Academicians on Online Social Networks: Visibility of Academic Research and Amplification of Audience

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Abstract
With Web 2.0 and online social networks, the contemporary idea of networking finds its application also within the academia, thereby allowing free access to scientific work through voluntary sharing of the scholar researchers/authors. This article investigates the tools that facilitate such amplification and its possible outcomes in the short and middle run. The explosion of user-created media content on the web in the past decade unleashed a new media universe, which was made possible by free web platforms and inexpensive software tools which enable people to share their media and easily access media produced by others. Besides the changes in the structure of the web, rapidly fallen costs and increased speed of internet connection also allowed for higher possibilities for collaboration, participation and amplification of audience for academic research.
Keywords: Digital culture, online social network, academic research, online visibility, open source journals.

Los académicos en las redes sociales: La visibilidad de la investigación académica y la amplificación del público

Resumen
En los contextos de la Web 2.0 y las redes sociales, la idea contemporánea de la creación de redes de contactos también tiene su aplicación dentro de la academia, lo que permite el libre acceso al trabajo científico a través del intercambio voluntario de los investigadores /autores. Este artículo investiga las herramientas que facilitan aquella amplificación y sus posibles resultados. La explosión del contenido creado por usuarios en la web en los últimos diez años desató un nuevo universo de los medios que facilita a las personas a compartir sus contenidos y permitan acceso a ellos producidos por otros. Además de los cambios en la estructura de la web, la velocidad de conexión a Internet también permitió mayores posibilidades para la colaboración, la participación y la amplificación de la audiencia para la investigación académica.
Palabras clave: Cultura digital, redes sociales online, investigación académica, visibilidad online, revistas scientíficas no lucrativas.

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1. Introduction
Over the past decade, we lived through the seamless integration of the *digital* and mobile technologies into our daily lives. Through the rise of the online social networks

and the participatory web, we have observed various changes in the way we live our lives, the way we communicate and the way we perform our professions. We slowly started to get used to a world which was at the *click* of a button. We also got used to being at the touch of a 'call' button as we walked the city streets with our mobile phones in our pockets, being all the time accessible to all the people that knew our number (Fernández & Arda, 2011: 3). Supposedly we had finally broken free off the physical; we were almost ethereal and ubiquitous. Following the brief moment of joy for this imaginary freedom, for the mobile individuals of the new millenium, came the claustrophobia of being *too accessible*, being *too visible* (Arda, 2009: 6). In this context, every professional and personal field is found effected and transformed in one way or another (Bernad & Mut, 2012: 1433).

Overwhelmed by the availability of elaborated academic texts and the ease of copying and pasting bulks of information, the ethical values of academic work receive yet another challenge. Digital availability forms a serious challenge to *originality* as a *modern* ideal that had emerged in Europe in the 18th century, though there is more margin for its contemporary interpretation in arts than in the sectors of academia and journalism.

2. Digital Era and Online Visibility

One of Google's founders, Larry Page, even as a young boy, had dreamed of creating a momentous invention, something that "would change the world" (Carr, 2010: 87). Later in his dissertation about the web, the analogy that he drew for understanding the data retrieval on this new network was from the world of academy. The *World Wide Web* was launched only four years prior to his investigation and it was growing explosively —it had half a million sites and was adding more than a hundred thousand new ones every month. Page realized that "the links on Web pages [were] analogous to the citations in academic papers" (Carr, 2010:87).

When an academician cites a paper by another author, s/he is vouching for the importance of that paper or the research that was carried out. The more cited an academic paper is the more prestige it gains in its field. Similarly, when a person administering a web page gives a link to someone else's page, s/he is fostering importance and prestige for that other page. Hence similar to the citation index logic, the value of any web page, as Page saw it, could be deducted from the links coming into it. This insight formed the basis of Google's search engine logic.

> "[…] again drawing on the citations analogy: not all links are created equal. The authority of any Web page can be gauged by how many incoming links it attracts. A page with a lot of incoming links has more authority than a page with only one or two. The greater the authority of a Web page, the greater the worth of its own outgoing links. The same is true in academia: earning a citation from a paper that has itself been much cited is more valuable than receiving one from a less cited paper"(Carr, 2010: 85).

