

Are southern academics virtually connected?

A review of the adoption of web 2.0 tools for research collaboration by development researchers in the South.

By Cheryl Brown for GNet



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Preface

Although this study was carried out to inform the work of the GNet program, GNet is committed to sharing its learning with other information and knowledge intermediaries, and others working to build capacity of researchers in developing countries and help them to communicate their knowledge to a global audience. You are warmly encouraged to give your feedback on the findings and conclusions of this study. Although the author sought as many sources as possible during the period of the study, inevitably some will have been missed. If you have suggestions of additional sources of information that will help increase understanding about the adoption of web 2.0 tools for research collaboration by academics, especially within developing countries, please do contact the author. A dedicated webpage will be created on www.gdnet.org which will provide links to the publications referenced in this study, and other related sources.

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About GNet

GNet is a Global Development Network (GDN) program which supports southern researchers to contribute and debate ideas in development thinking, policy and practice. GNet is managed by the GDN Cairo Team in partnership with the Economic Research Forum (ERF) and works in collaboration with local and international organizations for much of its regional work.



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Foreword

This paper forms the first phase of a study commissioned by GDNNet into supporting the use of web 2.0 tools for research collaboration, by its members: researchers in developing and transition countries,¹ and facilitating an online community of development researchers globally.

This study of secondary sources seeks to:

- Establish current levels of adoption of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender
- Identify any reasons for lack of use of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender
- Examine existing online academic communities to identify good practice in design, management and monitoring and evaluation

The findings relating to adoption are discussed on pages 12 to 15 in the context of a number of theories that explore adoption of innovation. General conclusions about the findings, and particularly the appropriateness of web 2.0 tools for research collaboration in a southern context are made on p.22 and recommendations are made on p.23 for how GDNNet can improve the GDNNet Community and encourage uptake of this and other web 2.0 tools and platforms that it offers now and in the future.

Due to the lack of available data specific to this topic in developing countries, and to develop ways of overcoming some of the barriers to use identified in this paper, the intention is for this desk-based research to be followed by primary research, including focus groups with southern researchers, and monitoring of trends through the annual GDNNet members survey.

What is meant by web 2.0 tools for research collaboration?

Definitions of web 2.0 tools are varied and frequently used interchangeably with other terms such as social media, and collaborative online tools. A useful explanation is provided by the Impact 2.0 iGuide (a wiki available at <http://iguides.comunica.org>) which is “web-based applications that facilitate interactive information sharing and collaboration on the web”. As this comprehensive wiki by the Association for Progressive Communications and Fundacion Comunica illustrates, web 2.0 tools can serve many functions for researchers including understanding the policy-making environment and broadcasting their findings.

For the purpose of this study, the focus is specifically on web 2.0 tools that support research collaboration: blogs, wikis, social networking sites, etc. and that are used by researchers to help them network, work with and exchange knowledge with other researchers online.

¹ The use of the terms “the South” and “southern” in this study and report refer to these developing and transitional countries collectively, as is common practice within GDN and GDNNet.

Summary

The Global Development Network (GDN) proposes making greater use of web 2.0 tools to create a critical mass of globally interconnected researchers who produce policy-relevant research on development with GDN acting as the test-bed for this activity. To support GDN and GDN in understanding how they might use web 2.0 tools effectively to increase collaboration and sharing of knowledge between researchers, research was commissioned including this study of secondary sources. This report covers the three areas examined in the desk-based study:

- adoption of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender
- reasons for lack of use of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender
- existing online academic communities and good practice in their design, management and monitoring and evaluation.

Key findings from the study include:

- Although external research was predominantly only available on adoption of web 2.0 tools among academics in Europe, rather than in the South, levels of take-up among academics are relatively low.
- Internal data indicates that there are regional differences in adoption of web 2.0 tools among southern researchers both in terms of use and reasons why adoption has not occurred.
- There does appear to be a gender divide when looking at frequency and purpose of use of web 2.0 tools and women may have particular needs that should be addressed to encourage adoption e.g. lack of time and concerns over security online.
- There are three broad reasons for lack of adoption: lack of awareness, being prevented from using them or choosing not to use them. Specific barriers include: poor infrastructure or lack of equipment, usability, time, perceived value or credibility of tools, and lack of institutional incentives.

These findings are discussed in the context of models that help explain why some individuals adopt technology, while others are more reluctant including: perceived risk, adopter categories and perceived attributes of innovations. A number of existing academic online communities are then reviewed together with evaluations of online communities in general, and lessons are highlighted for GDN and GDN in terms of design, operation, and monitoring and evaluation of an online community for academics. These include building a platform with the users rather than for them, working with existing behaviours, having academic champions and providing sufficient support.

The report concludes with five broad recommendations for GDN and GDN:

- Approach the development of a new academic online community and provision of web 2.0 tools for research collaboration with caution and with realistic expectations.
- Make use of opinion leaders.
- Focus on ease of use and providing excellent support.
- Find out what degree of privacy, vetting of profiles and moderation researchers require.
- Work at an institutional level to encourage adoption.

Background to the study

Why analyse the adoption of web 2.0 tools for research collaboration among development researchers and why should the experience in the South be any different?

From its earliest days, the World Wide Web was intended as a means of facilitating collaboration between scientists² whilst being open to all people online to use, however for many years it primarily followed a publishing model. Organisations produced websites and owned the content that they allowed visitors to view. What is now referred to as “web 2.0”, the second era of the web, is a use of the internet that realises and builds on the intentions behind the early web: continuous creation and editing of content, and an easy flow of data between websites. Essentially, web 2.0 tools such as blogs, social networking sites, RSS feeds and wikis, are those that enable greater user participation online and blur the boundaries between producer and user of website.

Although web 2.0 tools can be used by researchers to collaborate, connect with and exchange knowledge with their peers, they can be used for other purposes. For example, a wiki was used by the author to help organise notes made during this research rather than enabling multiple authors to write, edit and review a document. This study is interested in the extent to which web 2.0 tools are being used by researchers in the South for the purposes of research collaboration, including knowledge-sharing between researchers. The use of web 2.0 tools by researchers for research communication, for example, is only of interest to this study if the focus is on encouraging dialogue with other researchers through the use of those tools.

The use of web 2.0 tools for development and particularly for the production and uptake of development research, prompts mixed responses. Sceptics warn against jumping on the latest technological bandwagon and point to the continued lack of reliable internet access in the South, while enthusiasts champion the tools' potential to radically alter the way knowledge is created and shared³. There are many examples of how participatory online communication has been taken up and enabled groups to mobilise, draw attention to important issues and bring their views into digital discussions⁴. But what has been the impact of web 2.0 in development academia? How have these tools contributed to research collaboration, increasing research uptake and connecting development researchers across the world?

