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SPECIAL ARTICLE

Online platforms and social networks for the creation of research profiles

Plataformas online y redes sociales para la creación de perfiles de investigación

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Abstract: Nowadays, scientific communication is enriched by the use of new ways of storing, publishing and disseminating research findings. Said new ways of scientific communication are known as the so-called academic profile platforms, which include Scopus author ID, ORCID, Publons and Kudos and -on the other hand- social research networks, including Research-Gate, Academia.edu and Google Scholar citations. These tools have a main objective: enhancing both visibility and impact of contents and publications. They are multidisciplinary web pages that contain individual research profiles with network hyperlinks to magazines, databases and other sources. In some cases, bibliometric indicators are included, which allow measuring the impact caused by studies based on literature. This study compares the main online platforms, as well as some of the social research networks that currently exist for the creation of research profiles.

KEYWORDS: Online platforms, Social research networks, Researcher profile, Visibility, Diffusion.

Resumen: Hoy en día, la comunicación científica se está viendo enriquecida debido a la utilización de nuevos modos de almacenamiento, publicación y difusión de los resultados. Entre ellos se encuentran las denominadas plataformas de perfiles académicos, dentro de las cuales se encuadrarían Scopus author ID, ORCID, Publons y Kudos y, por otro lado, las redes sociales de investigación, entre las que se incluirían ResearchGate, Academia.edu y Google Scholar citations. Estas herramientas tienen como principal objetivo aumentar la visibilidad e impacto de los contenidos y publicaciones. Son páginas web multidisciplinares que contienen perfiles investigadores individuales con hipervínculos en red a revistas, bases de datos y otras fuentes. En algunos casos incluyen indicadores bibliométricos, que permiten medir el impacto causado por un trabajo a partir de la literatura. En este artículo se comparan las principales plataformas online, así como algunas de las redes sociales de investigación que existen hoy día para la creación de perfiles de investigación.

PALABRAS CLAVE: Plataformas online, Redes sociales de investigación, Perfil de investigador, Visibilidad, Difusión.

Introduction

The diffusion of research results is no longer restricted to the traditional academic community. More and more researchers are sharing their publications on social networks such as Twitter or Facebook in an attempt to gain more readers, citations and social impact[1].

Along with these more generalist social networks, the so-called social research networks have emerged, such as ResearchGate, Academia.edu or Google Scholar citations. Their main objective is to provide connection among scientists to share updated information, exchange opinions and access resources of interest instantly and easily[2-4]. A study showed that researchers also use these social research networks to share their academic profiles[5], although online platforms specifically designed for this purpose are more appropriate.

These academic profile platforms are online tools that allow identifying a researcher and linking them with their scientific production, enhancing their research results' visibility. In other words, these tools make a researcher's scientific history known in a grouped, systematic and updated way. They primarily consist of a website with different direct Internet access for each researcher, where their main data of current affiliation, their professional career and their academic merits are submitted, usually highlighting articles of scientific journals, which can be sorted by dates, themes, etcetera. Some of these platforms allow obtaining bibliometric indicators from the author.

It is thought that having a profile on these platforms enhances the value of the researchers' scientific production, as well as achieves an increase in citations[6]. Additionally, these platforms are used both for the evaluation and accreditation of professors and researchers in their work environment, as well as for the identification and evaluation of authors, reviewers and editors of scientific journals[7].

Some of these academic profiles platforms arise from the large databases of scientific articles, which have adjusted their online tools to periodically provide updated information on researchers and authors, linking these profiles to all their information. For instance, Publons is a tool associated with Web of Science (WoS), and Scopus author ID is associated with Scopus.

The content's accuracy, transparency and integrity on such platforms are the characteristics that should be sought when deciding which ones to use, as well as considering the scientific prestige of its founders and moderators[8]. These tools have great potential in terms of visibility, but they can also be problematic if they serve for the diffusion of merits achieved in a more or less fraudulent way. Another potential problem stems from the fact that some of these platforms may be infringing the journals' copyright, leading to conflicts between the author, the editorial committee, the publishing house and the online platform when articles not published under Open Access formats are disseminated.

