A Step-to-Step Guide to Write a Quality Research Article

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Abstract. Today publishing articles is a trend around the world almost in each university. Millions of research articles are published in thousands of journals annually throughout many streams/ sectors such as medical, engineering, science, etc. But few researchers follow the proper and fundamental criteria to write a quality research article. Many published articles over the web become just irrelevant information with duplicate information, which is a waste of available resources. This is because many authors/ researchers do not know/ do not follow the correct approach for writing a valid/influential paper. So, keeping such issues for new researchers or exiting researchers in many sectors, we feel motivated to write an article and present some systematic work/ approach that can help researchers produce a quality research article. Also, the authors can publish their work in international conferences like CVPR, ICML, NeurIPS, etc., or international journals with high factors or a white paper. Publishing good articles improve the profile of researchers around the world, and further future researchers can refer their work in their work as references to proceed with the respective research to a certain level. Hence, this article will provide sufficient information for researchers to write a simple, effective/ impressive and qualitative research article on their area of interest.

Keywords: Quality Research, Research Paper, Qualitative Research, Quantitative Research, Problem Statement

1 Introduction

The word 'Research' when we talk about it among new researchers/ students, students, feel blank and get fear what it is? Research means searching and refining old content in a new way. In simple words, for a literature review work, readers/ researchers do not need to read many papers; they can refer to a single article on the respective topic. For example, for class imbalance problem, refer to [wide scale].

1.1 For Science

For science streams like Economics, History etc., results are not mandatory. In such streams, hypothesis matter. But, subjects like Physics, Chemistry and mathematics-related filed required proper proof and verification of statements.

1.2 For Engineering

For engineering, results are a must. For example, we can show real-time or simulator-based results for the transportation sector. Similarly, for healthcare, either we can try our proposed model on primary data or collect data (secondary data). Also, if you want to put a literature review, then you can put a comparison of existing work like [13-14]. A literature work also contains some simulation-based results which show how other approaches can fit at which benchmarks or why these existing approaches do fit or fail. So, an efficient solution is required to solve the necessary raised problem.

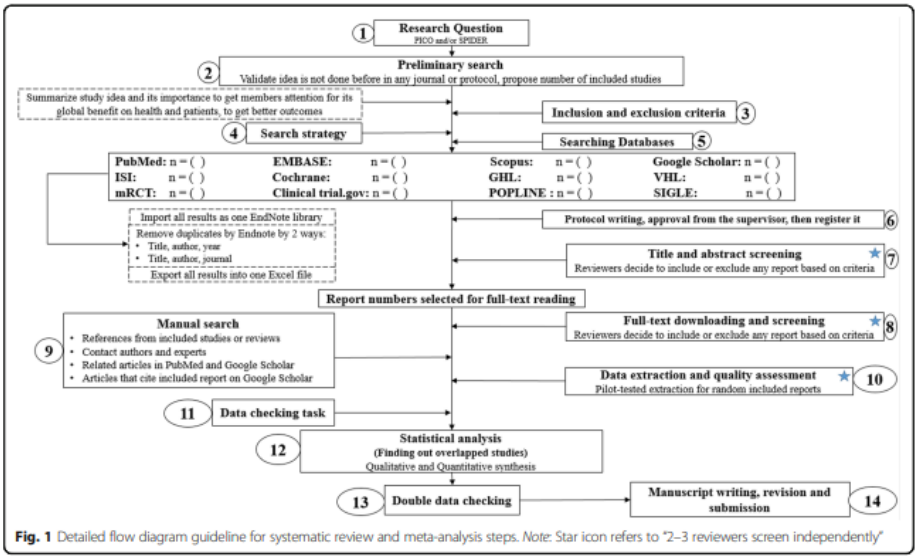

Fig. 1. Flow Diagram for Selecting Articles

2 Collecting Quality Research Articles

Many duplicate articles are available over the web, which we need to segregate while downloading our articles. Before moving further, we first need to select an interesting topic we like or our area of interest. If we do not know anything or what to search for,

we may refer to the web, leading technologies in the current era or top problems in computer science. Whereas results we will get many results. For that, we can refer to:

- www.googlescholar.com/ www.google.com
- www.xmol.com
- www.researchgate.com
- www.elsevier.com
- www.springer.com
- and many more scholarly related databases

2.1 Previously published Articles

First, we need to select our topics and download previously published topics for this task. In this task, we can categorise works with and without results. Works may be easier to read without results, while results give a specific or clear picture of how that problem has been solved via a framework/ method/ algorithm.

