The impact of web 2.0 on research practices

Social academia

Since the emergence of the web 15 years ago, information and communication technologies (ICTs) have become indispensable for most researchers. Email and online access to public or restricted databases have become essential tools, allowing academics to keep in touch with their peers and up to date with the latest developments. Widely dispersed research groups can now easily coordinate their work online by means of Skype conference calls.

Within some sections of the academic community there is considerable hesitation to adopt web 2.0 applications for social networking through blogs, wikis, twitter and sites such as Facebook and YouTube. Granted, some academics, including a few professors, now write personal blogs, but in general, researchers seem reluctant to enter the realm of social networks, and to start using web 2.0 tools for producing collaborative reports, sharing work in progress or publishing their results.

There are perhaps three major obstacles. First, the formal system of peer review to guarantee the quality of research is at odds with the informal and much more open ways of communicating via online social networks. The second obstacle is the 'publish or perish' rule – researchers must publish in peer-reviewed subscription journals in order to further their academic careers. This does not fit well with philosophy behind social networking that all knowledge should be freely available. Finally, the ambition of all researchers to publish their findings before anyone else, and to secure potentially profitable intellectual property rights, discourages them from sharing work in progress on platforms that are open to all.

In this special report, Janelle Ward examines two web 2.0 applications, blogs and wikis, that are slowly gaining acceptance among academics. *The Broker* wishes to open a discussion on the processes of generating and publishing knowledge in the web 2.0 era. In particular, *The Broker* will address whether the principles and applications of web 2.0 could contribute to greater inclusion and higher-quality research or represent a distraction that may dilute the quality of research, and whether a divide is in the making between researchers of the web 2.0 generation and the academic establishment.



The challenges of social media

Rewriting research

A growing number of academics are using web 2.0 tools such as blogs and wikis to share their findings, discuss new developments, and find new ways for collaborative research. How does this open and informal medium fit with traditional academic processes? Although there are still some significant hurdles to be overcome, as well as doubts, web 2.0 represents more than just a new technology. Its widespread use, including by academics, may offer solutions to many existing problems, as well as open up new prospects for communicating research.

A cademics have long operated within a system of peer-reviewed scholarship. The research process is seen as incomplete until a group of anonymous experts has commented on and approved a paper prepared according to specific criteria. Only then can the work be published in an academic journal. Publishing a piece of research in such a way demonstrates the author's legitimacy within a community of scholars, and such publications are the basis for advancement in any academic field.

But as academics embrace the opportunities offered by web 2.0 applications for social networking, especially blogs and wikis, are they about to shake up this traditional system?

Academic blogging

The term 'web log' was coined by blogging pioneer Jorn Barger, editor of the influential blog 'Robot Wisdom', who described it as a web page where a blogger 'logs' other web pages she finds interesting. They may be personal or group web pages that are regularly updated, often with fairly brief postings.

Blogging is online self-publication, and a blog has a potential audience ranging from zero to millions. There is no peer review, no editor, and spell checking is optional. But certain rules do govern the world of blogging, and there are parallels between success in academia and success as a blogger. In order to examine the world of academic blogging, it is first necessary to understand how such blogs are constructed, who is blogging, and why.

By **Janelle Ward**, assistant professor in the Department of Media and Communication at Erasmus University, Rotterdam, the Netherlands.

Jill Walker of the University of Bergen, Norway, has identified three types of research blogs, noting that some are closer to traditional forms of academic publication than others. Blogs of the first type are aimed at what she calls public intellectuals, and are forums for social debate based on theories of political science, feminism, media analysis, and so on. Blogs of the second type are used as research logs, and serve as 'a record of research conducted and ideas that might be pursued'. Such blogs have traditional roots, and are similar to a sociologist's notebook or a laboratory scientist's record of experiments. The third type includes pseudonymous blogs about academic life' that frequently demonstrate 'a tongue in cheek refusal to revere the ivory tower experience'. In such blogs, researchers tend not to focus on their work, but to discuss personal aspects of academic life.

Web 2.0: harnessing collective intelligence

Web 2.0 is a loose collection of 'second-generation' web-based technologies and services designed to facilitate collaboration and sharing between users. Web 2.0 applications include blogs and wikis, as well as social networking sites such as twitter, YouTube and Facebook that encourage user-generated content.

