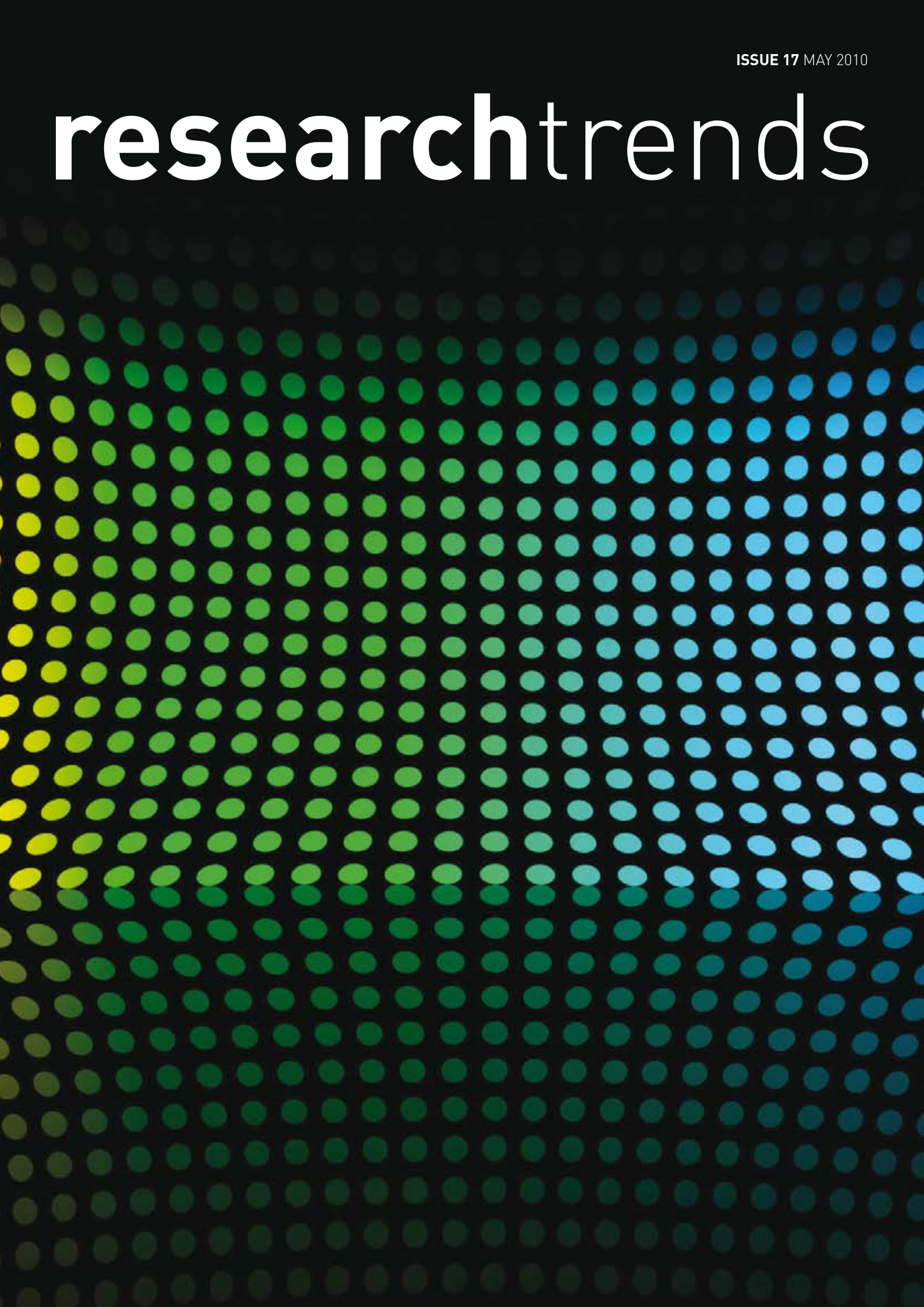
ISSUE 17 MAY 2010

researchtrends



ISSUE 17 MAY 2010

researchtrends

Welcome to the 17th issue of Research Trends, which is all about promoting your work and raising your profile. Blogging is one way to share your ideas with a wide audience. Although this might not be a direct line to your research community, it is an excellent way to reach non-scientists and academics from other fields.

