

## TAKING NEW ROUTES: BLOGS, WEB SITES, AND SCIENTIFIC PUBLISHING

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### 1 Scientific publishing

Scientific publishing plays an important role in the academic research process (Shugan, 2004). While the results of non-academic research are likely to be kept secret, it is necessary that the findings from academic research are made public. This way the results can be quickly and easily picked up and used by other scientists. From this viewpoint, scientific publishing appears like an altruistic exercise for the sake of common progress. However, publishing also has a very pragmatic function within the scientific community: it provides a foundation for the building of individual reputation, thus creating awareness within the community (Heimeriks & Vasileiadou, 2008). As such, scientific publishing is well established, with accepted procedures and platforms. However, as I wish to discuss in the following, there are limitations to what it can achieve. Or, to put it another way, I believe that due to the technology development, in particular the Internet, the traditional scientific publishing can be sensibly supplemented and improved.

To understand the role of scientific publishing, it is helpful to view it from a historical perspective. David (2004) offers a helpful discussion of the development of scientific publishing. He suggests, that scientists have been encouraged to move away from their first secretive attitude due to the sponsorship and patronage of wealthy elites. Besides reaping direct benefits of research efforts, these patrons also profited by improving their image, if they sponsored a successful researcher. As science became more granular and complex, the success and value of research results could only be judged by other scientists. Thus in order to secure the scientists' reputation - and by projection the image of their patrons - it became necessary to make research results available to peers. Hence according to David (2004), publishing of research results evolved as means of establishing reputation. The altruistic element of supporting progress by making findings quickly available became relevant after research began to be financed by the state (David, 2004).

Traditionally, there are three types of platforms for scientific publishing: conferences, journals, and books. Conferences are events requiring the presence of scientists, where findings are presented personally by

scientists. Conferences allow for a quick dissemination of findings as well as for personal contact among scientist. Journals aim to publish original, relevant, and rigorous findings. To ensure quality, journals use a blind peer review process. The journal rank and impact play a particularly important role regarding the scientists' reputation, though these measures are far from uncontroversial (e.g. Starbuck, 2005, Oswald, 2007). Finally, books can be used to publish complex and extensive information on topics from academic research. The importance and specification of these platforms differ across disciplines. These traditional platforms have been effected by the technological development, in particularly of the Internet.

Conferences can be supplemented by online resources, journal articles and books are made available in electronic form. This has improved the dissemination of scientific publications worldwide. Furthermore, the Internet has been a key element in the development of new form of journal publishing, which calls for an unlimited availability of scientific publications: Open Access (Bernius & Hanauske, 2007, Willinsky, 2005, Hedlund, Gustafsson, & Björk, 2004, Björk et al., 2010).

Thus in summary, it is possible to derive several functions of publishing within the scientific community. First, research results are promptly circulated, improving the effectiveness and efficiency of the joint research efforts of the community. Second, the published results can be evaluated by other scientists, thus minimising mistakes and maintaining high quality standards. This function is partially implemented even before publication through peer review processes. Third, scientists acquire awareness of their peers and their peers' work through reading of publications and conference attendance (Tenopir, King, Edwards, & Wu, 2009). Thus the publication and dissemination of results helps to create ties that bind the scientists in the community (Heimeriks & Vasileiadou, 2008). Fourth, a scientist's publications serve to establish the reputation of the scientist as they are accepted as a record of his or her research output (Pastowski, 2003).

There are of course limitations and problems in the publishing system, for example the question of access to already published work, problems with quantitative

evaluation of impacts, or the publish-or-perish attitude (Young, Ioannidis, & Al-Ubaydli, 2008). Besides these, I also see functions that are not covered by the system. These I would not call limitations, as they were originally not in the scope of the publishing system. Firstly, scientific publications are addressed to the scientific community. It is not their aim to inform the general public. The general public often lacks access to the publications as well as the background to understand them. Secondly, the form of a scientific publication is clearly defined. Although besides the results of original research, other publications are accepted by the community, the scope of publication types is limited. Thirdly, while through the engagement of scientific publications it is possible to find scientists working in a particular area, each publication represents but a small portion of their work. Although the pieces may be quantified and summed into measures of overall output, qualitatively, viewing simply the publishing output is insufficient to evaluate a scientist's work.

In the following section, I will discuss one aspect of the current development of online information and communication technologies: the emergence of individual spaces for user generated content, e.g. weblogs, personal web pages, or profiles on social networking platforms. In these spaces, Internet users including scientists are free to publish any content they choose. While it is possible to see these spaces as alternative platforms for scientific publishing, I see them as a supplement rather than as a substitute. If the scientific publishing system is not viewed only as a means of disseminating research-related content, but also as a networking foundation, then the use of individual online spaces can be seen as a supportive element that provides even those function that I considered missing.

