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Publikationsoutput in wissenschaftlichen Journalen: eine Monitoringstudie für die Universität Wien

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Juan Gorraiz, Ursula Ulrych,
Benedikt Blahous & Martin
Wieland

Bibliometrie und
Publikationsstrategien
Universitätsbibliothek, Wien

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Aim & Research Questions of this Monitoring Study

- ✓ to provide an example of a monitoring practice concerning the broader impact of the journal publication output on institutional level
- ✓ to discuss the opportunities and limitations when providing similar reports
- ✓ Which disciplines (or knowledge areas) are the most present and active according to the different metrics and their evolution within the timeframe 2014-2016?
- ✓ How can new metrics contribute to modern applied bibliometric assessments?



Data samples and methodology

Data Sources:

- Web of Science Core Collection (WoS CC) including all the comprised indices (proceedings, books, etc.)
- PlumX altmetrics dashboard (gathers and offers publication-level metrics for so-called artifacts and allows DOIs and other identifiers to be directly entered).

Data Sample:

All WOS CC publications containing “Univ Vienna” in their affiliation data for the publication years: 2014, 2015 and 2016 with available DOIs.

→ # documents with DOI increased from 2,384 in 2014 to 2,887 in 2016

→ % articles with DOI increased from 93.5% in 2014 to 94.4% in 2016



Data samples and methodology

The resulting dataset in PlumX includes the scores of all measures according to their origin. The **measures** are categorised into five separate **dimensions**: Usage, Captures, Mentions, Social Media, and Citations.

Year	Number of WoS-CC records = PlumX input	PlumX output	Number of WoS-CC records with matching record in PlumX (via DOI)	Share of WoS-CC records with matching record in PlumX (via DOI)	Number of WoS-CC records without matching record in PlumX (via DOI)
2014	2,384	2,359	2,359	99%	25
2015	2,500	2,477	2,477	99%	23
2016	2,887	2,851	2,851	99%	36

✓ high data accuracy

In order to analyse the differences between knowledge areas, all publications retrieved in WoS Core Collection have been reclassified according to the field “research areas” in the following six divisions :

- 1) Arts & Humanities
- 2) Engineering & Technology,
- 3) Health Sciences,
- 4) Life Sciences,
- 5) Physical Sciences,
- and 6) Social Sciences .



The Five Categories



Usage – A way to signal if anyone is reading the articles or otherwise using the research. Usage is the number one statistic researchers want to know after citations.

Examples: clicks, downloads, views, library holdings, video plays [Learn more](#)



Captures – Indicates that someone wants to come back to the work. Captures can be an leading indicator of future citations.

Examples: bookmarks, code forks, favorites, readers, watchers [Learn more](#)



Mentions – Measurement of activities such as news articles or blog posts about research. Mentions is a way to tell that people are truly engaging with the research.

Examples: blog posts, comments, reviews, Wikipedia links, news media [Learn more](#)



Social media -This category includes the tweets, Facebook likes, etc. that reference the research. Social Media can help measure “buzz” and attention. Social media can also be a good measure of how well a particular piece of research has been promoted.

Examples: +1s, likes, shares, tweets [Learn more](#)



Citations – This is a category that contains both traditional citation indexes such as Scopus, as well as citations that help indicate societal impact such as Clinical or Policy Citations.

Examples: citation indexes, patent citations, clinical citations, policy citations [Learn more](#)



