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Qualities and Characteristics of a Good Scientific Research Writing; Step-by-Step Approaches

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ABSTRACT

Many young researchers find it difficult to write a good and quality research thesis/article because they are not prone to article writing ethics and training. Yet, a thesis/publication is often vital and paramount for career advancement, grants, academic qualifications and others. This research work described the basics and systematic steps to follow in writing a good scientific thesis/article. This research also outlined the main sections that an average thesis/article should contain, the elements that should appear in each section, the systematic approaches in writing research, the characteristics of a good thesis/article, the attributes of a good research thesis/article, qualities of a good researcher and finally the ethics guiding research.

Keywords: Research writing, Ethics, Qualities, Publications, Thesis.

INTRODUCTION

Research is a scientific investigation of phenomena, including the collection, presentation, analysis and interpretation of facts that outline a researcher's speculation with reality. Research writing needs inspiration, creativity and an innovative mindset for good and quality research work to be done. Every researcher once in a lifetime faced difficulties of how to start and what to work on. Good research requires energy, maximum concentration, time as well as finance. The above-mentioned factors in research enable young researchers (beginners) to become intimately and emotionally involved in the system. Naturally, the subjectivity that goes hand in hand with deep involvement in the research makes it difficult for researchers to back off from the research even when the endpoint of the research is not clear. As research evolves and innovates the adage ''Publish or Perish'' is no more valid in this 21st century but "get Visible or Vanish" is the one in vogue. Many young researchers find it difficult to embark on lucrative and innovative research which ends up putting them under pressure to produce good and quality scientific publications. These quality innovative research publications will help in sharpening the researcher's career prospects, substantiate requests for funding/grants, justify previous funding/grant allocations or as a prerequisite /*requirement for awarding university qualifications such as a Master's degree or doctoral degree. Furthermore, some university graduates are novices in research writing because they were not exposed to good academic research writing, and graduates prone to such are the young medical doctors who are so much tied to clinical and surgical practices in the hospital. For an academician to

become a full scholar (s)he/she must be a good researcher, and academic writer and publishes in reputable journals for more visibility of his work. However, the competition is already quite fierce among all the good-quality articles that are submitted to journals for publication and it is of paramount importance to get the basics right for the paper to be accepted. Research articles are being judged by their world contribution to meritocracy and good quality writing/ data presentation. The researcher's ability to organize and present their research data/ findings in accordance with the basic rights and research ethics during writing enhances journal articles acceptance and disregarding the research basic rights and ethics leads to the rejection of some articles that has substantial data and contributions to knowledge [1]–[4][5].

Furthermore, as a result of these drawbacks mentioned, this research work will outline and explain in detail the characteristics of quality research, attributes of good research, research ethics, step-by-step guide to writing a scientific article. This guide aims to help young researchers with little experience in writing to create a good quality manuscript from their work (project or thesis) with the ultimate aim of achieving publication in a reputable scientific journal [6][7]. A good research paper will always craw from the general (unknown) to the particular (known) and begin with an introduction to statements of the problem (observed problems to be investigated and solved), materials and methods (deal with the empirical and/or analytical aspects of the work), finally develop the discussion and conclusion drawn based upon what has been covered in the paper.

Qualities of a Good Research Project

The step-by-step approaches that must be adopted in writing a good research project are as follows:

a. Background of the work: Background to the work (*not more than 3 pages*) which briefly explains the research work, how the work differs from other existing work and why the project work must be carried out. The benefits of the research work and its applications to the field of study finally end with a Statement of the Problem (*not more than 1 $^{1}/_{2}$ pages*). The statement of problems will take into account the generic problem, what necessitates the need for the research topic should clearly be discussed, be specific on the innovation to be added, the significance of your research (*not more than a page*), the objectives of the work (*not more than a page*) and specific objectives (*bulleted list summarizing your objectives in the work)*, Scope of work (*not more than a page*) and finally Organization of your chapters (*not more than half a page*).

