



(REVIEW ARTICLE)



## How to write a Research Paper: A guide for the beginner

Megha Shinde (Daga) \* and Sayyed N. M.

*Groundwater Surveys and Development Agency, Satara, Maharashtra, India.*

International Journal of Science and Research Archive, 2025, 17(03), 1216-1226

Publication history: Received on 24 November 2025; revised on 29 December 2025; accepted on 31 December 2025

Article DOI: <https://doi.org/10.30574/ijrsra.2025.17.3.3374>

### Abstract

This paper is guide for the beginner, students, researchers, academician who are interested to write the article, Research Paper, documents. Writing a Research Paper is an essential aspect of academics and should not be avoided on account of one's anxiety. In fact, the process of writing a Research Paper can be one of the more rewarding experiences one may encounter in academics. What is more, many students will continue to do research throughout their careers, which is one of the reasons this topic is so important. Becoming an experienced researcher and writer in any field or discipline takes a great deal of practice. There are few individuals for whom this process comes naturally. Remember, even the most seasoned academic veterans have had to learn how to write a Research Paper at some point in their career. Therefore, with diligence, organization, practice, a willingness to learn, perhaps most important of all, patience, one will find that they can achieve great things through their research and writing. The author found this paper will be useful to the whole research community.

**Keywords:** Research; Paper; Topic; Draft; Thesis; Exam; Evaluation

### 1. Introduction

The word research is composed of two syllables, re and search. "Re" is a prefix meaning again, anew or over again. "Search" is a verb meaning to examine closely and carefully, to test and try, or to probe. Together they form a noun describing a careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles. Research is undertaken within most professions. More than a set of skills, it is a way of thinking: examining critically the various aspects of your professional work. It is a habit of questioning what you do, and a systematic examination of the observed information to find answers with a view to instituting appropriate changes for a more effective professional service. Research is a structured enquiry that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable. Scientific methods consist of systematic observation, classification and interpretation of data. Although we engage in such process in our daily life, the difference between our casual day-to-day generalization and the conclusions usually recognized as scientific method lies in the degree of formality, rigorousness, verifiability and general validity of latter.

What image comes into mind as we hear the words 'Research Paper': working with stacks of articles and books; hunting the 'treasure' of others' thoughts; preparing research report on the basis of primary or secondary data? Whatever image we create, it's a sure bet that we're envisioning sources of information, articles, books, people, and artworks. Yet a research paper is more than the sum of sources, more than a collection of different pieces of information about a topic, and more than a review of the literature in a field. A research paper analyses a perspective or argues a point. Regardless of the type of research paper the researcher is writing, the researcher should present his own thinking backed up by others' ideas and information. A research paper involves surveying a field of knowledge in order to find the best possible information in that field and that survey can be orderly and focused. For decades, this text has been the leader in offering current, detailed guidance about academic research, writing, and documentation. Over the last two decades, the world

\* Corresponding author: Megha Shinde (Daga)

of academic research has changed dramatically. Most research is now done online, and this new universe of information has not only put an almost unimaginable wealth of new sources at our fingertips, but it has also brought challenges in evaluating the credibility and usefulness of those sources. Questions of academic integrity and unintentional plagiarism have arisen around the integration of electronic sources.

A Research Paper is the culmination and final product of an involved process of research, critical thinking, source evaluation, organization, and composition. It is perhaps, helpful to think of the research paper as a living thing, which grows and changes as one explores, interprets, and evaluates sources related to a specific topic. Primary and secondary sources are the heart of a research paper, and provide its nourishment; without the support of and interaction with these sources, the research paper would morph into a different genre of writing. It is also possible to identify a research paper by what it is not. A research paper is not simply an informed summary of a topic by means of primary and secondary sources. It is neither a book report nor an opinion piece nor an expository essay consisting solely of one's interpretation of a text nor an overview of a particular topic. Instead, it is a genre that requires one to spend time investigating and evaluating sources with the intent to offer interpretations of the texts, and not unconscious regurgitations of those sources.

---

## **2. Classification of Research Paper**

The goal of a research paper is not to inform the reader what others have to say about a topic, but to draw on what others have to say about a topic and engage the sources in order to thoughtfully offer a unique perspective on the issue at hand. This is accomplished through two major types of research papers. Generally, speaking, there are two types of research paper: an argumentative research paper or an analytical research paper. Each requires a slightly different focus, approach and writing style which should be identified prior to starting a rough draft.

### **2.1. Argumentative research paper**

The argumentative research paper consists of an introduction in which the writer clearly introduces the topic and informs his audience exactly which stance he intends to take; this stance is often identified as the research paper statement. An important goal of the argumentative research paper is persuasion, which means the topic chosen should be debatable or controversial. An argumentative research paper takes a position on a contentious issue and argues for one point of view. The issue should be debatable with a logical counter argument.