The work product of most scientific research is the peer-reviewed research article. Each year, over 2.5 million articles are published in over 24,000 peer-review journals

(Pickard, 2012: web), and these articles define the academic prestige of the world's scholars. Similarly, Page and Schmidt's Google defines the prestige or commercial value of web pages according to all possible keywords that the internauts could think of. On the intersection of the two systems lies the concept of online visibility of academic research. Nevertheless, as scholar articles are hardly cited in the graphic media, their visibility in Google remain relatively lower and their true reach almost always stays limited to the academic community (Blanco & Pereyra, 2012: 50).

By 2004, about a decade after the World Wide Web was a popular medium accessed by a substantial percentage of the world population, the definition of internet as we knew it changed completely. Full participation of the user thanks to the concept of Web 2.0, changed our perception of communication online radically – even though it was not brought about by a radical advance in technological development (Caldevilla, 2010: 26). Nonetheless, if the web in the 1990s was mostly a *publishing* medium, in the 2000s it increasingly became a *communication* medium (Manovich, 2008: 24). On a practical level, this universe was made possible by free web platforms and inexpensive software tools which enable people to share their media and easily access media produced by others (Manovich, 2008: 1).

With the arrival of social media, the main tendency of people became to combine their online identity with the real. With the possibilities of self expression expanded by the Web 2.0 tools, we started to observe a certain convergence between the concepts of identity and image. There arose the question of the loss of anonymity which was a previous joy of the virtual life and also an often discussed topic in the literature of the early days of communication in the internet. In such a context, there are new considerations also for scholars. Most of the *traditional* academic publications end up in journals that are accessed by the subscribers. Nonetheless, with the presence on the academic social networks in internet, the academicians who are willing to participate and upload their work start to make it available to wider audiences, as these online social networks indicate open access for everyone – especially students that were not able to pay the subscription fees unless they were provided access through university libraries. This advance brings about two main concerns: amplification of audience and plagiarism.

3. Methodology

In this paper, we will try to superpose the sociological changes mentioned above with the academic activity. Within the participatory architecture of Web 2.0, one may think that scholar articles are as accessible as any other piece of information; nonetheless, in a world where the academic activity is regulated by peer-reviewed scholar journals, open access is only applicable in voluntary cases or by the limit set by the scholars themselves.

We will try to treat the issue through the investigation of the possible tools for sharing academic research with wider audiences; focusing on the features, possible pros and cons of some of these specialized online social networks and the way academicians approach, accept and adapt to these tools. The *voluntary* participation of academicians in these online social networks, or their sharing/submission of their work,

creates a conflict between the "paid subscription" of various scholar journals and the open access provided by the authors themselves.

Five of the popular online tools/networks for sharing scientific material are: *Google Scholar, Scirus, CiteSeerˣ, Academia.edu and Researchgate.* This paper aims to compare these online tools on various criteria including whether they serve to make scientific research available to wider audiences, whether subscription to these services requires an academic email, whether they are user-driven, whether they contribute to the online visibility of the contributing authors, average number of articles/material shared by each author on these networks and whether they suggest a rating system for the academic content they provide. As such, we can raise and try to provide answers to a simple question: Is socialized academic research a benefit for the society or is it just individual exhibitionism?

4. Scientific Research & Open Access

Traditionally, to be published in scholar journals, research papers undergo peer review before publication. One or more referees read the article and give their academic opinion, ask for revisions, additions or clarifications and thus an article is considered *eligible* for publication. Today, two trends, open access and social media are changing the peer review process. Students, readers and young researchers must be aware that traditional peer review applies different criteria and methods than review through social media outlets. Although still developing, these review processes may affect the evaluation of research quality (Pickard, 2012: web).

