

University of South Africa
College of Agriculture and Environmental Sciences

TIPS FOR SCIENTIFIC WRITING

A guide for students

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For the
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University of South Africa

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Welcome to the Online Electronic Resource for:

TIPS FOR SCIENTIFIC WRITING

INTRODUCTION

Dear students, these tips on scientific writing are aimed at assisting you in the process of writing a proposal, dissertation, thesis, article or any other scientific document. Scientific writing differs from 'ordinary' writing in that it is more formal than the language that you would use when 'chatting' to your friends. This type of writing is accurate, precise, logical, coherent, consistent, focused, cohesive, clear and brief. It employs terminology that is appropriate for your subject field and uses specific research verbs which indicate that you are carrying out research (mental activities) rather than physical activities. This document is *not a textbook* but will, hopefully, help you to avoid some of the more common mistakes made by authors.

WRITING A SCIENTIFIC DOCUMENT IS A PREREQUISITE FOR ADVANCEMENT IN YOUR ACADEMIC CAREER. It is a skill that is an essential part of the toolkit of a researcher. SO WHAT PREVENTS YOU FROM STARTING TO WRITE YOUR DOCUMENT?



HERE ARE A FEW REASONS:

- **FEAR OF FAILURE:** Don't feel alone. Even veteran researchers sometimes experience feelings of anxiety when writing a scientific document.
- **WRITING IS DIFFICULT:** Yes - this is true for most people and that is why you must practice so that you can improve your writing skills.
- **PROCRASTINATION:** There are always other things that are more important than starting to write. It is obviously much more important to watch tennis or soccer on the TV. After all, the Soccer World Cup is only once every four years – and Wimbledon, only once a year!
- **FRAGMENTED EFFORT:** Very few students or lecturers have the luxury of having dedicated time to write on a full-time basis. You still have to do your work. There are constant interruptions and this makes it very difficult – if not impossible – to concentrate on writing a scientific document.
- **PERSONALITY TYPES:** You may be easily distracted or find it difficult to sit still. Perfectionists often want to get the first sentence 'right' and will spend days re-writing the same sentence or paragraph over and over again.
- **TOO MUCH INFORMATION:** You don't know where to start.

- **TOO LITTLE INFORMATION:** You don't have anything else to say, because you don't know what has been written about the topic.
- **PUTTING THE PUZZLE TOGETHER: LACK OF INTERNALISATION.** If you have not internalised your research, you will just skim the surface and will not reach the depth that is required for you to start writing. If you have not had dreams about your research, or woken up at night thinking about it, or sat in front of the TV and not taken in a single word but have been mulling over your research, you have not really made it your own. You will need to spend much more time reading, thinking and talking about your topic and research problem.

I WILL OFFER SOME SUGGESTIONS ON HOW TO OVERCOME THESE DIFFICULTIES AT THE END OF THIS DOCUMENT.

Before you can start writing, you need to understand the characteristics of a good document.

CHARACTERISTICS OF A GOOD SCIENTIFIC DOCUMENT

HAS A CLEAR, USEFUL AND EXCITING MESSAGE

IS PRESENTED AND CONSTRUCTED IN A LOGICAL MANNER

READERS CAN GRASP THE SIGNIFICANCE EASILY

THE MOST IMPORTANT CRITERIA FOR SUCCESSFUL WRITING ARE

NOVELTY & COMMUNICATION



COMMUNICATION

THERE ARE A NUMBER OF CRITERIA FOR GOOD COMMUNICATION IN YOUR WRITING. They are:

- **Know what you want to say.** If you don't, you will not be able to write an intelligible sentence! So think about what you want to say. It helps to actually talk to someone and tell them what you want to do. If they have grasped it correctly, your thoughts are clear. *If you can say it – you can write it.*
- **Know your audience.** If you are writing a funding proposal, it is the reviewers who will fund your research; if you are writing a proposal for a degree or a

dissertation or thesis, it is your supervisor(s) and the examiners; and if you are writing an article, the audience is the whole world. It is thus vital to write so that the **reader** understands what you mean. Your reader may not even live in South Africa or may not know anything about your study area. It is your duty to **write for the readers**. Be clear and concise. Remember the KISS principle: *Keep it short and simple*.

- **Be logical.** This seems to be surprising difficult for the majority of students. When writing a section – such as an Introduction - start with the general and move to the specific; start with the past and move to the present; start with one topic/sub-topic before moving to the next. Don't 'jump around' between topics/sub-topics, geographical areas or time. Don't discuss research that was done in South Africa, and then to that which was done in the USA, then global issues, then back to South Africa. **Logical thought requires planning the document beforehand.** When starting to write, **use headings and sub-headings to ensure that your work is logical.** You can always remove them later on if necessary.
- **Discuss each topic (or sub-topic) in a separate paragraph and use a 'bridging' sentence to indicate to the reader that you are moving to the next topic/sub-topic.** Each paragraph consists of 3 parts: The first sentence introduces the topic/sub-topic that will be discussed in that paragraph; the following sentences present the facts relating to that particular topic; and the last sentence is a bridging sentence that indicates what is to come in the next paragraph. Keep in mind that each paragraph centres on a single idea. Everything to do with that topic must be kept together. One sentence should follow the previous one in an understandable manner so that the work 'flows'. Once you have written a section, put your work aside for a while, **print it out** and read your work again. Ensure that everything related to the topic (according to the heading or sub-heading) are kept together. Does the paragraph make sense? Revise.
- **Ensure that the entire document 'hangs together'** i.e. there is a 'golden thread' linking the title, the aim, objectives, methodology, results, discussion, conclusion and recommendations. All aspect of the document must address a main issue or research problem – don't go off at irrelevant tangents.
- **Don't confuse or bore your reader! Say what you want to say in simple but understandable words that make sense to the reader. Thus don't use difficult, obscure language.** It is not necessary. All that you will achieve is to confuse and alienate the reader. If the reader doesn't understand what you want to say, your writing is futile. Complex ideas don't need complex language.
- Try to **write elegantly.** Use the correct terminology. Read articles published in good academic journals and notice HOW the authors expressed themselves –

and then emulate them (but ensure that it is applicable to your work). All you are learning from other authors is how to say something or how to express yourself. Entertain your audience; ensure variety in the way in which you write something. Let your words flow. Establish a rhythm for your writing. Vary the length of your sentences. This only comes with a lot of practice. **SO PRACTICE!**

