

**NOBEL CLASS CITEDNESS LEVEL:  
A REASONABLE CONCEPT?  
A synopsis of the paper to be presented  
(with a special slant to the notion of impact)**

**Vladimir S. Lazarev**

Belarusian National Technical University, Scientific Library,  
Minsk, Republic of Belarus  
E-Mail: vlas0070@yandex.ru

The claim that the citedness magnitudes point at the "Nobel class" of the scientist seems to be self-evident. However, to accept it as an absolute truth, a correspondence must be found between the characteristic (property) *adequately reflected by citedness data* and the characteristic *that determines the award of the Nobel Prizes in science*. The characteristic that determines the awarding of Nobel Prizes is the *benefit brought to mankind* by discovery or improvement; at least, according to the Nobel will, *benefit* is a criterion for awarding the Prize\*. At the same time, it is widely believed that citedness reflect *impact* or *quality* of scientific papers (e.g., [1]), while impact (e.g. [2; 10]) and quality [5, pp. 41–42, 49–50] are notions which semantically close to the notion of *benefit*.

At first glance, the notion of *impact* looks very tempting in the context of the problem under analysis as it is now practiced to be defined, inter alia, as “referring to contribution of research outcomes to the advancement of scientific/scholarly knowledge and to the benefits for society, culture, the environment, or the economy” [8, p. 1991]. This definition refers to society, culture, environment and economy, i.e. the principal notions, associated with the concept of the of mankind; besides, “impact” is treated as “contribution of research outcomes” exactly to the *benefits*, i.e. to this very notion that is the criterion for awarding the Nobel Prize.

However, according such a definition, impact is supposed to be evaluated not by the citedness level taken separately, but by an extensive set of indicators applied in the complex [8, pp. 1991–1994]. Thus, the definition under consideration does not correspond to the method used for determining the Nobel class *citedness*, and, therefore, it cannot be taken into account in our further analysis. Instead, traditional definitions of “impact” should be considered. But when we pass to the traditional definitions of “impact” (named in more recent terms as 'scientific impact' or 'impact on science'), the results of analytical interpretation of the literature related to the problem would inevitably demonstrate

---

\* <https://www.nobelprize.org/alfred-nobel/full-text-of-alfred-nobels-will-2/>.  
Date of access: 27.06.2019.

that the existing and used meanings of the term "impact" are practically synonymous with "influence" (without any further definition!) or do not go beyond the concept of "strong impression", or practically coincide with the meaning of the term "pertinence", or refer to purely technical indicators. No unified definition is in operation, no sufficient definition of the term "impact" has been found out at all [6]. Comparison of the notion of "impact" (interpreted as "influence" or "strong impression") with the possibilities of its quantitative evaluation by citedness data demonstrated the unreliability of citation counts as an aid of assessment of exactly the "impact" since in terms of cause-and-effect relationships, "impact" may or may not be the reason for the use of scientific documents reflected in their citedness data. In other words, citedness is not a very reliable proxy (substitute indicator) to be used for assessing "impact" (which notion is poorly defined) [7]. Thus, in search for the answer to the question if the citedness magnitudes point at the "Nobel class" of the cited items, it is not fruitful to use the traditional notion of *impact* as well as its modern concept.

As for the *quality* which is—roughly and universally—may be in all the cases defined as "degree of conformance to a standard"\* (including speculative "standards" that might exist only in the evaluator's mind and not be formulated in a documentary format [5, pp. 39–40] or to requirements†, it was demonstrated that that exactly the concept of "quality" of cited scientific documents is the best to correspond with the notion of "benefit to mankind" [5, pp.41–42, 49–50]. However, the *quality* of scientific documents, contrary to popular belief, is *not* reflected by citedness: the mentioned indicator has no causal relationships with the given property [1; 9; 4]. By its very nature citedness is primarily a "measure" of the *use* of scientific documents ([4; 5, pp.46–47] and many more...) which, in turn, indirectly reflects their *value* (e.g., [7]). The *quality* of a scientific document or a collection of documents is a property that is adequately quantitatively characterized by peer reviewing. But due to the revealed correlation between the number of citations to the collections of documents and results of their peer reviewing (see [11; 3] and many more) we can assume that

---

\* *Webster's Third New International Dictionary of the English Language. Unabridged. Utilizing All the Experience and Resources of More than One Hundred Years of Merriam-Webster Dictionaries, Ed.-in-Chief: Ph.B.Gove. Cologne, Köneman, 1993: 1858.*

† *Quality Management System. Main Provisions and Dictionary (Amended), GOST R ISO 9000-2015 (National Standard of the Russian Federation): Paragraph 3.6.5. Mode of access: <http://docs.cntd.ru/document/1200124393>. Date of access: 27.06.2018.*

the quality of scientific documents might be also evaluated by the citedness level. However, such an evaluation is purely probabilistic; it is not causal and therefore it is purely indicative. Herewith, “negative” citations seem to refer to items of high value but of low quality.