Articles as Pre-print or in the ArXiv database: Many researchers publish their work as pre-print or in the arXiv database to avoid paying a fee to a journal or conference and to ensure that their research article is received by its targeted audience before it is published in reputable journals. These publications are of great value and focus on the results of their research. These research papers will be of more use to you in the process of preparing a high-quality research paper. On the other hand, the majority of reputable journals advise against citing more than two publications from the pre-print or ArXiv database in a single paper.

We are only permitted to refer to articles that have been published by reputable publishers such as MDPI, Hindawi, PLOS one, Springer, Elsevier, IEEE, ACM, and other similar organizations. You could limit or mislead yourself in numerous ways if you download papers from fraudulent publications, which is why you should avoid websites that claim to be journals.

2.2 Segregating Unused/ duplicate articles

3 Reading Articles

Reading a research article is different from reading a scientific blog. Initially, it's time-consuming and reduces over time with experience gain. Abstract, introduction, literature survey, methods, simulation and findings, and conclusion are the basic sections that are included in the layout of the majority of research articles, which follow a

conventional pattern. Download from the internet at least twenty research publications based on the topic that most interests you in the field of research. You should always start with the introduction section and not the abstract. That should provide you with enough information to understand why the research is being done. First, for each article, determine the problem statement and then the solution that has been produced. The second step is to determine whether or not both the problem and the solution are clear or ambiguous. In the third step, it is important to comprehend the proposed framework or model. Finally, compare its performance and results to those of other frameworks and models presented in previously published research articles.

4 Summarizing All works for Literature Review

A literature review provides the reader with a full understanding of the developments in the field. The presentation of insight regarding conceptual and theoretical frameworks as well as procedures will be useful for the research communities. Discuss some of the most pressing concerns and topics currently being discussed in the field. With the help of newer works, you can explain how your study fits in with the field's overall trend and highlight its significance. It is not advised to provide scores based on the quality of the article. Instead, clearly mention the cons and pros of every research article. Review the relevant literature on your subject and emphasize the novel and important aspects of your research. The existing framework/ models should be assessed in such a way that the readers should be able to identify the reasons for selecting the research article for the particular problem. Elaborate on the key details of the contribution of the article, including the framework, models, codes, etc. A summary of relevant studies that illustrate how yours adds to contradicts or fills in gaps in the existing literature. To show what does and does not work, as well as what is lacking in the field, you can utilize your literature review as evidence.

Provide evidence of the relevance of your research to a real-world problem or issue. It's important to cite other studies in your field to demonstrate that you're building upon work that has been recognized as relevant by the academic community at large. A common practice is to provide a summary of the literature review in a tabular form. It makes the task easy for the readers to understand what to expect from your survey.

5 Finding a Feasible Problem

It's essential to strike a balance between questions that have previously been meticulously discussed and those that are unanswerable when choosing a topic for your research prospectus. Avoid picking something that has been discussed at length already, but also avoid picking something for which you have no good arguments. You should choose a subject that is not only interesting to you and leaves room for further investigation but also one that is feasible. Before beginning a research project, it is important for scientists to think through a few logistical concerns relating to its feasibility.

The nature and scope of the problem: This is more about figuring out what factors influence your topic of study so you can formulate research questions. This is also a good moment to step back and do some background research to make sure you can find evidence from recent studies that support the existence of this problem as a gap in the scientific literature. Secondly, you will need a theory to back up your research, whether it's qualitative or quantitative in nature. Thirdly, the methodology to solve the problem. This also concerns hardware and software availability. By answering the above points and with the help of the literature survey, a feasible problem statement can be chosen.