- **Note the rules of correct spelling, grammar and style. This is an important part of the preparation of your document. It must be written and presented in a professional manner so that it makes a good impression on the readers. It is vital that you pay attention to this aspect as readers become irritated if the writing is sloppy and does not conform to the rules and standards of scientific writing.**

This document focuses on the last point:

The rules of correct spelling, grammar and style



STYLE

UK ENGLISH: All documents for this College (College of Agriculture and Environmental Sciences (CAES)) should be written in UK English. Set your WORD program on *UK English*. [To do this go to *review*, then open *language* then *set proofing language* and choose *English U.K.*] This will ensure that you use words such as *through* rather than the US spelling (*thru*) or *prioritise* rather than *prioritize*; *realise* rather than *realize*. Be consistent throughout your document. HOWEVER, if you are writing an article and wish to submit it to an American journal, then set your language on English U.S.

TENSES: Usually *past* and *past perfect* are used in theses, dissertations, reports and articles. (Example of past perfect: *The sample consisted of 10 people who had suffered personal loss during the last 5 years*). If you are reporting on something, use the past tense; if generalising, use the present tense. For example: *The aim of the study was to....* or *Morris (2010) found that*. However, **aims, objectives and the methodology in the research proposal** are written in the future tense. *The aim of the study is to* *A total of 200 questionnaires will be distributed to ...*

SINGULAR v PLURAL: Note the following: Analysis = singular; analyses = plural
Hypothesis = singular; Hypotheses = plural
Datum = singular; Data = plural. Data were collected **NOT** data was collected.
Words such as *each, one, everybody, neither* always take the **singular** verb e.g. *Everybody was involved in ...; Neither is acceptable.....*

Use the singular for collective nouns as in: *The country was occupied by ..; The team was represented by....*

USE OF PRONOUNS: Try to avoid using words such as he, she, it, they, this, that, unless it is absolutely clear to what they are referring.

Conjunctions such as *therefore, however, moreover, furthermore, hence* and *thus* are often used to further the argument or connect the idea to the next sentence. **Use them sparingly.** Don't start every sentence with a conjunction.

KEEP SENTENCES SIMPLE AND SHORT (KISS). However, don't make all your sentences the same length. Vary the length. Establish a rhythm. The only way to achieve this is to read many academic articles and not only concentrate on WHAT is being said, but HOW it is being said. Then practice, rewrite and revise your own writing.



DON'T USE THE SAME WORDS OVER AND OVER AGAIN.

For example:

According to Swanson (2018); According to Prince (2017);
According to...

Rather write something such as:

*According to Swanson (2018)....
Prince (2017) also indicates that.....*

Instead of writing: Figure 1 shows....; Figure 2 shows...; Figure 3 shows....; rather write: *In Figure 1 the difference between the vitamin content of paw-paw and sunflower seeds are shown. It is clear in Figure 2 that the difference between the vitamin content of these seeds are Figure 3 also illustrates the*

Use a **thesaurus** to find synonyms. Words such as *'illustrate' 'indicates' 'depicts'* and many more can be used instead of *'shows'*.

ABBREVIATIONS: Write the words out first and then write the abbreviation in brackets. For example: *The South African Weather Service (SAWS) stated that the annual rainfall figures for the Western Cape were* Thereafter you may use the abbreviation unless it comes at the beginning of a sentence. This only applies to sections other than the abstract. Limit the number of abbreviations used since the use of many different abbreviations will confuse the reader. Always keep in mind that you are writing for the reader – someone who may not be familiar with South African terminology. For instance: RAF in England refers to the Royal Air Force. In South Africa, it refers to the Road Accident Fund. You cannot take for granted that all abbreviations stand for the same thing in different countries. It is better to only use well-known and globally accepted abbreviations such as DNA.

ACTIVE AND PASSIVE VOICE:



Examples: Active voice: *The boy throws the ball.* Passive voice: *The ball is thrown by the boy.*

Traditionally, scientific writing made use of the passive voice e.g. *One hundred questionnaires were distributed to ...* or *During the period, 1 March to 30 April, 20 water samples were collected from* In these examples the active voice would be: *We/the field workers distributed 100 questionnaires to ...* or *I collected 20 water samples during the period 1 March to 30 April.* **Even when using the active voice in a document; the passive voice is generally used for the methodology section of a thesis or article.**

Supervisors and the editors of journals often have set ideas of whether the active voice is acceptable. **Follow their advice.** There is an increasing move towards using the active voice in research papers – especially in the USA.

JARGON AND SLANG:

According to the Reader's Digest (1985:313), "the distinction between jargon and slag is a subtle one". There seem to be three differences: high status groups (scientists, doctors, lawyers) use jargon while lower-status groups (teenagers, dock-workers) are credited with slag. Jargon tends to be formal, while slag is informal. Jargon tends to consist of words for new and technical concepts (eg. *black hole* (meaning a collapsed star) whereas slang often consists of familiar concepts such as *stoned* for drunk or drugged.)

All fields of study have their own jargon. It is quite acceptable to use such terms, provided that you are writing for a peer group in your discipline. It shows that you are conversant with the subject field. However, if you are writing an article for a journal that caters for a broad range of readers, you should use simpler terms or define what is meant by the term. Note that when discussing results, words such as 'significant' and 'correlation' have precise statistical meaning. However, when referring to the 'significance' of a study, the word refers to why the study was important and how the results can be used.

SLANG should be avoided unless you want to make a point. So words such as *great* or *my new shoes are cool* (nothing to do with the temperature!) or *I chatted with the CEO of the company.* Rather say, *I interviewed the CEO...* Instead of referring to *kids*, rather use *students* or *learners* or *children* (unless you are writing about goats).