Public interest in general, often through the mainstream media, can also raise your profile. But, as we learn in Tending the GM garden: does public interest fertilize or poison the field?, if the subject is highly controversial, the attention might not be welcome.

Appearing on television will help you communicate your research to a very wide audience, but again, not necessarily a large research audience. Research Trends investigates the effect of a television appearance on citations.

For those looking to raise their profile, any public outlet or research project can be turned to your advantage. Dennis Weber, Professor of Tax Law, tells us how he has made his own opportunities and success.

Meanwhile, the scientific community has emerged as an early adopter of mobile apps, using them to access reference materials on the go. We review the best scientific apps out there. In fact, in an Elsevier survey, 65% of scientists indicated that they would appreciate the ability to access Scopus anytime. We are obviously very excited that researchers want to use Scopus even when they are not at their desks, so we have developed a mobile app packed with features to help you continue your research and collaboration projects while on the move. Please visit **Scopus Alerts** to learn more.

And finally, the QS World University Rankings use Scopus data to evaluate the comparative research performance of universities worldwide along with one other indicator – your collective opinion. Please click **here** to complete the online survey.

If you would like to comment on any of the topics covered, please use our **feedback** facility.

DID YOU KNOW?

... there are 6 degrees of separation between you and Albert Einstein?

Six degrees of separation is a social psychology theory about connectivity of networks across the globe. The idea is that any two individuals are connected by at most five others. The idea is applied in a popular game: Six Degrees of Kevin Bacon, where players have to find how a randomly chosen actor is linked to Kevin Bacon, using actors that have appeared together in the same films as links. Again, the degree of separation is typically no larger than 6.

A similar measure is the Erdös number in mathematics. Paul Erdös is probably the most prolific author in mathematics to date, with approximately 1,500 articles published in his lifetime. His direct collaborators have an Erdös number of 1, while those who have collaborated with them (but not with Erdös himself) have an Erdös number of 2, and so forth.

So how does this theory apply to the scientific community: how many steps are needed to go from one scientist to another, linking them by co-authors? Not surprisingly perhaps, a 2001 study has found the scientific degree of separation to be... six. *(1)*

Reference
(1) Newman, M.E.J. (2001) "The structure of scientific collaboration networks", *Proceedings of the National Academy of Science*, issue 98, p.2.

ISSUE 17 MAY 2010

Behind the data

Blogging about science

JUDITH KAMALSKI

Just five years ago, there were only a handful of science blogs in English, now there are thousands. According to Adam Bly from Science Blogs (Seed Media Group), around 33% of scientists are now using blogs for writing, reading or as a lab notebook.

Launched in 2006, Science Blogs has seen unique visitors per month rise from 200,000 to 2.5 million in just three years. Today, it publishes 150 blogs from around the world written by professional science researchers and science journalists in different languages.

Reaching out

While some, like Inna Kouper at the School of Library and Information Science, Indiana University, believe science blogs rarely reach the non-scientist community, even though they should *(3)*, others, like science blogger **Janet Stemwedel**, are proving that they can attract non-scientists as well as their peers.

Dr Isis, who writes the "**On Becoming a Domestic and Laboratory Goddess**" blog comments: "For me, I know that a single blog will be read by many thousands more non-scientists than any original scientific article I publish in a peer-reviewed journal". *(4)*

Drugmonkey adds that among a science blog's lay audience, a number could be made up of scientists reading about specialties other than their own, making them lay people in that particular field *(4)*.

Tight communities

According to Christina Pikas, a doctoral student at the University of Maryland College of Information Studies who performed a cluster analysis on science blogs, communities generally form within scientific disciplines. However, those authored by female scientists tend to attract a more interdisciplinary readership *(2)*.