Web 2.0 is not about centralized control and static web pages; rather, it sees users as co-developers and co-creators. Tim O'Reilly, founder of O'Reilly Media, believes that the real value of web 2.0 tools lies in their ability to harness the collective intelligence of many individuals, which is the driving force behind Wikipedia. Other applications include RSS (really simple syndication), which allows users to subscribe to a 'feed' from a website and automatically receive updates to its content.



Perhaps the most important function of academic blogs, says Adam Kotsko of the Chicago Theological Seminary, is that they fill a role analogous to the political blogs that link to and comment on particular news stories; that is, bringing new scholarly research to the attention of an interdisciplinary audience.

While it is generally assumed that academic blogs are written and maintained by individuals, there are also group blogs. A group blog can sometimes serve as a newsletter for members of the blogging community, offering reviews of recent articles and books, as well as spreading the word about conferences or grant opportunities.

In a recent study of 12 group blogs, María José Luzón of the University of Zaragoza, Spain, found that they served a number of purposes, including publicizing the group and its research. They helped to create a sense of community,

increasing opportunities for collaboration and providing a social outlet for members. The blogs were also used to make research available to the public, often to obtain feedback. Academics do this by writing about their ongoing research, sometimes in an attempt to improve the quality of their articles before submitting them for publication, or even afterwards. In June 2009, World Bank economist Charles Kenny posted the draft of a complete book on his blog, together with a request for comments and suggestions for improvement.

Who are academic bloggers?

It is difficult to estimate how many academics are active bloggers. Anecdotal information indicates that academic bloggers are a blend of researchers at the start of their careers, mid-level professionals and 'big shots'– tenured professors with perhaps more to say and little to lose.

ResearchBlogging.org: beyond peer review?

One example of a successful blogging community is ResearchBlogging. org, which 'strives to identify serious academic blog posts about peer-reviewed research, with an aggregation site where others can look to find the best academic blogging on the Net'.

Bloggers who wish to be included on the site register their blogs and select a variety of tags, or labels, describing their content (such as engineering, health, social sciences, etc.). The result is a large community of academics often post summaries of recent research and add their own commentaries, which ResearchBlogging.org posts on its homepage. Because the site pools together knowledge from a variety of disciplines at a central location, it may be especially useful for those involved in cross-disciplinary research. In a recent post, Dave Munger, the site administrator, discusses a number of scenarios regarding the criteria for blog posts published on the site. At present, all posts must discuss peer-reviewed research. This means that bloggers are not recognized (i.e. their content is not aggregated) for writing about research that has not been published in formal academic journals. This presents an interesting conundrum, as sites like Researchblogging.org want to make new research results available to a wide community of scholars. When Munger opened the discussion on twitter, some respondents offered enthusiastic support, while others expressed concerns about distinguishing preprints from peer-reviewed research, and that the site's overall mission might be diluted.

>

In 2007 Gina Walejko, of Northwestern University in Chicago, carried out an online survey of US-based academic bloggers. In her sample, which was drawn from the 'blogroll' (a list of links to other blogs) of the site Crooked Timber, and excluded graduate students, Walejko found that 50% of the 197 respondents were tenured; 57% were male; 44% worked in the humanities and only 14% in the social sciences.

When asked why they blog, 91% of survey respondents said they were motivated by intellectual stimulation and discussion; 73% enjoyed the opportunity to test their ideas and share them with non-academics; and 64% were interested in building an online community.^b Clearly, academics see benefits to their blogging that go beyond traditional academic rewards, such as obtaining feedback on their research ideas, and creating a network of like-minded scholars across the globe.

The focus of academic blogging often goes beyond research itself, to look at the struggles of academic life. This personal level of writing can help to create a support community. The *Chronicle of Higher Education*, a magazine and website for US academics, for example, has compiled a selection of blogs that it describes as featuring 'occasional discussions about academic life, careers and the job market'.

