

“Highly Read and Poorly Cited?” A Critical Perspective on Academic Social Networks

Mario Pagliaro

Istituto per lo Studio dei Materiali Nanostrutturati, CNR, via U. La Malfa, Palermo, ITALY.

ABSTRACT

On the occasion of 300,000 reads of our team's studies archived on ResearchGate, an Academic Social Network (ASN), this study offers a critical perspective on academic social networks from the perspective of research and educational dimensions of scholarly work. Findings of previous studies for which poor correlation between reads of articles archived in ASNs and citations exists are confirmed by this investigation. Academic social networking, however, provides unique benefits that deserve to be clearly identified to fulfil the potential of these digital resources available since 2009.

Keywords: Open science, Citations, ResearchGate, Research impact, Academic social network.

Correspondence:

Dr. Mario Pagliaro

Istituto per lo Studio dei Materiali Nanostrutturati, CNR, via U. La Malfa 153, 90146 Palermo, ITALY.

Email: mario.pagliaro@cnr.it

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INTRODUCTION

On March 14, 2024, the research items I co-authored archived on ResearchGate (RG), an academic social network, reached 300,000 reads (ResearchGate, 2024a). The occasion is timely to offer a critical perspective on academic social networks from the perspective of research and educational work, namely two of the three dimensions of scholarly work (research, teaching and societal service) (Pagliaro, 2021a). Previous studies have already shown poor correlation between reads of articles archived in ASNs and citations (Renjith, 2019). Citations being the “currency” (Garfield, 1998) of academia one might conclude that archiving research articles in ASNs is not worth the effort.

Conceived as social platforms where researchers can pose questions, share and discuss research papers and research topics, ASNs quickly became widely adopted by researchers following their launch in 2008-2009. For example, by March 2022 Berlin-based ResearchGate had over 23 million users of which 33% (7.7 million) in Europe, 28% (6.5 million) in Asia and 22% (5.1 million) in North America (ResearchGate, 2022). Today (early 2024), the website has more than 25 million users.

Ten years after its launch, in 2019, RG users were asking questions in its Q&A (Question and Answer) section on average 500 times per day, getting for free from peers over 2,000 answers daily.

Remaining available on the website, the same answers can be found by other scientists “when they run into the same problem” (Madisch, 2019).

Following a succinct insight into the aforementioned 300,000 reads and the related read and citation patterns, we identify unique benefits of using RG that deserve to be clearly identified so as to fulfil the potential of this digital resource available to scholars since 2009.

Selected findings concerning RG of relevance to researchers previously identified in scholarly research devoted to the ASN include the fact that that researchers in the life sciences are its most active users (Yan *et al.*, 2021); or that RG tries “to persuade the author” to upload articles published elsewhere (arXiv, in this case) to ResearchGate “to make it look like ResearchGate is the place to go to read this paper” (Arildsen, 2016)). The outcomes of the present investigation may be useful to further inform new graduate student and young faculty educational work on open science and scholarly communication in the digital and open science era (Pagliaro, 2020; Toelch and Ostwald, 2018).

RESULTS AND DISCUSSION

On ResearchGate a “read” is counted each time someone views a publication summary (such as the title, abstract and list of authors), clicks on a figure, or views or downloads the full-text (readers logged into the network and those who are not are both counted) (ResearchGate, 2015).

Figure 1 shows evidence that both reads and downloads for our team's research papers and books reached the highest level in 2020, when annual reads were 52,584 and full-text downloads 13,667 (ResearchGate, 2024a).



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Reads and citations

Figure 1 and data in Table 1 show evidence of lack of correlation between reads and citations on RG. For instance, the highest number of citations (2058) was reached in 2021 when reads were 25% lower than in the previous year.

Furthermore, even if reads continued to decrease and in 2023 it became 41% lower than in 2020, the number of citations in 2023 was 4% higher than in 2020. In brief, these findings confirm what unveiled by Renjith in 2019 (Renjith, 2019): reads on RG do not correlate with citations.