CAPITAL LETTERS: Don't use capital letters in an arbitrary fashion. A capital letter must be used at the beginning of a sentence and when using a proper name e.g. the name of a person, town, country etc. Chemical symbols: ...arsenic not Arsenic; but when using the symbol, the first letter is always written with a capital e.g. As, Fe, Zn.

The writing of surnames such as Van der Merwe or Du Plessis can be tricky (Kapp, 2007). Note the use of capital and small letters in the following:

- According to Du Plessis... /According to Van der Merwe ...
- Mrs Du Plessis indicated that... / Mr Van der Merwe...

- **BUT:** Mrs Z du Plessis indicated.... / Mr J van der Merwe...

WRITING NUMBERS: Write out the numbers from 1 to 9 **in words** (one, two,.. nine), but from 10 onwards – **use numerals** EXCEPT

- At the beginning of sentence. Rather, try to change the structure of the sentence e.g. instead of *Seventy one people replied to the questionnaire...* rather write *Of the 75 people who received the questionnaire, 71 replied.*

When referring to an actual number, don't write it out e.g.

Chapter 1 (NOT Chapter one);

Paragraph 3. (NOT: Paragraph three....)

He lives at no. 9 Station Road.....(NOT He lives at no. nine Station Road.)



SPACES: When typing your document you should be aware that there are no spaces between hyphens or two numbers in a range of numbers e.g. 30-40; or with the use of post- or -based e.g. *post-traumatic stress; research-based*. However there is always a space before and after a **dash** e.g. *A number of senior citizens – many of whom were academics – were vocal about the new rules.*

There are **NO** spaces between number and units such as % and °C or °F. e.g. 180°F; 90%, but there is usually a space between a number and any other scientific symbol e.g. 10 Km, 100 KPa, 2 W.

There is **NO** space before and after a slash e.g. *formal/non-formal*.

TIME AND DATES: Use 10:00 rather than 10h00; use 20 May rather than 20nd May. 1980s **NOT** 1980's.

THE USE OF AND v &: The general rule is that the ampersand (&) may be used in a reference which is in brackets in the text, but not in the sentence itself. For example:

Two important studies have been carried out on the role of quality (Castelo & Cabral, 2018) and goodness of fit (Pisut & Connell, 2007) on consumer behaviour.

A consumer's perception of quality is a key aspect for competitive advantage and sustainability in most industries (Castelo & Cabral, 2018).

A study by Castelo and Cabral (2018) indicated that

The use of & in the references depends on the **referencing system** that you are using. e.g.

Liebenberg-Enslin H, Rautenbach H, von Gruenewaldt R **&** Burger I 2017. Understanding the atmospheric circulations that lead to high particulate matter concentrations on the west coast of Namibia. *Clear Air Journal*, 27(20), 66.

or

Liebenberg-Enslin H, Rautenbach H, von Gruenewaldt R and Burger I 2017. Understanding the atmospheric circulations that lead to high particulate matter concentrations on the west coast of Namibia. *Clear Air Journal*, 27(20), 66.

Keep in mind that you must be CONSISTENT in the way in which these are used.

GENDER-BASED/SEXIST LANGUAGE: The use of any word or term that could possibly be construed as being sexist, is frowned upon. Below are some examples and their more accepted counterpart.

SEXIST	ACCEPTED ALTERNATIVE
Chairman	Chairperson
Mankind	Humankind
Foreman	Supervisor
Man in the street	People in general
Man-made	Synthetic
Manpower	Workforce, staff
Forefathers	Ancestors

There are a number of ways to remove gender in a sentence e.g. instead of writing *A lecturer should advise his/her students to* Change the sentence to plural: *Lecturers should advise their students to ...*

Alternatively replace “his” or “her” with “the” or “a”. *A lecturer should advise the students to ...*

THE USE OF SPECIAL SYMBOLS:

Special symbols are an underutilised function of WORD and give easy access to symbols that are not on the keyboard. They are accessed by clicking on *insert*; then click on *symbol*. Select *more symbols* and then *special characters* (top RHS). An em-dash is a very long dash — much longer than a hyphen. An en-dash is slightly shorter – and is often used as a punctuation mark. There is little difference between an em-dash and an en-dash; it is a matter of preference which one you use.

Non-breaking hyphens and nonbreaking spaces are very useful. For example, it may happen that a number such as R1 000 comes at the end of a line. Since there is a space between the R1 and the 000, these may be split with “R1” shown on one line and the “000” on the next. To avoid this, do the following: *Delete the space* but leave the curser at that position (between the 1 and the 0) and *click* where the space should have been; go to *insert, symbol, more symbols, and special symbols*. Click on *nonbreaking space* and then *insert* and *close*. The entire number will now appear on a single line. The same process can be used ensure that a number and its associated unit (e.g. 5 Km) are not split if they occur at the end of a line. Note special symbols such as the copyright©, registered® and trademark ™.

SPELLING AND GRAMMAR



BAD SPELLING SHOWS A LACK OF INTEREST AND INSUFFICIENT ATTENTION TO DETAIL. IT IS NOT ONLY IRRITATING, BUT MAKES A BAD IMPRESSION ON THE READER. KEEP A DICTIONARY HANDY AND USE THE SPELL-CHECKER FUNCTION ON YOUR COMPUTER.

Note: If your computer underlines a word **in red it usually means that the spelling of the word is incorrect. Always check where the document shows these underlined words and correct them – but only where necessary. (It is possible that there are specific terms used in your discipline that are not recognised by the program.)**

USE OF AN APOSTROPHE:

Apostrophes are used to indicate the **possessive form** (*the boy's shoes were lost* (singular) or *The boys' shoes were lost* (plural)) and to indicate that a **letter has been omitted** (e.g. *don't* (do not), *isn't* (is not)). **However**, *The dog wags its tail* is correct. The general rule is that one does NOT use an apostrophe when writing about inanimate things. Don't say: *The car's keys were ...* but *The keys of the car....* or *The car-keys were...*

PUNCTUATION: COMMAS (,) COLONS (:) SEMI-COLONS (;) BRACKETS (..) AND DASHES (-).