Other academics see their online contributions as part of their work, regardless of whether their employers encourage the activity. Torill Mortensen, of Volda College, Norway, describes the contents of her blog as 'media studies, readerresponse theory, role-play games, Internet culture, travel, academic weirdness and online communication put together at random'. Mortensen provides links to her online articles and encourages colleagues to participate in the dialogue. In

Benefits and risks of blogging

At a meeting in 2004, academics and industry representatives identified the following benefits and risks of academic blogging: **Benefits**

- speed of publication (and dissemination)
- spontaneity
- the ability to publish (and receive feedback on) work in progress
- bloggers can use their own personal voice, and speak informally about their work
- blogging bypasses the editorial process
- reports on work in progress and articles can be made widely available for peer review
- scholars can establish connections with others
- a blog becomes a searchable archive of ideas/observations that can be used or developed later.

Risks

- by sharing information about their work before it is published, researchers risk having their ideas attacked or even stolen
- blogging may damage a researcher's credibility
- blogging takes time, perhaps at the expense of more traditional research activities.

one recent post she noted that 'one of the responsibilities of a publicly paid academic is to participate in public debate. Yes, there should be ways to register blogging in a way that would give us "points" when counting publications, and I am certain this would propel Norwegian academics into a blogging frenzy. No, I wouldn't turn down the money if I were paid for this. But yes, I am willing to do it, because it's part of what I am supposed to do'.

Rewards of blogging

Academic blogging efforts are currently not rewarded, at least not officially. Academics are paid and promoted on the basis of articles published in quality, peer-reviewed journals with a high impact factor. Individual blogs are in many ways just the opposite. But there are clear indications that online writing may increase the quality of research and can result in a dedicated network of scholars.

For example, Julia Davies of the University of Sheffield, UK, and Guy Merchant have identified several themes in relation to academic blogging. They believe that the process of hyperlinking and allowing others to contribute content works to strengthen group membership. 'Through blogrolls, bloggers can stake out an interest, an identity and even loyalties to others; through blogrolls, a certain "character" for the blog can be established'. If so, then blogging holds real promise. Not only could it change the type of output that is expected of academics, but it might also help to improve the quality of their research by exposing their ideas to a broader audience.

Thus far, however, there is no solid evidence that blogs are having a real impact in the academic world. There is also very little information available about the individuals who read and comment on blogs, and what conditions lead to success – however that is defined. Statistics are hard to come by. Although scholars have attempted to sample various academic disciplines, there has been no global or national study that has examined this issue. At the same time, the practice of blogging has gained wide attention, and many believe that it is helping to bring about positive changes in the academic world.

But blogging isn't the only writing tool that has the potential to change academic practice. Another possibility is writing collaboratively, and some academics are already using online tools to cooperate in new ways.

Wise groups

Collaborative writing, by definition, requires that scholars work together. Can web 2.0 applications give rise to a new form of collaborative writing? Co-authorship is part of normal academic practice, but traditional writing culture may not support this type of bottom-up approach to knowledge gathering. What online opportunities exist for academics to collaborate in the writing process? Although a wide variety of open source tools are already available, including online editors and file sharing, synchronization and storage services, this section focuses on the use of wikis.



Collaborative writing refers to projects where texts are created by many people together rather than individuals. Some projects may be overseen by an editor or editorial team, but many grow without top-down oversight. Unlike blogging, collaborative writing requires that scholars work together. In a sense, this is part of normal academic practice, as coauthorship has long existed as a method of producing scholarship and also, perhaps, as a strategy for individuals to lengthen their lists of publications.

In order to understand the logic behind collaborative writing we first need to explore the notion of collective intelligence. In his book *The Wisdom of Crowds*, American journalist James Surowiecki observed that 'large groups of people are smarter than an elite few, no matter how brilliant – better at solving problems, fostering innovation, coming to wise decisions, even predicting the future'. But in harnessing collective intelligence, he recognized three types of problems– cognition, coordination and cooperation. Cognition problems occur when there's just one right answer to a problem or a question. Surowiecki gave the example of a crowd's nearly perfect ability to judge the weight of an ox: 787 people came within one pound of guessing its correct weight of 1198 pounds. The wisdom of crowds works best in these situations. Of course this is not often the case with an academic question, where the answer usually depends on the scholar's training and philosophy.

The second problem is coordination. Members of a group have to figure out how to coordinate their behaviour, knowing that everyone else is trying to do the same. The third problem, cooperation, concerns 'the challenge of getting self-interested, distrustful people to work together'. Academics hoping to work collaboratively to produce a research report have to work particularly hard to overcome the problems of coordination and cooperation.