b. Review of the Literature

Introduce your topic of research and the areas related to your topic and the models or techniques or designs of other authors. ***Discuss at least 15 existing topics in your area of research based on models or techniques or designs of other authors.*** Furthermore, organize the literature review so that each author's or authors' work will be sub-section by sub-section. Example, Section 2.1 Review of Existing Works, Section 2.1.1 First Author's technique or model or design. Section 2.1.2. Second Author's technique or model or design etc. There are unique and Scientific Formats for reviewing papers which are as follows:

1. The authors' objective/motivation
2. Discuss the authors' design
3. Evaluate the proposed technique or model or design used by the Author, if any
4. Data used for evaluation by the Author, if any, must be discussed
5. Results obtained by the Author, if any, must be discussed.
6. Strengths and achievements of the Authors' proposed technique or model or design must be captured
7. Problems/limitations of the author's proposed technique or model or design must be noted
8. Suggestions/recommendations of a solution to the problems could be included or discussed later as part of the researcher's statement of problems or future work.

9. Compare and state some limitations in each other's work.

Section 2.2. Compare the existing techniques/ models/ design based on the author's contributions, performance, strengths and limitations.

Finally, summarize by discussing the drawbacks in the referenced existing works that the researcher's technique or model or design would eliminate or solve.

c. Research Methodology

The objective of this section is to describe exactly what the researcher did, and how the researcher did it in sufficient detail such that any average reader with the same resources at their disposal would be able to reproduce the study. The model/technique or design method used must be fully described for every result the researcher intends to include in his/her results. This section of the research is the most difficult section of research because that is where the innovation and inspiration start to manifest. Contrarily, if details of any or all procedures have previously been published elsewhere, the researcher has to briefly summarize it accompanied by a reference to the relevant publication. You should start by specifying the design of the study (prospective/retrospective, randomized or non-randomized, double-blind or open-label, controlled, crossover, factorial, mathematical etc) It should be noted that for retrospective studies, the methods should begin with a description of the source data for the study. Lastly, the final paragraph of the methods section should detail the statistical analysis and the model/design/technique used for the research.

d. Results and Discussions

The aim of the results and discussion is for the researcher to report what he/she observed in a graphical chart be it a pie chart, bar chart, histogram or in tabular form. This section deals with either graphs or tables or both and each graph or table are being referenced based on their figure or table numbers. This section of the research is where the researcher discusses in detail all the data and metadata obtained from the research methodology. The researcher proves to the world that his/her inspiration has come to manifest by discussing the innovative idea and creativity which forms the researcher's contributions to knowledge.

The discussion section is where the researcher interprets and explains the significance of his/her results, and how they fit into the wider picture of what has already been observed and reported on the same topic. The discussion should start with a brief recap of the main findings of the researcher's study, preferably using the same formulation as being used in the specific objective (in the introduction) and the methodology.

e. Conclusion

This is a summary section that explains the findings and achievements of the researcher. It also aligns with the achieved specific objectives, the methods or techniques or designs adopted to achieve the expected result and the procedures taken to make it a success. It also highlights the percentage of achievements and as well makes recommendations for further research studies when necessary.

f. Abstract

It is usually the first item that gives a comprehensive summary of what the researcher did, and what the research is all about but one of the last parts of the research work to be added in a research project. It appears to be the last part because the researcher authoritatively writes it down when he/she has proven beyond every reasonable doubt that the research thesis/project result is valid. Therefore, it is of paramount importance that the abstract be succinct, informative and attractive to give the potential reader a foretaste of the main information and incite the desire to read the full paper. It is the quintessential marketing tool for the researcher's work as the researcher ensures that he/she makes it brief, so it is worth devoting some time and special thought to its preparation, to ensure it is brief.

g. Title

This is the first to be obtained during project/thesis work but the last to have a final shape as it is being modified as the researcher researches to suit the findings and results of the work. The title should

contain keywords to reflect the main issues in the researcher's project work. It should also awaken the potential reader's interest, and incite in them the desire to read the researcher's work. The title must be catchy and contain principal terms and attractive keywords so that it can easily be identified by other researchers when they search for similar research work.

h. References

This can easily be done by using Mendeley or endnote software which is one of the referencing software that helps researchers to navigate into any referencing style format that the institution, faculty, department or Journal uses.