6 Solving the Identified Problem

Simulation Tools: A computer simulation is a software that, when executed, allows one to investigate the approximate behaviour of a mathematical model employing a series of steps. The amount of computation required for a simulation is usually enormous. Therefore, computers are required to perform these computations. However, the sheer number of calculations is not the only challenge posed by simulation. There is a vast range of methods and resources available for simulating systems, as they are all used to help understand complex systems and make decisions. It is difficult to develop a simulation tool from scratch for a particular problem domain. There are some standard simulation tools available, such as Matlab, Simulink, ns-3, Vortex, etc. Various open source and proprietary simulation tools are available for different application domains. For example, ns-3 is an open-source tool for simulating network communication, CircuitLogix is a tool for designing and simulating electronic circuits, and Flood Modeller is a hydraulic simulation tool for modelling and visualising floods. Based on the application domain, support for libraries and the researcher’s experience, the right tool can be chosen for the implementation.

Languages need to be known: The selection of a language for the simulation is a challenging task. There are a lot of different languages that compete with one another, and each one has its own set of benefits and drawbacks. Every simulation tool supports its own set of languages. Language C, Python, Ruby, and java are necessary for simulating computer science results. The use of simulation tools would be limited to professional programmers if there weren't any dedicated libraries for these languages that attempt to alleviate the user of some of the effort. The ways in which its users make use of the standard programming features provided by all simulation languages will vary. Languages typically offer a degree of flexibility in describing various modelling circumstances.

7 Comparing Your Results with Existing Results

Reviewers will consider this section while deciding the practical applicability of your research findings; whether your findings confirm or refute your theory, you should briefly discuss them here. To what extent did your research cover gaps in the existing knowledge base, how beneficial is your methodology, and how well did your approaches to interpreting the results of your study all stand out as strengths in your writing will all be within your control. These can be achieved by interpreting the research findings from prior research works and comparing them to your findings. In addition to this, it demonstrates the depth of your knowledge in the research field.

The reason for this point is so that he or she can learn how to select traits, as well as which attributes are relevant, etc., for the needs of a certain situation (for prediction). Up to this point, all of the sections (sections 1 to 7) have been utilized to write an essay that is relevant to quality. However, now that we have finished writing it if we want to publish it, we need to seek the appropriate platform, which may be international conferences or journals. As a result, the next section will provide additional detail on such information.

8 Publishing your Research Work

As a researcher, choosing which journal to send your work to in order to get it published is one of the most essential decisions you will have to make. Regrettably, there is no one straightforward tool that may guarantee that you will choose the very best possible site to publish your research. Instead, take into consideration the following aspects so that you may make a knowledgeable decision. The journal/conference in which you select to submit your work could have a substantial effect on the reach and significance of your study. One needs to dedicate a considerable amount of effort to compile a list of appropriate journals, taking into account the research they cover, the publication process they use, and the turnaround time.

8.1 Journals

There are four to five categories of journals are:

- UGC – CARE
- Scopus
- Web of Science
- Extended Science Citation Index (ESCI)
- Science citation index – Extended (SCIE)
- Science citation index (SCI)

Keep in mind that SCI and SCIE indexed journals are very excellent tools for conducting high-quality research. Researchers can be more effective in providing insights into the many fields, applications, places, and industries by referring to the indexed papers that are available. There are a few SCI journals that are:

- IEEE transactions on networking
- IEEE Access
- MDPI sensors
- MDPI applied sciences
- FGCS, Elsevier
- JKS, Elsevier
- Wireless communication network
- Machine Learning, Springer
- Journal of Ambient.., Springer
- And many more journals existed on Elsevier, Springer, IET, MDPI, IOS Press, Wiley, etc.

The authors should check the scope of the journals before submitting their work to the respective journals/ conferences.

Other publishing options to consider are conferences, book chapters, etc.

8.2 Conferences

Scopus
Web of Science

Note that some reputed conferences around the world are (conducted every year): CVPR, ICML, NeurIPS, HPC, CoCoNet, ISDA, IAS, etc.

8.3 Chapters

Scopus
Web of Science
Note that we can find a call for chapters for respective books at respective publishers' web site or over Google. Read each mentioned detail carefully and submit your work accordingly and follow the same process for the future if any correction is required.