How, then, can crowds succeed where individuals do not? A wise crowd, said Surowiecki, 'needs to be diverse, so that people are bringing different pieces of information to the table. It needs to be decentralized, so that no one at the top is dictating the crowd's answer. It needs a way of summarizing people's opinions into one collective verdict. And the people in the crowd need to be independent, so that they pay attention mostly to their own information, and not worry about what everyone around them thinks'. Can online tools like wikis enable a new form of collaborative writing, and help to make the most out of collective intelligence?

The wiki factor

A wiki is a collection of web pages designed to enable anyone to contribute or modify content, using a simplified markup language. Wikis are often used to create collaborative websites and to power community websites. They are probably the most important tools for collaborative writing, although so far there have been far more failures than successes.

Using a wiki for collaborative writing has many advantages, says Carolyn Wei of Google Research. A wiki is a live, shared space where all members have writing and editing privileges and there is no gatekeeper. Contributors can also

Navigating information overload

Using search engines such as Google, or even Google Scholar or Scirus, can often result in a wealth of irrelevant results. For development researchers, help is now at hand.

The Focuss Info Initiative has developed a collaborative research tool with a search engine that focuses on global development information. Initiated by the Institute of Social Studies in the Netherlands, Focuss.Info relies on the staff of 40 partner organizations who use tags or keywords to describe relevant online resources using social bookmarking tools such as Delicious or Citeulike. They then share their personal collections of bookmarks with Focuss. Info, which are indexed by the site's search engine. Focuss.Info searches only the bookmarked websites, thus increasing the relevance of the results. The Focuss.Info search engine is available for anyone to use; the more people who share their resources, the better the search results will become.

www.focuss.info

>

create their own homepage to increase their social presence and develop an online community. There is no need for a webmaster. Little effort is necessary for editing and updating, which contributors can do at their leisure. Specific writing tools, such as Microsoft Word, are not needed. 'Open wikis' allow anyone to edit content anonymously, and the larger projects like Wikipedia and Wikibooks show that poor quality content and cases of vandalism (deliberately altering content for malicious purposes) are rare.

At the same time, there are disadvantages. Although wikis are not technically difficult to set up, contributors must learn wiki syntax and editing rules. Editing wars between a few opinionated individuals may reduce the quality of other interactions. Wei notes that such interactions were common during the 2008 US presidential election, when supporters constantly changed wiki content to favour their own candidate. Some collaborative communities dealt with this problem by introducing a rule that dissenting individuals could not alter a page more than three times within a 24-hour period.

Above all, to be successful, a wiki needs constant maintenance. 'Group buy-in' and 'collective adoption' are essential, which means that all members of the group must share an enthusiasm to make regular contributions.

In contrast with academic blogs, where the identity of the main contributor is clear, wikis tend to downplay individual identity in favour of the group. They also feature research that often places equal value on academic and non-academic perspectives.

One initiative that focuses on academic collaboration is Wikia, a free web hosting service for specialized wikis that offer more detailed or comprehensive content than Wikipedia. The Academic Publishing Wiki, for example, is intended to 'give people with original ideas a means of obtaining peer review and constructive criticism, and to publish these ideas in wiki format'. Users can also create

Thirst for knowledge?

The Water Wiki (wiki means 'quick' in Hawaiian) is a collaboration platform where users collect, share and signpost others to information on water-related issues such as integrated water resources management and water supply and sanitation. By enabling users to contribute to a larger pool of knowledge, the Water Wiki has grown from a small UN-focused tool to a global platform. The wiki still includes information on UN activities, but now also encompasses a much broader range of knowledge contributed by water professionals worldwide.

The wiki features country profiles, projects, videos, contacts and publications, and is open for anyone to browse. Users interested in water issues who register with the site are then free to add to or edit the wiki. A tutorial is available to help users to get started with their contributions. With its already substantial list of contributors, the site promises to be able to quench all users' thirst for water knowledge. www.waterwiki.net their own journals. One example is the *Journal of Sociology and Social Theory*, although at the time of writing no articles had yet been submitted.