Clearly, the spike of reads (and downloads) in 2020 and somehow also in 2021 was due to the restrictions (department and lab closures, conferences and travels canceled, mandatory stay-at-home) that forced scholars in many world's countries to work remotely (chiefly via their personal computers) due to the global health emergency of year 2020.

Staying at home, many scholars largely found the time to write papers previously difficult to complete. Writing scientific papers requires reading previous work, resulting in a substantial increase in reads on RG. Journals, accordingly, experienced a significant increase in submissions with decreased time to first editorial decision (Biondi *et al.*, 2021).

Data in Tables 2 and 3 confirm that little or no correlation exists between reads at ResearchGate and citations.

Ranking our team's top five most cited papers (citation data from Google Scholar) next to RG reads, Table 2 shows that two of the five most cited papers do not reach 1,000 reads. Table 3 shows our five most read papers on RG and their citations.

Once again, papers that are highly read on RG are far from being our most cited papers, though they have received a substantially high number of citations.

Benefits for research and education

Through not correlated with citations, the number of reads is a clear proxy to the interest of peers in a author's work. Data in Table 4, for example, suggest that users on RG in the chemistry community have a pronounced interest in chemistry advanced education, as well as in scientometric and open science aspects concerning their discipline.

This is not surprising because RG is widely used by students and early career researchers who found in ASNs a way to gain online visibility, share their research work and interact with other students and young researchers (Nicholas *et al.*, 2018). On one hand, young faculty may be interested in delivering new education in a number of subjects (from nanochemistry to catalysis) inspired by new approaches.

On the other, the same early career scholars are interested in scientometric aspects concerning chemistry such as the impact

factor (Ciriminna and Pagliaro, 2023a), the Hirsh (*h*)-index (Ciriminna and Pagliaro, 2013), citation patterns in chemistry (Ciriminna *et al.*, 2023), preprints (Ciriminna and Pagliaro, 2023b), "green" self-archiving (Ciriminna *et al.*, 2024) and other aspects of scholarly communication and its impact that were (and still are) generally ignored during undergraduate and graduate studies.

Similarly, article recommendations by other users - a feature widely employed by RG users - helps authors to understand that the research they shared through the ASN has been deemed relevant to other users so much that a scholar is suggesting the item to the broad scholarly community (Mataoui *et al.*, 2023).

As mentioned above, a uniquely important feature of ASNs that makes them a useful resource for scholars in all disciplines originates from their social networking nature (Madisch, 2019). Willing to produce a new study on preprints in chemistry informed by knowledge of preprints of our peers, on August 17, 2021 I posted on the Q&A section of RG the following research question:

"Research chemists continue in their slow uptake of preprints. I've lately suggested one key reason for this unique behaviour of scholars in the basic sciences in two OA studies, one published by Publications and another by Insights. What is your opinion on the origin of this delay? Has your team recently embraced preprint publishing? What are your favorite preprint repositories?" (Pagliaro, 2021b).

In a few days, I got valued response from eminent researchers Ramón Piloto-Rodríguez in the USA, James Henson in Great Britain, Peter Sobolewski in Poland and Frank Edelmann in Germany. One year later, on September 22, 2022 we added the outcomes of said open discussion to a new study from our team on preprints in chemistry originally preprinted at ChemRxiv and subsequently published as refereed study by ChemistryOpen (Ciriminna and Pagliaro, 2023b).

Similarly, one year later I posed another question to the RG chemistry community, this time concerning the role of the impact factor in chemistry research:

"The journal impact factor is a skewed metrics whose value is dictated by just a few highly cited articles. Therefore, the use of the JIF to evaluate journals, scholars, or research institutes is flawed. Still, the JIF continues to play a central role in evaluating scholarship in chemistry, the most reluctant amid basic scientific disciplines to embrace the principles of open science. OA study currently in preprint form (<https://bit.ly/3UUxmQR>) investigates the origins of this social behavior and suggests avenues to improve scholarly communication in the chemical sciences. Does the JIF still play a significant role in chemistry scholarly communication? Thank you for willing to participate in this open discussion" (Pagliaro, 2022).