These indicate a pause in the sentence. A good way to know when to use a comma or any other punctuation is to read the sentence out loud. Wherever you pause, one of these punctuation marks is required.

COMMAS (,) separate main clauses that are linked by coordinating conjunctions such as *and*, *but*, *or*, *for*, and *nor*. e.g. *The house was in ruins, but the garden was beautiful*. They are also used whenever there is a list of items e.g.

The Weather Service predicted a warm, sunny day for today.

Bacillus cereus, staphylococcus aureus and Klebsiella pneumoniae were found in the sample.

I came, I saw, I conquered.

Note the positioning of the comma may change the meaning of the sentence e.g. *For numbers with four figures only, commas are optional* v *For numbers of four figures, only commas are optional*. (The first example means that numbers ranging from

1 000 to 9 999 may be written with a comma i.e. 1,000 to 9,999) while the second example indicates that only commas and not full stops or colons or semicolons etc. can be used)



When the clauses are NOT linked by a coordinating conjunction, a **SEMICOLON (;)** is used instead of a comma e.g. *The house was in ruins; the garden looked beautiful.* A semicolon is used when **contrast** needs to be indicated.

When the clauses are parallel in structure or have a logical relationship,

a **COLON (:)** is also possible e.g. *The house was old: the garden was ancient.*

BRACKETS indicate an aside or supplementary material that is not crucial to the meaning of the sentence but merely elaborates on it.

If the bracketed material can connect or contrast with its surroundings more than material set off by commas, **DASHES** may be used.



Note the following examples:

Africa is endowed with a variety of natural – living and non-living – resources, such as water, diverse flora and fauna (including fish stocks), minerals, and hydrocarbons [1].

The Erongo Region is located in the western part of Namibia and is bounded by the Atlantic Ocean to the west and the continent's escarpment to the east (approximately 180 km inland)[2].

Water inflow in deep mines, building basements, underground tunnels (water and transport), subsurface water disposal sites (nuclear and other) and large rock caverns (hydro-electric and storage facilities) need to be quantified to create safe operational conditions [3].



QUOTES:

Double inverted commas (“...”) are generally used when you quote something. If there is a quote within the original quote, you may use single quotes (‘ .. ’) or if you add your own comments to a quote.

Do not over-use quotes since this indicates that you have not integrated information, but are just using a number of quotes to prove a point. It is a good idea to only use quotes from well-known sources such as Einstein, Shakespeare etc.

HYPHENS:

The hyphen shows that two words are linked together to form a totally new word e.g. *small-stock farm* vs *small stock-farm* (Small-stock farm is a farm of any size where sheep and goats are farmed). A small stock-farm is a small farm with stock of any kind.

Words with *-based*, always have a hyphen e.g. research-based. BUT: The troops were based at Cape Town.

Words such as first-year, second-year students always have hyphens. Note that some words may have more than one hyphen e.g. eight-year-old boy.

To avoid the hyphenated word being broken in two when it appears at the end of a sentence: use the **special symbol** in the insert function.

Words starting with *post-* are usually written as one word; otherwise they may be hyphenated. Consult a dictionary to find the correct spelling.

ADJECTIVES AND ADVERBS:

Words such as *only* should appear next to the word or phrase to which they refer. Note the different meanings of the sentences when the word *only* is placed in a different position:

It took only five minutes to complete the first test.

It took five minutes to complete the first test only.

DON'T SPLIT THE INFINITIVE:

Do not put anything between “to” and the verb.

Goldman (20//) attempted to control the airflow to ...

Goldman (20//) tried to successfully control

AMBIGUITY:



This means that a statement is open to more than one interpretation.

Examples:

- ***The new study on obesity looks for a larger test group.*** (Does this mean that they required more people for the experiment – or do they require fatter people?)
- ***Please send us your ideas about sky-diving on a postcard.***
- ***A piano is being sold by a lady with carved legs.***
- ***The construction of the bridge is being held up by red tape.***
- ***The police have begun a campaign to run down jay walkers.***

- *The students are revolting.*
- *Visiting aunts can be a bore.*
- *Tom phoned his brother before he left for work.* (Who does 'he' refer to? Did Tom phone before he (Tom) went to work or before his brother went to work?)



COMMON MISTAKES

The following section makes use of definitions and examples given in the Reader's Digest publication: *The Right Word at the Right Time* (1985) (see reference list).



AFFECT v EFFECT: Effect = noun = a result; an influence, impact on. To effect = to move emotionally e.g. *His speech had a profound effect on my study patterns.* Affect = verb = to influence. *I am affected by.... The cold weather is affecting my health.*

ADVISE vs ADVICE: Advise = verb (to tell). Advice = noun – means to give counsel or guidance. *The lecturer advised the students to visit the library...* BUT *The students followed the lecturer's advice.*

LICENSE v LICENCE: License = verb. e.g. *You don't have license to obtain material illegally.* Licence = noun e.g. *driver's licence.*

PRACTISE v PRACTICE: Practise = verb. *The player practices every day.* Practice = noun e.g. *A doctor's practice.*

PROGRAMME v PROGRAM: In UK English, program is only used for a computer program.

CITE v SITE: To cite is to provide a reference to a statement within a text. These are given in a variety of ways such as in brackets or by indicating that the idea is not your own but originates from someone else. Site (although pronounced in the same way as cite) means a place or location. For example: *The new shopping centre was sited 100 m from the nearest garage.*



DEPENDANT v DEPENDENT: Dependent = adjective; Dependant = noun. e.g. *The boy is dependent on his uncle for support* BUT *The boy is a dependant – he will starve without support.*

THAT v WHICH: *That* involves a restrictive clause. It is a vital part of the subject. It has no commas before or after e.g. *The car that has a dent in the bonnet is in the garage.* Here the clause (a dent in the bonnet) is restrictive. The emphasis here is on one specific car i.e. the car with the dent in the bonnet.

Which is followed by a non-restrictive clause. There is usually a comma before the word *which* and again after the clause. e.g. *The car, which has a dent in the bonnet, is in the garage.* This is case the clause is non-restrictive – the fact that there is a dent in the bonnet is not important. It is just an aside.

