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A Study of Pertinent Citations in Introduction Sections of Turkish Journal of Chemistry

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ABSTRACT

In this article, a report of a study to investigate pertinent citations in the introduction sections of empirical article published in Turkish Journal of Chemistry is presented. It is attempt to proceed with the validation that majority of citation made in the introduction sections of scientific articles are impertinent to the study. In this study, an empirical investigation of pertinence of citations made in Turkish Journal of Chemistry is presented. In this particular study, citations made in the introduction sections in issues published from 1997 to 2004 were analyzed. An empirical scientific article was randomly selected from every issue published, and the pertinence of selected article was determined. Overall, the result showed that less than 20% of the citations were pertinent to the study. This result suggests that over 80% of citations made in the introduction sections may not be applicable in the computation of effective impact of publications.

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Introduction

Due to widespread clamour for accountability, good management, and government revenue austerity in many countries of the world, the interest and demand for objective evaluation of research performance is increasing internationally (RAND Corporation, 2013). There is need to show policy making is evidence based and, in the current economic climate, to demonstrate accountability for the investment of public funds in research (RAND Corporation, 2013). Although many different approaches have been used to evaluate research, however, the methodologies with the most widespread application involve some forms of bibliometric assessments through citation analytics (Adedayo, 2015a). While the use and acceptance of citation analytics in evaluation of research performance is widespread (Sharma et al., 2013, Garfield, 1994), at the same time, many others have viewed this differently. As a result, many critiques of citation analytics have been published (Saha et al., 2003; Seglen, 1997,; Adedayo, 2015b, Adedayo, 2016; DoRA, 2013). Clearly, there is problem with the present usage of citation analytics as research performance evaluation tool. To refine the methodologies of citation analytics, various approaches proposed include careful cull and curate of appropriate citations to count in evaluation computations. Particularly, it has been suggested that the citation impact metrics would work better, only if every citing author meticulously cited only the earlier works pertinent to theme of the new manuscript (Cawkell, 1977). Therefore, pertinence of the cited reference to the new study being reported becomes crucial as an important consideration during performance evaluation.

In this present publication, an empirical study to investigate pertinence of citations made in the introduction sections of articles published in Turkish Journal of Chemistry is presented. The idea presented in the report is very fresh, and original! It forms one of the first attempts to use empirical methods to determine pertinence of citations in scientific publications. Herein, the rationale for the study is identified

Methodology

Citation pattern in articles published in Turkish Journal of Chemistry, was studied. Citation pattern in issues published in the journal from 1997 to 2004 was studied. An article is randomly selected from each issue published by the journal, and a systematic cull of citation in the articles was made (Adedayo, 2015a; Adedayo, 2015b; Adedayo, 2016). Citations in the articles were classified as citations with Real and Imaginary Pertinence (Adedayo, 2015a; Adedayo, 2016). Citations made in Introduction sections were considered as Citations with Imaginary Pertinence while those made in the Methodology/Results/Discussion of Result/Conclusions are considered to have Real Pertinence.

The total number of authors cited in the Introduction sections were counted and recorded as N_c. Also, a counting of common citations made both in the Imaginary and the Real sections was made, and recorded as n_c. Pertinence (p) of the Imaginary section (Introduction section) of each article was determined by finding the ratio n_c: N_c expressed as a percentage i.e.

$$p = 100\left(\frac{n_c}{N_c}\right) \quad (1)$$

The average Pertinence for the journal publication in a particular year was determined. The overall average pertinence for the journal entire study was also determined.

Results and Discussion

Tables 1 to 8 present the results for the study. Table 1 provides information on pertinence of Introduction section in articles published in Turkish Journal of Chemistry , in 1997. From the Table, the highest pertinence observed is 71%, which is for the article published in 1997 in volume 21,

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number 4, pages 239-245. The lowest pertinences were 0%. The average pertinence for articles published in the journal for the year 1997 is 22%.

Table 2 provides information on pertinence for journal issues published in 1998. From the Table, the highest pertinence observed is 43%, which is for the article published in 1998 in volume 22, number 2, pages 123-127. The lowest pertinences were 0%. The average pertinence for the journal issue for the year 1998 is 19%.

Table 3 provides information on pertinence for issues published in 1999. From the Table, the highest pertinence observed is 15%, which is for the article published in 1999 in volume 23, number 1, pages 15-20. The lowest pertinences were 0%. The average pertinence for articles published in the journal for the year 1999 is 4%.

Table 4 shows information on pertinence for Volume 24. From the Table, the highest pertinence observed is 100%, which is for the article published in 2000 in volume 24 , number 1, pages 35-41. The lowest pertinences were 0%. The average pertinence for articles published in the journal for the year 2000 is 36%.

In Table 5, we see the information about pertinence for Volume 25. From the Table, the highest pertinence observed is 25%, which is for the article published in 2001 in volume 25, number 4, pages 469-475. The lowest pertinence is 0%. The average pertinence for articles published in the journal for the year 2001 is 11%.

