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Towards Health Informatics 2.0: Blogs, Podcasts and Web 2.0 Applications in Nursing and Health Informatics Education and Professional Collaboration

A discussion paper

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Abstract

Health professionals and students are expected to be proficient in basic information technology so as to mitigate error, communicate effectively, manage information and collaborate with peers. Web 2.0 applications such as blogs, podcasts and wikis are social networking tools that may enhance health professionals' development of such skills. As Web 2.0 application use by health professionals is in its infancy, the purpose of this paper is to present examples of the use of such tools that hold potential for online and mobile information dissemination, knowledge building in education, and professional collaboration. Examples based in a collaborative model of virtual conference interaction, and in the use of blogs and podcasts within nursing education, are discussed. The paper concludes by seeking to promote debate on the possible development of Web 2.0 tools specific to health informatics, and so developing the next generation of health informatics, 'Health Informatics 2.0'.

Keywords: *Learning, Experiential; Educational Technologies; Education, Distance; Open Collaborative Platforms, social networking*

Introduction

This paper is based in the authors' and colleagues' use of web-based tools that facilitate online and mobile information provision, knowledge generation and virtual interaction. Blogs and podcasts are among the many applications supporting forms of social networking that are collectively described under the umbrella of Web 2.0 [1]. The authors are implementing applications and researching their use

within nursing and education contexts [2, 3], and also for the development of new collaborative models of providing virtual interaction with health informatics events and opportunities for continuing professional development [4, 5].

The essential features of Web 2.0 are described, together with a brief overview of the ongoing debate on the nature of the phenomenon. The basic features of blogs and podcasts are presented and examples of their use within formal educational contexts and the informal educational opportunities offered by conferences are discussed. Some of the emerging theories to explain the group interaction seen are introduced (e.g., 'smart mobs' [6] and 'connectivism' [7]). The paper concludes with a brief discussion of the potential that Web 2.0 applications might offer for changes to health informatics practice, as a means to stimulating wider discussion of the subject.

What is Web 2.0?

While the Web 2.0 meme has become widespread, some argue that it is not sufficiently defined, and there is little real understanding of what it means. It is described by Wikipedia [8] as 'a second phase of development of the World Wide Web, including its architecture and its applications' and its origin attributed to O'Reilly [1]. However, the lack of widespread consensus leads skeptics to argue that the term is little more than a buzzword, and that it means whatever its proponents want it to mean in order to convince users and the media that they are creating something fundamentally new, rather than continuing to develop and use well-established technologies.

According to Daniel [9], Web 2.0 websites are different from those of early web development, retroactively labeled Web 1.0, and designed to deliver applications to end-users, rather than being static.

Their content is characterised by open communication, decentralised authority, and freedom to share and re-use materials, across a more dynamic, interlinked and interactive World Wide Web. Among the technologies that are seen as contributing to Web 2.0 are blogs (weblogs) [10], wikis [11], podcasts [12], RSS (Really Simple Syndication) [13] feeds and other methods of providing many-to-many publication and communication. Social networking and social educational applications [14], which facilitate interaction and collaboration, are also a central component of Web 2.0. Zambonini [15] sees Web 2.0 as 'all about people', with the precise technologies used to achieve this being of secondary consideration, and becoming increasingly transparent. The collaborative aspects of the tools being explored are key elements in the authors' interests in them.

Blogs, podcasts and wikis as Web 2.0 applications

Exploring new technologies that enable efficient and effective written communication and professional collaboration is critical in today's educational and clinical settings. The US Institute of Medicine [16] recommends that health professionals be trained to use informatics in order to 'communicate, manage knowledge, mitigate error, and support decision making using information technology'. Web 2.0 applications such as blogs, podcasts and wikis provide tools to support achieving these aims.

Blogs (or 'weblogs') are web-based writing tools, first created in the late 1990s, which facilitate the dissemination of information and create an arena for social networking. Winer [17] describes blogs as "a hierarchy of text, images, media objects and data, arranged chronologically, that can be viewed in an HTML browser". Blogging is a form of reverse chronological public journaling that provides a comment capability. A blog is usually edited, organised and published using a Content Management System (CMS), many of are built with Linux/Apache/MySQL/PHP (LAMP) architecture [18]. Applications such as *Blogger* (www.blogger.com) and *WordPress* (www.wordpress.com) provide an intuitive environment for creative construction of a blog. An increasing number of applications are available to link or aggregate posts from different blogs having similar subjects, using either permalinks or tags, as for example the use of Technorati tags (www.technorati.com).

