

RE-EVALUATING THE PARAMETERS FOR FINDING RESEARCH IMPACT

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Abstract – The major objective of this research is to outline the way of calculating a research’s impact which includes the parameter considered for the calculation. Then it lay emphasis on the issues of current system; where it fails to address the scenario like comparison of two research each related to a different field and area. It then includes the suggestions made on the front of parameters which if added with the existing rules will open a new way of look towards solution. It all comes to the parameters which plays the important role in any decision and if correct parameters are put in place it changes the course of result and lead to a much more relevant, reliable and robust output. Parameters included in the research are already in use for different purposes but not for impact calculation of a research which makes them unique of use in this paper. The goal of this research is to achieve a system which could cater the need of current demands and mitigate the issues with the existing approaches. In this paper all the statements are made to make the current system more pronouncing.

Key Words: Impact factor, Citation Index, Parameters, Weightage, Research Paper, Criteria

1. INTRODUCTION

A great number of methods are available today to calculate a researcher’s impact based on number of evaluation criteria. While researchers are concerned about important decision being made solely based on such measures, the application of the approach has been extended to every possible aspect of researchers work and culture. Where the value of impact index (widely considered h-index) depends on the database used for calculating the number of citations. There are possibilities of giving weightage to highly cited paper which may lead to distribution of quality paper but still they will all depend on number of citation provided to an individual paper. It makes the situation no more different since the base criteria is the same.

Research impact is often measured using quantitative methods such as citation counts, the h-index, and journal impact factors. It can also be described qualitatively. Currently, there is no one tool or system that completely measures impact. Each database or tool uses its own measurement systems, indices, data and authority files.

While current methods seem to be correct but they are difficult to use to compare across disciplines that have different research and publication practices. Furthermore, as scholarly communication continues to evolve, the limitations of existing metrics and tools are becoming increasingly

evident. With this paper, we are trying to address this problem by suggesting some more parameters like –

1. Weightage to Individual research area
2. Including Significance of the topic of research in current scenario
3. Eliminating Self Citations of review papers
4. Combining Citations received by multiple papers related to same topic with elimination of repetitive citations

2. DISCUSSION

Numerous tools and techniques are used to calculate impact of research like h-index which is an index quantify an individual’s scientific research output, Citation analysis that is the process whereby the impact or "quality" of an article is assessed by counting the number of times other authors mention it in their work, Altmetrics a quantitative measure of the quality and quantity of attention that a scholarly work is receiving through social media, citations, and article downloads and the impact factor which is a measure of the frequency in which the average article in a journal is cited in a particular year. Impact factors measure the impact of a journal, not the impact of individual articles. The raw count of citations will vary depending on what the data source includes, some are Web of Sciences, Google Scholar, Publish or Perish, Scholarometer, Scopus, SciFinder Scholar and MathSciNet.

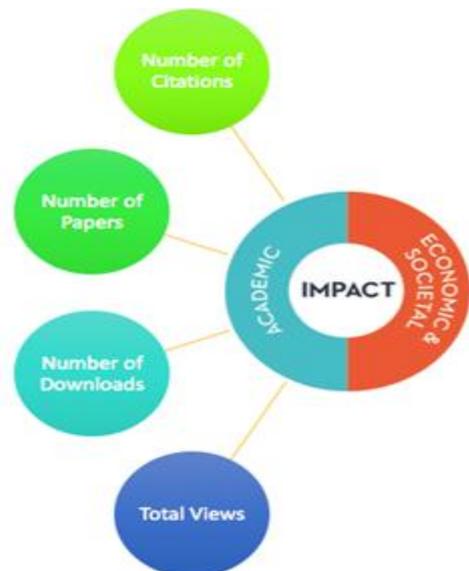


Fig -1: Current Parameters for Impact Calculation

Although the use of impact factor-based indicators for science policy purposes has increased over the last two decades, several limitations have been pointed out and should be borne in mind. Just Like Use of all the different indexing methods makes it hard to compare for researchers in different fields and at different career stages. None of the methods include criteria based on the area of research, their field of study, usefulness of research in current scenario or any previous experience factor. Still, organizations are using these methods to allocate funds, give promotions and other benefits. Research is paid for by taxpayers, organizations and individuals because of the benefits to society. These benefits might be economic if the research generates commercial opportunities. They might be improvements to quality of life or sustainability. But all of this is not taking place to the required extent because of the outlined fact that comparison is unsustainable since comparing scientist from different field like computer science, biology, nanomaterials using same analogy does not make much of a sense and produce less reliable results.