Many projects aimed at facilitating knowledge-sharing and collaboration between development researchers and practitioners now include web 2.0 in their armoury of communication tools, such as Evidence and Lessons from Latin America (ELLA)⁵, and the Eldis Community⁶. But to what extent have these tools been adopted by researchers and facilitated an increase in knowledge-sharing behaviours and collaboration? Despite the promise they hold, evidence from the UK (Research Information Network, 2010) suggests that many British academics are reluctant to adopt web 2.0 tools for their work. What is the picture in other countries?

² See interview with Tim Berners-Lee at <http://blip.tv/web-20-summit/web-2-0-summit-09-tim-berners-lee-and-tim-o-reilly-a-conversation-with-tim-berners-lee-2784292>

³ Two articles that illustrate these views are <http://www.scidev.net/en/opinions/web-20-can-benefit-the-worlds-poor.html> and <http://arstechnica.com/science/news/2009/01/science-online-09-social-network-failure.ars>

⁴ Web2forDev at www.web2fordev.net is a good source of examples.

⁵ <http://www.dfid.gov.uk/Global-Issues/Research-and-evidence/Poverty-Themes1/Evidence-and-lessons-from-Latin-America/About-ELLA/>

⁶ <http://community.eldis.org/>

The Global Development Network (GDN) proposes making greater use of web 2.0 tools to create a critical mass of globally interconnected researchers who produce policy-relevant research on development. Part of this new approach to working would include the development of an online platform to support research collaboration among geographically-dispersed research teams, sharing and uptake of development research among academics globally, and the development of peer-to-peer relationships. Through detailed tracking of researchers, the platform could generate insights into how research teams and networks behave. Within GDN, the GDNet programme, which aims to increase southern researchers' access to and communication of research, has recently introduced the GDNet Community Groups. These online collaborative workspaces provide groups of researchers with a range of communication tools in one shared space and are being piloted with participants of the GDNet research communication workshops. They represent an important first step towards GDN's vision of a collaborative platform for researchers but it is understood that success will depend on being responsive to the realities of southern researchers in terms of design, facilitation and support.

Although online academic communities, such as MyNetResearch and Academia.edu, already exist, they appear to have been designed to fulfil the needs of a (largely northern) minority of academics who are already 'web 2.0 literate', have reliable internet access and who recognise the value of using online tools to connect with other researchers. GDN and GDNet propose taking a more inclusive approach, focusing on encouraging and facilitating new behaviours, particularly among southern researchers who are likely to experience different constraints to their northern counterparts.

To support GDN and GDNet in understanding how they might use web 2.0 tools effectively to increase collaboration, networking and sharing of knowledge between researchers, research was commissioned to explore what is already known about adoption of web 2.0 tools for these purposes by development researchers, explore and address barriers to uptake and examine good practice in running online academic communities. The research seeks to increase understanding of:

- the needs of the target users and their contexts in order to develop appropriate services for them
- adoption of web 2.0 tools among researchers in developing countries for knowledge-sharing and collaboration
- any barriers to adoption, and what might motivate researchers to adopt them
- any areas of training and support that might be required to increase use
- existing online platforms that aim to promote knowledge-sharing and collaboration among the academic community and how GDN and GDNet might position their platforms in relation to them.

The research is being carried out in two stages: a review of internal and external secondary sources, and primary research among GDNet members in the South. This paper reports on the findings of the study of secondary sources. It is hoped that the insights gained from this study will also be of interest to those who fund, plan and implement programmes that use communication to increase research uptake, collaboration and knowledge-sharing and to those working in the area of information literacy.

Objectives and approach

This first stage of research focuses on three research objectives:

- To examine adoption of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender
- To identify any reasons for lack of use of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender
- To review existing online academic communities and identify good practice in their design, management and monitoring and evaluation.

Between January and February 2011, a desk-based study was carried out of sources relating to web 2.0 tools and development researchers, and existing online academic communities were reviewed. External sources included academic journals, conference reports, blogs, published research reports and evaluations, case studies, websites and videos. Initial findings were discussed with GDNNet and a further period of data collection was carried out from March to June 2011 including a focus on gender aspects of use of web 2.0 tools and the internet, and analysis of data from GDNNet surveys.⁷

A limitation of this study, and also a finding of it, is the scarcity of existing data and analysis of the uptake of web 2.0 tools among development researchers specifically in the South, although there are many stories of individual projects such as rural communities using blogs, for example. A significant amount of research is available regarding use of web 2.0 tools by students, however these tend to focus on the US. Some sources were found relating to academics, and again these were primarily based in countries that enjoy excellent internet access, but these were often concerning scientific researchers. As a review of literature about “collaboratories”⁸ indicates (Dormans, 2009), social scientists and natural scientists tend to work in different ways and in different environments; those in social sciences tend to be less familiar with technology and lack the longer tradition of online collaboration seen in the natural sciences. Consequently, this desk-based study has been widened to draw on more informal sources of information to try to answer the research objectives, but this lack of peer-reviewed material suggests a knowledge gap exists that could be filled with primary research. This is a topic that is receiving more interest from authors and conference organisers and it is likely that more information will be available in coming months⁹.

⁷ Certain web 2.0 tools were used in the process of this study, although for private rather than collaborative purposes: social bookmarking helped organise online sources, and findings were collected on a wiki to enable links to be made to related websites.

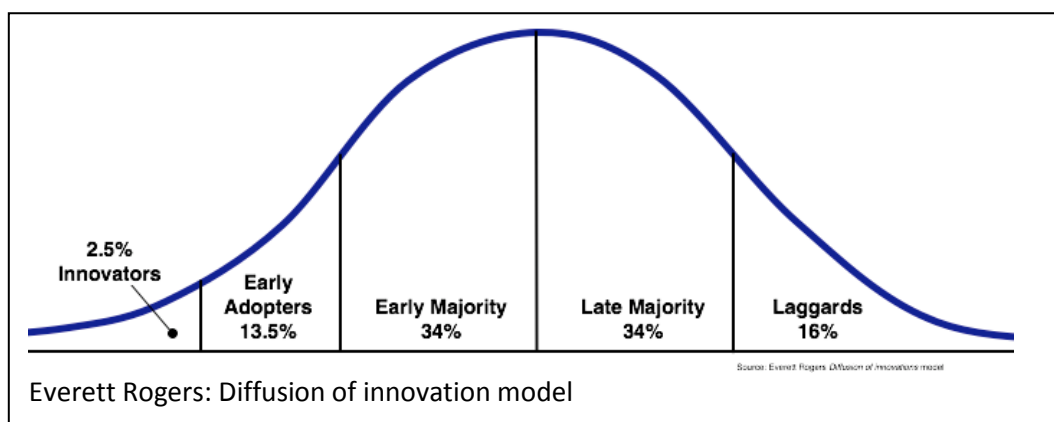
⁸ In the review, Dormans defines a collaboratory as “a combination of enhanced access to data and instruments with improved communication tools” (p.4). See also p.10 of this report on Virtual Research Environments.

