oxford University Press.

Jantzen, D. (2008). Reframing professional development for first-line nurses. Nursing Inquiry, 15(1), 21–29.

Kamel Boulous, M.N., Wheeler, S. (2007). The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education. Health Information and Libraries Journal, 24, 2-23.

Letendre, P. (2008). Perils and joys of blogging {Electronic letter to the editor]. CMAJ. Retrieved from http://www.cmaj.ca/cgi/eletters/179/3/292#19949.

Lowry, P. B., Curtis, A. & Lowry, M. R. (2004) Building a taxonomy and nomenclature of collaborative writing to improve interdisciplinary research and practice. Journal of Business Communication, 41, 66-99.

McCluskey, A. (2003). Occupational therapists report a low level of knowledge, skill and involvement in evidence-based practice. Australian Occupational Therapy Journal, 50, 3-12.

McCluskey, A. & Cusick, A. (2002). Strategies for introducing evidence-based practice and changing clinician behaviour: A manager's toolbox. Australian Occupational Therapy Journal, 49, 63–70

McLean, R., Richards, B.H., & Wardman, J. I. (2007). The effect of Web 2.0 on the future of medical practice and education Darwikinian evolution or folksonomic revolution? MJA. 187(3), 174-177.

O'Reilly, T. (2005). What is Web 2.0? Design patterns and business models for the next generation of software. Retrieved from http://oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html.

Potts, H. W. W. (2006). Is E-health progressing faster than E-health researchers? [Electronic Version]. Journal of Medical Internet Research, 8. Retrieved May 1, 2008 from http://www.jmir.org/2006/3/e24/.

Schaper, L. & Pervan, G. (2007). ICT and OTs: A model of information and communication technology acceptance and utilisation by occupational therapists (Part 2). International Journal of Medical Informatics, 76, 212-221.

Schembri, A. M.(2008). www.why-social-workers-need-to-embrace-Web2.0.com.au, Australian Social Work, 61(2), 119-123.

Seeman, N. (2008). Web 2.0 and Chronic Illness: New Horizons, New Opportunities [Electronic Version]. Healthcare Quarterly, 6, 104-110. Retrieved from http://www.electronichealthcare.net.

Townsend, E., Sheffield, S., Stadnyk, R., & Beagan, B. (2006). Effects of workplace policy on continuing professional development: the case of occupational therapy in Nova Scotia, Canada. Canadian Journal of Occupational Therapy, 73(2), 98-108.