Table 1: Reads and citations measured by ResearchGate for Mario Pagliaro's team publications, 2018-2023 [Data source: ResearchGate, 2024a].

Reads	Year	Citations
22,131	2018	1233
40,530	2019	1584
52,584	2020	1787
39,652	2021	2058
38,850	2022	1929
31,233	2023	1858

Table 2: Top five most cited papers and reads at ResearchGate for Mario Pagliaro's team publications.

Paper	Citations ^a	Reads ^b
From glycerol to value-added products.	1921	3448
The sol-gel route to advanced silica-based materials and recent applications.	674	2158
Artificial photosynthesis over graphene-semiconductor composites. Are we getting better?	571	726
Photocatalysis: a promising route for 21 st century organic chemistry.	551	2407
Limonene: a versatile chemical of the bioeconomy.	498	951

^aData from Google Scholar, Feb 2024; ^bData from Ref. ResearchGate, 2024a

Table 3: Top five most read papers at ResearchGate for Mario Pagliaro's team publications and number of citations.

Paper	Reads ^a	Citations ^b
Pectin production and global market.	25,266	179
Understanding the glycerol market.	14,352	465
Nanochemistry: a chemical approach to nanomaterials. By Geoff Ozin and André Arsenault.	9776	-
Pectin: a new perspective from the biorefinery standpoint.	8937	209
From glycerol to value-added products.	3448	1921

^aData from ResearchGate, 2024a; ^bData from Google Scholar, Feb 2024.

Table 4: Number of reads at ResearchGate for Mario Pagliaro's team publications devoted to chemistry and energy education.

Paper	Reads ^a	Citations ^b
Advancing nanochemistry education.	2318	21
Chemistry education fostering creativity in the digital era.	755 ^c	40
Improving education in electrochemistry via a modeling approach and focusing on green chemistry applications.	434 ^c	2
Preprints in chemistry: a research team's journey.	511 ^c	2
A scientometric analysis of catalysis research.	712 ^c	11

^aData from ResearchGate, 2024a; ^bData from Google Scholar, Feb 2024; ^c(article+preprint).

This time Wolfgang Dick from Germany and Joseph Lee from Australia joined the discussion, providing valued ideas that helped the authors of the preprint to revise it, alongside the reviewer reports, to eventually publish the refereed study a few months later in CHIMIA (Ciriminna and Pagliaro, 2023a).

In brief, far from having become marginal (Chawla, 2024) and even if the Q&A section at times “is flooded by horribly basic questions and clueless and factually wrong answers” (xLeitix, 2014), the use of RG as a discussion platform is a key feature of the ASN that researchers actively use generally employing scholarly writing style to exchange information (Jeng *et al.*, 2017). Called