If there is already a '*which*' or a '*that*' in the sentence, then the other term is used later in the sentence e.g. *Which is the horse that won last time? Is that the horse which won last time? We ate that which was placed before us.*



TO v TOO v TWO

To has many meanings and can be placed in many positions in a sentence. e.g.

Please put your mind to what the author could be referring to here.



Too also has different uses – most often to modify an adjective. In this case, that adjective should be placed after the noun it qualifies e.g. *The luxury edition is too expensive for me. These shoes are too big for me.* In these two cases, *too* is used to convey the idea of excess.

It can also be used instead of 'also' or 'in addition' e.g. *A large and growing concentration of lower-income citizens... are increasing the cost of city services... There is a growing' skills mismatch' too.*

Two = 2.

COMPARE WITH v COMPARED TO: Compare *to* is used to note a **similarity** between two unlike things e.g. "*Shall I compare thee to a summer's day?*"

To compare *with* is a combination of *compare to* and *to contrast with*. It is used to show that **two alike things are different**. *His latest composition can't compare with his previous one* – meaning that his latest composition is not as good as his previous one.

MAY v MIGHT: *May* suggests a serious possibility; *might* = remote possibility. *Might* must be used when referring to past possibilities e.g. *We were warned that we might miss the plane.*



NOTE: The past tense of lead (to lead) is led. e.g. *Hannibal led his army over the]*

Note the spelling for FULFIL, FULFILMENT (not fullfill or fullfil or fulfill).

NOTE: To indicate a range of numbers: if you use the word between, the numbers are separated with **and** e.g. *The ages of students varied between 15 and 20* **BUT** if you use the term **from**, the numbers are separated with **to** e.g. *The ages of students ranged from 15 to 20.*

NOTE: Perception of not perception on. e.g. My perception of art does not agree with that of **NOT** My perception on art.....

Kapp (2007) quotes Irina Russell (“Writing Erudite (?) Papers. One of the joys of being an academic”) in which she indicates what **NOT** to do by illustrating each with an obvious error:

Never use a preposition to end a sentence up with
And, never begin a sentence with a conjunction
A singular subject have singular verbs
Avoid repetition, duplication and reiteration
Remember to check your spelling
Keep your sentences short because if they get too long your reader will have difficulty in remembering what it is you were on about at the beginning and may even start to think about somethings else, like who’s winning the latest test in the West Indies.
Correct punctuation is, very important.



EXERCISE: correct each of the above points by rewriting each sentence. (The corrected version is given at the end of the document)

IN GENERAL:

DON'T USE	REPLACE WITH
<i>like (a is like b)</i>	similar to
<i>like (a renowned scientist <u>like</u> Einstein)</i>	such as
<i>individual</i>	person
<i>perception ON</i>	perception OF
<i>Etc.</i>	Such as
<i><u>do</u> research</i>	conduct research
<i>get</i>	obtain, gain, acquire, find
<i>give (e.g. give results)</i>	present

My personal ‘hate’ is when authors leave out important pronouns (such as “THE” or “A”).



RULES FOR SENTENCES AND PARAGRAPHS

CUT THE CLUTTER: Omit needless words and phrases

Edit out "it is" "it was" "there is" "there are" and "there has been".

Delete the obvious e.g. *According to an expert, something went wrong during the crash.* Did it really take **an expert** to know that? *If the strike doesn't end quickly, it may take a while.* (really?? – gee whiz!)

Keep terms such as "It is important ..."; "It is hypothesized that..."; "It was predicted that..."; "There is evidence suggesting that..."; "There is a significant relationship..." to a minimum or delete.

Read through a paragraph and try to 'tighten it up' so that the meaning is still clear. What can be deleted? What is extraneous and not relevant? Is there a better word/term that can be used? (Use a thesaurus to find synonyms – but BEWARE! - do not just choose any synonym – it must have the correct meaning). Does the sentence make sense? Do the sentences flow logically?



Example:

Original version:

In the year 2002 attempts were made through the Limpopo Basel Convention initiative on health care waste management, talks were held and the objective was to try and address the issue of poor or improper health care waste management but after all deliberations made from the talks , in practice and currently the situation remains the same because the Province still does not have hazardous waste landfill site and managing this waste remains a problem as Hospitals are forced to outsource the waste to private waste management groups. [88 words]

Shortened version: (note – this is just one of many possibilities)

The Limpopo Basel Convention was initiated in 2002 to address the issue of the management of health-care waste. Despite talks being held with relevant provincial authorities, the situation remains unchanged since Limpopo Province still does not have any hazardous waste landfill sites and hospitals are forced to outsource to private waste management groups. [53 words]



DO NOT EXCESSIVELY REPEAT WORDS: You will pick up repetition by reading your work out loud.

• **Example (Stanford University, 2018):**

Although there are several self-report symptom measures available that evaluate symptomatic distress, the utility of such instruments for measuring outcome is limited. Many symptom measures group symptoms into categories and provide clinicians only with information about specific problems rather than a global measure of symptom severity.

v

While several self-report inventories evaluate psychiatric symptoms, the utility of such instruments for outcome research is limited. Many of these measures group items into highly specific syndrome categories, providing little information about global symptom severity.



MAINTAIN PARALLELISM THROUGHOUT i.e. **the sequence in which things are described.** For example, when writing a proposal or a report (dissertation/thesis) and using the Objectives as basis, describe the methodology of Objective 1 before dealing with that of Objective 2 etc. In the results section: present the results related to Objective 1 first, thereafter, the results of Objective 2. Follow the same pattern for the discussion section

before synthesising all of the findings.

CONSISTENCY: Don't mix singular and plural in one sentence e.g. *He wanted to work hard so that **they** could pass.* ❌ *He wanted to work hard so that **he** could pass.* ❌

When there are two accepted ways of spelling a word (e.g. focused/focussed) **decide on one** and use it throughout the document.