In concern of researcher’s individual impact, numerous criteria could be introduced such as topic of research, area of publication, impact of previously accorded work in the same research plus the influence of material published by author over a period of time are the factors which after coming together will generate a better and more reliable result. Here, area of publication would be included by providing each area of research it’s own unique weightage based the influence of the area. Topic of research is a factor which emphasizes on the viability of research topic in the time of publication. Let’s take an example, Researcher1 is working on x technology which is used in 80’s and now become obsolete and Researcher 2 is working on y technology where research spread very recently. It is imminently clear that Research 2 has more viability with time as compare to Research 1 while both are termed research and used for indexing.

3. METHODOLOGY

Increasing size of database with ever highest rate of publication creates an ever increasing issue of generating true results concerning the researcher’s impact. We are proposing to include number of different criteria for calculation to make the result a lot more reliable, robust and sustainable.

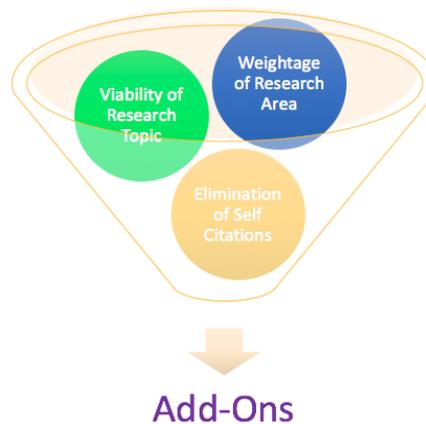


Fig -2: New Parameters to be included

3.1 Weightage to Research Area

We are giving weightage to different streams of science. Since, every research paper relates to one of field of science and all of them have their own significance yet they all are different. Then there should be a different parameter for weighing papers of different streams.

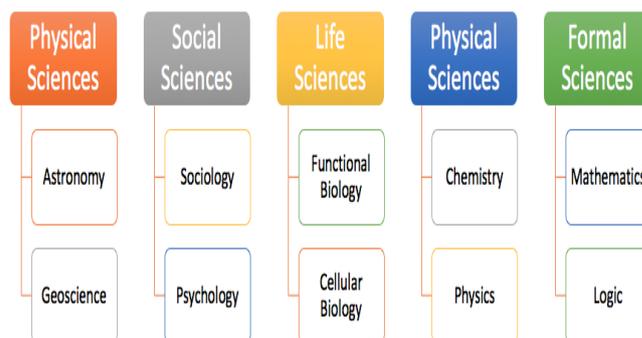


Fig -3: Disciplines of Science

The easiest way to calculate weight is to calculate the ratio of number of citations one area received during a period of time with number of publications in the same time. It will generate a weighing factor which will be used with the paper related to the weighted area. It will help in incorporating the use of area in finding the impact of research.

3.2 Significance of Field of Research

Sub-field exists in the streams of sciences but all of them does not has the same level of viability with respect to the time and evolution of technology. Some fields become obsolete over time either due to the amount of research already been done or non usability of field in practical terms. The reason could be many while they never effect the research’s so called impact but the reality does not seem to be same because the research in this field will not generate any significant impact in real world. For example, Computer

Science has many field available for research while now research in database management is becoming less worthy in the contrary research in fields like AI, Machine Learning & Deep Learning is making real impact and changing the computing world. Still, both are treated same for calculation of research's impact.