Pikas comments: "When I reviewed these blogs, I found that they are more likely to have anonymous or pseudonymous authors, and often discuss work-life issues, including gender issues. In the blogosphere in general, there are few blogs that are very heavily read and linked-to; the majority have just a few readers, exhibiting the 'long-tail' phenomenon. However, within the 'female' community, the blogs have almost the same number of readers, they all link to each other, and they all comment on each other's blogs. It's more evenly distributed. More research is needed to understand precisely why this is, but it does seem to be a more supportive community than some of the others."

What is science blogging?

A science blog is an online article written either by a scientist or written about science or being a scientist. According to Adam Goldstein: "A weblog ('blog') is a publication on the World Wide Web in which brief entries are displayed in date order, much like a diary or journal." *(1)* Christina Pikas defines science blogs as, "blogs maintained by scientists that deal with any aspect of being a scientist, or blogs about scientific topics by non-scientists" *(2)*. According to Bora Zivkovic, better known as Coturnix, author of "A Blog Around The Clock", "most are really science blogs – covering science in every, or almost every, post."

Blogs by female scientists tend to have a lot of links and short paths to other nodes in the network *(1)*. Pikas explains: "The links among the blogs are formed when one blogger comments on another blogger's post or when one blogger includes a link to another blog in his or her blogroll. Each blog is a 'node' or actor in the network. A path traces the connections between nodes or actors. If blog A links to blog B, then there is a direct connection. If blog B links to blog C, then A can get to C through two hops on the path. If the network is densely connected, there are multiple ways you can trace a path from one node to another, and you don't have to make many hops to get from one blog to another."

A personal touch

Adam Goldstein, Assistant Professor of Philosophy at Iona College, notes that blogs may not be the best type of source for systematic and authoritative information. *(1)* Kouper agrees, noting that, "this way, the news becomes more entertaining, thereby making it difficult to rely on this form of reporting as a source of accurate information." *(3)*

For bloggers, this is a personal expression that illustrates science engagement more than objective authoritative information. Many science blogs have different categories in which they classify their posts. Some can be about more personal topics and others on more research-oriented themes.

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Pikas says: "Mixing various posts is useful in public communication because it reinforces the point that scientists are real people with real lives." And then there are blogs where the boundary between personal and scientific can be blurred: **Cognitive Daily**, which sadly stopped in January 2010, featured "Casual Fridays", in which light-hearted surveys and experiments were conducted with the help of readers.

Punch line

Coturnix hits the nail on the head when he says that a science blog's success is down to "the personality of the owner, combined with her/his expertise, that draws in the audience". Elements that he lists as common in a successful blog are humor, juicy language and strong opinions.

David Crotty blogs on **The Scholarly Kitchen** that, "the best blogs (not just science blogs) are written with passion and personality". *(6)*

Pikas adds: "A good blog is useful to either its owner, its readers, or both. [...] When I asked scientists about the blogs they read, they told me that they enjoy good writing, a sense of humor, and good science. There is no right answer for what should be on a science blog."

In general, it is a combination of the blogger's personality and the content on the blog that makes for a great read and successful blog. Science blogs are a great source of information... and a true must-read.

Useful blogs:

Science Blogs
"A Blog Around The Clock", Coturnix
"Adventures in Ethics and Science", Janet Stemwedel
"On Becoming a Domestic and Laboratory Goddess", Dr Isis
"The Scholarly Kitchen"

References:
(1) Goldstein, A. (2009) "Blogging Evolution", *Evolution: Education and Outreach*, vol. 2, issue 3, pp. 548–559.
(2) Pikas, C. (2008) "Detecting Communities in Science Blogs." *Fourth IEEE International Conference on eScience.*
(3) Kouper, I. (2010) "Science Blogs and public engagement with science: practices, challenges, and opportunities", *Journal of Science Communication*, vol. 9, issue 1.
(4) Dr Isis (March 2010) "Science blogs and public engagement with science: practices, challenges, and talking out of your ass".
(5) Drugmonkey (March 2010) "When scientist audience is from another field it is still 'outreach'".
(6) Crotty, D. (March 2010) "Science Blogging as a Public Outreach Tool — Unfulfilled Potential or Unrealistic Expectation?" *The Scholarly Kitchen.*

Research trends

The mobile lab

SARAH HUGGETT

The growing prevalence of mobile devices cannot be ignored: cell phone subscriptions worldwide have reached 4.6 billion and this figure is expected to increase to five billion this year *(1)*. With a global population of around 6.8 billion *(2)*, this means that approximately two-thirds of people now own a cell phone *(3)*.

