

Writing Error Free Scientific Research Paper

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Abstract

This paper is intended to guide researchers into the world of 'academic writing. The goal is to provide learners with a practical and efficient approach to learning the skills, strategies, and knowledge that are necessary for writing error free research articles. Writing without any error is an essential step in the research process. But many researchers are never taught how to write an error free, publishable scientific paper. This article explains and reviews some grammatical rules emphasizing the importance of developing a voice as a writer, and provides helpful proofreading strategies to enable researchers to identify—and correct errors and weaknesses in their writing. Finally, this paper highlights the most common errors in writing scientific research papers. The findings of this qualitative research show some common pitfalls and recommend strategies to avoid them.

Keywords: Errors and weaknesses, Proofreading strategies, Voice as a writer, Scientific writing

"If you don't have time to read, you don't have the time (or the tools) to write. Simple as that."- Stephen King

Writing is an art. But many writers face difficulty in writing as there are so many problems in doing that, whether it is a thesis or a research paper, or just a paragraph. But the good news is that it can be acquired through

practice like other skills. Writing is a circuitous process with three distinct stages: Pre-writing / Writing / Re-writing (“The Writing Process”, 2022) . Your motivation and passion are enough to master this art. In “On Writing”, Stephen King writes, “If you don't have time to read, you don't have the time (or the tools) to write. Simple as that” (Gotham Writers, n.d.) Reading allows you to witness the possibilities of the craft. As you read, you accumulate knowledge about what has been done and how it has been done. You gain an understanding of the diverse approaches to the craft and the effects of those choices on the reading experience. All of this observation sharpens your writerly and editorial eye, which is useful when you turn it back to your own work.

This paper guides researchers into the world of academic writing by providing learners with a practical and efficient approach to learning the skills, strategies, and knowledge that are necessary for writing error free research articles.

The key to great writing is great revising. But what if you're not sure what to look for? Or how to begin? Luckily, you don't have to be a linguistic scholar to be a competent writer or editor. With just enough grammar and a few easy strategies, you will be well on your way to some effective revising—and some great writing— soon.

Motivation and passion are enough to master this art and there is no shortcut or royal road to learning. There is only one magical formula for mastering a skill – hard work , hard work , and hard work.

The first part of this paper reviews some grammatical rules emphasizing the importance of developing a voice as a writer, and provides helpful proofreading strategies to enable researchers to identify—and correct— errors and weaknesses in their writing. The second part of this paper would highlight the most common errors in writing scientific manuscripts and research papers.

Some common grammatical errors plague manuscripts (Writing a Better Research Article, 2017). The researchers can avoid the following grammatical errors easily.

- Essential punctuation marks

- Subject-verb agreement
- Nouns and pronouns
- Fragments and run-on sentences
- Active versus passive voice
- Plurals versus possessives
- Coherence, cohesion, and unity
- Easy proofreading strategies

Punctuate accurately

Using commas, periods, colons, semi-colons, quotations, and parentheses accurately is an important skill to have. It requires years of study and practice in English to punctuate sentences perfectly. Consult an experienced editor whenever you are doubtful about the use of punctuation in your manuscript.

Article

Accurate article usage is extremely important for clarity and readability. Authors who are not comfortable with English tend to use articles incorrectly often. It is important to understand the difference between indefinite articles (a and an) and definite articles (the). One should know when to use which article. The definite article, "the", is used to refer to somebody or something that is the only, normal, or obvious one of their kinds such as body parts, countries, and decades. (For example, The President of the United States of America, The 1980s, The heart was harvested from an animal). "The" is also used before superlatives and ordinal adjectives such as "the fastest", "the highest", "the first of its kind", "the third replicate".

An indefinite article, "a/an", is used to refer to somebody or something that is not unique but rather just one among many. For example, "A student of medicine" or "An apple from New Zealand".

Spelling

Always check the guidelines of your target journal. Some journals prefer the use of American English and others prefer British English. Many spellings, formats, and conventions vary between American and British English. Although document creation software such as MS Word gives you the option to choose an English convention, employing the services of a native English-speaking editor is the best way to ensure that your manuscripts conform/follows all the guidelines of the target journal.

Coherence

Coherence in writing means that all the ideas in a paragraph flow smoothly from one sentence to the next sentence. With coherence, the reader has an easy time understanding the ideas that you wish to express.