The objective of this study is to analyze and compare the main systems for the creation of research profiles, such as online platforms or social research networks.

General characteristics of online platformsand social networks for the creation of research profiles

The most relevant characteristics are shown in Tables 1 and Table 2, respectively, while its main bibliometric indicators are shown in Table 3.

Table 1

Main online platforms for the creation of research profiles[9-12]

	Scopus author ID	ORCID	Publons	Kudos
Location	https://www.scopus.com	https://orcid.org	https://publons.com	https://www.growkudos.com
Creation	2004	2009	2012	2013
Founder	Elsevier	¿?	Andrew Preston, Daniel Johnston (From Clarivate since 2017)	Melinda Kenneway, Charlie Rapple, David Sommer
Users	16 million[9]	More than 6 million[10]	1,800,000[11]	More than 250,000[12]
Affiliation[a]	Yes	Yes	Yes	Yes
Name variants[b]	Yes	Yes	Yes	No
Keywords	Yes	Yes	No	No
ID No.	Yes	Yes	Yes (contains the Researcher's ID)	No
Photography[c]	No	No	Yes	Yes
Languages[d]	English, Chinese, Japanese, Russian	12 languages	English	English
Bibliometric indicators	Yes	No	Yes	Yes
Confidentiality Level[e]	No	Yes	Yes	Yes
Transparency Policy	No	Yes	No	No
Co-authors[f]	Yes	Yes	Yes	Yes
Compatibility[g]	ORCID	Publons Scopus author ID	ORCID	ORCID ResearchGate Academia.edu
Articles in journals[h]	Yes	Yes	Yes	Yes
Tesis[i]	No	Yes	No	No
Other	Alerts Remote access	QR code	Awards	

a The platform is able to associate the author with their institutional or professional affiliation.
b The platform groups different ways of naming the author in the same profile.
c Possibility of displaying an image of the author.
d Languages in which the platform is presented.
e Possibility of making the profile public, private or visible to certain people.
f Opportunity to associate the profile with the co-author(s) of the scientific papers they have published jointly.
g Combination with another online tool to be able to transfer all data from one platform to another.
h Opportunity to include scientific papers published in scientific journals.
i Possibility of showing doctoral theses.

Table 2

Social research networks[13-15]

	ResearchGate	Academia.edu	Google Scholar citations
Location	https://www.researchgate.net/	https://www.academia.edu/	https://scholar.google.com/citations
Creation	2008	2008	2012
Founder	Ijad Madisch, Sören Hofmayer and Horst Fickenscher	Richard Price and Brent Hoberma	Google
Users	More than 15 million[13]	More than 78 million[14]	389 million[15]
Affiliation[a]	Yes	Yes	Yes
Name variants[b]	No	Yes	No
Keywords	Yes	Yes	Yes
ID No.	No	No	No
Photography[c]	Yes	Yes	Yes
Languages[d]	English	English	Approximately all the world's languages
Bibliometric indicators	Yes	No	Yes
Confidentiality Level[e]	No	No	Yes
Transparency Policy	Yes	No	No
Co-authors[f]	Yes	No	Yes
Compatibility[g]	No	ORCID, Google Scholar citations	Academia.edu
Articles in journals[h]	Yes	Yes	Yes
Tesis[i]	No	No	Yes
Downloading work in pdf	Yes	Yes	No
Other	Adding disciplines, skills. Alerts, chat Posters, presentations, conferences, projects	*Curriculum vitae*	Card of each article Congress Proceedings Chapters of books

a The platform is able to associate the author with their institutional or professional affiliation.
b The platform groups different ways of naming the author in the same profile.
c Possibility of displaying an image of the author.
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Table 3

Main bibliometric indexes of some of the existing platforms for researcher profiles