Between 2000 and 2008, the cell phone industry boomed, recording average year-on-year subscriber growth of 24%. Scholarly publications on the subject kept pace during this period, rising 18% per annum (see Figure 1, reflecting data 1996-2008).

In more recent years, the industry has expanded to include smart phones and other mobile devices, and many of us now expect to be able to access the information or services we need anytime, anywhere.

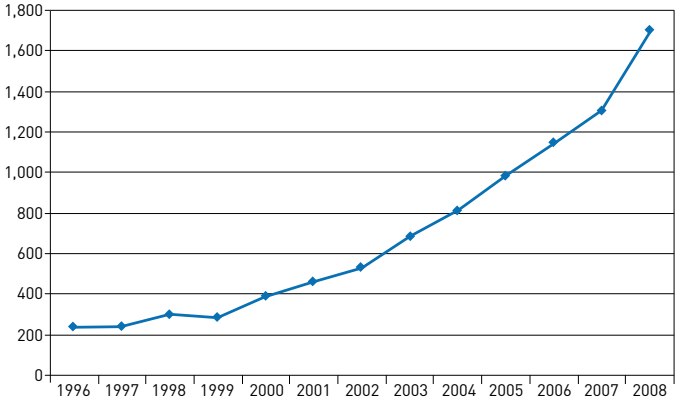

Figure 1: From 1996 to 2008, scientific literature (articles, reviews and conference papers) with variants of "cell/mobile/smart phone" in their titles, abstracts or keywords shows an annual growth of 17%. Research output was relatively stable in the late 1990s but started climbing steadily after 2000, with a jump of more than 30% between 2007 and 2008.

Source: Scopus

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Academic apps

The mobile boom has led a growing number of actors in the Science, Technology and Medicine (STM) community – from academics and universities to publishers and database providers – to ensure their services are easily accessible from handheld devices. Academia's uptake has been swift, and applications designed specifically for researchers and health professionals (see box, right) have mushroomed. This is significant, especially as the market is still in its infancy – online app stores only began to emerge about two years ago.

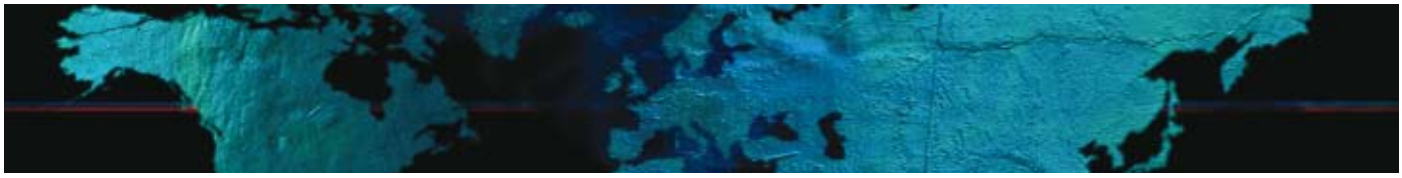
As more apps are released, we are in danger of seeing an "app" overload hit the market, and busy academics will need help choosing the best apps for their needs. User reviews, visibility, popularity and usefulness will, therefore, play a part in determining the success or failure of various science apps. Among the early adopters, some will prove successful and others will fade away, but it is certain that scientists' interest in mobile apps is set to continue.