Cohesion

All the supporting sentences connect to the topic sentence.

Cohesive Devices

- connectors: and, but, so, when, in addition, before
- definite articles: the
- personal pronouns: he, she, they
- demonstrative pronouns : this, that, these, those

Unity

Unity means that one paragraph is about only one main topic. That is, all the sentences -- the topic, supporting sentences, the detail sentences, and (sometimes) the concluding sentence -- are all telling the reader about one

main topic. If your write-up/ paragraph contains a sentence or some sentences that are not related to the main topic, then we say that the write-up /paragraph "lacks unity," or that the sentence is "off-topic."

PROOFREAD

The best way to avoid typographical errors and awkward sentences are to proofread your manuscript thoroughly before submission. Print out your document and proofread each sentence with a pencil in your hand. Errors in sentence construction can be spotted easily by reading the manuscript backward, one sentence at a time. Although the spell-check tool built into MS Word also functions as an English sentence corrector, it is not reliable, especially if your manuscript contains a lot of scientific languages. Reading out the entire manuscript aloud can also help you identify the incorrect placement of punctuation.

What is proofreading?

To proofread a document is to carefully read it to find any errors in spelling, punctuation, or grammar, so they can be corrected before publishing ("How to Proofread", 2019).

Why should you proofread?

Proofreading is important for several reasons, but most importantly for ensuring clarity of meaning in your finished text. You want to make sure your information is clear, and your message is understood – there should be no room for misunderstanding or misinterpretation.

You also want to make sure your reader is not distracted by errors. Having a lot of grammatical errors or spelling mistakes in a piece of writing is not only distracting but can also be seen as a poor reflection of your knowledge and expertise in a subject – even when your actual content is great.

Unfortunately, even minor errors in your writing can negatively affect your reputation and undermine the weight of your arguments, which is especially

important if you're writing because you want to be an influencer and be recognized as an expert in your field (“How to Proofread”, 2019).

Proofreading Techniques

Get your content right first. Proofreading is the final check of your writing. Write your content and make sure you've included all your ideas and arguments, and that you have the right structure for your type or genre of writing. Carry out overview editing to check for things like: do your paragraphs flow well from idea to idea and guide your reader through your writing?

if you're writing an essay, thesis, article, etc., does your title and your introductory paragraph let your readers know what to expect?

Is your formatting correct? e.g. titles, subtitles, contents page, headers, footers, etc.

Check for whatever's relevant to your piece of writing. Then when that's done, you can begin your proofreading.

Write first, proofread last.

Leave your proofreading until you've finished writing. Writing and proofreading/editing use very different mental processes and trying to proofread as you write can break the flow of your writing, the creative process of writing, and your chain of thought. However, this is general advice only, as many people much prefer to proofread (and edit) as they go along.

Print a copy.

Print your document out for proofreading. It helps you see errors you might have missed when proofreading digital versions. Change how it looks. If you're reading on a screen, change the font size and type.

Work on one section at a time.

If you have a very long document to proofread, break it down into sections and work on one part at a time. This way, what could be an overwhelming task becomes much more manageable. You will be able to concentrate more fully on each section and will be less likely to miss errors.

Take your time.

Read everything through slowly and carefully. Try tapping or pointing to each word with a pencil. Leave time between finishing your writing, and proofreading. For example, two or three days if you can for things like articles, essays, and ebooks, so you can look at them with fresh eyes. Check for spelling errors. Most writing tools have spell-checkers built in. Depending on your audience, if you're writing in English check you're using the correct spelling variations e.g. US or British/UK.

Check for punctuation.

Especially punctuation that commonly causes problems such as semicolons and colons. A labor-intensive but effective way to identify any punctuation errors is to pick out every single punctuation mark with a red pen.

Check for missing words.

These are very easy to miss as our brains automatically fill in the blanks, and we read what we expect to read.

Proofread for only one error at a time.

It helps you to focus and not miss proofread anything.

Identify your weaknesses in your writing, and focus on checking for these.

Every writer has them. If you know you tend to over-season your writing with semi-colons and exclamation marks, or you know you sometimes have trouble with subject-verb agreement, make a point of checking for those. When you get feedback on your writing, note down any recurring errors you make so you can hunt them out the next time you proofread.

Try reading aloud.