Attributes of a Good Research

Good research alone is of relevance in solving the problem under consideration. Hence it becomes imperative that we understand the attributes that define good research. Some of the essential features of good research are:

1. good research has a well-defined goal. It should have a clear statement of objectives.
2. It should also have a systematic plan of work. A specific programme helps in monitoring and carrying out the research within a budgeted time and cost framework and at the same time yields conclusive results.
3. good research contributes towards the existing knowledge bank. It aims at increasing the understanding of existing and new facts and ideas.
4. Good research is logical. A clear logical argument is required to communicate an ordered sequence of ideas and activities and hence support research conclusions.
5. The results of good research should be verifiable. The research if replicated should yield the same conclusions. Research that relies on concrete data collected from a real-life situation would have a good chance of yielding valid results.
6. good research is frank. In other words, it lists the flaws in the research and also explains the impact of such flaws on research results.

However, it is a fact that a good researcher alone can conduct good research. Hence research can give fruitful results only if the person conducting the research is true to it.

Characteristics of a Good Research

1. **Empirical**. Research is based on direct experience or observation by the researcher.
2. **Logical**. Research is based on valid procedures and principles.
3. **Cyclical**. Research is a cyclical process because it starts with a problem and ends with a problem.
4. **Analytical**. The research utilizes proven analytical procedures in gathering the data, whether historical, descriptive, experimental or case study.
5. **Critical**. Research exhibits careful and precise judgment.
6. **Methodical**. Research is conducted methodically without bias using systematic methods and procedures.
7. **Replicability**. The research design and procedures are replicated or repeated to enable the researcher to arrive at valid and conclusive results.

QUALITIES OF A GOOD RESEARCHER

1. **Inquisitiveness:** Curiosity to know something new is what guides a researcher during thick and thin times. He should have an inner urge to achieve his aim.
2. **Innate Creativeness:** A good researcher should have some degree of creativity and imagination. It would help him not only look out for new things but will also enable him to look at old things with a different perception.
3. **Unbiasedness:** Personal prejudice should not enter into his research. He should be unbiased in collecting and interpreting the results.

4. **Perseverance:** Research requires a lot of patience and hard work. A researcher should have the grit and courage to overcome hurdles at all stages. He should remember that even best-laid plans can go wrong and persevere ahead.
5. **Analytical Mind:** A good researcher should have an analytical mind to unearth new relationships, give sound reasoning and co-relate his findings logically.
6. **Technology Savvy:** In the current times a good researcher must have an understanding of various analytical tools and software available to analyze his data. He should not use them simply to make his research look glamorous but also understand the appropriateness of their use.
7. **Communication Skill:** Research involves communication with people who sponsor your research, who collect data i.e. field workers and respondents from whom you collect data, apart from a large number of other people who assist you in one way or the other. A good researcher is one who can maintain his humour without losing direction and get things done from others effectively.
8. **Expert in His Field:** Last but not least, it is important that the researcher is well-versed in the theories, concepts and terms relevant to his topic. He should be also aware of existing research in his field and feel confident of the contribution that his research would make in the relevant area.

ETHICS IN RESEARCH

Ethics generally is considered to deal with beliefs about what is right or wrong, proper or improper, good or bad. Ethical can also be defined as conforming to accepted professional practice.

i. Ethical Considerations in Conducting Research/ Publications

1. Objectivity and integrity
2. Respect for the research subjects' right to privacy and dignity and protection of subjects from personal harm
3. Presentation of research findings
4. Misuse of research role
5. Acknowledgement of research collaboration and assistance
6. Distortions of findings by the sponsor

ii. Unethical Practices in Conducting Research/Publications

1. Deceiving a respondent about the true purpose of a study
2. Asking a respondent question that may be embarrassing; guilt emotional turmoil by reminding him/her of an unpleasant experience
3. . Invading the privacy of a respondent
4. Studying the respondents or research subjects without their knowledge
5. Plagiarism
6. Simultaneous Submission
7. Duplicate submission
8. Conflict of interest

CONCLUSION

This research successfully itemized and systematically showed the step-by-step approaches to writing a good scientific research thesis and article. It also discussed the characteristics of good research work and research/publication ethics together with the quality of a good researcher. The attributes and qualities of a good research work were also revealed and the best approaches to writing a research work were discussed and recommended.

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