Title: Controversies of Citations as Research Impact Measurement

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In recent years, citations are increasingly used as performance indicators of individuals, research groups, departments, and even institutions. In many places, it is used for allocation of research funding, hiring of academic personnel and even for career progression, promotion or tenure [1,2]. It is always presumed that citations in some way measure the scientific impact of a study or researcher. It has been used as one of the core indicators in many university rankings for decades too. However, in reality, what citations actually measure and how it relates to the scientific quality has always been a controversial topic as citation rates are determined by many factors, starting from technical issues to researcher bias. Many technical problems associated with recording and retrieval of citation data such as incomplete journal coverage in the database, expensive on-line database access, bias of database, not-inclusion of books as source items in the database, solely first-author retrieval in some databases etc. can influence directly on the citation rate.

It is quite obvious that researchers primarily cite an article that they make use of in their work. Therefore, “utility in research”, rather than pure scientific quality, is the primary criterion for reference selection. Sometimes, due to journal space limitations, referencing may be incomplete. Researchers sometimes cite reference of secondary sources like reviews rather than of primary articles - established knowledge is not cited at all. “Self-supportive argumentative citation” is another issue which is used to justify their work. Among other issues are extreme self-citation, in-house citation (citation of friends and close colleagues), flattery (citation of editors, potential referees etc.), Show-off (citation of “hot” papers), and many more. So, the question of relation between citations and research quality is not so simple. However, we can infer that citations are not very useful for the evaluation of research quality.

Quality and impact of a research is multidimensional. Three well accepted dimensions to assess the quality or impact of a particular research are plausibility, originality, and scientific value [3]. A good research should be evidence based, scientifically sound (plausibility), should provide new knowledge (originality), and should have importance to other research (scientific value). Recently, another aspect is added to evaluate a research - societal value, i.e. importance for the society [4].

It seems unlikely that citations can be seen as valid indicators of the solidity of the publications and in fact, there is no relationship between the novelty of a research and citations. Citation impact and scientific impact are not at all the same as an influential researcher might possess lower performance but highly cited publications than a less influential one [5]. Many times uncited or less cited publications are also found to have great societal relevance.

The number of citations is not at all a perfect tool for impact measurement. So we recommend the adoption and practice of the San Francisco Declaration on Research Assessment (DORA) in research assessment, where they strongly recommended that “Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist’s contributions, or in hiring, promotion, or funding decisions.”[6] Rather,

they recommended to the institutions and funding agencies to look into the scientific content of a paper than the publication metrics or the identity of the journal in which it was published .

We hope that slowly the use of citation as performance indicator will subside and institutions and funding agencies will give more focus on the scientific content of a paper in terms of plausibility, originality, scientific value and societal merit.

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