Most peer reviewed journals have subscription fees, thus, access to these published research papers is closed to many potential readers. Open access seeks to make this research freely available. According to the Budapest Open Access Initiative, open access achieves its goal of "free and unrestricted online availability" through two central tenets: (1) depositing refereed journal articles in open online archives (called self-archiving), and (2) creating new journals that will not invoke copyright to restrict access to the material they publish. Today, open access journals often employ *Creative Commons* licenses to ensure unrestricted access. Although over 5,000 open access journals are available today, only 10% of published research in biology and medicine is open access (Pickard, 2012: web).

The concept of the citation index was introduced by Eugene Garfield, a founder in the field of bibliometrics, over fifty years ago. His original idea developed into a host of "impact factors" that measure the degree of a journal's influence by counting the number of times its articles are cited. Since academic advancement is tied to publication, most researchers tend to submit articles to high impact journals, even though acceptance rates can be in the single digits. Although open access articles may be accessed more frequently, traditional impact factors measure citations rather than readership.

When open access is combined with social media, the influence of research articles shifts from publications to individual researchers. For example, in a recent controversial paper illustrating the influence of social media, future research citations were correlated with the number of times the article was discussed on Twitter, espe-

cially within the first three days after publication. Some recent examples of this kind start to formulate the social media as an alternative to peer review – which has been criticized for a long time now as it is considered to be slow, stifling innovation and lacking transparency.

The most commonly employed model of using social media in this context is based on comment crowd-sourcing, similar to how buyers rate products and sellers on *Amazon* or *eBay*. Anonymous peer review is replaced with public reviews that can include the reviewer's reputation (as determined by peers) to weight the review score. Weighting an author's reputation can be achieved with concepts such as the author's scholar factor, h-index, or other "altmetrics".

These platforms employ concepts such as invited moderation, post-publication comment, post-publication measures of quality and impact, and community-based review. If opinion formation shifts through the influence of social media on research, academics may have to worry about "get visible or vanish" instead of "publish or perish". Indeed, developing a comprehensive online presence increases the likelihood that research published in open access journals will be found, read, and cited by other scientists.

5. Online tools/social networks for academicians
5.1. Google Scholar
Released in its beta format in 2004, *Google Scholar* is a web search engine just like *Google* itself which indexes specifically the full text of academic literature across an array of publishing formats and disciplines. Freely accessible by everyone, *Google Scholar* index includes most peer-reviewed online journals of Europe and America's largest scholarly publishers, scholarly books and various other non-peer reviewed journals. Though it provides a very simple way to broadly search for academic references, *Google Scholar* does not necessarily mean open access, as *Google* ensures that publishers have control over access to their articles and that author copyrights are not infringed. Hence, publishers' rights to preserve their control over access to their content is respected together with their rights to subscription fees as *Google Scholar* only caches articles and papers that are not access-controlled.

The way search results are ranked in *Google Scholar* is the way research is ranked in general, the search engine weighs the full text of each document, where it was published, who it was written by, as well as how often and how recently it has been cited in other scholarly publications. In their words, as given on the introduction of the search engine, "Google Scholar can boost the worldwide visibility of your content" (Google, 2012). Besides, giving visibility to academic work, being indexed on *Google Scholar* with publications would also boost search results for an author's name in the regular search engine results provided by *Google*. This also serves as a *rating system* for the scholar authors.

5.2. Scirus
Scirus, owned and operated by *Elsevier*, is a comprehensive science-specific search engine like *Google Scholar* and *CiteSeer*[x]. In its own definition, *Scirus* is the most

comprehensive science-specific search engine on the Internet. Driven by the latest search engine technology, *Scirus* searches over 440 million science-specific Web pages, enabling you to quickly pinpoint scientific, technical and medical data on the web, to find the latest reports, peer-reviewed articles, patents and journals that other search engines miss (Scirus, 2012: web). The difference of *Scirus* lies in that it filters out non-scientific sites. For example, if you search for "REM" on Google, you locate the rock group; *Scirus* finds information on sleep and rapid eye movement instead.

5.3. CiteSeerx
Developed in 1997 at the NEC Research Institute by Steve Lawrence, Lee Giles and Kurt Bollacker, *CiteSeer* was the first digital library and search engine to provide automated citation indexing and citation linking using the method of "autonomous citation indexing". An autonomous citation indexing system autonomously locates articles, extracts citations, identifies identical citations that occur in different formats, and identifies the context of citations in the body of articles, hence creates citation indices similar to the Science Citation Index.

