



Parts of a Research Paper

One of the most important aspects of science is ensuring that you get all the parts of the written research paper in the right order.

You may have finished the best research project on earth but, if you do not write an interesting and well laid out paper, then nobody is going to take your findings seriously.

The main thing to remember with any research paper [1] is that it is based on an hourglass structure. It begins with general information and undertaking a literature review [2], and becomes more specific as you nail down a research problem [3] and hypothesis [4].

Finally, it again becomes more general [5] as you try to apply your findings to the world at general.

Whilst there are a few differences between the various disciplines, with some fields placing more emphasis on certain parts than others, there is a basic underlying structure.

These steps are the building blocks of constructing a good research paper. This section outline how to lay out the parts of a research paper, including the various experimental methods [6] and designs.

The principles for literature review [2] and essays of all types follow the same basic principles.

- Abstract [7]
- Introduction [8]
- Method [9]
- Results [10]
- Discussion [11]
- Conclusion [12]
- Reference List [13]

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Introduction

For many students, writing the introduction ^[8] is the first part of the process, setting down the direction of the paper and laying out exactly what the research paper is trying to achieve.

For others, the introduction is the last thing written, acting as a quick summary of the paper. As long as you have planned a good structure for the parts of a research paper, both approaches are acceptable and it is a matter of preference.

A good introduction ^[8] generally consists of three distinct parts:

1. You should first give a general presentation of the research problem.
2. You should then lay out exactly what you are trying to achieve with this particular research project.
3. You should then state your own position.

Ideally, you should try to give each section its own paragraph, but this will vary given the overall length of the paper.

1) General Presentation

Look at the benefits to be gained by the research or why the problem has not been solved yet. Perhaps nobody has thought about it, or maybe previous research threw up some interesting leads that the previous researchers did not follow up.

Another researcher may have uncovered some interesting trends, but did not manage to reach the significance level ^[14], due to experimental error ^[15] or small sample sizes ^[16].

2) Purpose of the Paper

The research problem ^[3] does not have to be a statement, but must at least imply what you are trying to find.

Many writers prefer to place the thesis statement ^[17] or hypothesis here, which is perfectly acceptable, but most include it in the last sentences of the introduction, to give the reader a

fuller picture.

3) A Statement of Intent From the Writer

The idea is that somebody will be able to gain an overall view of the paper without needing to read the whole thing. Literature reviews [2] are time-consuming enough, so give the reader a concise idea of your intention before they commit to wading through pages of background.

In this section, you look to give a context to the research, including any relevant information learned during your literature review. You are also trying to explain why you chose this area of research, attempting to highlight why it is necessary. The second part should state the purpose of the experiment and should include the research problem. The third part should give the reader a quick summary of the form that the parts of the research paper is going to take and should include a condensed version of the discussion.

Method

This should be the easiest part of the paper to write, as it is a run-down of the exact design [18] and methodology [19] used to perform the research. Obviously, the exact methodology varies depending upon the exact field and type of experiment [20].

There is a big methodological difference between the apparatus based research of the physical sciences and the methods and observation methods of social sciences. However, the key is to ensure that another researcher would be able to replicate the experiment to match yours as closely as possible, but still keeping the section concise.

You can assume that anybody reading your paper is familiar with the basic methods, so try not to explain every last detail. For example, an organic chemist or biochemist will be familiar with chromatography, so you only need to highlight the type of equipment used rather than explaining the whole process in detail.

In the case of a survey [21], if you have too many questions to cover in the method, you can always include a copy of the questionnaire in the appendix [22]. In this case, make sure that you refer to it.

Results

This is probably the most variable part of any research paper, and depends on the results [10] and aims of the experiment.

For quantitative research [23], it is a presentation of the numerical results and data, whereas for qualitative research [24] it should be a broader discussion of trends, without going into too much detail.

For research generating a lot of results [25], then it is better to include tables [26] or graphs [27] of the analyzed data and leave the raw data in the appendix, so that a researcher can follow up and check your calculations.

A commentary is essential to linking the results together, rather than just displaying isolated and unconnected charts and figures.

It can be quite difficult to find a good balance between the results [10] and the discussion [11] section, because some findings, especially in a quantitative [23] or descriptive experiment [28], will fall into a grey area. Try to avoid repeating yourself too often.

It is best to try to find a middle path, where you give a general overview of the data and then expand on it in the discussion - you should try to keep your own opinions and interpretations out of the results section, saving that for the discussion later on.

Discussion

This is where you elaborate on your findings, and explain what you found, adding your own personal interpretations.

Ideally, you should link the discussion [11] back to the introduction, addressing each point individually.

It's important to make sure that every piece of information in your discussion is directly related to the thesis statement [17], or you risk cluttering your findings. In keeping with the hourglass principle, you can expand on the topic later in the conclusion [29].

Conclusion

The conclusion [12] is where you build on your discussion and try to relate your findings to other research and to the world at large.

In a short research paper, it may be a paragraph or two, or even a few lines.

In a dissertation, it may well be the most important part of the entire paper - not only does it describe the results and discussion in detail, it emphasizes the importance of the results in the field, and ties it in with the previous research.

Some research papers require a recommendations section, postulating the further directions of the research, as well as highlighting how any flaws affected the results. In this case, you should suggest any improvements that could be made to the research design [18].

Reference List

No paper is complete without a reference list [13], documenting all the sources that you used for your research. This should be laid out according to APA [30], MLA [31] or other specified format, allowing any interested researcher to follow up on the research.

One habit that is becoming more common, especially with online papers, is to include a reference to your own paper on the final page. Lay this out in MLA, APA and Chicago format, allowing anybody referencing your paper to copy and paste it.

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Links:

[1] <https://explorable.com/write-a-research-paper-0>, [2] <https://explorable.com/what-is-a-literature-review>,

[3] <https://explorable.com/defining-a-research-problem>, [4] <https://explorable.com/research-hypothesis>, [5] <https://explorable.com/what-is-generalization>, [6] <https://explorable.com/experimental-research>, [7] <https://explorable.com/writing-an-abstract>, [8] <https://explorable.com/how-to-write-an-introduction>, [9] <https://explorable.com/writing-methodology>, [10] <https://explorable.com/writing-a-results-section>, [11] <https://explorable.com/writing-a-discussion-section>, [12] <https://explorable.com/writing-a-conclusion>, [13] <https://explorable.com/writing-a-bibliography>, [14] <https://explorable.com/significance-test>, [15] <https://explorable.com/type-i-error>, [16] <https://explorable.com/statistical-significance-sample-size>, [17] <https://explorable.com/what-is-a-thesis-statement>, [18] <https://explorable.com/research-designs>, [19] <https://explorable.com/research-methodology>, [20] <https://explorable.com/conducting-an-experiment>, [21] <https://explorable.com/survey-research-design>, [22] <https://explorable.com/writing-an-appendix>, [23] <https://explorable.com/quantitative-research-design>, [24] <https://explorable.com/qualitative-research-design>, [25] <https://explorable.com/statistically-significant-results>, [26] <https://explorable.com/how-to-format-a-table>, [27] <https://explorable.com/floating-blocks>, [28] <https://explorable.com/descriptive-research-design>, [29] <https://explorable.com/drawing-conclusions>, [30] <https://explorable.com/apa-writing-format>, [31] <https://explorable.com/mla-writing-format>, [32] <https://explorable.com/users/martyn>, [33] <https://explorable.com/parts-of-a-research-paper>