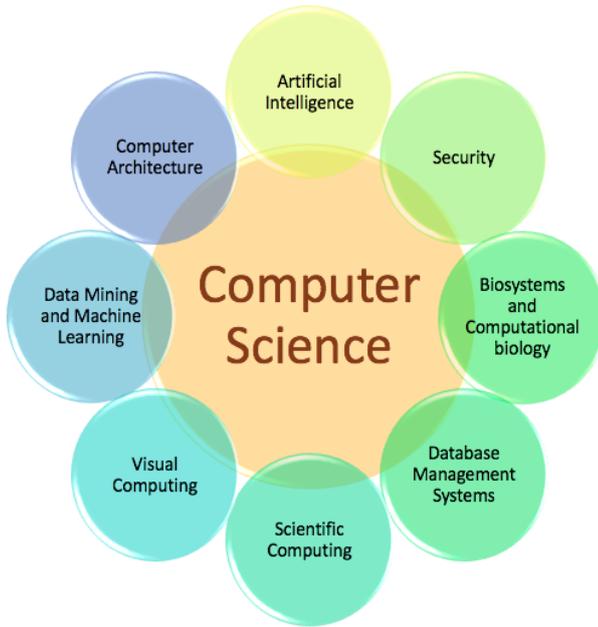


Fig -4: Fields in Computer Science

Our research proposes the need of considering the field of research which affect the actual impact; should be added to the calculation of theoretical impact. We propose use of technology with readily available online database. Algorithms can be made to extract database online as per the required criteria just like for calculating impact based on previous work on the same topic in the time consideration would not be an issue because it could be easily found using the keywords, filters and existing databases like Google Scholar or Web of Sciences.

3.3 Considering the Journal's Impact

It is widely acknowledged that research published in good journal, highly reputed journal in same the journal with high journal impact factor is much better, unique and trustful. Since, journal impact factor itself is calculated with the paper published under it. While some journals produced great researches and made their name. They have experts in their editorial board with high level of scrutiny.



Fig 5: Highly Reputed Journals

All the good will go in vain because journal's good will (Quantitative value) is never get considered for papers impact. It is very important for the researcher to have its paper in the above listed journals but in actual it never makes any difference in researcher's impact.

Thus, consideration of JIF is needed to make the calculation of impact more truthful.

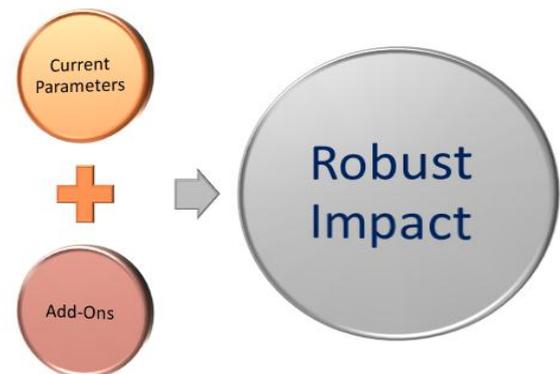


Fig -6: New Impact Factor

Suggestions made and methodology underlined can be used with any of the existing indices and approaches with slight alteration in the method. Data of the new parameters is already available but never used in collaboration. These facts make the use of new parameters very easy. All the parameters coming together will generate accumulated impact of the paper which would lead to the finding of researcher's true impact in the near extent possible.

4. CONCLUSION

An extensive emphasis has been put on the parameters used to generate a researcher's impact with the methodologies available to do that. Detailed discussion put in place about the issues arise with the current use of system for our research analysis. Despite of all the issues the paper laid a strong foundation on the usage and benefits of new

parameters and found that mere use of number of citations based on individual paper does not justify one's true ability of producing great results. Approaches use to calculate impact irrespective of metric should greatly emphasize on the details of paper, papers coverage with respect of area as well as topic and research's work scope. Change in approach of calculating individual paper would not change the overall researcher's impact but will increase the emphasis on detail with consideration of broader perspective which produce best results.

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