Research Paper Format

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The research paper format may be difficult to master. But you will risk not being taken seriously, if you try to avoid the main rules.

Here are some important points about the format and other tips on writing a research paper (listed alphabetically).

An example of the research paper format

Appendices

Most reports have at least one appendix section to allow you to include data, figures [1] and calculations without breaking the flow of the main body of the report. Most scientists reading your report will not be too interested in the exact details, only the results [2].

The appendix [3], however, allows somebody interested in your results to check your research more thoroughly. Whilst it can be regarded as a 'dumping ground' for peripheral information and raw data, it should still be structured properly and referred to in the report.

Back-ups

Please make sure that you back up all your files on disk and as a hard copy. So many students over the years have lost days of hard work because they did not bother. If you are not sure how to then ask the computer department for help.

Drafts and Checking

Sometimes, when you think that you have finished your report, it is a good idea to ask another person to read through it for you and pick out the obvious mistakes.

They can give you input on your research paper format [4] and it is also very easy to miss your own mistakes so an independent review is useful. After this process you can finalize your first draft of the report.

Grammar and Spelling

Even though you are writing scientific reports, it is essential to the research paper format that your grammar and spelling [5] are correct and readable.

If your report is poorly written, people will tend to assume that your research is also poor and you are giving the assessor an easy excuse to give you a lower grade.

Spell-checkers are good for an initial check on your language use but they are not powerful enough to pick up every mistake. If you are not confident enough about your language skills to write a good report, "bribe" or pay somebody more skilled to edit it for you, when you've finished your paper.

Most students studying English or other languages are only too happy to have the chance to earn a little money on the side.

Graphs

Graphs [1] are one of the easiest ways to display your results and findings in an easy to understand format. Any graphs should take up a full page and be numbered as diagrams 1, 2 etc. They should be referred to by these descriptions in the body of the text.

Graphs are not essential to the research paper format, but helps you present your main points.

Where relevant, graphs should include any error bars so that anybody reading your report can quickly see the degrees of significance of your results. If you don't know what an error bar is, don't worry about this.

Graphs are best kept as simple as possible and, in the computer age, should be drawn with one of the many software programs available.

You should not lose credit for using traditional pen and paper, but most universities and schools will teach you how to utilize computer spreadsheet applications and the saving in time and effort is worthwhile.

Hypothesis

Most scientists were taught, during the earlier years at school, that you should include a hypothesis statement [6] at the beginning of every experiment [7]. This would take the form of

> "Bacteria reproduce more quickly at higher temperatures".

There is a debate about whether it is a good practice or not to include your hypothesis statement in the research paper format.

This is mostly because many people seems to be "skewed" against defending their hypothesis [8]. Remember that because you want something to be true (your hypothesis), never do affect how true it is.

It is, however, essential to make sure in your abstract [9] and introduction [10] exactly what you are trying to prove.

Illustrations and Photographs

Illustrations such as flow diagrams and diagrams of apparatus set-up can be a powerful way of simplifying the methods [11] you used in your experiment. If you have the means and ability, it is useful to draw these on a computer but no credit will be lost if paper and pencil is used, as long as it is neat and clear.

In the case of photographs, it is preferable to use a digital camera as scans and photocopies have less clarity. They should be compressed a little to save file space and printing ink but still clear. Along with graphs, illustrations and photographs should be numbered as 'figures [1]'.

Keywords

In the age of the internet, it is becoming increasingly important to ensure that your research can be found, both on the internet and on university intranet search facilities.

Many scientists are moving towards putting a section under the abstract [9] with about 10 - 15 keywords and phrases which will allow search engines to pick up the research paper [12].

At this time, this is a 'gray-area' of report writing so probably not worth worrying about too much. Check with your department if this is common practice for their papers.

A curiosity is that it was the scientific community in CERN, Switzerland/France, which invented keyword-search on network computers to easier spread their research [13] to other scientists. That was actually the a great leap towards internet as we now know it.

Layout

Most departments, when starting the report writing process, will give you instructions on what is the common used research paper format. The style can vary a bit between different department (such as the style of references [14]), but it is mostly similar. If you're not sure about

the research paper format, ask your supervisor.

A few general rules of thumb are that it should be written in a common font, size 10 or 12 and double spaced.

In the age of the internet, it is becoming bad practice to underline headings or other text as anybody reading your report online may expect there to be a link there.

Map References

In the case of field work, it is always a good idea to list the name and the exact map co-ordinates of the places from where samples were taken. This enables another researcher to duplicate your <u>experiment</u> [15] exactly.

The date and time are also useful as nature often varies wildly even within the space of a few hours. With the advent of mapping applications such as Google Earth, it is no harm to include a map of the site or sites in the appendices.

Passive Voice

There are an increasing number of campaigns to persuade scientists to use 'everyday English' in their reports.

At the moment, scientists writing reports tend to use the passive voice; "It was found that……" or "The results showed….." By contrast, the active voice takes the form of; "We found….." or "I discovered…."

If you were writing for a mainstream publication that was read by the general public then using the active voice may be useful.

However, the vast bulk of research papers are going to be read only by other scientists so it is best to stick to the passive voice. The passive voice is essential to the research paper format, and suggests to others that this is not your personal theories, it is scientifically based statements.

Update:The APA-standard does now allow for a more active voice. Read more <u>here</u> [16].

Presentations

For higher level reports and dissertations you will have to give a presentation, either in front of fellow students or lecturers. They will be looking to find holes in your report or will try test your knowledge outside the report.