TECHNICAL ASPECTS

In addition to using the correct style, grammar and spelling, it is essential that your work appear neat and methodical. Important points to note are:



NUMBER THE PAGES:

When writing a dissertation, thesis or report, the cover page is usually not numbered and the page numbers of the preliminary sections (such as the declaration, list of abbreviations, list of figures etc.) have small Roman numerals such as (i), (ii) etc. However, the pages of the rest of the document

are shown using the Arabic numbering system (1, 2, 3 etc.) How does one manage this? There may be a number of ways to do this, but here is the technique that I use.

Step 1: Start on the cover page. Go to *page layout* and select *breaks* and then *next page*.

Step 2: On the page following the contents page go to *insert*. Select *page number* and select your choice of the position of the page number e.g. *Bottom* and then decide whether you want the page number to be positioned in the centre or to the left or to the right. *Click* to select. *Page number* will now appear on the top toolbar.

Step 3: Select *format page number* and choose the format that you want to use. Use the dropdown menu for this (in this example it would be i, ii, iii.) and click on the *OK*. While there, go to *page numbering start at* and select *i*.

Step 4: To change the page number format from Roman to Arabic numbering: go to the last page of the preliminaries (the page before Chapter 1). Now go to *page layout* and click on *Breaks*. Select *next page*.

Step 5: Ensure that your cursor is now on the first page on Chapter 1. Go back to *insert* and repeat the process, but in this instance *choose the numbers 1, 2, 3* etc. and then *OK*.

If you have made an error, you can always select the *remove page numbers* option.

Note the wide variety of formats that are available.



PAGE MARGINS:

If you look where the thick line has been drawn you will notice that all the paragraphs touch this line. That is what block or justify the margins mean

Your work will look much neater if you **justify [block] the margins**.

Compare these two paragraphs:

Often students do not know what they want to write on. If you don't have a clear idea, asking you to 'choose' any topic that interest you is to leave you feeling quite lost and under pressure to find something, anything! Such looseness can result in you floundering for a long time (not altogether a bad thing in itself perhaps!) and often leads to ambitious, vague, uncritical approaches to a topic. In cases where you clearly do not know what to write on, you can ask your supervisor [4]

Often students do not know what they want to write on. If you don't have a clear idea, asking you to 'choose' any topic that interest you is to leave you feeling quite lost and under pressure to find something, anything! Such looseness can result in you floundering for a long time (not altogether a bad thing in itself perhaps!) and often

leads to ambitious, vague, uncritical approaches to a topic. In cases where you clearly do not know what to write on, you can ask your supervisor ... [4].

HEADING & SUB-HEADING NUMBERING:

Be consistent with your numbering style. Decide how you are going to indicate the title of the chapter, and then the main headings, first, second and third order headings. Options include: capitals, bold, small letters, italics, roman numbers or letters or a combination of these. You can also vary the positioning of the headings and sub-headings. For the latter, you will have to decide on the tab settings. Don't make the indents too wide or else you will run out of space!

Here is an **example** that was used in a Water Research Commission **research report** by Olivier & Jonker (2013):

CHAPTER 1: SETTING THE SCENE

1.1. INTRODUCTION: THE NATURE OF THERMAL SPRINGS

- 1.1.1 Background
- 1.1.2 Physical characteristics
- 1.1.3 Chemical composition

1.2 GLOBAL PATTERNS OF THERMAL SPRING USE

1.3 HISTORICAL USE OF THERMAL SPRINGS IN SOUTH AFRICA

- 1.3.1 The period prior to 1900
- 1.3.2 The changing scene in the 20th Century

1.4 MOTIVATION, AIMS AND OBJECTIVES OF THE STUDY

CHAPTER 2: THE GEOLOGICAL AND BIOLOGICAL HOT SPRING SCENE IN SOUTH AFRICA.

2.1 AN OVERVIEW

- 2.1.1 Methodology
- 2.1.2 Location of thermal springs
 - 2.1.2.1 *Geological distribution*
 - 2.1.2.2 *Geological controls*
 - The tectonic setting*
 - The role of structural geology*

2.2 THE BIOLOGICAL SETTING

etc

Note that the numbering only extends to the 4th order e.g. 2.1.2.2. In the example shown above, there would **not** be a sub-heading number, 2.1.2.2.1. This is why the following sub-headings (*The tectonic setting* and *The role of structural geology* are not numbered. However, note the positioning of these sub-heading in the Contents Page – this makes it clear that they are 5th order sub-headings).

Ensure that you use the same layout in the document itself. The heading/subheadings must be identical to that given in the Contents.

INDICATING PAGE NUMBERS IN THE CONTENTS SECTION:

Ensure that the page numbers of each of the sections as shown in the Contents page are correct. This also implies that the page number is aligned to the specific heading. Don't use tabs or dots (.....) between the heading and the page number. I use a table with two columns to ensure that everything is aligned. The second column is obviously much narrower than the first. I show all the cell borders while completing the CONTENTS page, and only remove them once I have completed this section.



PARAGRAPH AND LINE SPACING

In order to ensure that the line- and paragraph spacings are consistent throughout your document, pre-set them by going to *page layout*, then *paragraph*. Click on the small arrow next to the word *paragraph*. Ensure that you are on *indents and spacing* page. Under *General*; set the *alignment* as *justified*; the *spacing* as '0 pt' for *above and below*; and the *line spacing* as *multiple, 1.5*. Then click *OK* or set as *default*.



TABLES AND FIGURES:

Ensure that:

- ❖ All tables and figures are referred to in the text.
- ❖ Tables and figures are still clear and **legible** when the table or figure is reduced in size.

Maps should have a scale and a North (N) arrow.

Ensure that you refer to all the tables and figures in the text. Thus 'tell' the readers when they should look at the table or figure. **Note:** When referring to a **specific table or figure**, use capital letters (Tables, Figures). For example: "*Data may be gathered by a variety of data collection methods. These methods correspond with the data sources (see Table 7.1). Using this classification as a point of departure, a typology of data collection methods is presented in Table 7.5*" (Mouton, 2001:104).