General Results

Category or Dimension	Measure	Year 2014 (input: 2,384 / output: 2,359)								
		Items with data available	Items with data available (%)	Intensity (Sum)	Mean	Density (Mean available)	Median	Maximum	Standard deviation	T confidence interval ($\alpha = 0.05$)
Captures	Exports-Saves:EBSCO	1,298	55%	16,822	7.13	12.96	1	464	26.42	1.07
	Readers:Mendeley	2,161	92%	54,198	22.97	25.08	11	834	44.09	1.78
	Total Captures	2,227	94%	71,020	30.11	31.89	14	848	54.70	2.21
Citations	Scopus	2,007	85%	27,524	11.67	13.71	5	872	28.27	1.14
	PubMed	643	27%	4,815	2.04	7.49	0	186	8.08	0.33
	CrossRef	1,935	82%	25,423	10.78	13.14	5	843	27.09	1.09
	Total Citations	2,091	89%	58,067	24.62	27.77	11	1,715	59.38	2.40
Social Media	+1s:Google+	69	3%	488	0.21	7.07	0	263	5.52	0.22
	Tweets:Twitter	634	27%	10,202	4.32	16.09	0	2,481	65.06	2.63
	Shares, Likes & Comments:Facebook	259	11%	9,869	4.18	38.10	0	1,021	37.88	1.53
	Total Social Media	726	31%	20,559	8.72	28.32	0	2,533	85.73	3.46
Mentions	Blog Blog	51	2%	91	0.04	1.78	0	9	0.34	0.01
	Links:Wikipedia	94	4%	146	0.06	1.55	0	17	0.49	0.02
	News News	43	2%	87	0.04	2.02	0	11	0.37	0.02
	Total Mentions	163	7%	424	0.18	2.60	0	33	1.28	0.05
Usage	Abstract Views:EBSCO	2,093	89%	311,800	132.17	148.97	26	6,427	388.16	15.67
	PDF + HTML Views:EBSCO	800	34%	56,193	23.82	129.42	0	3,139	n.a.	n.a.
	Link-outs:EBSCO	1,346	57%	31,065	13.17	23.08	1	808	50.90	2.05
	Total Usage	2,102	89%	918,135	389.21	436.79	34	69,260	2084.36	84.16
<i>Total All</i>		2,310	98%	1,068,205	452.82	462.43	81	69,885	2128.60	85.94



Main Information

- Data with scores = number of data records traced in PlumX with at least one score (>1);
- data with scores (%) = number of data records traced in PlumX with at least one score (>1) in relation to the number of the WoS CC records searched;
- intensity = sum of all signals or scores;
- density (mean available) = sum of all signals or scores in relation to the number of all WoS records traced in PlumX with at least one score (>1);



Resulting Trends

- ✓ Large diversity of signals traced for each measure in each dimension
- ✓ Highest coverage or degree of data availability by the number of readers in Mendeley, followed by abstracts views
- ✓ Mentions almost insignificant
- ✓ Usage counts quantitatively predominant in comparison to other metrics
- ✓ Abstracts views responsible for the highest intensity and density
- ✓ Expected decrease for captures, citations & usage but opposite trend for social media
- ✓ Intensity of tweets increase despite the reduced time window from 10,000 in 2014 to around 25,000 for 2015 and 14,000 for 2016
- ✓ % publications with data availability in social media steadily increasing from ~31% in 2014 to ~40% in 2016