⁹ For example, a book by IGI Global plans to explore Web 2.0 and developing countries <http://www.igi-global.com/authorseditors/authoreditorresources/callforbookchapters/callforchapterdetails.aspx?callforcontentid=00e083d0-03ef-4698-99ac-d10e15255f6c>

Findings on adoption of web 2.0 tools

1. Adoption of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender

What do we mean by “adoption” of web 2.0 tools? The work by Everett Rogers on the diffusion of innovations provides us with some helpful models to look at what adoption means in the context of technology. Rogers (2003) describes an innovation-decision process, (knowing about the innovation, forming an opinion on it, putting it to use, etc.) the end stage of which is where an individual either rejects or adopts an innovation. In this case, adoption is the “decision to make full use of an innovation as the best course of action available” (Rogers, 2003, p.21). But as Rogers explains, an individual can still reject an innovation at a later stage, perhaps if it fails to live up to expectations. Web 2.0 tools are likely to be more susceptible to this subsequent rejection than technologies that require planned investment before first use, e.g. a DVD player, as evidenced by the thousands of dormant blogs and Twitter accounts online. Rogers states that the degree to which a person can be referred to as innovative is determined by the length of time it takes them to travel through the innovation-decision process to adoption of an innovation. Based on this, Rogers presents five categories of adopter, with different personalities, differentiated by the time it takes for an innovation to be adopted (as shown below) and these are explored further in the next section. However, identifying which stage of adoption web 2.0 tools are at may help us to understand how to encourage adoption by those who have not yet done so.



Research was only available on adoption of web 2.0 tools among academics in Europe, rather than in the South. A study of UK academics for example, found that “current levels of take-up are relatively low” (Research Information Network, 2010, p.5) with 13% of the respondents reported using the tools once a week or more, while 39% were not using them at all. In a study of German researchers, 13% was also the figure of those who had online profiles (Lackes et al, 2008). If we accept that adoption of web 2.0 tools implies regular use, then according to Rogers’ diffusion of innovation model, this puts adoption of web 2.0 tools somewhere in the stage of early adoption on the diagram above. The discussion of Innovators and Early Adopters on p.14 of this report helps us understand what type of researcher might already be using web 2.0 tools.

Adoption in the South

No statistical external data was available on the adoption of web 2.0 tools by academics in the South, however GDNNet's own data helps us to draw some conclusions. Two recent survey reports were available to explore what is known about southern researchers' use of web 2.0 (referred to as social media in the surveys). The first was a 2008 survey of members and non-members of GDNNet in LACEA and CIPPEC in Latin America and the Caribbean (LAC) and AERC in Africa¹⁰, issued as part of the Output to Purpose Review (OPR) of GDNNet undertaken for DFID by ITAD. The second was the baseline web survey of GDNNet's southern members, carried out by ITAD in November 2010.

Although the sample sizes in the OPR survey make the results indicative rather than conclusive, they suggest that lack of adoption of web 2.0 may not just be about access or awareness issues. Researchers were given the choice of indicating whether they use, don't use or don't know about/don't have certain web 2.0 tools, although regularity of use was not recorded. Many researchers reported not using web 2.0 tools rather than not knowing about them or lacking access to them. Across the five tools studied in the OPR survey (blogs, wikis, social networking sites, social bookmarking and RSS feeds), on average, 28.2% of LAC researchers are using these tools to some extent, but among those who are not, for the majority it is due to choice (only one third of non-users report being unaware of or lacking access to the tools). In Africa, on average, 9.4% of researchers are using the tools, but here non-use is attributed more evenly between lack of access to or knowledge of the tools, and those who choose not to use them.

The picture is more promising for social networking sites but with major regional disparities. The surveys show that some southern researchers are already using them and in the 2010 baseline survey of GDNNet members, Facebook, LinkedIn and Academia.edu were specifically mentioned, however the OPR survey shows marked regional differences in adoption. Nearly half the respondents from LAC were using social networking sites, but in Africa this dropped to just 4.7%.

Although not about the use of web 2.0 tools specifically, the OPR survey reports on another online behaviour. The survey found that 29.6% of researchers from LAC, and 47.3% of African researchers were not putting their research online at the time of the survey. However the reason for this difference is not known. Although internet connection may be a factor it is also the case that the respondents of these surveys from two organisations in LAC and one in Africa and it is possible that the culture of online knowledge-sharing is peculiar to those organisations rather than indicative of researchers in the regions generally.

Gender issues in adoption of web 2.0

In parallel to this research, the author carried out a short study into gender and ICTs¹¹ to help GDNNet perform a gender analysis of its online services and develop meaningful indicators of use. The study found that women have 35 per cent fewer opportunities than men to benefit from the African information society (ENDA, 2005) and in terms of ICT usage, there did appear to be a gender divide when looking at frequency and purpose of use of web 2.0 tools. Among academics in the UK, men were nearly twice as likely as women to report using them frequently (Collins and Hide, 2010) while a study by ENDA (2005) of francophone Africa found that women tend to use ICTs more for private and social purposes, while men tend to use them for professional and public ones. The findings relating

¹⁰ CIPPEC was included as control group as AERC and LACEA are two of GDNNet's Regional Network Partners.

¹¹ Brown, C. (February 2011) *How can gender analysis be applied to GDNNet?* Internal discussion paper for GDNNet.

to web 2.0 from the GDNNet survey data were not disaggregated by gender and it may be useful to invite female members of GDNNet to participate in a survey that investigates these issues further.

Virtual Research Environments (VREs)

In exploring adoption of web 2.0 among academics, some material was found on virtual research environments (VREs). VRE is the name given in the UK and Europe to a “set of web applications, online tools, systems and processes interoperating to facilitate or enhance the research process within and without institutional boundaries” (Carusi and Reimer, 2010, p.11) which in other countries is sometimes referred to as a “collaboratory”. If this definition reflects the ambitions of GDN then there will be many lessons to be learnt from studies of VREs. Although no figures in relation to adoption were found, lessons on design and encouraging use of VREs are also discussed in a later section on online communities.