	Index h*	i10**	Total References	Citations/year	Average number of citations/article	Statistics tools
Online platform						
Scopus author ID	No	No	Yes	Yes	No	PlumX Metrics***
Kudos	No	No	Yes	No	No	Altmetrics****
Publons	Yes	No	Yes	No	Yes	Altmetrics****
Social Research Network						
ResearchGate	No	No	Yes	No	No	No
Google Scholar citations	Yes	Yes	Yes	Yes	Yes	No

* Index h is short for Hirsch index, which is a metric citation benchmark used to measure the impact of an author or journal's publication. It is defined as (h) value when either the journal or the researcher have been cited at least n times. That is, if the index is worth n, then n publications have been cited more than n times16.

** Index i10 implies the number of publications with at least 10 citations. This measure is very simple and has the advantage that it is very easy to calculate, and Google Scholar citations are free and easy to use. A clear disadvantage to this approach is that this index is only used in this platform17.

*** PlumX Metrics is a tool to measure the impact of repositories and online platforms. It elaborates the metrics of the different versions of the same article, so that its authors can see the impact and scope of their research in one place. It also analyzes the impact and statistics of our research profile based on five categories: citations, use, captures,mentions and social networks18.

**** Altmetrics tools are altimetric markers that quantify the digital attention that an article receives in an "online" crowd, that is, the influence in real time of an article in social networks, Wikipedia, blogs, news and media, all tracked and reviewed by the Altmetric database. This process allows measuring the attention that an individual article receives from the moment the article is published19.

Online research profile platforms

Scopus author ID is presented as the oldest online platform, while ORCID is the most implanted in the academic world, and Publons as the one with the greatest dynamism and current growth. All platforms are experiencing a continuous growth in the number of users, as researchers are increasingly aware of making a more visible scientific production of their own. All belong to commercial companies, with the exception of ORCID that defines itself as a "non-profit organization".

All four online platforms have an unequivocal website per researcher and an identification number (except Kudos). Also all (except Kudos) offer the possibility of having a list of the researcher's variant names. This is an advantage in countries such as Spain, where compound names are common and have two last names. All offer the possibility of associating the research profile with the different co-authors of the published works.

Regarding the type of merits that can be recorded, all platforms are focused on the journal articles, which, after all, is the main result to be disseminated in a research profile. ORCID includes doctoral thesis and Scopus author ID, Publons and ORCID provide the option of a keywords list, which is a point to bear in mind, since these words can be linked to the author's own research lines. The novelty of Publons is the possibility of providing a peer review work of a verified researcher as a curricular merit in connection with the scientific journals. The selection of included merits, as well as the greater capacity to verify their authenticity and quality is the main difference between online research profile platforms and social research networks.

All online platforms have different bibliometric indicators, with the exception of ORCID (Table 3). These indicators are quantitative and qualitative tools that allow us, in theory, to know the importance of a written scientific production, by either an author, a group or an institution[20,21].

As shown in Table 1, all tools are compatible with at least one other different online platform, and even with some social research networks. This fact could solve the problem detected in a study regarding inconsistencies found in the available information on the different platforms for the same researcher, for instance, a different number of citations[22].

Scopus author ID

This online platform was founded in 2004 by Elsevier. It allows classifying authors in certain fields of research and assesses their impact over time[23]. It generates researcher profiles that are compatible with other tools, such as ORCID. It also performs different search options for both author and publications and provides the calculation of citations.

Integrating PlumX Metrics to Scopus recently has added more value by adding important bibliometric information, such as usage (downloads,

HTML views), captures (bookmarks), mentions (blog posts, comments, Wikipedia references), attention in social networks, and citations beyond Scopus (https://blog.scopus.com/topics/plumxmetrics).

However, there are limitations, as Scopus profiles may contain technical errors due to automatic data processing and generation of more than one identifier of the same author, a problem that can be overcome by regularly monitoring updates or merging two or more profiles by request of users.