Very often it's easier to pick out missing words and misspellings when you have to slow down and pay attention so you can read your writing aloud. However, much as you do when you're reading your writing to proofread it, there's a chance you may also read aloud what you're expecting to read/say. So for an important document, you could get a friend, family member, or colleague to read it aloud for you instead. Or you could even try text-to-voice software.

Read it backward.

Try something different and start at the end of your text and read it backward! It might sound strange, but it's effective because it forces you to focus on just one word at a time.

Have someone else check your writing.

Ideally, you need to have more than one pair of eyes looking over your work. For things like emails that need to be sent immediately, it's not realistic to do this of course, but for RESEARCH PAPERS/longer pieces get at least another two pairs of eyes to look over your work if you can. It's not always easy to find someone to check your work, but perhaps you could partner up with someone and reciprocate.

Use Online Proofreading Software.

Online proofreading software is a very useful tool for picking up a variety of issues in your writing and suggesting ways you improve it. Remember to keep in mind not to rely on it, as it won't identify some common grammatical errors.

Hire a Professional proofreader.

If precision and clarity are vital for an important document, and if your budget allows, you can have a professional proofreader check your work. There are many sites offering proofreading services online, and finding one to suit your budget and time frame is straightforward. You can even find proof-reader who specializes in different areas. For example, academic proofreading to check for errors in your essays and research papers, or proofreading for medical, legal, or business writing.

There is a warning to the proofreading techniques suggested above - no matter how carefully a document is proofread, something will slip through the net. Who hasn't spotted a typo or two in a published novel that's probably gone through multiple stages of professional proofreading and editing?

If you have something to say that you feel strongly about, it would be a great pity if you didn't write it because of the fear that someone might call you out on your mistakes. The best way to improve your writing is to practice – keep writing, keep learning, and get into the habit of proofreading your work.

It is worth spending the extra time to make sure your writing is the best it can be, and that you're giving the best impression of yourself and your writing that you can. But don't let fear of making errors put you off writing. Every writer makes mistakes and even professionally edited and proofread documents are sometimes published with odd typos, missing words, and grammar blunders.

The Most Common Errors in Writing a Paper

INTRODUCTION SECTION

Researchers “often underestimate the 'Introduction', the first section of a manuscript, in both its relevance and its complexity”(“How to Write and Publish a Research Paper”, 2020). .

The most common mistake is to write a too long 'Introduction'. There is no specific size limit for the Introduction, but a rule of thumb is to limit the word count to about 10% of the total number of words in the manuscript.

The second most common error is a lack of coherence. Sometimes studies focus on many different questions, and their rationale is unclear. The Introduction often begins with a paragraph that contextualizes the theme of the study and presents the state of the art of what is under analysis. Authors should gradually guide the reader's thoughts to the objectives of the study, which are always described in the last paragraph of the Introduction. However, ideas should be organized so that, immediately before reading the objective, the reader understands the relevance of the topic and anticipates which gap in knowledge has to be filled.

The number of references should be limited to what is necessary. The most innovative studies tend to list few references, and an excessively large number of quotes harms the most qualified readers, as it suggests that the study does not bring anything new to the literature.

These are the most common shortcomings when writing the Introduction section. When there is any question about how to approach what and when, remember the KISS acronym: Keep It Simple, Scientist ("How to Write and Publish a Research Paper", 2020).

Recommended Guidelines

1. Be concise: no one wants to read excessively long studies.
2. As a rule, the Introduction should not be longer than 10% of the total length of the manuscript.
3. Pay special attention to text coherence and cohesion.
4. Do not present long reviews of the literature; use the literature to set the context for the problem under study.
5. Avoid sentences in which the authors of articles are the subject.

MATERIAL AND METHODS SECTION

The Material and Methods (MM) section often has errors that originate from its construction. It is written at several phases of the study and different points of its generation. Therefore, writing atavisms are frequent. All the MM sections should be written in the past tense because methods refer to what has been done, not to something that will be or is currently being carried out (“How to Write and Publish a Research Paper”, 2020).

Incomplete data are also frequent. Lack of information often results from the fact that authors have such a profound knowledge of their investigations that no information left out will affect their manuscript comprehension. However, such a gap will affect its understanding by other readers. Such inconsistencies must be avoided.

Additionally, authors often submit incomplete descriptions of their studies, which harms their reproducibility. A scientific study must always be reproducible. It should include information about the materials used, such as the active agents, manufacturers, and place of manufacture.