The presence of the studies which results show a good correlation between the results of the analysis of documents citedness and documents expert evaluation do not indicate the adequacy of the method of citation analysis to assess the *quality*, but demonstrate a certain coincidence of the assessments of the properties of “value” and “quality” in practice and, apparently, about proximity (but not identity!) of the essences of value and quality. Since in most of the studies that I know such correlation is invariably confirmed, the citation analysis can be successfully applied to assess the quality of a large number of scientific documents in cases where it is technically unacceptable to conduct an expert evaluation. It is only necessary to understand that it actually reflects—due to cause-and-effect relationships—not *quality*, but *value*. However, in practice these properties differ from each other quite rarely (it is quite confident to talk about their practical mismatch only in cases of “negative citations”).

So, “Nobel class level of citedness” is a reasonable concept, but it is reasonable not due to the causal relations between *citedness* and *benefit to mankind*, but due to probabilistic relationships between *citedness* and *quality*, as well as to the proximity of the concepts of “*quality*” and “*benefit to mankind*” [5].

(In the paper I hope also to consider some other properties of scientific papers, such as, e.g., “importance”, “usefulness” etc. as well as the ability of their evaluation on the basis of citedness. The consideration is going to be carried out in the context of possible correspondence of these characteristics to the notion of “benefit brought to the mankind”).

#### References

1. Bornmann L., Haunschild R. Does evaluative scientometrics lose its main focus on scientific quality by the new orientation towards societal impact? *Scientometrics*. 2017; 2(2): 937-943.

2. Garfield E., Malin M.E. Can Nobel Prize winners be predicted? *Paper presented at 135<sup>th</sup> Annual Meeting, American Association for the Advancement of Science, Dallas, Texas – December 26-31; 1968*; S.I., s.a. Mode of access: <http://garfield.library.upenn.edu/papers/nobelpredicted.pdf>. Date of access: 27.06.2019.

3. Lawani S.M., Bayer A.E. Validity of citation criterion for assessing of scientific publication: new evidence with peer assessing. *Journal of American Society for Information Science*. 1983: 34(1): 59–66. <https://doi.org/10.1002/asi.4630340109>.

4. Lazarev V.S. Is it right to consider the level of citations to scientific papers as the indicator of their quality? *Scientometrics: Methodology, Tools, Practical Application: Scientific Collected Articles*, Ed. by A.I.Grusha et al. Minsk,

Belaruskaya navuka Publ., 2018: 88–103. **Mode of access:** <https://rep.bntu.by/handle/data/37342>. Date of access: 28.06.2019.

5. Lazarev V.S. *Nobel class citedness level and the notions that designate characteristics and properties of cited scientific documents*, Ed. by V.M. Tyutyunnik. Tambov – Moscow – St.-Petersburg – Baku – Vienna – Hamburg – Stockholm – Bouake, International INIC Publishers of “Nobelistics”, 2018: 70 pp. (in Russian, with English synopsis. The book is available at the Congress).

6. Lazarev V.S. Insufficient definitions or a vaguely grasped notion? On definitions of “impact”. *Scholarly Research and Information*. 2019;2(1):63–78. (in Russian, with English abstract.) <https://doi.org/10.24108/2658-3143-2019-2-1-63-78>.

7. Lazarev V.S. The property that is factually being evaluated when they say they evaluate impact. *Scholarly Research and Information*. 2019;2(2):129-138. (in Russian, with English abstract.) <https://doi.org/10.24108/2658-3143-2019-2-2-129-138>.

8. Moed H.F., Halevi G. Multidimensional assessment of scholarly research impact. *Journal of the American Society for Information Science and Technology*. 2015;66(10): 1988-2002. <https://doi.org/10.1002/asi.23314>.

9. Ricker M. Letter to the Editor: About the quality and impact of scientific articles. *Scientometrics*. 2017;111(3): 1851–1855. <https://doi.org/10.1007/s11192-017-2374-2>.

10. Shadbolt N., Brody T., Carr L. Harnad S. The open research web: a preview of the optimal and the inevitable. *Open access: key strategic technical and economic aspects*, Ed. by N.Jacobs. Oxford, Chandos, 2006: 195–208.

11. Virgo J.A. A statistical procedure for evaluating the importance of scientific paper. *The Library Quarterly*. 1977; 47(4): 415–430. DOI: 10.1086/620723.