### **2.2. Analytical research paper**

The analytical research paper often begins with the one asking a question on which he has taken no stance. Such a paper is often an exercise in exploration and evaluation. An analytical research paper offers a fresh look at an important issue. The subject may not be controversial, but you must attempt to persuade your audience that your ideas have merit. This is not simply a regurgitation of ideas from your research, but an offering of your own unique ideas based of what you have learned through research.

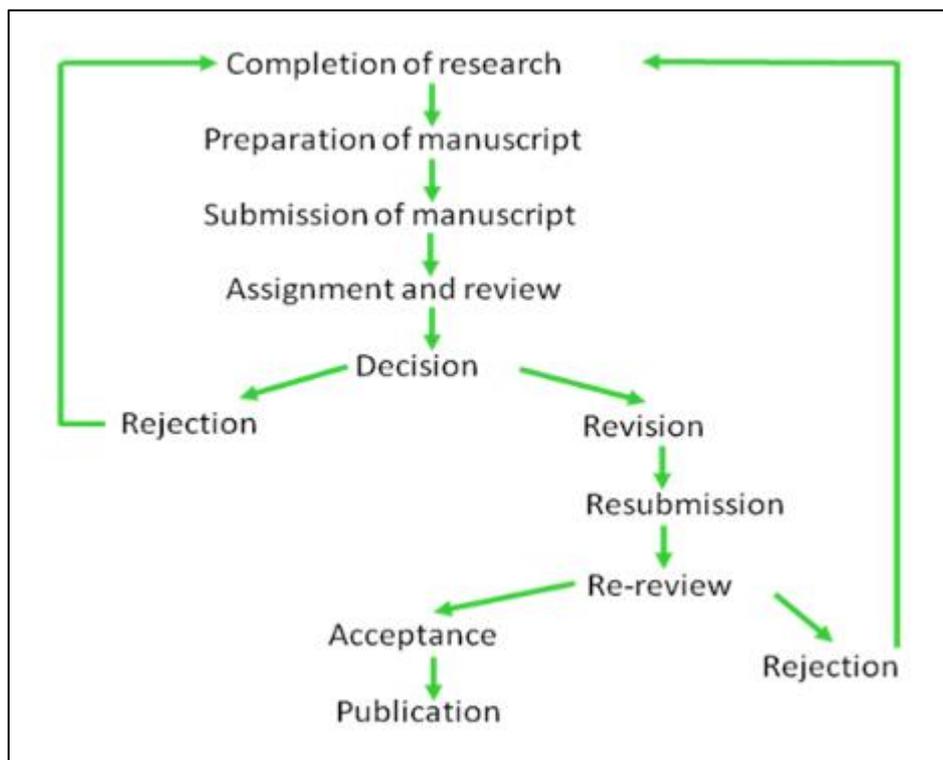
Another type of Research paper may refer to Academic paper (also called scholarly paper), which is published in academic journals and contains original research results or reviews existing results, Term paper, written by high school or college students, Research paper or dissertation, a document submitted in support of a candidature for a degree or professional qualification, presenting the author's research and findings.

### **2.3. Choosing the Topic**

Choosing your topic is the first and most important step in your research paper project. Ask yourself important questions. Regardless of whether your topic can be anything you want or has a more rigid rubric, it is important to keep few questions in mind: is there enough research available on this topic? Is the topic new and unique enough that I can offer fresh opinions? Is it pertinent to my class/occupation? Whenever possible, choose a topic that you feel passionate about. Writing about something you enjoy certainly shows in the final product, making it more likely that you will be successful writing a paper about something you enjoy. Keep your work unique by contributing your idea and thinking. If paper is unique and interesting then it will increase your reader. If you are struggling to come up with a topic that feels just right, ask your professor or co-workers/classmates for advice. They will likely have great ideas that, even if they aren't options for you to choose, can inspire you with new ideas. Asking a supervisor for help may seem frightening, but they want you to be successful with your work, and will do what they can to make that happen. This shows your interest in your topic. If you choose a topic, begin researching, and realize that it isn't the right decision for you for some reason, don't fret. Although it requires a bit more time, you have the ability to change your topic even after you begin researching others.