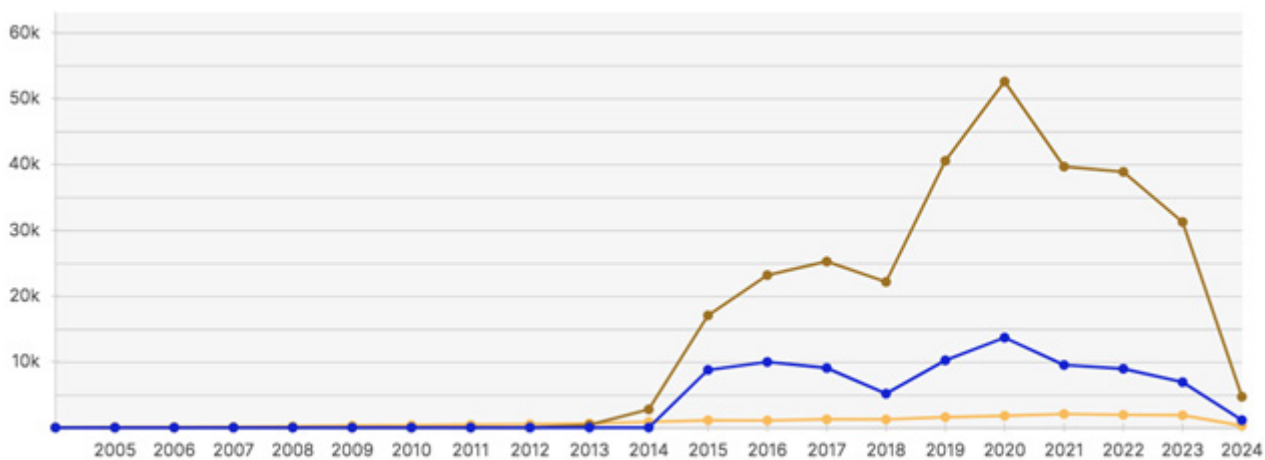


Figure 1: Reads (●), full text downloads (●) and citations (●) for Mario Pagliaro's team publications on ResearchGate. [Reproduced from Ref.1, with kind permission].



DigitalKoans

What is the Sound of One E-Print Downloading?

Inteview with Stevan Harnad: "Open and Impactful Scholarly Communication"



Charles W. Bailey, Jr.
February 12, 2024
E-Prints, Open Access,
Publishing, Scholarly
Journals, Self-Archiving

We posed selected questions to Stevan Harnad thirty years after his "subversive proposal" to self-archive online scholarly articles in university-hosted or disciplinary repositories to make them openly available and thus maximize research impact. A combination of factors including unfounded scepticism concerning open access, and bureaucratic access to the few institutional repositories launched by

DIGITALKOANS OVERVIEW

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Figure 2: News on DigitalKoans on February 12, 2024 of our preprint on open, impactful scholarly communication posted at ResearchGate. [Reproduced from DigitalKoans, 2024, Creative Commons Attribution 4.0 International License].

“Q&A”, the web page (interface) allows users to start a scientific discussion with her/his peers, or to ask a technical question. To remain in the chemistry field, questions and answers include some of the world’s leading research chemists. For example, in late 2013 Russia Academy of Sciences’ Ananikov was asking colleagues if they were aware of the newly discovered “cocktail-type” catalysis his team found to be due to metal nanoparticles, metal clusters and metal complexes:

“It seems that many cross-coupling and Heck reactions operate as ‘cocktail of catalysts’ system (multiple species catalysis in solution): <http://pubs.acs.org/doi/abs/10.1021/jo402038p>

“Are there other catalytic reactions that involve multiple species in the catalytic cycles? Was it observed experimentally? (Ananikov, 2013)”

To whom Grice, then an assistant professor at DePaul University Chicago, responded:

“Sure, there are plenty. Look up cascade or tandem catalysis...

“The trick is to find catalytic systems that are compatible. Some catalysts inhibit each other. I know there are many examples in the organic literature, but I am more familiar with the inorganic literature. Here’s a recent example with regard to CO₂ reduction:

<http://pubs.acs.org/doi/abs/10.1021/ja208760j>

“Then there is the Brookhart-Goldman Alkane metathesis catalysis: <http://www.sciencemag.org/content/312/5771/257.abstract>” (Grice, 2013).

Another relevant use of ResearchGate benefiting research is its use as a preprint platform. It is enough to upload a manuscript and specifying it is a preprint (namely a scientific article not yet peer reviewed) to immediately share the study in preprint form not only with the entire scholarly community of RG users, but with any internet user that can readily find and download the preprint from the website even though not being a registered RG user.

For instance, on January 2024 we published on RG a preprint on open and impactful scholarly communication (Ciriminna *et al.*, 2024) including an interview to Stevan Harnad, the scholar author in 1994 of the “subversive proposal” to self-archive and make openly accessible to all and for free all research articles on institutional websites (FTP servers at that time, almost concomitant with the launch of the world wide web).

A few days later, the DigitalKoans website providing news and commentary on open access, scholarly communication and other digital information issues highlighted the preprint (Figure 2) (DigitalKoans, 2024) that in just a month accrued over 150 reads.