The effectiveness of wikis

Can collaborative writing, particularly the use of wikis, help to improve the quality or quantity of academic output? Put simply, does collaboration add value to current research practices, particularly those that have traditionally been individual activities? Proponents of wikis argue that such collaboration has the potential to ensure that the quality of research is higher than that produced by individual scholars. But in an academic setting this will happen only if Surowiecki's collaboration and cooperation problems are resolved. But keep in mind Surowiecki's conditions for wise crowds: diversity, decentralization, the ability to summarize opinions into one collective verdict, and independence. Traditional academic writing culture does not support such a bottom-up approach to knowledge gathering, and this may be difficult to achieve with the notion of authorship so firmly engrained in academia. On a more positive note, however, such collaboration creates a new form of peer review by international scholars, thus broadening the scope of available knowledge and expertise.

As for the effectiveness of wikis in general, opinions are mixed. Josef Kolbitsch and Hermann Maurer of Graz University of Technology, Austria, maintain that after a period of time, 'single articles in wikis usually become authoritative, and their level of accuracy and completeness is high'. Philosopher Martin Cohen is much more critical, however, pointing to the hypocrisies and inconsistencies of Wikipedia. He admits that someday the internet may be the ultimate source of knowledge, but not as long as Wikipedia leads the pack. Wikipedia began, Cohen says, by 'shamelessly plundering articles from the celebrated 1911 edition of the Encyclopaedia Britannica'. It is still 'not trusted and is increasingly vulnerable to rival initiatives'. Cohen's criticism also extends to Citizendium, an offshoot of Wikipedia, which describes itself as a 'wiki with stricter editing rules and obligatory disclosure of editors' real names'.

It is nevertheless clear that online collaborative writing is still at an early stage and needs time to become established and gain legitimacy. But resistance to its adoption makes sense: it represents a radical departure from traditional ways of publishing. Academics still revolve around the idea of transparent authorship, such as getting credit for their work in an obvious way.

More discussion and analysis is needed. For example, is there an ideal number of researchers who can be involved in a collaborative writing project? Is it better to include a diverse group of scholars or individuals, including from outside academia? How would universities react to such a development – would collaborative writing in this context be acknowledged and rewarded, or would it continue to be regarded as an extracurricular activity, shunned or reserved for administrative purposes only?



The most important requirement for a successful collaborative writing project via a wiki is that all those involved must be motivated to contribute. Further, says Emma Tonkin, of the UK Office for Library and Information Networking at the University of Bath, 'wiki use – and indeed the motivation to contribute – is likely to vary by gender, status and relationship to the apparent community'. Whether the project involves a close-knit group of researchers within a department or an international group of scholars, the wise crowd must be willing to participate in such efforts.

Web 2.0, web 3.0 and beyond

Efforts are underway to extend web 2.0 applications to facilitate collaboration between diverse language groups. At the 2008 WikiSym, an international symposium on wiki research and practice, for example, Canadian researchers Louis-Phillipe Huberdeau and colleagues presented the 'cross-lingual wiki engine', a system designed to support concurrent, collaborative authoring and the translation of content into multiple languages. Although this wiki engine has not yet been implemented in academic communities, it has been successful elsewhere, indicating that initiatives are possible in the future.

Just a few researchers have only recently discovered the benefits of web 2.0 tools for collaboration, so it is perhaps too early to provide a set of best practices. Reflecting on ways to improve communication both to students and among research staff, Paul Williams of the University of Worcester, UK, points out that 'web 2.0 is not really about the technology, but is more people and content-driven'. By enabling individuals to connect and collaborate in new ways, these technologies have the potential to change or improve academia. Knowledge is not static, but this is how it has traditionally been disseminated in academic publications. Although it is difficult to argue that the quality of publications is actually improved through blogging or online collaborative writing, evidence from various scholars does suggest that this is a possibility. Such issues will continue to be debated among those who embrace technology and those who do not – particularly with regard to the notion of collaborative knowledge building.

Virtual gatherings

It might sound like something from a sci-fi movie, but researchers and academics are using the 3D virtual world of Second Life to meet, present papers and network at conferences. Participants in virtual conferences do not need to board a plane and check into a hotel near the venue, but can participate in the event via their computer at home. A digital character can walk into the conference hall, look at the exhibits, take a seat and perhaps chat with people seated nearby, who in reality could be in any country in the world. The conference then begins, either in conjunction with a 'real life' meeting, or one conducted entirely in the virtual world.