## 2.4. Researching

With a topic selected, the next step is to begin research. Research comes in numerous forms including web pages, journal articles, books, encyclopedias, interviews, and blog posts, legacy data, among others. Take time to look for professional resources who offer valid research and insight into your topic. Try to use a minimum of five sources to vary your information; never rely on only 1-2 sources. Whenever possible, look for peer reviewed empirical research. These are articles or books written by experts in your field of interest, whose work has been read and vouched for by other experts in the same field. These can be found in scientific journals or via an online search. Take a trip to your local library or university library. Although it may seem old fashioned, libraries are chock full of helpful research materials from books to newspapers and magazines to journals. Using a search engine and picking top three results isn't necessarily the best method of researching; use critical thinking to thoroughly read every source and understand if it is legitimate. Websites, blogs, and forums online aren't required to publish facts only, so make sure that then information you find is trustworthy. If you find one really awesome book or journal that fits your topic perfectly, try looking in the works cited/bibliography/reference list at the end of it. This should contain many more books and journals that are about your topic as well.



**Figure 1** Process of Research

## 2.5. Making an Outline

Once you've gathered all your research, print it out. Read through your research, take notes on what you think is important and highlight key facts and phrases. Write directly on copies you've made or use slips of paper ticked into pages to mark places of importance. Do a thorough job annotating to make your outlining and paper writing easier in the end. Make marks on anything that you think might be remotely important or that could be put to use in your paper. As you mark off important pieces in the research, add your own commentary and notes explaining to yourself where you might use it in your paper. Writing down your ideas as you have them will make writing your paper much easier and give you something to refer back to. Annotating your research can take quite a bit of time, but needs to be taken one step further in order to add a bit more clarity for the outlining process. Organize your notes by collecting all of your highlighted phrases and ideas into categories based on topic. For example, if you are writing a paper analysing a famous work of literature, you could organize your research into a list of notes on the characters, a list of references to certain points in the plot, a list of symbols the author presents etc.

Try writing each quote or item that you marked onto an individual note card. That way, you can rearrange and lay out your cards however you would like. Color code your notes to make it easier. For example, write down a list of all the notes you are using from each individual resource, and then highlight each category of information in a different colour.

For example, write everything from a particular book or journal on a single sheet of paper in order to consolidate the notes, and then everything that is related to characters highlight in green, everything related to the plot mark in orange etc. As you go through your notes, mark down the author, page number, title, and publishing information for each resource. This will come in handy when you craft your bibliography or works cited page later in the game. Who would be reading this paper, should it be published? Although you want to write for your professor or other superior, it is important that the tone and focus of your paper reflect the audience who will be reading it. If you're writing for academic peers, then the information you include should reflect the information you already know; you don't need to explain basic ideas or theories. On the other hand, if you are writing for an audience who doesn't know much about your subject, it will be important to include explanations and examples of more fundamental ideas and theories related to your research. The research paper statement is a 1-2 sentence statement at the beginning of your paper that states the main goal or argument of your paper. Although you can alter the wording of your research paper statement for the final draft later, coming up with the main goal of your essay must be done in the beginning. All of your body paragraphs and information will revolve around your research paper, so make sure that you are clear on what your research paper is? An easy way to develop your research paper is to make it into a question that your essay will answer. What is the primary question or hypothesis paper that you are going to go about proving in your paper? For example, your research paper question might be "how does cultural acceptance change the success of treatment for mental illness? Your research paper should express the main idea of your paper without listing all of your reasons or outlining your entire paper. It should be a simple statement, rather than a list of support; that's what the rest of your paper is for. The body of your essay will revolve around the ideas that you judge to be most important. Go through your research and annotations to determine what points are the most pivotal in your argument or presentation of information. What ideas can you write whole paragraphs about? Which ideas do you have plenty of firm facts and research to back with evidence? Write your main points down on paper, and then organize the related research under each. When you outline your main ideas, putting them in a specific order is important. Place your strongest points at the beginning and end of your essay, with more mediocre points placed in the middle or near the end of your essay. A single main point doesn't have to be kept to a single paragraph, especially if you are writing a relatively long research paper. Main ideas can be spread out over as many paragraphs as you deem necessary. Depending on your paper rubric, class guidelines, or formatting guidelines, you may have to organize your paper in a specific way. For example, when writing in APA format you must organize your paper by headings including the introduction, methods, results, and discussion. These guidelines will alter the way you craft your outline and final paper. With the aforementioned tips taken into consideration, organize your entire outline. Justify main points to the left, and indent subsections and notes from your research below each. The outline should be an overview of your entire paper in bullet points. Make sure to include in-text citations at the end of each point, so that you don't have to constantly refer back to your research when writing your final paper.