Finally, a key feature of ResearchGate that has remained elusive to most scholars is that the high “reputation” of the website amid search engines (and primarily Google) provides largely increased online visibility to scholarly journals that, however well-curated, have poor visibility due to the low online reputation ascribed to them by the search algorithm of Google and other search engines.

For instance, alongside with Murzin and Simakova in 2020 we published in the Journal of Scientometric Research a scientometric study on catalysis research (Ciriminna *et al.*, 2020).

Produced in India, this free-to-publish (“diamond” or “platinum”) Open Access (OA) journal started publication in 2012 after several members of the International Society for Scientometrics and Informetrics and other scientific societies identified the need of having such a research journal particularly focusing on the Global South (Giri and Kumar Das, 2023). Though being indexed by Scopus (a large research database owned by Elsevier) since 2018 and having received by the company owning the Web of Science database (Clarivate Analytics) its first journal impact factor (0.8) in 2023, the journal is still poorly indexed by Google Scholar. As a result, when searching for our scientometric study on catalysis research (Ciriminna *et al.*, 2020) in Google Scholar, the research database only counts 11 citations to the preprint posted at Preprints (the preprint platform owned by MDPI) (Google Scholar, 2024), but does not return the refereed article.

Hence, posting the study on RG largely contributed to enhance its online visibility because Google prioritizes RG links. To date, the study posted at ResearchGate (in preprint and refereed

article forms) has been read 712 times and the refereed study recommended 5 times (ResearchGate (2024b), with 15 citations found by ResearchGate.

CONCLUSION

A high number of reads on ResearchGate is highly valued by a number of eminent scholars in widely different. British linguist Hyland underlines in his personal academic website that “he has over 400,000 ‘reads’ on ResearchGate” (Hyland, 2024)). On October 16, 2019, the Brunel Business School reported the news that Professor Balmer had reached 200,000 reads on ResearchGate (Brunel Business School, 2019). Based in London at Brunel University, the Brunel Business School is one of the very few business schools accredited by the Association to Advance Collegiate Schools of Business, whereas Balmer, a professor of marketing, nowadays has accrued over 560,000 reads on RG (Balmer, 2024). “Sharing my research is one of my duties” wrote on Twitter the Spanish eminent marine biologist Angel Borja on November 22, 2022 “seeing that over 300,000 reads have happened in my ResearchGate profile makes me proud of the usefulness of my papers and presentations” (Borja, 2022).

On the occasion of 300,000 reads of our team’s research items at ResearchGate, we carried out an investigation of the reads and citation patterns from the perspective of research and educational dimensions of scholarly work with the aim to identify the main benefits offered by academic social networking. Deserving better knowledge amid scholars in order to fulfill the potential of this digital resource, said benefits are three.

First, RG offers a truly useful “Q&A” interface allowing any user to start a scientific discussion with her/his peers, or (for students and young researchers) to ask technical questions and get answers from other users. At times questions posted are “horribly basic” and get “clueless and factually wrong answers” (xLeitix, 2014). In many other instances, as briefly shown in this study, questions were (and are) posed by world-class scientists and the ensuing discussions remain openly available to all.

Second, RG is a particularly effective preprint platform allowing users to completely disintermediate the scholarly communication process by self-posting a preprint, ultimately placing the researcher “in a central role, using the Web to communicate research findings directly with their peers” (Fyson, 2017). This is not the case for most preprint platforms where editors acting as gatekeepers of knowledge (Noel, 2022) decide (typically in 1-3 days) which preprint can be published and which preprint “submission” to reject. Third, thanks to the high “reputation” ascribed by most search engines to the researchgate.net website (and primarily by Google that still accounts for over 90% of all the searches carried out on the web) (StatCounter, 2024), RG is able to dramatically enhance the visibility to articles in scholarly journals having poor online visibility.

This study, in conclusion, will hopefully assist scholars in the effective and purposeful use of this academic social network.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

ABBREVIATIONS

ASN: Academic Social Network; **OA:** Open Access; **RG:** ResearchGate; **Q&A:** Question and Answer.

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