8.4 Other

We are able to transform novel works that have a product and process (including an inventive step and industrial use) into patents or projects. But such inventions should not be filed before by anyone around the world. Before submitting a patent application, the inventor is required to check such information as part of the patentability search. We can file a patent in

- National- India
- International – USA, Germany, Japan, China, etc.

Many sample documents of patents for National and international counties can be found on their respective patent office (of that country) websites.

We suggest all future researchers share the research data, such as the code, dataset, supplements, etc., with the research communities. This will enable research communities to verify the results, reuse your data and work on it for the betterment of the results. The research data can be uploaded to repositories such as Github, Mendeley data or Kaggle, and the URL can be shared in the research paper. Sharing data gives you lots of benefits, such as exposure to your work, citations, etc. Also, it boosts the faith and authenticity of your research.

9 Challenges faced during Conducting/ Implementing research

There are several changes faced by all newcomers/ researchers, which can be listed here as:

- Availability of Poor internet
- Not accessing all research-related databases/ limited access to quality research articles
- Copyright/ permission from the third party
- Collection of data sets, i.e., primary or secondary
- Validity of data set/ Genuineness
- Validating the simulating results for a particular data set
- Existing many models for simulation
- Less skilled people
- Privacy of communicated work with reviews of any conferences/ journals
- Not availability of high-performance systems for processing
- Weather situation

In the last, we suggest all authors verify the following points before submitting their articles to any journal/ conference.

- Abstracts need to be 250-300 words, including a summary of problem definition, background, motivations, proposed work and results.
- Proper Keywords (minimum 4, maximum 6)
- Avoid using writing small lines.
- All the references and figures need to be highlighted in black colour in the manuscript.
- Proper Citation throughout the work (minimum 20 References)

- At the end of the introduction part, all the section descriptions and organisation of the work need to be depicted/ explained
- Introduce all authors in references, do not write et al. in references (in literature survey can be).
- One heading needs to start from one page and needs to end on the second page.
- Each and every figure need to be made by yourself.
- Plagiarism needs to be below 10 per cent with a zero/ one words similarity index (3% per cent from Single Source).
- All references need to be in a format like the author's name, paper title, journal name, page no., year/ APA styles/ according to journal/ conferences style (where you are referring/ submitting your work)
- Heading 12 points Times new roman, Margin for up, down, left and right 1.30", References 10 Times new roman, the title of the work18 points, all other content, 11-time new roman (including author name and affiliations).

For the sample, researchers have suggested articles to refer to for journals [1-4], conference papers [5-12], and chapters [13-22]. Note that the above-discussed points may vary from journals to journals or conferences, so use such points in your research work according to the journal/ conference guidelines.

10 Conclusion and future scope

As was just mentioned, conducting research is essential in order to discover new ideas, inventions, and thoughts. However, the vast majority of students, academics, and researchers continue to struggle with a number of obstacles while discovering new things. This is due to a lack of adequate understanding regarding what to do, how to do it, and other relevant topics. As a result, in this work, we have provided a summary of all necessary elements, ranging from the most basic to the most advanced, for the publication of research articles (in reputable journals or conferences). If we check any research article that has been published in a high-impact journal or that has been presented at a reputable international conference, we will discover that all research articles employ the same methodology. It is important that the content of our respective works does not conflict, that we retain our ethical standards (for example, by adhering to the COPE rules), and that we do not favour or cite the work of others only for the sake of mutual understanding. This work can be utilized in the future to write chapters, reports, and other types of work for very influential publishers. This work will be considered future work.

11 Acknowledgement

We want to think of the anonymous reviewer and our colleagues who helped us to complete this work.

12 Conflict of Interest

The author declares that no conflict exists regarding the g publication of this paper.

13 Authors Contributions

Amit Kumar Tyagi & Sathian Dananjayan have drafted and approved this manuscript for final publication.

14 Scope of the work

As the author belongs to the computer science stream, so he has tried to cover up this article for all streams, but the maximum example used in situations, languages, datasets etc., are with respect to computer science-related disciplines only. This work can be used as a reference for writing good quality papers for international conferences journals.

Disclaimer. Links and papers provided in the work are only given as examples. To leave any citation or link is not intentional.

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