## **2.6. Draft of Paper**

Although it may seem counterintuitive, writing your introduction first may be more difficult to accomplish than starting with the meat of your paper. Starting by writing the main points (focusing on supporting your research paper) allows you to slightly change and manipulate your ideas and commentary. Support every statement you make with evidence. Because this is a research paper, there shouldn't be any remarks that you make that cannot be supported by facts directly from your research. Supply ample explanations for your research. The opposite of stating opinions without facts, is stating facts with no commentary. Although you certainly want to present plenty of evidence, make sure that your paper is uniquely your own by adding commentary in whenever possible. Avoid using many long, direct quotes. Although your paper is based on research, the point is for you to present your own ideas. Unless the quote you intend on using is absolutely necessary, try paraphrasing and analysing it in your own words instead. Use clear segues into adjacent points in your paper. Your essay should flow well, rather than stopping and starting in a blunt fashion. Make sure that each of your body paragraphs flows nicely into the one after it.

### *2.6.1. Write the Draft of the Introduction*

The introduction is, in many respects, the conclusion written in reverse: start by generally introducing the larger topic, and then orient the readers in the area you've focused on, and finally, supply the research paper statement. Avoid repeating exact phrases that you already used in the conclusion.

### *2.6.2. Document your paper*

All research essays must be documented in certain ways in order to avoid plagiarism. Depending on the topic of your research and your field of study, you will have to use different styles of formatting. MLA, APA, and Chicago are the three most common citation formats and determine the way in-text citations or footnotes should be used, as well as the order of information in your paper. MLA format is typically used for literary research papers and uses a 'works cited' page at the end. This format requires in-text citations. APA format is used by researchers in the social sciences field, and requires

in text citations as well. It ends the paper with a “references” page, and may also have section headers between body paragraphs. Chicago formatting is used mainly for historical research papers and uses footnotes at the bottom of each page rather than in-text citations and a works cited or references page.

### *2.6.3. Edit your rough Draft*

Although it is tempting to simply read over your essay and use the spell-check tool, editing your paper should be a bit more in-depth. Have at least one, but preferably two or more; person/people look over your essay. Have them edit for basic grammatical and spelling errors as well as the persuasiveness of your essay and the flow and form of your paper. If you edit your own paper, wait at least three days before returning to it. Studies show that your writing is still fresh in your mind for 2-3 days after finishing, and so you are more likely to skim over basic mistakes that you would otherwise catch. Don't ignore edits by others just because they require a bit more work. If they suggest that you rewrite a section of your paper, there is probably a valid reason for their request. Take the time to edit your paper thoroughly.

### *2.6.4. Create the final draft*

When you have edited and re-edited your paper, formatted your work according to the subject matter, and finalized all the main points according to referee remarks and comments. Go through your paper and fix all mistakes, rearranging information if necessary. Adjust the font, line spacing, and margins to meet the requirements set by journal where you are publishing. If necessary, create an introduction page and a works cited or references page to bookend your paper. The completion of these tasks finalizes your paper. Make sure to save the paper (in multiple places, for extra security) and print out your final draft.

---

## **3. Structure of the Paper**

### **3.1. How to write the Title**

Use proper and meaningful title to the research paper, use 14 pt bold and write it at the top, e.g. Artificial Recharge Measures is better than “The conventional and Unconventional measures for Artificial Recharge of Groundwater”. It includes names and sequence of the authors, with all initials; the Institute or organization, with full address; the date. Only the title page, the abstract, the introduction, and the references should start on a separate page; the other sections should not. Even though it is less specific.

### **3.2. How to write the Abstract**

First couple of sentences should focus on what the study is about. Include major findings in a style that a general readership can read and understand (i.e., avoid detailed experimental procedures and data.) Keep it short and effective. It should include a short statement of the main task, the methods used, conclusions reached and any recommendations to be made. The abstract or summary should be concise, informative and independent of the report. The Abstract is not a part of the body of the report itself. Rather, the abstract is a brief summary of the report contents that is often separately circulated, so potential readers can decide whether to read the report. The abstract should very concisely summarize the whole report: why it was written? What was discovered or developed? and what is claimed to be the significance of the effort? The abstract does not include figures or tables, and only the most significant numerical values or results should be given. Four sentences should be followed at the time of writing abstract.

- State the problem
- Say why it's an interesting problem
- Say what your solution achieves
- Say what follows from your solution

Write this section after you have written the paper. Be creative in generating curiosity.

### **3.3. How to write the Introduction**

The Introduction should provide a clear statement of the problem posed by the project, and why the problem is of interest. It should reflect the scenario, if available. If needed, the introduction also needs to present background information so that the reader can understand the significance of the problem. In the introduction one will need to write relevant background or contextual material, define terms or concepts when necessary, explain the focus of the paper and your specific purpose, and reveal your plan of organization. Four sentences should be followed at the time of writing introduction.

- What is the problem and why is it interesting?
- Who are the main contributors?
- What did they do?
- What novel thing will you reveal?