ORCID

This platform, widely used in Spanish universities and, in general, in the academic world, has become a global standard, that is, a type of "digital curriculum vitae". Among its advantages, ORCID has a unique digital identifier, a comprehensive coverage of all types of academic contributions, it is free to use, provides an integration of identity generation (ID) services with other platforms, such as Scopus author ID and Publons, and is of non-commercial nature[24-26].

ORCID also solves the problem of variable transcription and the order of complex names, the omission of middle and initial names, the changes of names of married and divorced women and the existence of common names in most countries[27]. In addition, it is compatible with multiple languages, which increases international visibility for researchers and authors.

It is also consistent with open repositories of digital libraries and classic platforms -such as PubMed Central or CrossRef-, and other less typical ones -such as ScienceCentral and KoreaMed Synapse-[28].

ORCID has a long list of supporters, such as leading universities, the British Library, large publishers -Elsevier, Springer, Nature Publishing Group and Dove Press-, and funders -Welcome Trust, National Institutes of Health-. More than 100 publishers and more than 1,000 journals have already integrated it into their websites and editorial management systems[29].

As a limitation, ORCID does not have author bibliometric indicators.

Publons

Publons was founded in 2012 by Andrew Preston and Daniel Johnston. In 2017 it was acquired by Clarivate Analytics, one of the world leaders in information. This online platform initially presented a more specialized approach, aimed at evaluating academic activities[8]. Currently, having the old ResearcherID profiles incorporated in 2019, has contributed to be a much more comprehensive platform. ResearcherID was an online platform created in 2008 by Thomson Reuters and was integrated with the WoS[30] platform.

As previously mentioned, one of its main characteristics (which made it a pioneer) is that Publons partnered with publishers to provide solutions

to the peer review process by adding greater transparency, efficiency, quality and, subsequently, allowing researchers to accredit the review work as a curricular merit[31-33]. It allows researchers to display the year the review was conducted, the journal for which it was carried out, the title of the article and the full text of the review. However, these last two options are only available with the prior authorization from the editor, and once the manuscript has been published[34]. In 2016, the number of journals collaborating with this platform had already exceeded 10,000[35]. Farmacia Hospitalaria is one of the collaborating journals that -with the recent signing of the agreement- has taken an important step towards bringing itself at the forefront of publishing.

Kudos

Kudos is a web service that encourages its users to generate links to their publications and share them through general social networks (Facebook, LinkedIn, Twitter, etc.), combining data from research social networks and metrics.

It also allows the user to upload additional links as slides to complement their publication. A study has shown that explaining and sharing through this platform takes an average of 10 minutes and leads to a 23% increase in full- text downloads[36]. Another study postulates that Kudos is less known to the scientific community[37].

As is the case with Publons, Kudos uses Altmetrics tool as a metric alternative (https://www.altmetric.com/), which considers the latest system to measure the different impacts on research beyond the traditional metrics of scientific production, including the influence of scientific work within the new digital, social and information contexts.

Social research networks

Regarding social research networks, ResearchGate, Academia.edu and Google Scholar citations have been included in this work, the latter is added into this block by some authors[8,38,39].

The use of social networks has increased rapidly over the past few years. Even though its average acceptance among academics has been slower than by the general population[36], more and more academics and researchers have begun to see its usefulness, and even some anticipate that it may eventually influence promotion processes in academic institutions[40].

Social networks are perceived as effective tools for the discovery and diffusion of research findings[41]. All social networks present similarities, such as sharing manuscripts, presentations, posters and other forms of general communication to science[37].

Displaying each user's associated affiliation, incorporating articles from journals in their profiles and including a list of keywords based on the

research line are the common characteristics of these three social research networks. None of the social research networks assign an identifier to each profile. This entails a limitation regarding platforms that do have it incorporated, since authors with similar names and/or surnames can be found, resulting in causing confusion on certain occasions.

As presented in Table 2, these social research networks have a greater number of users as opposed to research profile platforms. For instance, in an analysis of 4,307 Norwegian researchers, profiles revealed that the former ResearcherID platform was the least popular, with only 130 user holders (3%) compared to 1,307 researchers in ResearchGate (30%), which makes it the most popular[38]. Another study based on an email survey disseminated by Nature[5] journal reported that ResearchGate (48%) was the most used profiling tool compared to ResearcherID (12%) and Academia.edu (5%).

