April 3, 2017

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Cite as: Bong, Y. B., Ale Ebrahim, N. (3 April 2017). The Rise of Alternative Metrics (Altmetrics) for Research Impact Measurement, *Asia Research News 2017, DOI: https://doi.org/10.6084/m9.figshare.4814215.v1*

The Rise of Alternative Metrics (Altmetrics) for Research Impact Measurement

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Summary: Altmetrics are new metrics proposed as alternatives to impact factor for journals as well as individual citation indexes (h-index). Altmetrics uses online activities to measure the impact, buzz and word of mouth for scientific information. It includes new methods to measure the usage at citation level.

Keywords: Altmetrics, Research impact measurement, Research visibility, Mentions, Citations

Content

"Alternative Metrics" is formulated based on the idea that the web is not just mere usage by academics, but may serve to provide evidence for the wider research impacts [1]. The term "article level metrics" was first put forward in 2010, but Altmetrics (derived from "alternative metrics") become prevalent as it better suggested a range of new metrics. These metrics are usually based on data from the social web. Some of the most promising alternative metrics tools are Altmetric.com, Impactstory.org, Plumanalytics.com, Usage Count and PLoS Article-Level Metrics.

Altmetrics can be applied not only to articles, but also to people, journals, books, data sets, web pages, etc. The impact of a work does not depends on citation counts alone, but other aspects of the work as well, such as, article views, downloads, mentions in social media and news services [2]. However, the Altmetrics scores by Altmetric.com do not imply the quality of the paper, the researchers nor the whole research impact story.

Researchers are able to understand the type of attention received by reading the mentions for a research outputs, whether the attention is positive or negative, or if the paper has gained traction in a particular country (Table 1) [3].

Traditional bibliometrics	**Alternative metrics "*Altmetrics*"**
• Journal Impact Factor • Citation counts • H-index • Number of publications	• Mentions in news reports • References in policy • Mentions in social media • Wikipedia citations • Reference manager readers etc.

Table 1 shows a comparison between the traditional and new systems for measuring research impact

Why Altmetrics?

Altmetrics is calculated through real-time basis. As compared to the traditional citation counts, Altmetrics receive immediate feedback on attention for a scholarly content. This is particularly useful for early career researchers whose work may yet to have accrued citations. As altmetrics track attention to a broad range of research outputs, which includes articles, posters, data sets and working papers, etc., it provides a more coherent understanding of research attention, thus helping researchers to get credit for

impact activities as well as to understand the broader reach in this digital era and early impact of research attention. Public and private funders sometimes require for evidences or impacts "on society", whereby Altmetrics is best suited to present this picture of impact. Lastly, Altmetrics showcase attention to a research output beyond academia, and researchers might be able to uncover unknown conversations about their research, and perhaps plan about the future directions.

How is the Altmetric score calculated?

The score is derived from an automated algorithm, and represents a weighted count of the amount of attention Altmetric have picked up for a research output. It is weighted to reflect the relative reach of each type of source (Table 2). For an example, the average newspaper story is more likely to bring attention to the research output than the average tweet.

Figure 1 Alternative metrics which are available online

TYPE OF SOURCE	WEIGHTED COUNT OF ATTENTION RECEIVED
News	8
Blogs	5
Twitter	1
Facebook	0.25
Sina Weibo	1
Wikipedia	3
Policy Documents (per source)	3
Q&A	0.25
F1000/Publons/Pubpeer	1
YouTube	0.25
Reddit/Pinterest	0.25
LinkedIn	0.5
Open Syllabus	1
Google+	1

Table 2 Weighted count of Altmetric score by type of source [Source: https://help.altmetric.com/support/solutions/articles/6000060969-how-is-the-altmetric-attention-score-calculated-]

Finding new collaborators through Altmetrics?

Altmetrics can help in finding potential collaborators for researchers by the detailed breakdowns of the mentions received for those who are already discussing about the researchers' work online, who might be working on the topics of same interest or even those who are good at promoting research. By clicking on the relevant tweet, blog post or other mention type, researchers are able to see the profile of the person who is discussing about their paper. Usually, their social media profile will include a link to their professional website for researchers to reach out to them.

Conclusion

This short article introduced a new research impact measuring systems - Altmetrics. As such, if researchers are looking for strategies to improve their research impacts, it is wise to consider the research visibility and availability on the different social academics platform besides high quality journal publications. Research publication promotion through academic social networks/Twitter/Blogging not only improve the Altmetrics score, but also improve the article citations. Studies found a link between scientists' public engagement and citation rates [4, 5]. Altmetrics are measures of online attention and engagement, and are meant to complement, but not completely replace the traditional impact measures.

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