Outline the problem and why it was worth tackling. Review the literature, recording briefly the main contributors and summarizing the status of the field when you started the research. Provide any specialized information that the reader might need if he is to understand what follows. State what you will do that has not been done before (new experimental approach? new data? new model? new interpretation?) Keep it as brief as you can whilst still doing all this.

### **3.4. How to write Objectives**

Objectives are the goals you set out to attain in your research. They inform a reader what you want to attain through the study. It is extremely important to word them clearly and specifically. Objectives should be listed under two headings:

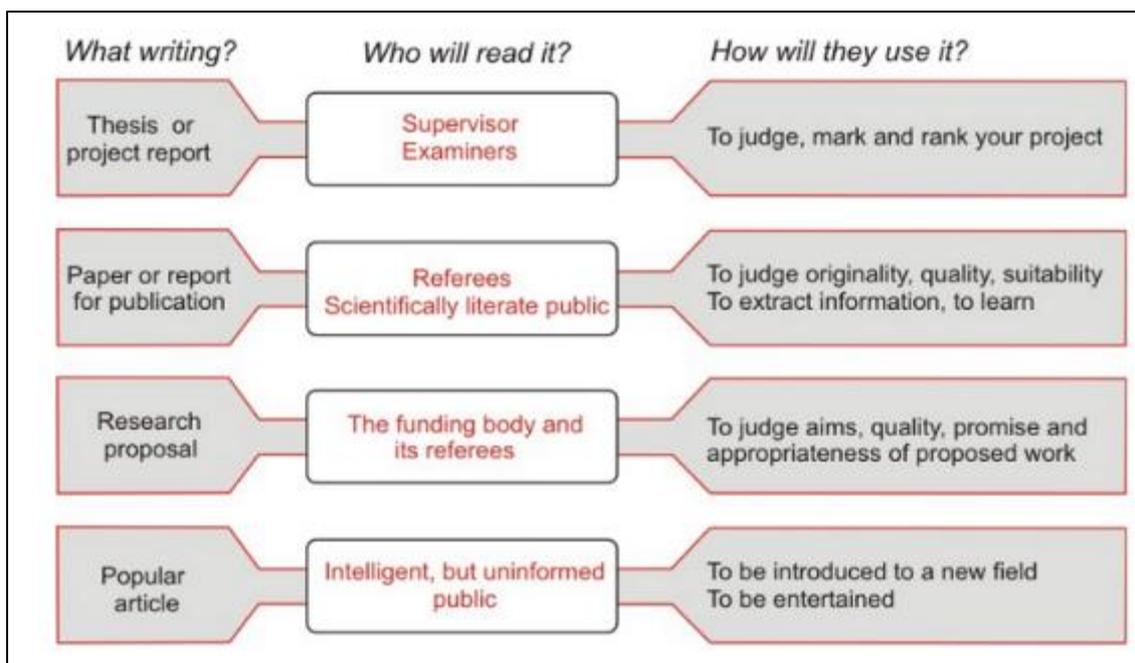
- Main objectives (aims) - The main objective is an overall statement of the thrust of your study. It is also a statement of the main associations and relationships that you seek to discover or establish.
- Sub objectives- The sub objectives are the specific aspects of the topic that you want to investigate within the main framework of your study. They should be numerically listed. Wording should clearly, completely and specifically communicate to readers your intention. Each objective should contain only one aspect of the Study. Use action oriented words or verbs when writing objectives.

The objectives should start with words such as 'to determine, to find out, to ascertain, to measure, to explore' etc. The wording of objectives determines the type of research (descriptive, correlation and experimental) and the type of research-design you need to adopt to achieve them.

### **3.5. How to write Scope of the Work**

Your market is your readers. Put yourself in their shoes: what, if you were they, would you wish to find? The readers of your research paper are your examiners. They expect details of all relevant parts of your research: why you did it, its background, your thinking, what you did your conclusions and your views on where it is going. They don't want the irrelevant parts.

A paper is read by one or more skilled referees, and, if accepted, by a scientifically informed audience. A research proposal usually addresses two markets. One is the funding agency: the international agencies, the National agencies, any Government organization or private or a Charity. They will look for a match between their priorities and yours. The other is the referees that the funding agency will use; they are charged with judging quality, promise and relevance. Hardest to write is a popular article, addressing an audience who is intelligent, one should always assume that who may know nothing of your subject. Here style, always important, must be fine-tuned to meet their needs. Make no mistake. Poor writing will exasperate, bore, and ultimately lose your readers. Write well, and they'll respond in the way you plan.