Information delivery and personal expression is not limited to written text, but increasingly via personal audio broadcasting in forms that are easy to learn,

create, and share online [19]. Podcasting, a portmanteau of 'broadcasting' and 'iPod' (Apple Computer's MP3 player), is an Internet-based MP3 audio event, conversation, lecture, song, or speech that is distributed via RSS feed. The podcast may be heard from a computer's desktop (via most common audio software) or from a MP3 player via free podcatching software, such as Apple iTunes or iPodder. The audio content may provide many creative opportunities for truly 'any time, any place' distance education. Enhanced podcasting, a relatively new addition to personal broadcasting, includes text, chapters, images and video. Software packages, such as Podcast Maker and Apple iLife06, are available for the user who wishes to create podcasts that also include images, animation and text.

Wikis are dynamic, group-developed web pages that can be easily created and accessed via an Internet browser, and the content may be updated or changed by anyone visiting the website. Wikis allow for asynchronous group socialisation, communication and collaboration and a tool for archiving documents, brainstorming, and collaborative writing. Among the most well-known wikis are Wikipedia (www.wikipedia.org/wiki/Main_Page), the online editable encyclopedia, and Wikinews (www.wikinews.org/wiki/Health). An enhanced form of a wiki is illustrated by *Writely* (www.writely.com), according to Valenza [20] one of the top 10 technology applications affecting education in 2005, which allows anyone to compose online and collaborate (write and edit) with others in real time.

The use and value of Web 2.0 tool in education

Web 2.0 tools are considered social networking software, and afford connection and collaboration among individuals who wish to affiliate with one another. These tools may be of value in nursing and medical education because they encourage students to write, review, edit, comment on each other's work and archive reference materials within a free online database. Students may use their own voices to deliver group projects, collaborate with peers, develop social and language skills, and provide audio feedback to one another. For example, podcasting may be used by students to provide interviews, photographs and videos in a specific field of interest (e.g. community health) to classmates, instructors and future employers. Multimedia may be added to the students' projects and distributed to other learners worldwide. These tools offer open information and the potential development of knowledge for everyone. The gathering of research data may be enhanced by using a MP3 player and a microphone; such as focus

groups, nursing narratives, and individual interviews. In addition, the pedagogical underpinnings of blogs, podcasts and wikis are important to consider when developing student centered learning objectives. Moreover, the use of these software programs may assist with student reflection (clinical blogs) after caring for patients in the clinical setting.

At present, there is little academic or research-based literature on the use of blogs within education, especially from the health or nursing domains, but substantial amounts of non-refereed 'popular' material [21]. Most bloggers, it would seem, even within the academic domain, are more interested in exploring their practical use than in speculation and discussion of theoretical contexts. Maag [3] has explored the potential use of blogs within nurse education, and cites examples of small-scale evaluations within other educational contexts, for teaching and research purposes. Her conclusion is that they can 'enhance health professionals' writing, communication, collaboration, reading, and information-gathering skills'. Other practical examples support the use of blogs within education [22, 23] for professional development, sharing information, interacting as part of a learning community and building an open knowledge base.

These technological tools have an educational value because they are convenient to use, ubiquitous, primarily open-source software, lead to social engagement, professional collaboration, peer feedback and foster a sense of a 'learning community'. Within any novel developments, the question arises of why we are using them, and whether they are effective instruments of enhanced learning. While theoretical analyses are at an early stage, the theoretical underpinnings that support the use of these tools include Paivio's Mental Representations [24] and Mayer's Multimedia Learning Theory [25]. The creation of enhanced podcasts taps into the learner's auditory and visual channels for dual coding, while by sharing the enhanced podcasts with others and having students develop their own, Siemens Connectivism [7] theory is being enacted.

Students can be actively involved in the construction of knowledge and connection with peers in educational settings, both online and face-to-face. Instructors may interview colleagues about best practices in nursing education [19] and easily turn the information around and share the expert opinions of others on the web for commentary feedback. Presentations at professional meetings may be recorded and uploaded as podcasts for colleagues who were not able to travel and attend the conference. Attendees may be interviewed during a conference in

order to provide feedback to the organizers of the meeting. Another valuable use of podcasting is the delivery of continuing education for healthcare providers, e.g. through creating a downloadable enhanced podcast that delivers quality audio, video, and transcribed text. In the clinical setting, the video/audio MP3 player may be used for patient instruction, delivery of relaxing music and imagery to alleviate patients' anxiety, and a healthcare provider's instructions for home care.