References:
(1) [February 2010] "Number of Cell Phones Worldwide Hits 4.6B", *CBS News*.
(2) United States Census Bureau.
(3) Wray, R. [September 2008] "Half world's population 'will have mobile phone by end of year'", *Guardian*.

APPlied science: mobile apps for researchers on the go

Atom in a Box: an iPhone app that aids in visualizing hydrogenic atomic orbitals in quantum mechanics.
Chemical Touch: an iPhone app for detailed periodic and amino acid tables.
Epocrates: the Rx version is a free comprehensive handheld drug guide for Palm, Windows Mobile, iPhone and BlackBerry.
iCut DNA: this iPhone app allows users to search the Restriction Enzyme Database for enzymes and DNA nucleotide sequences.
MD Consult Mobile: designed for use with the iPhone, BlackBerry and other smartphones, MD Consult Mobile gives access to an extensive library of medical content.
Molecules: an application for the iPhone and iPod touch that allows users to view and manipulate three-dimensional renderings of molecules.
Netter's Anatomy Flash Cards: an iPhone app to navigate more than 300 anatomical flash cards. Neuroscience and other versions are also available.
PubSearch Plus: a free iPhone app that allows users to navigate and search the biomedical literature database PubMed.
Papers: an iPhone app dubbed the "iTunes for literature" allowing purchase and storage of journal articles.
Scopus Alerts: an iPhone app enabling users to search and save searches in the Scopus literature database, set up and view alerts, and annotate and share documents.
Starmap: a sophisticated interactive iPhone app claiming to be a "portable planetarium".

Country trends



Tending the GM garden: does public interest fertilize or poison the field?

TOM JONES

Genetic modification (GM), which involves altering the genome of an organism, typically by introducing genes taken from a distantly related species, has become a highly controversial technology. Both hailed as a solution to world hunger and vilified as a potentially devastating attempt to subvert nature, its development and applications have become a polarizing and emotional issue.

GM technologies are an effective way of introducing novel traits to organisms and, with the launch of the FlavrSavr tomato (a tomato with a gene to prevent ripe fruit from going soft) in the mid 1990s, GM crops have become a commercial reality. Initially, advocates promoted GM technologies as the great 'Green' hope – with benefits for our health, productivity and economies. There was rapid uptake in a number of countries, including Canada, the USA and Japan.

However, crises linked to industrial agriculture (such as the bovine spongiform encephalopathy (BSE) epidemic in the UK, for example) fuelled concern about the potential risks of GM in Europe, and public attention rapidly became focused on the negative aspects of GM crops, including impacts on biodiversity, health issues for consumers, and consolidation of control of the food chain.

The UK, for instance, has shown continued public resistance to GM crop technologies *(1)*: surveys suggest that only 2% of British people would be happy to eat GM food, and 50% are against it being publicly available.

Broader shifts in the developed world have also seen the increasing popularity of organic and locally sourced food, small-scale production (an approach that is in opposition to GM agriculture), and strict legislation and control of GM material in the EU.

Additional focus

The storm of negative media attention and public opinion does not seem to have had a direct effect on publication output on the development and applications of GM crops, which has grown steadily since the launch of the FlavrSavr tomato. However, these public concerns may be helping to boost research into the environmental impact of GM crops, an issue that has attracted considerable public attention and has also seen a significant rise in research output (see Figure 1).