**Figure 2** Chart of Types of Writing and their use

### 3.6. How to write Methodology

The purpose of this section is to describe the materials, apparatus and Data analysis, characterization and procedures used to carry out the measurements. Most importantly, the section needs to provide a clear presentation of how key measurements were obtained and how the measurements were analyzed. This is where the particular approach be followed to reach the research objectives. The details should be sufficient so that the reader can easily understand what was done. An accurate, schematic diagram depicting the apparatus should be included and referred to in the text as needed (if a diagram has been already provided it can be used in the paper, provided that the source is properly referenced). To improve clarity of presentation, this section may be further divided into subsections (e.g. a Materials subsection, an Apparatus subsection, a Methods or Procedures subsection, or any relevant data) Explain what is especially different about your method. Don't mix Method with Results or Discussion, they come next. It is one of the principles of science that a paper should contain sufficient details to allow the work to be repeated by someone else. Provide this but nothing more. Keep the results for the next section. Remember that inferences should be drawn on the basis of methodology which is core of the paper. Measurement units should be uniform and globally accepted.

### 3.7. How to write Results

The Result section is dedicated to presenting the actual results (i.e. measured and calculated quantities), not to discussing their meaning or interpretation. The results should be summarized using appropriate Tables and Figures (graphs or schematics). Every Figure and Table should have a legend that describes concisely what is contained or shown. Figure legends go below the figure, table legends above the table. Throughout the report, but especially in this section, pay attention to reporting numbers with an appropriate number of significant figures. A formal error analysis (such as, perhaps, was done in Physics lab) is not necessary. Still, features of the data-taking and processing that may have especially contributed to errors should be pointed out. One classical example is the taking of small differences between large numbers; for instance,  $11.5 \pm 0.2 - 10.8 \pm 0.3$  yields a very large fractional error (about 70 %) on the resulting difference,  $0.7 \pm 0.5$ . Another procedure that usually increases error is numerical differentiation. Report your results simply, without opinion or interpretation at this stage. Define all symbols and units. Give emphasis in the text the most important aspects of the tables, graphs or figures. Give error-bars or confidence-limits for numerical or graphical data. Statistics should be meaningful; avoid confidence-eroding statements such as "33.3% of the samples failed: 33.3% survived; the third sample was unfortunately misplaced." Sometimes the results speak for themselves so aim for a concise, economical style. Present data in a form other people can use.

### 3.8. How to write Discussion

The Discussion interprets the results in light of the research objectives. The most important goal of this section is to interpret the results so that the reader is informed of the insight or answers that the results provide. This should also

present an evaluation of the particular approach taken by the group. For example: Based on the results, how could the experimental procedure be improved? What additional, future work may be warranted? What recommendations can be drawn? Bring out the most significant conclusions first; develop subsidiary conclusions after that. Be clear and concise; a Discussion is not a license to waffle.

### 3.9. How to write Conclusion

The Conclusions should summarize the central point's made in the Discussion section, reinforcing for the reader the value and implications of the work. If the results were not definitive, specific future work that may be needed can be (briefly) described. The conclusions should never contain "surprises". Therefore, any conclusions should be based on observations and data already discussed. It is directly suffice with objectives of the paper. It is considered extremely bad form to introduce new data in the conclusions. Now that you have carefully worked through your evidence, write a conclusion that briefly summarizes your findings for the reader and provides a sense of closure. Start by briefly restating the research paper statement, then remind the reader of the points you covered over the course of the paper. Slowly zoom out of the topic as you write, ending on a broad note by emphasizing the larger implication of your findings. The goal of the conclusion, in very simplified terms, is to answer the question, "So what?" Make sure the reader feels like (s) he's come away with something. It's a good idea to write the conclusion before the introduction for several reasons. First of all, the conclusion is easier to write when the evidence is still fresh in your mind. On top of that, it's recommended that you use up your most choice language in the conclusion and then reword these ideas less strongly in the introduction, not the other way around; this will leave a more lasting impression on the reader.

The reader scanning your paper will read the Abstract and the Conclusions, glance at the Figures and move on. Do not duplicate the Abstract as the Conclusions or vice versa. The Abstract is an overview of the entire paper. The Conclusions are a summing up of the advances in knowledge that have emerged from it. It is acceptable to present conclusions as a bullet-pointed list.

- Include major findings followed by brief discussion on future
- Perspectives and/or application of present work to other disciplines.
- Important: Do not rewrite the abstract.
- Statements with "Investigated" or "Studied" are not conclusions.
- If the argument or point of your paper is complex, you may need to summarize the argument for your reader.
- If prior to your conclusion you have not yet explained the significance of your findings or if you are proceeding inductively, use the end of your paper to add your points up, to explain their significance.
- Move from a detailed to a general level of consideration that returns the topic to the context provided by the introduction.
- Perhaps suggest what about this topic needs further research. Future work section in some cases is combined along with the "conclusions" section. Here you state aspects of the problem you have not considered and possibilities for further extensions.