2. Reasons for lack of use of web 2.0 tools for research collaboration and knowledge-sharing by development researchers in the South, including any differences by region or gender

Although data was in short supply about extent of adoption, considerably more was available about why researchers may or may not be able to, or want to, use web 2.0 tools. Again these sources referred predominantly to academic communities in the US, the UK and elsewhere in Europe. The study found that there are three broad reasons for lack of adoption: lack of awareness, being prevented from using them or choosing not to use them. Under these three headings there are many specific reasons and barriers and they are explored below. Conversely these can be viewed as some of the conditions necessary to encourage widespread adoption i.e. increased awareness of web 2.0 tools and recognition of their value; sufficient access to, time and ability to use the tools; usability and credibility of the tools, etc.

a) Unaware of web 2.0 tools

GDNNet’s survey data points to a significant proportion of southern researchers who reported they “don’t know about/don’t have” web 2.0 tools such as online social networks and blogs; a greater number of these were in Africa than in LAC in the OPR survey. Unfortunately it is not possible to know what proportion of these are attributed to lack of awareness, and which are lack of access. Qualitative comments contributed to the baseline survey suggest that lack of knowledge about some of GDNNet’s online services is what has stood in the way of using them, at least for the first time. For some researchers, increasing awareness may be all that is needed to increase use.

b) Prevented from using web 2.0 tools

This reason covers a number of barriers. As highlighted above, a large number of southern researchers in the OPR survey were either unaware of or lacked access to web 2.0 tools, but the specific breakdown between the two is unknown. However other sources confirm that **poor infrastructure** and **lack of equipment** can be an issue in developing countries. Although ITU forecasted that 162 million of the 226 million new internet users in 2010 would be from developing countries (ITU, 2010), it still predicted that by the end of 2010, only 21% of the population in developing countries would be online, and in Africa, this would be as little as 9.6%. Even where internet access is available, the quality of the connection may not be enough to make regular use of web 2.0 tools for academic purposes worthwhile. A study funded by JISC reports that a VRE in West

Africa, for example, found that “Limited access to bandwidth and computational resources is a key barrier for virtual research collaboration” (Carusi and Reimer, 2010, p.85).

In some cases, national **laws** or institutional rules prohibit the sharing of research data online. In South Africa, for example, it is illegal for data from state-funded research to be shared outside of the country without prior permission (Carusi and Reimer, 2010).

Finally, researchers may be **unable** to use web 2.0 tools due technical problems and not knowing how to use the technology. A lesson from Carusi and Reimer’s 2010 study of VREs is that technology can be unreliable due to being in constant development and therefore needs to be allowed to be tested before encouraging people to use it. The same study also found that “some scholars are reluctant to use new technologies...because it appears to be difficult to learn new systems and processes” (p.39). The Research Information Network study (2010) supports this and concludes that for widespread adoption of web 2.0 to occur among researchers, the tools will need to be intuitive and easy to use, and build on their existing practices.

c) Choose not to use web 2.0 tools

If we assume that all researchers have no legal or technological impediments to using web 2.0 tools and are aware of their existence a third set of reasons for not adopting them come into play. Some of these are familiar reasons that may apply to any community of potential users, while a number are peculiar to the academic context.

GNet survey data and external studies indicate that **time** is a key reason for not adopting web 2.0 tools. If we think of time as being one of a researcher’s resources, like money, then it would seem that for many academics, signing up to and using web 2.0 tools are not worth the “price”. For women in particular, who are more likely to have an additional domestic workload¹², there may be even less time available to spend on activities that are not required by their work.

Connected with being time-poor, web 2.0 tools are not adopted when their use is not perceived to be of any **value**. The Research Information Network 2010 study, found that for UK researchers, this lack of clarity about what the benefits of adoption might be is a major barrier to uptake and there is a sense of waiting to see which tools will be popular with their colleagues before signing up to use them. A related challenge here is that with the proliferation of web 2.0 tools, researchers will need a strong incentive to adopt an additional social network for example and it is recommended that creators of online platforms incorporate existing applications e.g. Flickr and Blogger rather than create substitute versions. Age may be a factor here, for example, in the experience of one editor of an online forum for researchers, older scientists do not find online academic networks to be better than email and telephone communication for facilitating collaboration¹³. However the Research Information Network found that the age of a researcher was not a strong predictor of adoption in itself (2010) and their gender, position and discipline are also important variables to consider.

Online **security** and privacy concerns are another deterrent to adoption. Published and informal sources (including Carusi and Reimer, 2010; Research Information Network, 2010; Science in the Open, 2008) report on researchers’ fears about their data and ideas not being secure on social networks and the desire for private spaces for discussion. Safety online may be a particular fear for

¹² See http://www.apcwomen.org/gemkit/en/understanding_gem/icts.htm for a discussion of this.

¹³ See comment by Brian (creator of www.labspace.net) on Facebooks for scientists – they’re breeding like rabbits! August 1, 2008, *Science in the Open*, <http://cameronneylon.net/blog/facebook-for-scientists-theyre-breeding-like-rabbits/>

women in some countries, and GKP recommendations on women's participation in knowledge sharing online, includes that safe and secure online spaces should be created for women where they can express themselves freely and privately and feel safe from harassment (i4d, 2008).

Studies have found that for researchers to accept web 2.0 tools for professional purposes, they need to be seen as **credible**. This credibility may come from the volume of members already making use of the tool i.e. a critical mass, or from recognising specific academics using the tool (Research Information Network, 2010). For this reason, the approval process that GDNNet applies to its researcher profiles is likely to give it an advantage over other networks that lack such rigour. In online networks, the use of senior researchers acting as academic champions, can give the site the credibility it needs to attract more hesitant users. Credibility can also come from the content featured which needs to be preferably unique to the site, of good quality, relevant to the community, and up-to-date (Online Community Report, 2008).

The GDNNet baseline survey examined the reason why researchers become members of GDNNet and this may help us to understand another aspect of the low uptake of web 2.0 tools. While there was no single clear motivating factor for joining GDNNet, the primary reasons were related to consumption of information rather than sharing or connecting to others. This **passive** approach to internet use matches the "web 1.0" model of publisher and reader. This is backed up by the findings of a survey for the design of the EURAXESS Links India (the evaluation partnership, 2010) where there was strong desire for collaboration but services for consumers were preferred over those that enabled contribution.

The perceived or actual lack of **usability** of web 2.0 tools and insufficient support for users is reported as being another key reason behind low adoption rates among academics. Several studies and evaluations¹⁴ highlight the importance of involving researchers in the design of web 2.0 tools that are intended for use by academics. Furthermore, support for users in terms of training, FAQs and online support needs to be provided by people who understand both the technology and the research environment. Feedback on GDNNet obtained through the baseline survey indicates that processes need to be made as simple as possible and support is needed to help users adopt online services.

Finally, a major disincentive for the academic community to adopt web 2.0 tools for research activities is the lack of **institutional incentives** for using them or for publishing online. The Research Information Network 2010 study found that for UK researchers, the policy of international peer-reviewed journal citations being those that count towards academic promotion, rather than online citations, discourages informal publishing online.