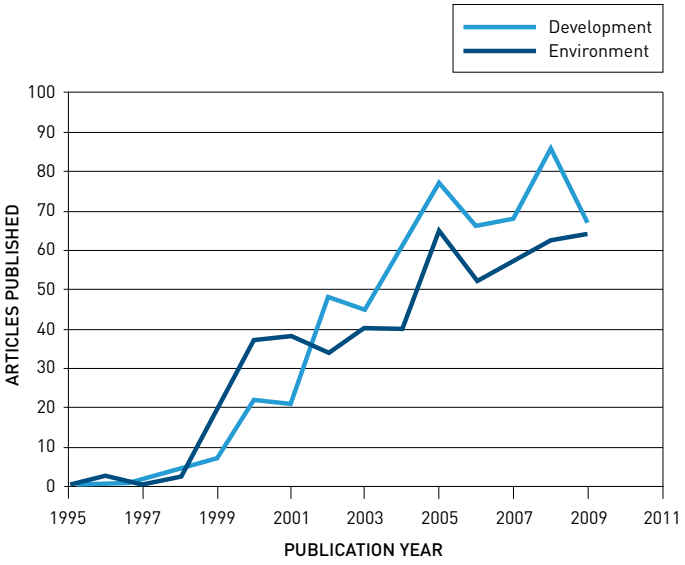


Figure 1: While there was a steady increase in research output into the development and applications of GM crops between 1995 and 2009 (keyword search: gm and crop* and develop*), this was matched by growth in research into the environmental impacts of growing GM crops (keyword search: gm and crop* and environment*).

Source: Scopus

Where GM blooms

Not everyone shares these environmental and health concerns, and developing countries have been quick to develop their GM farming sector. Brazil, for example, has significantly stepped up its GM soybean production. A major concern for developing economies, however, is that by growing GM crops they will harm their prospects of exporting food to wealthy countries with stringent restrictions and labeling rules on GM in the food chain *(2)*.

For developing countries, GM crops are also a food-security issue, and for those with rising wealth and growing populations, GM crops offer great promise. In China, for instance, where famine is within living memory, public attention is naturally concerned with food security and this has helped fuel a huge expansion in research into the development and applications of GM crops. In 1998–1999, China was the 20th most prolific producer of research on this topic; in 2007–2008, it had jumped to fourth place (see Table 1).

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	2008–2009		1998–1999
Country	**Number of articles**	**Country**	**Number of articles**
USA	1,586	USA	1,232
Germany	752	Spain	301
Spain	668	France	281
China	513	UK	219
Italy	417	Japan	205
Japan	407	Germany	180
UK	399	Canada	140
France	390	Italy	140
Canada	317	Netherlands	81
Belgium	174	Switzerland	66
Netherlands	172	Belgium	63
Switzerland	166	Taiwan	54
Taiwan	164	Australia	48
Korea, Republic of	146	Denmark	47
India	142	India	39
Brazil	138	Sweden	34
Australia	131	Israel	33
Sweden	114	Brazil	30
Denmark	108	Korea, Republic of	30
Austria	94	China	28

Table 1 – Developing countries are steadily overtaking their developed counterparts in research output on the development of GM crops (keyword search: gm and crop* and develop*).

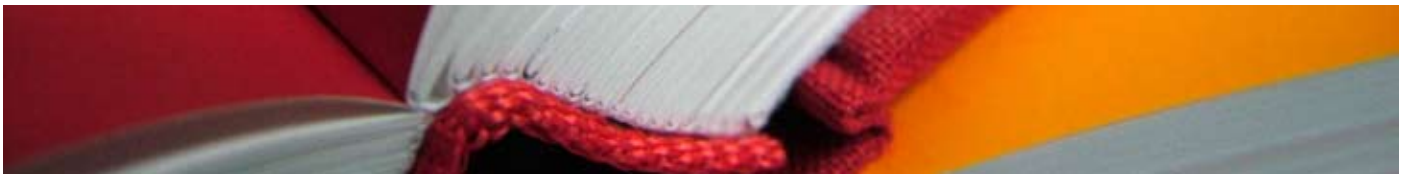
Source: Scopus

Because these lists can be distorted by factors such as national wealth or the size of the historical research base, a better alternative is to look at relative research growth in different countries. Even here, developing countries with increasing wealth and populations, coupled with food-security concerns, are outstripping their developed counterparts. Between 1998–1999 and 2007–2008 China's output rose by 1,700%, India's by 264% and Brazil's by 360%, compared with growth of 82%, 28.7% and 39% in the UK, the USA and France, respectively, all of which were early leaders in GM research.

It seems that media interest is not only fuelling research into the effects of GM crops, it is boosting research output in regions where GM is seen as a potential answer to food-security concerns and suppressing output in countries where public opinion is more skeptical of its potential.