## 2 Blogs, Web Pages & Co.

The Internet, with its time- and space-independent accessibility appears to be a perfect medium for the dissemination of information. In the past, it was possible for individuals to programme their own HTML web pages and thus create an individual space online. Through the recent development in the direction of so-called Web 2.0, creating online content has become even easier. There are now many platforms where Internet users can create content of different form. These include weblogs, social networking systems, microblogs, bookmarking areas, and more. Most of these platforms target a general audience, but some also focus directly on the scientific community. But if scientists are free to publish any content they want online, what impact can this have on the established system of scientific publishing? Before I discuss the relationship of online user-generated content, I will first briefly introduce some of

the platforms that scientists can use to publish information about themselves and their work: personal web pages, weblogs, microblogs, social networking systems, and resource-management platforms. Both within the web presence of their institution and in private, scientists can create web pages to present themselves. Although web pages theoretically offer high flexibility, their design can be limited by the owner's programming and administrative skills or institutional policies (for research on personal web pages see Döring, 2006, Hawisher & Sullivan, 1999, Hess, 2002, Dillon & Gushrowski, 2000, Miller, 1995, Saint-Georges, 1998). Weblogs or blogs for short are web pages with a list of dated entries that are typically displayed in a reverse chronological order (Alcock, 2003, Herring, Scheidt, Bonus, & Wright, 2004, Williams, 2008). Most blogs combine text, images, and links to other blogs and web pages and allow the readers to comment blog postings, generally in a mediated manner, where the blog host retains control (for research on blogs and blogging see Wang, Jiang, & Ma, 2010, Hendricks, 2010, Kjellberg, 2010, Ferguson, Clough, & Hosein, 2010, Ewins, 2005, Luzón, 2009, Blood, 2002, Herring, Scheidt, Wright, & Bonus, 2005, Nentwich, 2010). Microblogs are platforms where users can post short messages (e.g. 140 characters on Twitter). Messages are posted in reverse chronological order (Boyd, Golder, & Lotan, 2010, Honeycutt & Herring, 2009), similar to blogs (for research on microblogs see Honeycutt & Herring, 2009, Java, Song, Finin, & Tseng, 2007, Mischaud, 2007, Herwig, Kittenberger, Nentwich, & Schirmmund, 2009). Social Networking Services (SNS) offer their users the opportunity to create personal profiles and connect to other users (Boyd & Ellison, 2008). Their content is typically semi-structured. Increasingly, SNS also support the creation of communities of interests among their members (for research on SNS see Boyd & Ellison, 2008, Möslin, Bullinger, & Söldner, 2009). Increasingly, other platforms also offer the opportunity to create a personal profile or connect to other users. These features have been added by platforms originally focusing on management of resources, like citations (e.g. Mendeley, CiteULike) or presentations (e.g. SlideShare) (Farooq, Ganoë, Carroll, & Giles, 2007).

In a recent study, I have examined how scientists use the Internet to publish information about themselves and their work. The most important finding of my research was the complexity and the variety in ways scientists deal with the opportunities offered by the Internet. Firstly, the type of content that scientists publish on the profiles can be manifold. (1) It can serve as the identification of the scientist who owns the space, e.g. the scientists photo, affiliation, or contact data. (2) The content can be also related to the owner's activities, e.g. research work. (3) The scientist might also present content regarding his or her

achievements, e.g. career milestones, publications, or important findings. (4) The content might also be related to the scientist's area of expertise. The content can be discussed with different depth and breadth and infused with varying degree of personal views and opinions. Viewing the ways the scientists combine these different types of content, I have identified six patterns describing the function of online spaces belonging to scientists:

- **Presence:** Spaces of this type provide only a minimum of information, identifying the owner and making him or her present in the virtual environment. Such spaces can be found on any kind of platforms.
- **Visit card:** On these spaces, content is provided that identifies and describes the scientist owning the spaces and potentially also his or her achievements (often in the form of a curriculum vitae) (compare Miller, 1995, Saint-Georges, 1998). These spaces are often on institutional web sites or SNS.
- **Knowledge base:** These are spaces that offer content elaborating on topics related to their owner's area of expertise. They may focus on the dissemination of facts or may also present the scientist's opinions (compare Blood, 2002, Herring et al., 2004, Nentwich, 2010). These spaces are mostly found on blogs, but institutional or private web pages as well as potentially SNS can also host them.
- **Personal journal:** Some spaces can serve as the presentation of the scientist's activities (compare Blood, 2002, Herring et al., 2004, Nentwich, 2010). This can be done with more elaboration for example on blogs or in a briefer form on microblogs.
- **Notebook:** Scientists may also combine the presentation of content related to their areas of expertise and the description of their activities. By doing so, they create spaces that present facts combined with personal experiences (compare Halavais, 2006).
- **Coffee house:** Scientists may also create spaces, where they can interact actively with interested individuals (compare Halavais, 2006). Platforms hosting such spaces have to provide means of discussion, e.g. a forum or a comment function.