An evaluation of the use of social media tools by the ICCO Alliance (Coenders and White, 2010) highlights potential challenges for individual organisations and networks in encouraging adoption of social media for collaboration and knowledge-sharing among their staff, partners or members. For example, where adoption is optional, it is likely to suffer at the expense of activities that are mandated by an organisation while adoption is more likely where users can see how it has direct value to their work. The evaluation also raises the potential barrier of **language**; text-based social media tools that require users to write in English will be more time-consuming to use for people who have a different first language.

¹⁴ Including Research Information Network (2010), Carusi and Reimer (2010) and cases stories submitted to the Knowledge Management Impact Challenge (2011)

Discussion of reasons for low adoption rates

There are several models that help us explore why some individuals adopt technology, while others are more reluctant. These models can also provide insights into how to develop approaches that will increase adoption.

a) Perceived Risk

Various authors have looked at perceived risks as barriers to individuals in purchasing decisions or adoption of technology. From this work, six facets of perceived risk that may affect a researcher's uptake of web 2.0 services are presented in the table overleaf and capture many of the findings from the secondary sources about why some academics may not be using web 2.0. Suggestions are made for how these risks could be reduced, including lessons from those who have evaluated web 2.0 in a research setting (e.g. Carusi and Reimer, 2010; and Loumbeva et al.)

Facet of Perceived Risk	As it applies to web 2.0 tools
Performance	That the tool may not work and will fail to deliver the promised benefits.
	<ul style="list-style-type: none"> • Ensure the technology is working before trying to grow a community. • Design in collaboration with the intended users so the tools deliver what the researchers need. • Incorporate tools that are already established e.g. SlideShare, etc.
Financial	That the costs of using the tool will be wasted. Normally the financial costs involved are those of internet connection although some online academic social networks do require a fee for use of additional features.
	<ul style="list-style-type: none"> • Respect the low bandwidth experienced by researchers in developing countries and test the tools under low bandwidth conditions before launching • Ensure that the tools are compatible with older technologies and software
Time	The time taken to understand how to use the tool, and to make use of it will be greater than the value gained from using it.
	<ul style="list-style-type: none"> • Only include the tools that are needed by the researcher rather than all those that are available • Undertake usability testing of new platforms to identify how to make it easier to use, and provide self-help resources and email helpdesk that can respond quickly • Make registration processes as simple as possible
Psychological	Potential loss of self-esteem if the tool fails, or the individual is unable to use the tool.
	<ul style="list-style-type: none"> • Encourage researchers to try easier tools first, to achieve quick wins, rather than expecting them to adopt a full portfolio or more complicated tools. • Provide support and guidance that is written for an academic audience
Social	The risk of loss of status by using the tool, of being seen in a poor light and lacking in credibility, perhaps through the lack of control over removing comments and images once shared online.
	<ul style="list-style-type: none"> • Include a clearly-worded privacy statement when users register • Respect data protection rules and give users the opportunity to remove any material they have posted online.
Safety	That the individual is at risk of online harassment or will be punished for their activity online.
	<ul style="list-style-type: none"> • Require all users to accept a code of conduct as part of use of the site. • Give people the opportunity to make personal data only visible to other members, to use pseudonyms, or icons rather than photos. • Moderate comments published online, based on a moderation policy • Provide spaces for private communication and discussion between members

Privacy	Potential loss of control over data and personal information shared through use of the tool.
<ul style="list-style-type: none"> • Include a privacy statement in the registration process that has information on the organisation's use of any data. • Only collect essential personal data and do not make this public without the user's permission. 	

Facets of perceived risk, adapted from Featherman and Pavlou, 2002.

b) Rogers' adopter categories

On page 7 of this report, Rogers' Diffusion of Innovation model was introduced. The five stages represent five types of people categorised by the rate at which they adopt innovations: innovators, early adopters, early majority, late majority and laggards. These categories only refer to those who adopt an innovation – there are still likely to be non-adopters unless using web 2.0 becomes a requirement of research. Rogers (2003) describes these five archetypes as having particular characteristics, adapted below in the context of web 2.0:

Innovators – the first 2.5% of people who adopt an innovation

- Have sufficient time and money to enable them to risk trying new tools
- Able to understand and apply complex technical knowledge
- Can cope with uncertainty about a web 2.0 tool when adopting it and happy to take risks
- Tend to be in contact with other innovators e.g. subscribed to e-newsletters on developments in ICTs
- Their interest in innovation sets them apart from their peers
- Are the first in their social group to adopt an innovation and tend to play the role of expert
- Tend to be younger and more educated than other adopters

Early Adopters – the next 13.5% of eventual adopters

- Often turned to for advice and opinions about the tools they use
- Play the role of opinion leaders as they are more integrated into their social system than innovators
- Respected by their peers; if these people are seen to be using web 2.0 tools it greatly encourages others to do so. In an online academic network for example, having respected academics among the early adopters would greatly increase the chance of building up a critical mass of users
- Will tend to choose carefully which web 2.0 tools to adopt to maintain the respect they are held in by their peers, rather than adopt something because it is new
- Also tend to be younger and more educated than other adopters, which may make identifying senior researchers to act as opinion leaders harder

Early Majority – the next 34% of adopters

- These individuals will adopt web 2.0 tools just before the average person in their social system does
- They will deliberate for a while before making a firm decision to adopt a new tool and their decision-making process is longer
- Although they tend not to influence others as individuals, they represent over a third of the total number of adopters so can influence adoption of web 2.0 tools by being a critical mass of users

Late Majority – the next 34% of adopters

- Cautious and sceptical about anything new
- Tend to adopt through peer pressure or institutional encouragement
- Tend to have limited time and money so will be cautious of trying anything that is not guaranteed to work and be of value
- Using web 2.0 tools needs to be the norm among their social group before they will choose to adopt it

Laggards – the final 16% of people to adopt web 2.0 tools

- Tend to be traditionalists and interact with those who share their values
- Base their decisions on what has been done previously
- Tend to be suspicious of anything new and those who try to encourage them to try something new
- Their resistance to web 2.0 tools is likely to be rational from their point of view e.g. may have no spare time to try something new unless they are certain it will not fail or may have negative experiences in the past of trying new technology

These archetypes, particularly innovators and early adopters, have become familiar terms in literature on technology and marketing and can help us understand what encourages or dissuades different people from adopting web 2.0 tools and respond accordingly.

For example, one might identify the opinion leaders among different research communities and encourage and support them to adopt a new web 2.0 tools application and make their use particularly visible in order to attract the early majority. The academic social networking site Academia.edu puts this into practice by drawing attention to several prominent academics who are members of their online network.