References:
(1) Franks, J.R. (1999) "The status and prospects for genetically modified crops in Europe", *Food Policy*, issue 24, pp. 565–584.
(2) Azadi, H. and Ho, P. (2010) "Genetically modified and organic crops in developing countries: A review of options for food security", *Biotechnology Advances*, issue 28, pp. 160–168.

Expert opinion



Creating your own destiny

MICHELLE PIROTTA

At the age of 40, Dennis Weber is already a professor of European Corporate Tax Law at the University of Amsterdam, head of the European Tax Law desk at Loyens & Loeff and a deputy judge in s'Hertogenbosch, the Netherlands.

He is also a regular speaker on European tax law at seminars and institutions worldwide, holds several directorships, and edits and contributes to various publications.

However, he only entered tax law by a process of elimination: he knew he did not want to work with languages, so entered law, which he discovered he was very good at. "When you're good at something, it's often more fun." However, he is keen to point out that success is no accident. "Once you discover your strengths, you need to study hard and set new limits every day."

Yet as a student, he did not set himself long-term career goals. He had a vague idea that he would like to be a top European tax lawyer and maybe get an article published in one good journal. Now he is a professor with 43 journal publications and three books, not to mention countless newsletters and short articles, to his name. "I had no clear vision. You just work hard at things you enjoy, and suddenly you look around and realize that you have succeeded," he says.

He sees himself as primarily an academic, but in most cases there is no difference because the two activities feed into each other. As a legal consultant, he advises from an academic perspective, so the academic feeds into the practical. He then uses case examples for his research, allowing the practical to feed the theoretical.

Opportunity knocks

Weber actively seeks out opportunities for interesting and useful research. For example, there was a lot of discussion on the most-favored nation principle in EU direct taxation, but no clarity and no answers. So, he set up a test case and took it to the European Court. "I also thought it would be a nice academic project," he adds. He not only got an answer, he was also able to write a paper on the case.

He says: "Sometimes you hear people complaining that they need an organization to research a particular subject. I believe you have two choices: wait for someone else to start an organization or start one yourself. I always say that anything is possible if you try. And, this is what I did. I helped set up the Group for European and International Taxation and the EU Tax Law group. I'm the general editor of *Highlights & Insights on European Tax Law* because everyone was saying we needed a journal like that. And I organize seminars on hot topics and winter courses on international and European taxation."

He has always been an initiator. "When I was a student, I got bored of the parties in Amsterdam, so I started my own. I even had my own magazine. I'm good at organizing things." He was on holiday in Sri Lanka when the tsunami hit, so he raised money to help. "It seemed the obvious thing to do," he says.

Academics also need to work on boosting their visibility. "If you do research but nobody knows about it, it is useless," Weber says. "Build your network and make sure people receive your research, even if you have to send it to them."

Making time for success

According to Weber, to achieve success in European tax law, you must be a critical thinker; have independent and new ideas, or at least be open to them; do excellent research; and always be one step ahead of your peers. You must also have passion for your subject, manage your time carefully and do high-quality research. Seizing opportunities is one thing, but you must have the time to take on dream projects when they do come along.

He says: "Don't waste your time and talent on less important research projects. If you are busy with unimportant work, you won't have time for that big project. I always make time for that."

Weber believes that quality is far more important than quantity in research, and much more likely to lead to success. This is why he deliberately sets time aside for the important questions. "You get more attention if you write about important topics, because you will initiate debate."

Packed social life

Perhaps not surprisingly, Weber approaches his social life with the same energy he gives to his professional work. There is some overlap: he travels a lot for work, which is also a hobby. "When I travel for work, I always go out – to bars, restaurants. Tell me a city and I will tell you a good restaurant; the last one was Caprice in Hong Kong – amazing. I am also lucky to have a strong social network with my family and friends."

But he is too busy living his life for one pastime: television. "Why would I want to watch other people's lives? It is better to live your own life, isn't it? To create your own life and your own opportunities."