Scientists, however, do not have to select just one of these patterns and implement them in the space of their choice. They are free to choose from a range of platforms, create multiple profiles and spaces, and

connect them with hyperlinks to create networks. This way, they can reach a broad audience, comprised of close colleagues, known and unknown peers from related disciplines, as well as the general public and peers from unrelated disciplines (compare Pearson, 2009).

### 3 Publishing as Self-Presentation

The online presentation of content generated by individual scientist can take numerous forms. The content can cover different topics, vary from brief to elaborate, be contained in a single space or spanned across several platforms and linked into a complex network. All these forms have one characteristic in common: as the spaces belong to an individual scientist, so is the content published there connected to their owner. On some spaces (e.g. SNS profiles or personal web sites) the scientist is in the center of attention, while on others (e.g. blogs focused on presentation of facts) he or she is in the background. This is not unlike in the traditional scientific publishing, where published results are always connected to the author. Therefore, both scientific publishing as well as online generation of content by scientists can serve not only to disseminate facts and findings, but also to present the person of the scientist who authored them.

In scientific publishing, the content of a publications is in the foreground. Therefore, while scientific publishing is a foundation for awareness within the scientific community and a crucial factor in determining a scientist's reputation, a single publication represents only a 'breadcrumb'. Through the reading of publications, scientists are able to connect an author's name to a certain area of expertise. However, to acquire further information about the author's person, the scientists have to look elsewhere. A face-to-face meeting at a conference is an option, but not a sufficient one given the disciplinary breadth and geographical spread of the scientific community. But scientists can use online spaces to collect the 'breadcrumbs' and connect them to other relevant contents, thus creating a complex self-presentation. Some scientists do so by providing a publication list alongside with personal information or a curriculum vitae. Others prefer to present their expertise through topic discussion or activity logs. In whatever form, an online space can serve as an information point for fellow scientists, who wish to find out more about their peers.

Unlike scientific publishing, online content generation is not bound by strict norms and procedures. Scientists are free to publish on their spaces practically anything they consider fit. This would mean, that scientists could avoid peer review and publish content that was not tested against the quality standards of the

community. While this is possible, I believe that it is less problematic than it appears. Firstly, the content published online is technically available to the scientific community and can thus be read, evaluated, and commented. Secondly, the scientific community - just like any other community - operates on the principles of supply and demand. If most members of the community do not consider individual spaces as suitable platforms for scientific publishing, there will be little demand for them and, consequently, a decreasing supply of such publications. Instead of viewing the potential dangers of unregulated publishing on individual online spaces, I wish to point to the opportunities they offer. As I noted above, the traditional publishing has a limited number of well-defined publication types. While these forms have proved suitable for the dissemination of research results, they do not cover all types of communication that scientists might like to engage in. These may include open discussions of scientists opinions, presentations of practical topics, or dealing with areas not directly connected to research. However, scientists are free to use online platforms like blogs to present and even discuss such topics with interested audience.

The target audience of a scientist's individual online space may also differ from the audience of traditional scientific publishing. As I have pointed out, scientific publications target mainly scientists. If scientists want to address a general audience, they have to find alternative publishing channels. Given the current popularity of the Internet, a blog or a personal homepage appear to be suitable publishing platforms.

#### 4 Conclusion

Scientific publishing with its processes and structures has evolved over centuries to fit the needs of the scientific community. It may thus appear, that scientific publishing as we know it today is a perfect system and should not be interfered with. However, not even scientific publishing is exempt from the influence of constant technological or social development. Or to put it another way: perfect as it may seem, it can surely be improved.

I have pointed out, that while scientific publishing appears to be mainly concerned with securing high quality of research findings and disseminating them to the scientific community, it also plays a crucial role in helping to form the community. This is done through creating awareness and influencing reputation. I have also noted, that the functions of scientific publishing could be further developed by targeting a broader audience, offering new publication formats, and presenting authors' work beyond single publications.

It appears to me, that author-controlled spaces for user-generated content such as blogs, web pages, SNS etc. are suitable 'sandboxes' for trying out new ways to further develop scientific publishing. These spaces allow publication of different contents including text, pictures, audio, and video, thus supporting creative forms of publication. What gets published on these spaces is not limited by existing processes and rules of scientific publishing. This way, these rules and processes can be challenged and rethought. The spaces are bound to an individual scientist and typically offer communication functions like forums or comment fields. Other members of the scientific community are thus given the opportunity to discuss and provide feedback to what has been published on the space. And best of all - these spaces are already being used by scientists. Of course not all scientists are present on the Internet and only a minority is involved in intensive content production like blogging. Even so, this still adds up to a considerable amount of virtual spaces managed by scientists, who engage in a variety of ways to publish content about themselves and their work. Thus there is an abundance of examples online that can be used to observe new ways of content generation, examine their potential for scientific publishing, and - last but not least - to participate.

We are presented with scientific publishing as a result of tireless work of generations of scientists. As it is crucial to scientific research, we must use it well. But we ought to do more than that: we should actively engage in improving and honing the system of scientific publishing and thus contribute to better science.

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