Remember to provide a reference for the table or figure if you are copying it from elsewhere, even if you have modified it. You must provide the source for the original. Acknowledge the source of a photo and obtain permission for using it from the person who took the photograph or from the editor of the journal or publisher of the book.

Tables have **headings** above the table itself whereas **figures** have **captions** below the diagramme.

Example of a table (Rampedi, 2010)

Table 2: Specific plant parts used for beverages

Plant part used	Number of plants (%)	Traditional beverage
Fruit pulp	42 (78%)	Fruit juice
Fruit pulp	14 (26%)	Beer; Spirits
Fruit pulp	1 (2%)	Tea
Leaves and twigs	5 (9%)	Tea
Flower nectar	1 (2%)	Tea
Stem cell sap	1 (2%)	Beer
Roots	1 (2%)	Tea
Bark	1 (2%)	Tea

Example of a figure (Jonker *et al.*, 2013)

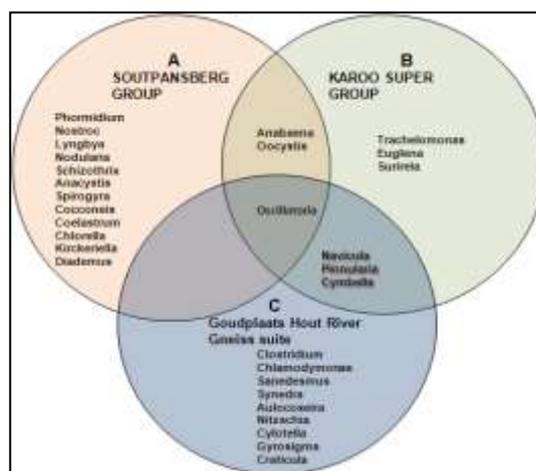


Figure 3. Geological distribution of algae at thermal springs in Limpopo. (A= Mphephu and Siloam; B= Tshipise and Sagole; C= Eiland and Soutini)

Decide on the **format of Tables** that you are going to use. Decide on aspects such as whether the heading will be inside the table or above it? Are you going to show the cell borders or not? Will the letter in a table be the same size as in the rest of the document? Where will you place the heading? – in the middle or to the left? Will the heading be in caps? bold? This is especially important when writing an article. Interrogate the specific journal in which you want to publish. Each journal has its own format. Follow their rules.



EXERCISE: Examine the format of tables in a variety of different academic journals and note the format of the tables.

If you are writing a dissertation or thesis, it is a good idea to number the figures and Tables sequentially **within each chapter**. For instance: the first figure in Chapter 1 = Figure 1.1 (not Figure 1). The second one is Figure 1.2 (not Figure 2). The first table in chapter 5 would be Table 5.1 etc. This will make it much easier to make any changes at a later date.

Decide what style you are going to use for the figure captions e.g. *Fig. 1.1:* or *Figure 1.1* or Figure 1.1. or Figure 1.1 (without the full stop) or Fig. 1.1: ...

There are so many styles. Select one and use it throughout the manuscript. **Be consistent.**

SOME SCIENTIFIC TERMS

There is often confusion with terms used specifically in proposals, dissertations and theses. Unless specified by your supervisor/department use the following:

MOTIVATION v SIGNIFICANCE:

Motivation applies to the **reasons why the research needs to be conducted**. Thus it is the motivation **FOR** the study. **Significance** applies to how the **(RESULTS OF) THE STUDY** can be used/why they are important? Thus: the significance **OF** the study. (*Significance* includes the actions that can be taken based on the results – including practical actions relating to theory, practice or policy.)



AIM v OBJECTIVES:

The aim is the overarching goal of the entire study. It reflects the main research question. There is usually only one aim. Objectives are the sub-aims or sub-questions i.e. the questions that must be answered so that an answer is obtained for the main research question. They form the steps that must be carried out so as to achieve the aim. Each objective is a small research project with its own aim, research design, data collection and data analytic methods. Both the aim and the objectives start with “to” followed by a **scientific action verb**. An action verb indicates (to the reader) that you are conducting a research activity.



Scientific action verbs include:

EXPLORATORY VERBS such as explore, identify, discover, examine, characterise, document, determine, investigate, analyse. These verbs answer the question WHAT? What does it look like? What are its components? etc.

DESCRIPTIVE VERBS such as: map out, audit, describe, compare, monitor, track.

EXPLANATORY VERBS such as: explain why, construct a causal model, compare, test a hypothesis, interpret.

EVALUATIVE VERBS such as evaluate, assess, determine impact, monitor outcomes. These verbs answer the questions HOW? or WHY?

RESEARCH HYPOTHESIS v STATISTICAL HYPOTHESIS.

The **research hypothesis** is an educated guess of what the answer is. A research hypothesis is often used when the research is aimed at confirming/refuting research results that have been conducted elsewhere/previously. Thus, you already have an inkling of possible results. A **statistical hypothesis** is a statistical technique aimed at determining the likelihood of a result of an experiment being valid or due to chance.



**AVOID THE FOLLOWING
AT ALL COST:**

- ❖ **PERSONAL ATTACKS** on other researcher or authors. You are free to disagree with anyone, but be tactful. Don't say "Only fools will agree with the findings of" Or "The government doesn't care about supplying clean water to people". Your RESULTS may agree with or differ from those found by x, y or z. (Keep in mind that technology is changing at a phenomenal rate and it is only for the last 25 years or so ago that lecturers have had access to computers and laptops. Some of your older supervisors may even remember a time that their dissertations or thesis were typed on a typewriter and they literally had to cut (using a pair of scissors) and pasted (using glue) to make changes. Maps were drawn by hand; and calculations were done using a slide rule, a log book or a hand-held calculator. Much more information can be obtained on any topic in this day and age – but don't discount the older research - it laid the basis for what you are investigating. It is not surprising that the results of research using the latest technology might differ from older work.)
- ❖ **PERSONAL VIEWS.** There is no place for personal views in a scientific document. All information/results are based on facts/research results. **Keep emotion, political views and religious views** out of your work. **Never write: / believe or I think**
- ❖ **BIAS.** It is not your job as a researcher to PERSUADE/CONVINCE the reader of anything. You may not have an objective such as "To **convince** the government that " NO, it is your duty to present results to the readers and to discuss their meaning by placing them in context with other research so as to make logical deductions as to the actions that should be taken to solve the initial problem.