In ResearchGate, at least one publication is required to create a profile. In addition, Academia.edu is the only one that has the characteristic of name variants.

Google Scholar citations is the most cosmopolitan social research network, since it is presented in almost all languages. It is also the only social research network that offers the option of making it public or private, and the only one that shows the possibility of including doctoral theses.

In connection to bibliometric tools, social media platforms such as Twitter, Facebook or LinkedIn allow researchers to promote their work. However, the results are measured in terms of social media metrics -such as views, actions, likes, etc.-, and not in terms of publication metrics -such as downloads, citations or bibliometric indexes-.

Some networks, such as ResearchGate, offer the opportunity for authors to upload all their works in pdf format, regardless of the copyright they receive (in case the author has not uploaded a certain article, it can be requested through a private request). This has generated a variety of opinions. Some authors have positively valued this option because it contributes to the more transversal diffusion of research. Others, as previously mentioned, pay attention to the legal and moral conflict that arises between the author and the editor, as there is no mechanism defined to prevent this problem and there are no well-defined sanctions in case of the editor's copyright infringement.

ResearchGate

This platform is one of the largest research social networks that in 2014 already had more than 4.5 million registered users[5]. Unlike other profiles or social networks, such as Academia.edu, or Google Scholar citations, it was specifically designed for the exchange of data between researchers, authors and journal editors[42].

One study revealed that ResearchGate and Google Scholar citations cover almost the same academic articles. However, it has been shown that

the accepted manuscript is much more visible in ResearchGate and has a better chance of being cited[43]. There is even evidence to suggest that readers see articles in ResearchGate and then tend to cite them in their articles that are indexed on platforms like Scopus author ID[44].

Along with the advantages presented by ResearchGate, there are also a number of limitations, due to the lack of validation tools to prevent the storage of unchecked items or "predatory" items[43,45]. As mentioned above, cases of copyright infringement are common, due to the lack of user knowledge about the regulation of accessible files[46].

Special concern has also been expressed about ResearchGate abuses, aimed at intimidation, such as cyber-bulling, and privacy violations[47].

Academia.edu

This social research network contains approximately 8.5 million articles[48]. Although it shares some characteristics with ResearchGate[49], it is more appropriately adapted to academic needs, including humanities disciplines[50]. It also includes an employment section that announces recruitments for academic positions in universities around the world (https://blogs.iadb. org/conocimiento-abierto/es/3-plataformas-gratuitas-para-el-intercambio-academico-y-cientifico/).

A study affirms that, over the past five years, articles uploaded to the Academia.edu tool have received a 69% increase in citations[48].

The limitations of this website are related to the inappropriate use of its domain (edu), since it was registered before the legislation became effective[8]. Finally, a study indicates that this social research network can enhance visibility to younger researchers and women[51].

Google Scholar citations

In 2012, aGoogle Scholar individual page was presented, which received the name of Google Scholar citations, as an alternative to other existing tools, simply providing a follow-up of the articles' citations. Authors can check who is citing their publications, as well as see graphs of evolution of citations over time, along with several citation indicators[52].

In a study conducted in 2015 on the growth of profiles in this tool for a year, it was observed that they were multiplied by six, from 27,000 profiles in December 2011 to approximately 190,000 in December 2012[53].

It seems to be a useful tool to complement other sources. However, there is lack of filter on low quality and irrelevant works, absence of a thesaurus to systematize searches, and lack of protection against manipulations and increased citations to upload seemingly false quotes from the Internet[54]. It should not be forgotten that the high penetration of the so-called "predatory" journals damages the reputation and reliability of this platform[55].

Despite these limitations, improvements are being made to introduce tools that can increase the reliability of Google Scholar citations, including the withdrawal of citations that have proven to be fictitious[56].

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