When writing your report, you must bear this in mind and make life easier for yourself. Make certain that your background research is thorough and that you have been very self-critical when discussing and elaborating your <u>results</u> [17].

References

Each scientific discipline and sometimes even each individual supervisor has their own way of setting out references [14] so it is always good to ask for the correct research paper format. Relevant journals [18] you have been reading are also a good guide.

As long as you are consistent and include all of the information that will allow somebody else to replicate your research then it should not matter.

In general, the best ways are;

For books;

SARGENT, J.R. (1995); Origins and functions of lipids in fish eggs: Nutritional implications. Found in; Broodstock management and egg and larval quality, Edited by Bromage, N.R. and Roberts, R.R, pp 353 - 372, Blackwell Science, Oxford, 1st Ed.

For journal articles;

NAVARRO, J.C. AMAT, F. SARGENT, J.R. (1991) A study of the variations in lipid levels, lipid class composition and fatty acid composition in the first stages of Artemia sp. Marine Biology, Issue 111, pp 461 - 465.

For websites;

http://en.wikipedia.org/wiki/Artemia [19] (2006).

Most internet articles should include the date that they were written or last updated. Also include the author in the case of an online article.

Personal communications;

SARGENT, J. R., (2007), personal communication

In the main body of the text you should refer to the article [20] by the name of the author and year. If there was more than one writer then use all of their names the first time, then use 'et al' (Navarro et al, 1991) or 'Navarro et al (1991) found that…'

Set out your reference list [14] alphabetically by first author and try to be consistent with layout [21].

It is more important for the research paper format that your references are clear than worrying about where every last full stop should go.

Research

Research is the foundation of any scientific report and will allow you to learn the background information leading to your particular experiment.

You should include a synopsis of your research in the introduction [10] of your report as it will provide a non-specialist with a quick history of the field.

When following the trail of citations [20] it is very easy to lose track of where you are so it may be useful to draw yourself a 'tree' structure to keep track of all the linked articles.

The best place to start your research is on the internet as it will give you direct information. You should beware of using information from the internet that is not cited as there is no system of peer review [22] and information can be very inaccurate.

Domain names can be a guide as .edu, .gov, .ac.uk or similar show that the information is from a reputable site. Wherever possible you should try and follow any citations to the original source.

Books and journals are the safest way to find information. They are usually peer reviewed and the information, as long as up to date, can be regarded as accurate.

Personal information is another way to obtain information. Although many scientists are busy people they are often willing to spend a little time providing you with information. As long as you do not have a class full of students pestering people for meetings, a quick e-mail or letter can often produce results.

For any research, citations [20] should be laid out in an accurate manner, as described above.

Scientific Names

It is essential that scientific/Latin names are used for describing all species, from elephants to bacteria. The reason for this is that common names vary wildly from country to country and even between regions within a country.

For the first use of any name it is good practice to use the full name e.g. Parus caeruleus. After this, a shortened form, P. caeruleus, is fine as long as it is clear to the reader if very similar scientific names are used during the course of the experiment.

If you are being exact, it is good practice to name the person or organization which first documented the species although, except for recently discovered species, this is not usually essential.

Significance

This is an often misunderstood word in the method of analyzing scientific results. In the case of statistical tests, statistical significance [23] shows whether a result has been proved beyond doubt or whether it may be the result of experimental or sampling errors [24].

Trends and results can still be important even if not proved by statistical tests; proving the hypothesis [25] to be incorrect is still significant to science.

Statistics

Many scientists and students spend a large part of their careers trying to avoid statistical tests.

They are still an essential part of analyzing your results so must be used; if you are unsure, most high schools and universities have a few statistical wizards [26] in place to guide you on which tests to use.

It is a good idea to talk to them before you design your experiment [27] because they will tell how many samples need to be collected to prove significance.

Tables

Tables [28] are an essential part of analyzing your data and allowing others to see your results. Where applicable, graphs are a clearer way of publishing your results, but where you have many small variations it may be preferable to use a table for clarity.

Tables should be numbered and referred to in the text by these numbers. Even if you use graphs in your results, it is often no harm to include tables in the appendix.

It is an unnecessary practice to include both graphs and tables showing the same information in the main body of your report.

Source URL:https://explorable.com/research-paper-format?gid=1584

Links
[1] https://explorable.com/floating-blocks [2] https://explorable.com/statistically-significant-results [3] https://explorable.com/writing-an-appendix [4] http://www.ruf.rice.edu/~bioslabs/tools/report/reporterror [5] https://explorable.com/article-writing-help [6] https://explorable.com/how-to-write-a-hypothesis [7] https://explorable.com/conducting-an-experiment [8] https://explorable.com/research-hypothesis [9] https://explorable.com/writing-an-abstract [10] https://explorable.com/how-to-write-an-introduction [11] https://explorable.com/writing-methodology [12] https://explorable.com/writing-a-research-paper [13] https://explorable.com/what-is-research [14] https://explorable.com/writing-a-bibliography [15] https://explorable.com/experimental-research [16] https://explorable.com/apa-writing-style [17] https://explorable.com/writing-a-results-section [18] https://explorable.com/academic-journals [19] http://en.wikipedia.org/wiki/Artemia [20] https://explorable.com/in-text-citation [21] https://explorable.com/how-to-write-an-outline [22] https://explorable.com/peer-review-process [23] https://explorable.com/significance-test [24] https://explorable.com/sampling-error [25] https://explorable.com/hypothesis-testing [26] https://explorable.com/statistics-tutorial [27] https://explorable.com/design-of-experiment [28] https://explorable.com/how-to-format-a-table