   CiteSeer computes citation statistics and related documents for all articles cited in the database, and not just the indexed articles. It can show the context of citations to a given paper, allowing a researcher to quickly and easily see what other researchers have to say about an article of interest. It indexes the full-text of the entire articles and citations. Full Boolean, phrase and proximity search is supported.

5.4. Academia.edu
Academia.edu is an online platform for academics to share their research papers, follow other academics with similar research interests and see analytics on your academic profile and publications. Launched in September 2008, *Academia.edu* had 1.2 million registered users by 2011 (Levi, 2012: web) and as of September, 2012 about 2 million as communicated real-time on the site (Academia.edu, 2012). *Academia.edu* employs the concepts of academic genealogy. This was established by its founders as a method of distinguishing the website from other social platforms. The site displays academic users in a tree format, linking them to their departmental or university affiliation.

   Academia.edu is a participant in the open science / open access movements, responding to and supporting a perceived need in science for instant distribution of research and the need for a peer-review system that occurs alongside distribution, instead of occurring before it. It has been described as a "huge deal" because academics "get quick and easy access to their colleagues' work, and they get quantifiable proof that their own research matters" (Saenz, 2011). Other positive comments include that *Academia.edu* gives academics a "powerful, efficient way to distribute their research" and that it "will let researchers keep tabs on how many people are reading their articles with specialized analytics tools", and "also does very well in Google search results" (Kincaid, 2011: web).

   Despite being a good attempt at connecting researchers and contributing to open access to academic work, *Academia.edu* lags behind the pace of online social net-

working and offers few interactions that would encourage its users to participate more and spend more active time on the site.

5.5. ResearchGate

ResearchGate was set up in May 2008 and according to an interview with one of the founders, less than two years later it already had a very respectable 300,000 members, of whom some 30% are thought to be active on a regular basis (Hofmayer & Wieselberg, 2009: web). Today it is believed to have 1.4 - 1.7 million users from 192 countries (Wired, 2012; Pickard, 2012).

The site *is* an academic social network where the members provide a profile in which they describe themselves. As with other, comparable networks, private interests and similar details can also form part of the profile, but the main focus is on details of relevance to the individual's research – classification of one's work according to academic discipline, specification of one's main areas of research, and lists of one's own projects and publications.

ResearchGate is the network that bears the most resemblance to a "Facebook for scientists" (The Economist, 2012: web). This site allows researchers to create a professional profile manually. From there, one can add contacts; follow the activities of users with similar interests, like in *Academia.edu*. The members are also asked to upload bibliographies so that these too can be shared with others. Whenever a scholar logs on to *ResearchGate*, and when s/he searches or browses the site, s/he is made aware of relevant new literature, interesting potential contacts, and so on. This is done on the basis of the profile already provided, via what is known as "semantic matching" (Nentwich, 2010: 69).

6. Conclusion

Even though academic social networks online create expectations for the amplification of audience for scientific research and light up the way for mechanisms other than citation indexes and peer review for regulating scholar publications, it is not possible to determine in this paper whether, or if so to what extent, such networks can be used to good effect and efficiently in everyday scientific work yet. The promised network effects can only be expected to appear after longer trial periods and better participation in such networks, both in terms of quantity and quality: These networks seem to be populated by younger researchers for now, mostly postgraduates and even undergraduates. Nonetheless, the reliability of such crowd-commenting, or real-time reviewing would be significantly higher with the participation of more senior academics.

> "The dream behind the Web is of a common information space in which we communicate by sharing information. Its universality is essential: the fact that a hypertext link can point to anything, be it personal, local or global, be it draft or highly polished. There was a second part of the dream, too, dependent on the Web being so generally used that it became a realistic mirror (or in fact the primary embodiment) of the ways in which we work and play and socialize. That was that once the state of our interactions was on line, we could then use

computers to help us analyse it, make sense of what we are doing, where we individually fit in, and how we can better work together" (Berners-Lee, 1998: web).

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