Relevant results from the six main research areas

PY	Subject category	Mendeley			Scopus			Twitter			EBSCO					
		% documents with Readers in Mendeley	Readers Intensity in Mendeley	Readers density in Mendeley	% documents with citations in Scopus	Citation Intensity in Scopus	Citation Density in Scopus	% documents with Tweets in Twitter	Tweets Intensity	Tweets Density	% documents with Abstract Views in EBSCO	Abstract Views Intensity in EBSCO	Abstract Views Density in EBSCO	% documents with HTML/PDF Views in EBSCO	HTML/PDF Views Intensity in EBSCO	HTML/PDF Views Density in EBSCO
2014	Arts & Humanities	50%	138	2.56	31%	42	0.78	6%	3	0.06	87%	11,402	211.15	57%	2,279	42.20
	Eng. & Technology	95%	10,326	33.42	88%	4,571	14.79	34%	4,701	15.21	86%	51,494	166.65	36%	10,458	33.84
	Health Sciences	98%	4,395	26.16	86%	2,070	12.32	43%	577	3.43	96%	29,689	176.72	30%	5,444	32.40
	Life Sciences	96%	21,981	30.87	91%	9,248	12.99	36%	3,928	5.52	92%	68,604	96.35	30%	5,904	8.29
	Physical Sciences	90%	9,345	11.90	89%	9,611	12.24	13%	226	0.29	85%	20,733	26.41	16%	2,712	3.45
	Social Sciences	86%	8,013	24.21	70%	1,982	5.99	28%	767	2.32	91%	129,878	392.38	40%	29,396	88.81
	<i>Total</i>	<i>92%</i>	<i>54,198</i>	<i>22.97</i>	<i>85%</i>	<i>27,524</i>	<i>11.67</i>	<i>27%</i>	<i>10,202</i>	<i>4.32</i>	<i>89%</i>	<i>311,800</i>	<i>132.17</i>	<i>28%</i>	<i>56,193</i>	<i>23.82</i>
2015	Arts & Humanities	46%	141	2.31	26%	26	0.43	11%	21	0.34	85%	12,268	201.11	49%	2,617	42.90
	Eng. & Technology	97%	9,546	29.28	86%	3,457	10.60	39%	20,182	61.91	76%	47,848	146.77	30%	7,960	24.42
	Health Sciences	93%	3,968	20.88	80%	1,297	6.83	53%	664	3.49	93%	19,936	104.93	25%	1,492	7.85
	Life Sciences	96%	17,857	23.37	88%	5,683	7.44	46%	3,049	3.99	92%	91,863	120.24	30%	4,602	6.02
	Physical Sciences	88%	8,938	11.01	82%	5,260	6.48	18%	853	1.05	75%	22,551	27.77	13%	1,494	1.84
	Social Sciences	89%	5,283	16.36	66%	1,126	3.49	33%	911	2.82	89%	94,765	293.39	37%	14,453	44.75
	<i>Total</i>	<i>91%</i>	<i>45,749</i>	<i>18.47</i>	<i>81%</i>	<i>16,850</i>	<i>6.80</i>	<i>34%</i>	<i>25,680</i>	<i>10.37</i>	<i>84%</i>	<i>289,236</i>	<i>116.77</i>	<i>25%</i>	<i>32,618</i>	<i>13.17</i>
2016	Arts & Humanities	31%	65	0.78	13%	14	0.17	5%	31	0.37	84%	6,565	79.10	23%	660	7.95
	Eng. & Technology	94%	9,675	22.87	65%	1,866	4.41	47%	5,428	12.83	76%	48,693	115.11	21%	7,049	16.66
	Health Sciences	92%	3,123	14.00	69%	679	3.04	55%	794	3.56	87%	13,545	60.74	14%	2,993	13.42
	Life Sciences	95%	16,230	19.55	78%	3,378	4.07	58%	6,080	7.33	88%	64,977	78.29	16%	14,578	17.56
	Physical Sciences	82%	6,061	7.38	68%	2,911	3.55	17%	809	0.99	65%	15,231	18.55	6%	605	0.74
	Social Sciences	78%	4,826	10.49	43%	561	1.22	32%	918	2.00	81%	77,704	168.92	17%	15,395	33.47
	<i>Total</i>	<i>86%</i>	<i>40,019</i>	<i>14.04</i>	<i>65%</i>	<i>9,411</i>	<i>3.30</i>	<i>38%</i>	<i>14,072</i>	<i>4.94</i>	<i>78%</i>	<i>226,746</i>	<i>79.53</i>	<i>14%</i>	<i>41,280</i>	<i>14.48</i>



Results from the 6 main knowledge areas

- ✓ The lowest percentage of total coverage for the area Arts & Humanities.
- ✓ highest coverage or degree of data availability provided by the number of readers in Mendeley independently of the knowledge area (almost 90%)
- ✓ The behaviour of the four hard sciences (Engineering & Technology, Health Sciences, Life Sciences and Physical Sciences) and the Social Sciences is similar in “captures and citations” - in the social media the Social Sciences are actually ranked on third position (Health and Life Sciences account for highest percentages of data availability, followed by Engineering & Technology).
- ✓ Social media: low values for the Physical Sciences and relative insignificance in the “Arts & Humanities”.
- ✓ Data availability for the dimension “usage” higher in Arts & Humanities as in Engineering & Technology or Physical Sciences.
- ✓ Density results correspond very well with the ones concerning data coverage & are decreasing according to the reduced measuring window



General Conclusions

- ✓ Monitoring practices provide an interesting information and help to reveal new trends and to assess the degree of implantation
- ✓ The results reinforce the importance of usage metrics in order to assess the broad impact of journal articles, especially in disciplines related to the area Arts & Humanities
- ✓ Study hints at an increasing use of Social Media within the scholarly community in general and a particularly increase of Twitter usage in Austria and at the University of Vienna
- ✓ A clear restriction of our study is that more than 90% of the publications with DOI retrieved in WoS were journal articles and reviews. An analysis of the web impact of the total publication output should, of course, also consider other publication types, even if they lack a DOI.
- ✓ PlumX has proven to be a very useful tool in order to monitor the broad impact of the publication output at country or institution level → multidimensional aspect is well addressed!
- ✓ It is further necessary to clarify the stability and reproducibility of altmetrics data and to improve technical aspects: possibility to select different measuring windows is missing!



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Dr. Gernot Deinzer

Editorial address

Dr. Gernot Deinzer (V.i.S.d.P.)
Universitätsbibliothek
Regensburg
Universitätsstr. 31
93053 Regensburg
Tel.: 0941/943-2759
Email: bibliometrie@ur.de

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