Finally, a very common error is not including a detailed description of statistical methods. Such a description should be at the end of the MM section. Several factors may explain this absence. The most important may be that most authors have a limited knowledge of statistics, which complicates the preparation of this manuscript section.

Recommended Guidelines

1. Write all the sections in the past tense.
2. Where necessary never forget to include IRB [Institutional Review Board] approval.
3. Describe all methods thoroughly.
4. Include all the materials used, as well as information about their manufacturers.

5. When conducting the statistical analysis of your study data, ask the statistician to describe all methods as they should be published.

Do not fail to include a detailed description of those methods in your manuscript.

RESULTS SECTION

The Results section is often inadequately short. Some authors may summarize findings insufficiently and then only refer to tables and graphs. Paradoxically, authors are also often verbose and show data in tables and graphs that repeat what has been described in the text. Tables are usually great means of showing results. However, authors have to be familiar with how to organize data in tables.

A useful tip is to check how other authors have shown their results and get inspiration to prepare your findings. An interesting format for the presentation of results is to write about the most important points in the text and then refer to graphs and tables that show findings in detail (Ten Simple Rules for Structuring Papers, 2017).

Tables are usually richer than graphs, but graphs may be a good tool to show results. However, some graphic presentations should be avoided whenever possible, such as, and especially, bar and line graphs. Figures in scientific communications are extremely relevant because they visually and intuitively show data that otherwise would have to be read. Some images are worth more than words, and this resource should be used wisely and creatively in scientific manuscripts. However, bar graphs are seriously limited when data have to be detailed. In this type of graph, different distributions may have the same graphic distribution. An alternative is boxplots, as they clearly show the distribution of data and use visual resources to present results

Another difficulty in being accepted for publications is the poor quality of illustrations in general.

Recommended Guidelines

1. Do not be too concise.

2. Avoid being verbose. Briefly report the most important findings and then refer to tables and graphs.
3. Avoid bar and line graphs.
4. Include professional-quality illustrations.

DISCUSSION SECTION

The Discussion is the heart of all scientific studies and the section where the authors should express their interpretative creativity and capacity. Several cases of “relevant scientific results have gone unnoticed by the scientific community because their authors failed to interpret the results” (“How to Write and Publish a Research Paper”, 2020). This means that data should be interpreted. Authors do not have to follow other authors' claims to argue in favor of an idea. This section is where the authors may be bold, make propositions and suggestions, and explain results; in other words, this is where they may introduce innovative interpretations. At the same time, this is where criticism of other studies that have noteworthy flaws should be made.

The most common error in this section is writing it as a literature review. The Discussion section should not be a review of the literature; it should compare and contrast findings with those reported by other authors and explain their differences and similarities.

Another frequent shortcoming is failing to include a presentation of the study's limitations. Honesty in clearly presenting limitations shows that the authors analyzed their study comprehensively. Failing to include limitations may convey the idea —often correct— that the authors simply did not understand the exact scope of the study that they have conducted.

Finally, any published study has to deal with all the results presented in the Discussion section. As a rule, if a set of data was presented, it must be discussed. Not included in this rule are minor details, such as data distribution normality and error of the method, which are discussed only

when they have a such relevant impact on data that they deserve specific consideration.

Recommended Guidelines

1. Do not make a review of the literature: use the literature to compare your results with those of other studies.
2. Make clear what the study limitations are.
3. All results reported should be fully discussed in the manuscript.

CONCLUSION SECTION

The Conclusion section should be simple. The most common problem in this section is not addressing all the objectives listed at the beginning of the study ("How to Write and Publish a Research Paper", 2020). The second most common problem is the presentation of conclusions that are beyond the scope of the study design.

FINAL CONSIDERATIONS

The purpose of this article is to improve the quality of manuscripts that authors submit to scientific journals. Following the suggestions described above will increase the chances of acceptance for publication as the "only way to get a thing done is to start to do it, then keep on doing it, and finally, you'll finish it..." (Huges, n.d.) However, "authors should be aware that writing a scientific manuscript demands careful attention and many hours of work. Even experienced authors write and review their manuscripts several times before submitting them to a journal"("How to Write and Publish a Research Paper", 2020). In science, as in literature, an author's reputation is not shaped by the number of publications, but by the quality of what is produced.

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