### 3.10. How to write Acknowledgement

You should acknowledge any help you have received in collecting the information for the paper. Thank people who have helped you with ideas, technical assistance, materials or finance. Remember to thank the funding agency, your parent institution Colleagues/scientists/technicians who might have provided assistance. Give credit to the people who are directly or indirectly helped during your work. At last acknowledge your near and dear ones. Keep it simple, give full names and affiliation, and don't get sentimental.

A formula such as this works well:

I wish to thank Dr. U.R. Patanakar of the Groundwater Surveys and Development Agency, Nashik, for suggesting this review, and to acknowledge my debt to the paper listed below.

or

The authors wish to thank Director, Groundwater Surveys and Development Agency, Pune, Mr. D. Rameshwar Rao of Wadia Institute of Himalayan Institute for suggesting the approach developed for research in me. Mr A. Shekhar for his technical assistance throughout the project and Mrs A.S. Kamble for proof-reading the manuscript. The research was supported by the DST and by a Research Fellowship from Council of Scientific and Industrial Research, New Delhi, India.

### **3.11. How to write References**

References tell the reader where an idea, prior results and data have come from. It is important that you reference, all such sources. It is a conventional courtesy to reference the originators of key ideas or theories or models, even if you modify them. There are almost as many different formats for references as there are journals. If you have ENDNOTE on your PC it can solve the problem.

The Reference section should contain complete citations following standard form. The form of the citation depends on the type of source being referenced, and is different for whole books, chapters in books, and articles published in a journal. The references should be numbered and listed in the order they were cited in the body of the report. In the text of the report, a particular reference can be cited by using a numerical superscript that corresponds to its number in the reference list. If a reference has not been actually consulted, it should be listed "as discussed in name of the work that discussed the reference". The styles vary for different journals. (Use ENDNOTE, Ref Works), Some journals require complete titles of the cited references. Please check for the accuracy of all citations.

In text : "Lu (1998)". If there are two names then "Lu & Chen (1998)". If there are more than two, then "Lu et al (1998)".

In reference list, ordered alphabetically: "Lu, T.J and Chen, C. (1998) An Analysis of Defects in Metal Foams, Acta Mater. 15, 222-226".

All are important. Do not be tempted to make a reference list without all of these. It takes far longer to track down the missing information later than to do it right in the first place.

---

## **4. Process of Communication**

### **4.1. Selecting a journal**

Each journal specializes in a specific area of research. Hence its readership varies. A proper choice of journal can make a larger impact of your research. Get to know the focus and readership of the journal that you are considering. General vs. specialized area journal Select 2 or 3 journals in the chosen area with relatively high impact factors. Discuss with your advisor and decide on the journal. Find out the journal's submission criteria and format.

### **4.2. Submission**

Read the finalized paper carefully. Check for accuracy of figures and captions. Are the figures correctly referred to in the text? Get feedback from advisor and colleagues. Make sure the paper is read by at least one or two colleagues who is not familiar with the specific work. Provide a cover letter to the editor along with a brief paragraph highlighting the importance of this work and names of possible reviewers. Have all co-authors approve the finalized version of the paper. Submit the paper online along with copyright form.

### **4.3. Revision and Galley Proof**

The manuscript is usually reviewed by 2-3 reviewers. Reviewers point out deficiencies and/or suggestions to improve the scientific content. Read their comments carefully. (If reviewer misunderstands a point, the point probably needs revision or additional support). Do not blame the reviewer for his/her misunderstanding. Be polite and respectful when disagreeing a reviewer's comment (use the word differs). Include a point-by-point explanation of changes made in the text in response to reviewers' comments. Once again, carefully read the paper for its accuracy in presenting the data. Submit the revised version. Once accepted for publication you should receive the galley proof within a month. This is one last chance to make any final corrections. Acknowledge to the reviewer for his valuable comments which improves quality of your paper.

### **4.4. What to do if a paper/article gets rejected**

Do not get discouraged. Read editorial comments and discuss with advisor/students/collaborators. Find out how you can make this study stronger and acceptable for publication. Do not just turn around and submit the paper to another journal. Read carefully the comments and find ways to improve the scientific quality of the papers. Carry out additional experiments and improve the quality of scientific discussions. (Journals often look for papers with quantitative and mechanistic information that represent new physical insights). Rejected papers can be resubmitted if and only the concerns of the reviewers are adequately addressed and new results are included. If you have questions, please feel free to contact the editorial office.