Blogs for virtual conference participation

Murray, Ward and others [4, 5, 26] have described the development of an innovative approach to reporting on and encouraging virtual participation in health informatics conferences through the use of blogs. The collaborative model being developed purposely differs from the common form of single-author blog or conference report. It provides an environment for the health informatics community to engage with formal and informal professional development activities previously only available to the limited numbers able to attend such events. Conference blogs can be mechanisms for providing information and for interacting with online communities comprising the members of the sponsoring health informatics organisations and wider constituencies of interest. These online communities could then share resources or knowledge, develop tools to support interaction and dissemination, or seek to improve benefits to patients and improve health and healthcare. The approach has been developed for several international nursing informatics and health informatics events during 2004-06, and the basic model refined with the addition of other Web 2.0 tools to encourage interaction and participation.

An integration of a range of Web 2.0 applications, which provides a seamless combination of content from more than one source into an integrated experience, and referred to as a 'mashup' [27] provides opportunities to expand the levels of interaction with educational and conference blogs, taking them beyond simple text-based reporting and comments. For the UK's HC2006 health informatics conference, tools were incorporated that provide automatic text-to-speech production of audio files for each blog post, which are then available as podcasts (www.differance-engine.net/HC2006blog). These developments will be evaluated and reported elsewhere, together with the use of other applications that can be added to blogs, so as to explore the potential for creating genuine, even if sometimes short-lived, communities of interest or communities of practice around health informatics events.

The relevance of Web 2.0 to health informatics

The questions always exist for any general application, i.e. one not specifically developed for health informatics uses, as to how health informaticians can make use of them within their practice, education, or research, and whether applications specific to health informatics can be developed. At present, we believe the latter question cannot be answered, but must rely on further exploration of the former. We have focused in this paper on just three of the rapidly growing number of Web 2.0 applications. As part of an informal international collaborative team (www.hi-blogs.info), the authors have been actively involved in trialing several Web 2.0 applications within nursing and health informatics. We intend to build on these experiences to explore the potential of tailoring existing and new generic Web 2.0 applications within nursing and health informatics, as well as examining the possibilities for specific nursing and health informatics developments utilising Web 2.0 principles.

In their original brainstorming of the differences between Web 1.0 and Web 2.0, O'Reilly and colleagues developed the listing in Table 1.

Table 1. Adapted from O'Reilly [1]

Web 1.0	Web 2.0
Ofoto	--> Flickr
Akamai	--> BitTorrent
Britannica Online	--> Wikipedia
personal websites	--> blogging
domain name	--> search engine
speculation	--> optimization
screen scraping	--> web services
publishing	--> participation
content management systems	--> wikis
directories (taxonomy)	--> tagging ("folksonomy")
stickiness	--> syndication

If we consider briefly how some of these ideas might be applied within the health domain, we can readily see several potential implications for some of the major components of the discipline of health informatics. The development of the concept that some people call 'folksonomy' [28] (in contrast to taxonomy), is a style of collaborative categorization of sites using freely chosen keywords, often referred to as tags. Such tagging allows for, and is even dependent on, the kind of multiple, overlapping associations that the brain itself uses, rather than rigid categories. The development of health informatics

folksonomies could potentially challenge, or even supersede and make redundant, the many taxonomies that have been developed within nursing informatics and health informatics. It has been suggested that folksonomy could provide for development of a true semantic web [28].

In many countries today, we hear at least the rhetoric of governments seeking to develop 'patient-centred' health services and individualised electronic health records. Many Web 2.0 applications offer the possibility of achieving personalisation outside of silo-like structures, and of patients genuinely creating and controlling their own records. They facilitate personalised and customisable searches for health information, e.g. through 'swikis' [29], a search engine development that allows for focused searches that can 'evolve' over time according to the needs of the community.

Conclusion

According to students' feedback [30], Web 2.0 social networking tools are enjoyable to use, accessible for the majority of learners, and dovetail with novel pedagogical theories. Early, as yet unpublished, evaluation of the use of conference blogs shows benefits to users. Some of the challenges faced when considering the use of these leading edge tools are bridging the digital divide, effectiveness as a learning modality, meeting the needs of all learners and users, quality versus quantity, and faculty buy-in for these new teaching and collaborative tools. There is a need for more empirical studies to be conducted in order to determine the effectiveness of these applications and a willing openness to consider and learn about other emerging technological tools that hold great potential for educational, professional, and collaborative purposes. According to the Horizon Report [31], technological learning tools that will emerge as powerful learning applications are cell phones, educational gaming, augmented reality and enhanced visualizations, and context-aware environments and devices. It is truly a wonderful era for healthcare educators, collaborators, and professionals to adopt technological tools that may be applied to learning, teaching, and artistic expression. We may also be on the verge of a new series of approaches to addressing some of the thornier problems of health informatics, and the development of 'Health Informatics 2.0'.

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