To attract the late majority, one might need to work at an institutional level, helping it to become the norm to use web 2.0 tools, and encouraging institutions to allow researchers to have the time they need to familiarise themselves with new tools.

c) Perceived attributes of innovations

From the GNet survey data we saw that many southern researchers are either aware of web 2.0 tools or have access to them, but are still not using them. The barriers in this case are therefore related to how the tools are perceived. Rogers (2003) argues that an individual's perception of an innovation is strongly tied to the rate of adoption, and identifies five attributes of an innovation that influence perception: relative advantage, compatibility, complexity, trialability and observability. These are discussed in relation to academics and adoption of web 2.0 tools in the table overleaf with recommendations and considerations for how to respond.

Attribute	Relevance to web 2.0 tool adoption
Relative advantage	Does the user benefit from adopting this new behaviour? To what extent is an online social network for academics superior to using email and telephone, for example.
<i>When promoting web 2.0 tools to academics it is important to explain the additional benefits they will bring to the user, over the tools they are currently using.</i>	
Compatibility	To what extent do web 2.0 tools fit with the way the researchers work now, their needs, what the norms are in their sector and institute?
<i>If the researchers do not agree with the values of web 2.0 – sharing of data, collaborative writing and editing, etc. - then they are very unlikely to adopt web 2.0 tools. Until their needs and behaviours change, then they will be likely to use them for consumption purposes only.</i>	
Complexity	How difficult to use are web 2.0 tools perceived to be? Are the concepts easy to understand?
<i>Some excellent work has been done to make web 2.0 tools easy to understand e.g. videos by www.commoncraft.com on what RSS is all about and can be helpful to increase understanding among people who are unfamiliar with web 2.0 tools. Avoid jargon as much as possible, which may mean not mentioning the term web 2.0 at all. It may be worth encouraging researchers to use the simpler tools first, and then presenting them with additional ones.</i>	
Triability	Is it possible to have a go at using web 2.0 tools without investing much time or committing to using them? Innovations that enable people to try them out are perceived as less risky and are more likely to be adopted.
<i>Hands-on training sessions at workshops and conferences can be a good way to help researchers use web 2.0 tools for the first time and without having to commit to their use. Pilot projects can also be helpful, using a wiki among one research team to produce a research proposal for example. Also allowing researchers to participate in online academic networks to a certain extent without having to register, e.g. reading but not posting comments.</i>	
Observability	How visible are the results of the innovation? The easier it is for researchers to see visible results or that others are using web 2.0 tools, the more likely they are to adopt them.
<i>Announcing the numbers of people registered on a network, or signed up to RSS feeds, etc. can help. Also enabling feeds from a researcher's blogs to be displayed on the online social network would show the level of adoption of web 2.0 tools among the community.</i>	

Review of existing online platforms for research collaboration and examples of good practice.

Online social networks for researchers, particularly in the natural sciences, have proliferated in recent years. This creates a problem in terms of adoption, as a large number of researchers are likely to wait until one or two leaders emerge with a critical mass of users, before committing themselves to joining (see discussion on types of adopters, p.14 of this report). Rather than list and discuss all available networks, a few have been selected to illustrate the variety that exist but others include NatureNetwork (25,000 members) and ResearchConnect (unknown membership).

2collab.com - discontinued

This site was removed by owners, Elsevier in April 2011 (see separate discussion below). When active, it was free to use and enabled the creation of public or private discussion groups and social bookmarking.

<http://www.2collab.com/>

Academia.edu – 413,000+ members

Acts more as a database of researchers that is focused on tracking member activity. The platform enables academics to track what others are doing, to share and download publications, see who is following them and notifies members when they are found on Academia.edu through a Google search. The database relies on self-moderation; profiles are not checked before going live and can therefore be inaccurate. Visitors can browse the site but must be registered to see more than basic information about researchers in the database.

<http://www.academia.edu/>

EURAXESS Links – membership unknown

Created by the EC for European researchers working outside of Europe to support international research collaboration. The USA branch of EURAXESS Links is reportedly composed of thousands of members however there is very little sign of any member participation. Although free to join, the sign up process gives no information on the benefits of joining or what it involves and no members or member content is visible without logging in, but does present a lengthy set of terms and conditions. The survey carried out to help design the EURAXESS Links for India found desire among European researchers for collaboration (the evaluation partnership, 2010) which suggests the problem could be related to barriers of usability or credibility, for example. <http://ec.europa.eu/euraxess/links/>

GraduateJunction.net – 18,500+ members

The content here is almost entirely restricted to members and to register an individual must have an email address that is recognised as being from an academic institute e.g. ending in ac.uk or .edu (although this is not in fact a guarantee that the individual is either a researcher or a postgraduate student). The site appears to be popular and user-friendly and is supported by UK Higher Education funding.

<http://www.graduatejunction.net/>

LabSpaces.net – membership unknown

This is a public access news site for scientific researchers. It includes discussion groups (members must register to participate in them) and features feeds from members' blogs and other news sources. Set up and managed by an individual, its operation is funded through adverts.

<http://www.labspace.net/>

LinkedIn – 100 million+ members

Although intended as an online networking site for professionals, there are many researchers on the site, including those from developing countries. The site is designed to enable people to maintain and grow their professional network through identifying contacts and asking for introductions and the site suggests people they might know. Although free to join, members can pay to access additional features. Limited details of members are visible to the public. It enables members to add content from other web 2.0 tools e.g. Twitter updates, WordPress, Amazon reading lists, etc. LinkedIn allows users to customise their own homepage and to track who has visited their profile.

<http://www.linkedin.com/>

MyNetResearch – 17,500+ members

A commercial, sophisticated and user-friendly site which is free to join but with more advanced research and communication tools available for fee-paying members and institutions such as online survey software, bibliography creator, etc which brings it closer to a collaboratory or VRE model. MyNetResearch's homepage is designed to encourage adoption: quotes from satisfied users, evidence of recent activity, explanation of its benefits and how to use it. Members can create online project spaces, and participate in forums, while visitors to the site can view forum discussions, browse research papers, and a global directory of dissertations.

<http://www.mynetresearch.com/>

VIVO – seven partner institutions

This is quite different from the other social networks in that it is an open source software developed to enable academic organisations to create their own "one-stop shop for publicly-available institutional data" (Sourceforge). The aim of the National Institutes of Health-funded program is to support cross-disciplinary collaboration within and between scientific institutions in the US. VIVO is installed on the organisation's own server and produces an institutional database, the data from which can be repurposed to create a searchable database on a public website. In comparison to other researcher networks, VIVO uses automatic retrieval of data from existing verified sources so removes the need for individual members to manually enter data, however VIVO recommends that participating organisations will need to allocate the equivalent of up to 3 full time posts to set up and maintain the system (Brooks et al, 2010). At the Cornell University VIVO site, users can browse data on Cornell's people, events, grants and research outputs. VIVO recognises the need to encourage adoption of this kind of tool and provides education and outreach resources to help organisations promote uptake and support¹⁵.