## 4.5. Additional Remarks

### 4.5.1. Writing styles

A suitable font is Times Roman, 12 pt. A uniform verb tense should be used throughout the report, preferably past tense. The imperative mood, i.e. as if giving directions or orders, should not be used. The purpose is to state what was done, not to tell other people what to do. Since the reports are formal, the first person (singular "I" or plural "We") should not be used. Sentences should not start with "It" unless the object that "It" refers to is absolutely clear from the context. All text should be double-spaced to allow room for comments. All pages, including figure pages, should be numbered consecutively. Overly long sentences should be avoided. Two or more short sentences should be used instead. An excellent way to improve style and grammar is to have others proofread the report. Needless fancy presentation (bold, italic, or underlined fonts; color in text or figures) should be avoided unless it truly enhances the clarity of the report. Every journal has their own format for submission so follow that also.

### 4.5.2. Figures

Figures are categorized as either graphs or drawings. Graphs should follow engineering standards, not Excel defaults. Backgrounds should be white, not shaded. Style should be similar to that found in standard engineering textbooks. Grids should be appropriate to what the reader is likely to extract from the figure. It should correspond to figures (diagrams) and units. Scale is linear with the ratio of figure. Type sizes for coordinates and legends should be appropriate: not too small, not too large. A sans-serif (e.g. Times New Roman) font works well for figure legends and coordinate labels. All legends should be within the graph area, not beside it. Line thickness should be sufficient to provide for good visibility, but not heavier than necessary. Figures (drawings, schematics) should be kept simple. Fancy art work and three-dimensional renditions can be distracting if used indiscriminately. Below every figure or graph should be a caption that concisely describes what is shown. Figures and graphs should be numbered consecutively.

### 4.5.3. Tables

Tables should be well organized, with unshaded backgrounds. A table should not include columns that have all entries identical. As with Figures, a standard engineering textbook can be used as a guide to good table composition. Tables should be numbered consecutively, and above each table should be a caption describing the table contents.

#### Words and expressions to avoid

Jargon	Preferred use
a considerable amount of	much
on account of	because
a number of	several
Referred to as	called
In a number of cases	some
Has the capacity to	can
It is clear that	clearly
It is apparent that	apparently
Employ	use
Fabricate	make

#### Terms

- Impact Factor - The impact factor (IF) of an academic journal is a measure reflecting the average number of citations to recent articles published in the journal.

- Abbreviation - is a shortened form of a word or phrase. Usually, but not always, it consists of a letter or group of letters taken from the word or phrase
- Citation - is a reference to a published or unpublished source (not always the original source). More precisely, a citation is an abbreviated alphanumeric expression embedded in the body of an intellectual work.
- Galley Proof - are the preliminary versions of publications meant for review by authors, editors, and proof readers, often with extra-wide margins.
- Endnotes - is a commercial reference management software package, used to manage bibliographies and references when writing essays and articles. It is produced by Thomson Reuters.
- Reviewer - is a person who does an evaluation of a publication, product, service, or company.

Legitimate- able to be defended with logic or justification.

- APA- (American Psychological Association) is used by Education, Psychology, and Sciences
- MLA - (Modern Language Association) style is used by the Humanities
- Chicago/Turabian style- is generally used by Business, History, and the Fine Arts

---

## Compliance with ethical standards

### *Acknowledgments*

The author is thankful to anonymous reviewer. Author is grateful to her department Groundwater Surveys and Development Agency, Maharashtra, India.

### *Disclosure of conflict of interest*

The authors do not have any conflicts of Interest.

---

## References

- [1] Dr. Kulkarni, M. 2008, Research Methodology For Business, Nirali Publication, M.Com: Part-1:Semester-II
- [2] Buffa, L. 1997, Research Paper Smart: Where to Find It, How to Write It, How to Cite It. New York, NY: Random House.
- [3] Kothari, C.R., 1985, Research Methodology- Methods and Techniques, New Delhi, Wiley Eastern Limited.
- [4] Dawson, Catherine, 2002, Practical Research Methods, New Delhi, UBS Publishers'Distributors
- [5] Day, RA. "How to write and publish a scientific paper," 5th edition, Oryx Press, 1998.
- [6] Hall, JE. Writing research papers (and getting them published) <http://dor.umc.edu/ARCHIVES/GMarshallPublishingarticle.ppt>
- [7] Schaum's Quick Guide to Writing Great Research Papers by Laurie Rozakis, 2007
- [8] The Academic Writer's Toolkit by Arthur Asa Berger, 2010
- [9] How to Write Reports and Proposals by Patrick Forsyth, 2013
- [10] Writing Research Papers: A Guide to the Process by Stephen Weidenborner; Domenick Caruso; Gary W. Parks ,2005
- [11] Writing Winning Reports and Essays by Paul B. Janeczko, 2003
- [12] The College Student's Guide to Writing a Great Research Paper by Atlantic Publishing Group Inc. Staff; Erika Eby