Don't discuss only those results that suit your original hypothesis.

If you already know the answer, why do you bother to do the research?



PLAGIARISM. This means copying or stealing someone else's ideas or the infringement of copyright i.e. when you use thoughts of another author without authorization and the representation of that author's work as your own. This is why it is vital to always cite the original author from which you obtained information. You must summarise or paraphrase the author – and, of course, cite the author(s). See the Policy on Academic integrity at

<https://www.unisa.ac.za/sites/corporate/default/Colleges/Agriculture-&-Environmental-Sciences/Masters-&-Doctoral-information>



SUMMARY:

SOME IMPORTANT TIPS

- ✓ **In order to be able to write, you must READ, READ, READ articles in academic journals.** Don't only read articles for the contents or the results, but study the language that the authors use and emulate.
- ✓ **PLAN WHAT YOU WANT TO SAY.**
- ✓ **SAVE THE DOCUMENT FREQUENTLY AND MAKE BACKUPS.** Don't keep the laptop and backups in the same place or in the same bag! It happens all too often that the bag (with laptop and backups) is stolen. So keep a spare copy in a safe place.
- ✓ **DO NOT SUBMIT THE FIRST DRAFT OF YOUR DOCUMENT.** Once you have written a section, read it through and see if you can spot any obvious errors. Then put it away for a week or so – and then re-read it as if you were not the author. You might be surprised at the nonsense you wrote. Make the necessary corrections and repeat the exercise a few times. Only submit once you have truly done your best.
- ✓ **HAVE A 'PEER EVALUATION' GROUP.** They don't need to be from the same discipline – in fact – it is preferable if they are not. This means that they won't make assumptions about what the reader knows. Don't ask husbands/wives/girlfriends/boyfriends to be a member of the group – not if you want the relationship to continue.
- ✓ **DON'T TAKE CRITIQUE, PERSONALLY.** Critique is meant to assist you. It is not an attack on your ability. Keep in mind that it is very difficult to see one's own mistakes and thus you need constructive criticism of your work. Take comments seriously and make changes where necessary.

- ✓ **ENSURE THAT THERE IS A 'GOLDEN THREAD' THROUGHOUT THE DOCUMENT** – some issue/theme/problem that brings cohesion to all parts of the document.



POSSIBLE SOLUTIONS TO WRITING BLOCKS

- ✓ **JUST DO IT.** Start. Don't wait for inspiration to come to you. It doesn't matter how rough your first draft is. You will have to revise your work many times, so just get started by getting something on paper, you can always add the references later. If you have planned your document, you will have some idea of where to start.
- ✓ **WORK ON ONE PART AT A TIME** and finish each. It is daunting to think of writing the entire report/article or thesis. Concentrate on one small part and aim at completing it. Once finished, tackle the next – and so on.
- ✓ **REMIND YOURSELF.** Once you have progressed to a certain point, but have not the time or opportunity to complete the next part, jot down any ideas that have occurred to you. Highlight them so that you can easily see where you should start working when the next opportunity arises. Don't think that you will fix something or add something later. **You will forget.** Write a note to yourself and highlight it. It may sometimes be a week or two before you can start working on your document again and it is so easy to forget what you wanted to do next.
- ✓ **WORK ON YOUR DOCUMENT REGULARLY** - even when you don't feel creative. Do 'manual' tasks such as checking whether the tables and figures are numbered correctly. You will soon find that you are working creatively.
- ✓ **CREATE BLOCKS OF TIME.** Very few people can write an article using a few minutes here and there. Arrange for a day or two in which you will be able to concentrate on writing and nothing else.
- ✓ **ARRANGE A SUPPORT SYSTEM.** Ask a neighbour to fetch the children from school. Stock up on frozen meals so that you don't have to cook or worry about shopping for groceries. Give yourself dedicated time to work on your research.
- ✓ **REMOVE YOURSELF PHYSICALLY.** Don't even try to work in your office. There will be constant interruptions to distract you. It might be a good idea to attend an article-writing or proposal-writing workshop or retreat where you can focus on your writing.

- ✓ **HAVE A REWARD SYSTEM.** Reward yourself with something you really like (such as a good glass of wine or similar) once you have completed a section of work. Pavlov's Principle – you will soon associate writing with the rewards.
- ✓ **KEEP A MEMO BOOK AND PENCIL/PEN HANDY** – next to your bed, in the bathroom, near the TV, in the kitchen – in every part of your home. If you wake up at midnight with a brilliant idea, have the tools handy to write it down (or else you will wake up the next morning, remembering that you had a great idea – you just won't be able to remember what it was).
- ✓ **CHANGE YOUR ATTITUDE.** This is the one thing that you can change. Enjoy the process of growing as an academic. Yes – it not always easy, but it is so rewarding.
- ✓ **ABOVE ALL: ENJOY WHAT YOU ARE DOING.**

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Other sources

Jan Venolia's *Write Right!* or *Grammar Girl's Quick and Dirty Tips for Better Writing* by Mignon Fogarty. Also, read blogs such as [Fogarty's](#), [Grammarphobia](#) and [Daily Writing Tips](#).

Once you've read up, use an app to quiz yourself. [Grammar Up's](#) basic version is free for iOS and Android devices. The [Practice English Grammar app](#) for iOS and Android has free basic quizzes and premium.

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CORRECTED VERSION OF RUSSEL'S EXAMPLES

Never use a preposition to end a sentence. ~~up with~~

~~And,~~ Never begin a sentence with a conjunction.

A singular subject ~~have~~ has a singular verbs-verb.

Avoid repetition, ~~, duplication and reiteration~~

Remember to check your ~~speling~~ spelling.

Keep your sentences short. ~~because if they get too long your reader will have difficulty in remembering what it is you were on about at the beginning and may even start to think about somethings else, like who's winning the latest test in the West Indies.~~

Correct punctuation is, very important. (Remove the comma)