This concept is being explored by a number of organizations, most recently by the Health Panel Expo, which met on Second Life to bring together panellists from health-related organizations to showcase recent developments in fields such as HIV/AIDS research. Other examples include the UN Climate Change Conference in Bali, which ran parallel events in Second Life, and the Pan-American Health Organization, which organized virtual 'meet the author' events. For links to further information, visit www.thebrokeronline.eu.

5



As the pace of technological change increases, what we see as cutting edge today may seem like ancient history in just a few years. Enter web 3.0, the semantic web, which journalist Jonathan Richards explained as follows: 'If web 2.0 was all about harnessing the collective intelligence of crowds to give information a value ... then web 3.0 is about giving the internet itself a brain'. One example of a web 3.0 technology is 'natural-language search', in which search engines will be able to understand and answer questions. This means that in the future the web will be more about knowledge than data, and that academics may increasingly turn to technology to gather and organize information automatically. How the academic world will respond to such technological developments, only time will tell.

Experimenting

Academics are starting to use web 2.0 tools for blogging, online collaborative writing, and a variety of other purposes. Since 2002, Technorati, a blog search engine, has indexed more than 133 million blogs. According to Wikipedia, the blogosphere has seen the emergence and growing popularity of collaborative blogging efforts, often set up by established bloggers who wish to pool their time and resources, both to reduce the pressure of maintaining a popular website and to attract a larger readership. If the growth of academic blogging continues, then it will be necessary to encourage traditional 'offline' research systems to adapt these new technologies to existing knowledge-sharing activities.

Like blogging, collaborative writing efforts are also becoming more common, although it is difficult to estimate the number of wikis that have been created, because many are not in the public domain. The academic interest in the use of wikis is apparent in the dynamic annual conferences such as WikiSym and Wikimania, which focuses on international Wikimedia. But in this case the wiki itself is the subject of research.

Will these applications lead to positive outcomes in terms of knowledge building? Will they actually lead to better research? It is of course too early to tell where they will lead. It is only through experimenting that new ways forward will be found, as well as new solutions for some of the problems that will emerge.

In the meantime, blogs in particular are a powerful way of communicating research. Recognizing Francis Bacon's maxim that 'knowledge is power', many agree that knowledge can and should be distributed beyond the ivory towers of academia. But what will be the consequences?

The growing use of online tools, particularly in education, is not without its critics. Tara Brabazon of the University of Brighton, UK, fears that the internet is instilling mediocrity, and that online information gathering is leading to a 'flattening' of expertise. 'There has never been a greater need to stress the importance of intelligence, education, credentials and credibility. The problem is not only accuracy, but also the mediocrity initiated through the Google effect'. Using search engines rather than consulting quality academic sources is dangerous, Brabazon warns, because the information has not been filtered by academic experts. But what of the academic experts who blog, and the collaborative documents that are available to all? If those with established credentials contribute to online content in the ways outlined above, then critics like Brabazon may have fewer concerns. Perhaps this is the strongest argument of all for a more collaborative, open access academic environment.

In the process of research collaboration, as well as communicating via blogs, the main question is how to maintain quality. If traditional mechanisms such as anonymous peer review are no longer feasible, what can take their place? Should it be a similar process, like open peer review, or should the quality of the blogs and wikis be judged by 'crowds' of experts? Perhaps we are witnessing the start of an era of separation between what could become two realms of research. One is the realm of traditional 'pure' research where, independent of technologies like the internet, the goal is to achieve scientific discoveries that may eventually trickle down to the outside world. In the other, a realm that is much more closely focused on society and policy, practitioners communicate directly, and in real time, with that outside world.

- Luzón, M.J. (2006) Research Group Blogs. Paper presented at the Fifth AELFE Conference, Zaragoza, Spain.
- O'Reilly, T. (2005) What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software. O'Reilly Media.
- □ Richards, J. (2007) Web 3.0 and beyond. *The Times Online*, 24 October.
- □ Surowiecki, J. (2005) The Wisdom of Crowds. Random House.
- Walejko, G.K. (2007) Why Academics Blog and What This Means for Scholarly Communication. Paper presented at AoIR 8.0, Vancouver, Canada.

For a longer version of this report, visit www.thebrokeronline.eu