<http://vivo.cornell.edu/> Cornell University VIVO site

¹⁵ The media kit for VIVO uses Rogers' theory of diffusion of innovation to explain how speed and likelihood of adoption might vary among researchers (VIVO, 2010)

Categorising online academic social networks

These networks can be positioned on a number of axes and any new online academic community should establish where it needs to be positioned to be attractive to the target user, when developing specifications for design and management. Ways of categorising online academic networks include:

Involvement of researchers in the design

Labspaces.net, Academia.edu and GraduateJunction.net all emerged from a personal need identified by the researchers who created them. While these are very focused on researchers' needs, 2collab.com, a site provided by publishers Elsevier, by contrast had very little research-related activity.

Objective of the site

LinkedIn, which hosts several researcher groups, and MyNetResearch are run with commercial objectives. Although they are both free to join, members must pay to access advanced tools and functionality of the sites. Others, such as VIVO and GraduateJunction.net receive external funding.

Balance between public and private content

At one extreme, sites like LabSpaces.net make all content and discussions accessible to be read by visitors, while GraduateJunction.net restricts most of its content to only be viewed by registered members. Sites like Academia.edu sit somewhere between the two.

Moderation of content and membership

Most sites allow people to register as researchers without an approval and checking process, with the exception in particular of GraduateJunction.net. In VIVO, members belong to a database created by their own institution and the institution is responsible for the data, although there is the facility for people to login and amend their own data. There is more variety in terms of moderation of content, ranging from non-research discussion groups on 2Collab to more facilitation of groups as seen on GraduateJunction.net.

Ability to customise the site and access tracking data

Some sites, as demonstrated by LinkedIn, enable users to feed in content from web 2.0 applications that they already use e.g. blogs, Twitter, etc. which helps their profile appear more interesting without any effort from the user. LinkedIn and Academia.edu use their tracking data to allow users to see how effective their profile is e.g. telling them who or how many people have viewed their profile. By allowing LinkedIn to access their Outlook email account, members are alerted of any of their email contacts who are also members of LinkedIn.

Lessons from a failed platform: 2collab

2collab is perhaps the latest in a series of failed online academic communities (others include LabMeeting, launched in 2008, SciLink, which claimed to have 44,000 users in 2008, and SocialMD.com). It is not surprising that online communities that can be opted into are likely to fail unless they are uniquely attractive in comparison to the many other competitors. This phenomenon is so common that in reaction to the failure of platforms intended to appeal to large communities of academics, the Small Worlds Project was established at Leicester University, which sought to build online networks around existing communities.¹⁶

¹⁶ An account of the closure of this project is available here <http://scienceoftheinvisible.blogspot.com/2008/12/son-of-small-worlds.html>

Produced by Elsevier as a service to its users, the fate of 2collab is a cautionary tale for those planning to create a new platform for researchers. 2collab was promoted as a platform for researchers “to connect with others in their fields, making it possible to explore, share and collaborate, increasing the chances to discover new research opportunities and mine the collective wisdom of [its] member community” (Elsevier, 2008). The site has since been closed down, with the publisher saying that it had decided to “focus resources on providing optimal integration with and support for the leading bibliographic management and social-bookmarking tools currently on the market” (<http://www.2collab.com>). This supports the findings presented earlier in this report about not trying to compete with tools that are already accepted by researchers. When the author reviewed 2collab in February 2011, there was little research-related activity taking place with a lot of discussion groups having only one member and many of them being used to promote commercial activities. The site should have been a success: it had access to the target audience (the readerships of its journals) and could offer content that would appeal to them. Furthermore, Elsevier said that 2collab was developed “in conjunction with Elsevier’s usability labs and its premier Development Partners, which include many established research institutions” (Elsevier, 2008). However it seems to have ignored its own 2008 survey data which found that uptake of social media by researchers would be dependent on the provision of specialist tools, and a higher level of security and validation of users, in order to be seen as professional and credible (Elsevier, 2008).

Lessons learnt from Virtual Research Environments (VREs)

The Carusi and Reimer 2010 study of VREs concludes that these platforms (as discussed on p.10 of this report) will have a key role in “facilitating a new type of research that is highly international, interdisciplinary and that relies on distributed data” (p.43). But a key lesson from their study, one which is repeated in several evaluations of web 2.0 in development¹⁷, is that a VRE must be built with researchers, rather than for them and for the process to be iterative. A comment from a funder of a VRE illustrates this point:

“You really need to answer the needs of the researchers instead of creating something for them and hoping that they will take it up. That was a direction that we actually started from a few years ago, when we thought, well this is going to be very cool for researchers, so let's develop it, and let's throw it at them and see what they do with it. If you take that approach they will not do anything with it at all. Some enthusiasts might, but you will not reach the whole community. So we are actually listening better to our researchers. Maybe we should have done that from the start! We are now actually almost sitting next to the researchers and seeing what they are doing in the research environment, and how we can make things more efficient.” (Carusi and Reimer, 2010, p.24).

Other lessons for online academic networks, from the review of VREs include:

Work with existing behaviours – work with tools researchers already use otherwise they will revert to their preferred applications (as 2collab discovered). The Research Information Network 2010 study reinforces the need to offer tools that build on the researchers’ existing practices.

Have academic champions – senior researchers need to be seen using the site in order for it to have credibility with the wider academic community. The design of the platform should enable visitors to see members that lend credibility to it.

¹⁷ For entries in the KM IMPACT Challenge (KMIC), see <http://kdid.org/kmic/entries>

Plan for sustainability – building up a thriving online community takes time so the platform needs to have sustained funding. Being demand-driven will make it more likely that renewed funding will be available.

Provide sufficient support – training, FAQs, and online support should be available from people who understand both the technology of the platform and the context in which academics work.

Build up a visible, critical mass of active users – this will encourage people to participate; many authors highlight the impact that others' activity can have on encouraging participation e.g. Rogers (2003).

Respond to issues of trust and access – researchers will need to be sure that the people they are connecting with are who they say they are. This points to the need to balance public content (to motivate people to take part) and private access (to enable conversations to happen).