People Focus

15 minutes of fame

JUDITH KAMALSKI

Every scientist believes in the importance of their own research. And, when that long desired breakthrough finally arrives, they believe the whole world will want to hear about it. What happens when the popular media actually agree and feature your research? Do other researchers pick up on it? Does it mean you will get more recognition from your peers for that breakthrough? In other words, can media coverage increase citations to your work?

Researchers certainly do use other sources of information, aside from the traditional scholarly journals. For instance, a 1991 survey found that 57% of Dutch biologists said they use national newspapers as sources of information for their work, and 30% said they relied on Dutch television *(1)*. Therefore, if the media cover your finding, other researchers are likely to pick up on it.

However, does this exposure also lead to more citations? Vincent Kiernan has shown that breaking news coverage by daily newspapers was associated with more frequent citations, but coverage by network television was not *(1)*. One of his possible explanations is that people remember things better when they have seen them in writing. The results of our investigation into the effects of a television appearance on citations appear to confirm Kiernan's finding (see Case Study), but it is of course difficult to tease out the direction of causality – does exposure bring about additional citations as a by-product of increased attention, or are inherently more citable breakthroughs selected for media coverage?

Knowledge should be shared

Citation impact aside, it is very important for scientists to share their findings with a wider audience. The results of academic research are relevant to many more people than those in the same academic subject field, and should be shared with anyone with an interest in the area. At the same time, scientists can do their bit to promote science by speaking with enthusiasm about their results on TV.

There is a risk involved, however. When media report on scientific findings, they can misinterpret or oversimplify. Meaningful results get edited to the point that they fail to communicate the original idea or complex findings are interpreted differently according to the journalist *(3)*. Ben Goldacre, a writer, broadcaster, and medical doctor, gives this example:

> "Prostate cancer screening could cut deaths by 20%" said the *Guardian*, and "Prostate cancer screening may not reduce deaths" said the *Washington Post*. About exactly the same study. *(3)*

So some caution is certainly warranted when interpreting non-scientific popular articles about science.

Ultimately, scientific work that is novel or important deserves to be broadcast to the widest possible scientific and lay audiences. The question of additional citation impact might, perhaps, be seen as an optional bonus for the researchers involved.

Case Study: Does fame affect citations?

Every month, the President of the Royal Netherlands Academy of Sciences, Robbert Dijkgraaf, appears on a Dutch talk show to introduce up-and-coming scientists. Research Trends looked at the Scopus records for three young scientists who appeared on the show in early 2009. Previous research has shown that the effect of media coverage on citations is strongest in the first year after the media attention, where publicized research received more than 72.8% more citations *(3)*.

In early 2009, Martin Jurna discussed a new microscope, Martine Veldhuizen talked about swearing in the Middle Ages and Appy Sluijs addressed climate changes in history.

A year on, Veldhuizen is not listed in Scopus. Scopus lists eight documents for Jurna, with 10 citations in 2008 (before his TV appearance) and 17 after. For this to be a direct result of his TV appearance, the increase would have to be mainly from Dutch citations, but his only Dutch citations are three self-citations; the rest are international. Sluijs has 25 articles in Scopus, which attracted 222 citations in 2008 but only 220 in 2009 – a slight fall after the show aired.

Useful link:

'How science became cool', *Guardian*

References:
(1) Willems, J. and Woustra, E. (1993) "The use by biologists and engineers of non-specialist information sources and the relation to their social involvement", *Scientometrics*, issue 28, pp. 205–216.
(2) Kiernan, V. (2003) "Diffusion of News about Research", *Science Communication*, vol. 25, issue 3, pp. 3–13.
(3) Philips, D.P., Kanter, E.J., Bednarczyk, B., and Tastad, P.L. (1991) "Importance of the lay press in the transmission of medical knowledge to the scientific community", *New England Journal of Medicine*, issue 325, pp. 1180–1183.
(4) Goldacre, B. (March 2009) "Science journalists? Don't make me laugh", *Guardian*.

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