Table 1. Representative citation distribution in articles published in the journal issue in 1997.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 21 (01)	1997	65-70	25	4	16
2.	Vol. 21 (02)	1997	92-99	6	0	0
3.	Vol. 21 (03)	1997	225-228	8	0	0
4.	Vol. 21 (04)	1997	239-245	7	5	71
	Average for the year					22

Table 2.Representative citation distribution in articles published in the journal issue in 1998.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 22 (01)	1998	47-53	14	0	0
2.	Vol. 22 (02)	1998	123-127	21	9	43
3.	Vol. 22 (03)	1998	253-260	15	4	27
4.	Vol. 22 (04)	1998	361-366	14	1	7
	Average for the year					19

Table3.Representative citation distribution in articles published in the journal issue in 1999.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 23 (01)	1999	15-20	13	2	15
2.	Vol. 23 (02)	1999	163-169	8	0	0
3.	Vol. 23 (03)	1999	319-327	4	0	0
4.	Vol. 23 (04)	1999	361-367	4	0	0
	Average for the year					4

Table 4. Representative citation distribution in articles published in the journal issue in 2000.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 24 (01)	2000	35-41	3	3	100
2.	Vol. 24 (02)	2000	165-175	3	0	0
3.	Vol. 24 (03)	2000	231-237	11	5	45
4.	Vol. 24 (04)	2000	333-341	13	0	0
	Average for the year					36

Table 5. Representative citation distribution in articles published in the journal issue in 2001.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 25 (01)	2001	33-38	17	1	6
2.	Vol. 25 (02)	2001	157-164	7	1	14
3.	Vol. 25 (03)	2001	273-281	4	0	0
4.	Vol. 25 (04)	2001	469-475	28	7	25
	Average for the year					11

For Table 6, we see have pertinence for Volume 26. From the Table, the highest pertinence observed is 39%, which is for the article published in 200 2in volume 26 , number 2, pages 171-178. The lowest pertinences were 0%. The average pertinence for articles published in the journal for the year 2002 is 16%.

Table 6. Representative citation distribution in articles published in the journal issue in 2002.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 26 (01)	2002	37-44	9	3	33
2.	Vol. 26 (02)	2002	171-178	18	7	39
3.	Vol. 26 (03)	2002	335-343	16	0	0
4.	Vol. 26 (04)	2002	547-550	9	0	0
5.	Vol. 26 (05)	2002	669-679	22	1	5
6.	Vol. 26 (06)	2002	830-842	11	2	20
	Average for the year					16

Table 7. Representative citation distribution in articles published in the journal issue in 2003.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 27 (01)	2003	77-83	12	1	8
2.	Vol. 27 (02)	2003	189-196	12	0	0
3.	Vol. 27 (03)	2003	403-415	32	15	47
4.	Vol. 27 (04)	2003	423-431	17	2	12
5.	Vol. 27 (05)	2003	623-637	18	5	28
6.	Vol. 27 (06)	2003	695-702	11	2	18
	Average for the year					**19**

In Table 7, the information about pertinence for Volume 27 is presented. From the Table, the highest pertinence observed is 47%, which is for the article published in 2003 in volume 27, number 3, pages 403-415. The lowest pertinence is 0%. The average pertinence for articles published in the journal for the year 2003 is 19%.

In Table 8, the information about pertinence for Volume 28 is presented. From the Table, the highest pertinence observed is 22%, which is for the article published in 2004 in volume 28, number 2, pages 193-202. The lowest pertinence is 0%. The average pertinence for articles published in the journal for the year 2004 is 10%.

Table 8.Representative citation distribution in articles published in the journal issue in 2004.

S/N	Journal Issue	Publication Date	Article Pages	N_c	n_c	Pertinence (%)
1.	Vol. 28 (01)	2004	39-45	9	0	0
2.	Vol. 28 (02)	2004	193-202	18	4	22
3.	Vol. 28 (03)	2004	299-309	14	1	7
	Average for the year					10

Overall the average pertinence for the study is found by calculating the mean for the average pertinences for all the journals issues analyzed i.e.

$$p_m = \frac{p_{Vol.21} + p_{Vol.22} + p_{Vol.23} + p_{Vol.24} + p_{Vol25} + p_{Vol26} + p_{Vol.27} + p_{Vol.28}}{8}$$

Where p_m is the mean of the average pertinences for the entire journal issues analyzed.

$$p_m = \frac{(22+19+4+36+11+16+19+10)\%}{8}$$

p_m = 17%

From the foregoing, the results indicate that, on the average, only 17% of citations in the introduction sections of the articles studied are pertinent to the reported research. This result is supported by the predictions made by Adedayo,(2015b). In his study, Adedayo, (2015b) extended the work of Saha et al., (2003), drawing similarities between citations and votes. When citations are considered as votes, Adedayo, (2015b) predicted that about 80% of citations made in the introduction sections may not be applicable in the computation of effective impact of publications.

Conclusion

This investigation has shown significant agreement with the assertion of Cawkell, (1977), that pertinence of cited literature reference in a scientific article is very important in impact evaluation considerations. Larger proportions of citations made in the introduction sections of scientific articles only have imagined pertinence to the study reported. Overall the average pertinence for the study is less than 20%. Also, *pertinence;* a new parameter useful in the evaluation of scientific publications has been introduced.

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