Good practice in managing online communities

Further advice on creating a successful online academic social network (in terms of active membership) can be obtained by reviewing evaluations and reports on online communities and networks¹⁸. This suggests that success comes from:

- **Incentivising contributions from members and running short-term campaigns** e.g. the KM IMPACT Challenge invited people to contribute stories of knowledge management in development through encouragement, the chance to win a prize, and by promoting those that had been contributed.
- **A value statement that informs the design, function, policies, etc. of the site** – the creators of the platform should set clear goals and measurable objectives at the outset
- **A clear, jargon-free code of conduct** – there are numerous examples of badly written codes of conduct on online communities
- **Having a dedicated facilitator** – this person needs to be accessible and respond quickly
- **Tailoring the platform to the audience** – several organisations have reported learning the hard way that researchers need to be involved at the outset and the community should be tested with them. The FAO, for example, learned that “networks should be created as a response to a real and articulate need of an identifiable group of people sharing the same interests, rather than in a top-down way” (Loumbeva et al.)
- **Providing unique, up-to-date, good quality content** and motivating members to contribute good quality content
- **Acknowledging and reinforcing positive contributions by members**
- **Welcoming new members to the group**

¹⁸ Especially, <http://www.onlinecommunityreport.com/2008/11/online-communities-establishing-a-communitys-culture/>

Measuring and tracking in online communities

Some online communities use their tracking data to provide additional services to their members, e.g. Academia.edu and LinkedIn and from this we can see that they are able to monitor:

- A member's membership of groups within the site
- Connections made to other members (where this is a feature)
- Which profiles members are visiting
- Which sites members' profiles are accessed from

Although the number of members is often publicised by online communities, and may attract new members, volume of members is not a good indicator of success as the majority of these may be inactive i.e. registered and then never returned. A better indicator of "life" in an online community is the amount of activity taking place: How recent are the discussions in the forums? Do members reply to questions posed by other members?, etc.

Findings from the *Online Communities: Metrics and Reporting* research study suggests that online communities are restricted by what they can measure through the platform's built-in web stats (Online Communities Report, 2008). The study found that the top five items online communities say they would like to measure but are unable to are far more qualitative measures:

- Level of member satisfaction
- Amount of influence/evangelism by members
- Member lifecycle
- Member loyalty
- Referrals to the community

Research by Reichheld (2003) found that the question that is most likely to predict repeat use and recommendations of a service or organisation is "How likely is it that you would recommend [xxx] to a friend or colleague?". This measure, known as the Net-Promoter score, is useful for benchmarking and comparisons between countries and gender, for example, and is being used by a number of online communities and businesses, e.g. Amazon and eBay achieve a rate of between 75% to 80% (Reichheld, 2003).

Other useful measures from the Online Communities Report are:

- Ratio between contributors, connectors and consumers among the membership
- Ratio of registrations to casual visitors (if conversion to membership is one of the goals)

Conclusions and recommendations

Reference has already been made to the limitations of this study, in terms of the availability of secondary data about social science researchers, and researchers in the South. However, this study and the discussion of theories of adoption of innovation and perceived risk highlight the numerous challenges that organisations will face when trying to encourage adoption of web 2.0 tools among the academic community for collaboration and knowledge-sharing. In particular, encouraging registration and participation in online academic communities or VREs is difficult and has seen the closure of several platforms already, including those with significant organisational resources and external funding.

The appropriateness of web 2.0 tools in a southern context

From the data available there does not seem to be any reason why researchers in developing countries should be more reluctant to adopt web 2.0 tools than their counterparts in the UK, although female researchers may perceive risks that deter or prevent them from adoption. However, in practical terms the proportion of southern researchers who are able to adopt the tools is likely to be lower, particularly in Africa where reliable access to the internet continues to be an issue.

Although mobile technology has the potential to enable southern researchers to use some web 2.0 tools e.g. Twitter and Facebook through their mobile phone, it is likely to limit the engagement in online research collaboration and platforms will need to be designed to be “mobile-friendly”.

Recommendations to increase adoption of web 2.0 tools for research collaboration and knowledge-sharing among southern academics

Suggestions were made in the discussion of adoption (pages 12 to 15 of this report) and numerous examples of good practice from online communities and VREs have been highlighted (pages 19 to 21 of this report), all of which are worth considering. However based on these, the following broad recommendations are made for GDNNet to increase adoption of the GDNNet Community, and any other web 2.0 tools it offers to academics:

1. Approach the development of a new academic online community and provision of web 2.0 tools with caution and with realistic expectations.

Considerable resources have been wasted and organisational reputations put at risk through poorly-planned and ambitious platforms that were neither demand-driven nor conscious of the realities of the academic environment. Design should be based on making the existing working practices of researchers easier and more effective, rather than requiring new and undesired behaviours. If web 2.0 tools do not add value in the mind of the intended user to the tools already being used, then they will not be adopted.

2. Make use of opinion leaders.

Academics who are not naturally quick to adopt innovations may take them up if they witness the people they respect using them. Credible and popular bloggers are examples of opinion leaders, and GDNNet might identify southern academics who are already influencing people online and particularly encourage and support them to use their web 2.0 tools.

3. Focus on ease of use and providing excellent support

Time is a critical resource for academics and web 2.0 tools will need to be easy to use from the first time of using them. Guidance on how to use the tools in plain English should be made available and GNet should also be prepared to offer an email or Instant Messenger helpdesk, and respond quickly to requests for support.

4. Find out what degree of privacy, vetting of profiles and moderation researchers require

Academics are cautious about sharing their data online, and need to trust that researcher profiles are accurate and honest. Women in particular may need reassurance that their data will be private, unless they choose otherwise, and comments will be moderated.

5. Work at an institutional level to encourage adoption

Even an intuitive web 2.0 tool requires some time to allow the user to familiarise themselves with it and assess its value before adoption. GNet should work with research institutes and networks to obtain institutional backing for taking time to use web 2.0 tools and look for opportunities to build taster sessions into workshops and conferences.

Recommendations for future research

Given the lack of reports on adoption of web 2.0 tools by academics in developing countries, it is strongly recommended that primary research among southern researchers is undertaken to supplement these findings. For example, it would be helpful to understand:

- the reasons for adoption among those southern researchers who are known to be using web 2.0 tools and the value they obtain from using them
- the extent of desire to collaborate online (an important pre-requisite to adoption of web 2.0 tools) what can be done to facilitate this adoption: improving access, increasing understanding of how to use the tools, gaining support from the research institution to experiment with them, etc.
- the incentives institutes are using that lead to increased adoption of web 2.0 tools by their researchers.

Primary research would also be needed to assess the feasibility of creating a new VRE for development researchers given what is known about academics' particular needs for online communities, namely security, vetted registration, ease of use, credibility in terms of content and membership, etc. And the planning should draw on the lessons learnt by existing and failed online communities, especially those aimed at academics as well as exploring the reasons why some VREs are trusted and used by researchers

It would be useful to explore further the potential regional differences in adoption of web 2.0 tools that were highlighted through examination of GNet survey data.

Finally, this subject is of growing interest and publications and conferences should be monitored for further research on adoption of web 2.0 tools by academics, especially in the South.

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