PRINCIPLES OF ACADEMIC WRITING

Thesis Writing Workshop 2
Science/Applied Science Stream
9am-12pm Friday 23 September 2011
Social Sciences South Rm 2202

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Objectives Workshop 1:
- To discuss the purpose of a thesis
- To determine the elements of a good thesis
- To discuss how different theses are organised
- To provide strategies to equip you to write a good thesis

Objectives Workshop 2:
- To consider strategies for writing a thesis that has a logical structure and communicates effectively
- To consider sentence and paragraph structure
- To demonstrate the essential components of an introduction

Objectives Workshop 3:
- To explore writing as a process
- To practice using strategies to facilitate your continued writing

Workshop plan

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Acknowledgements

This workshop booklet is adapted from Krys Haq’s & Michael Azariadis workshop notes. Krys thanks Writer’s Liberation Front members Dr Jennifer Davis and Helena Clayton, respectively, for finding the Gopen & Swan 1990 reference and for passing it on to her.
Reflecting on academic writing skills

How do you think academic writing (scientific writing / technical writing) for your thesis differs from writing you have done previously?

What thesis writing skills do you have?

What do you find difficult when you are writing? What skills do you need to develop?
Features of ‘good’ academic writing

Aim for a thesis that is easy to read (accessible), interesting & intellectually rigorous

In this order of importance:

- Precise & complete – conscious choice of words that conveys exact and complete meaning. Don’t leave your reader thinking ‘What?’ or ‘So what?’
- Clear – simple language with exception of required technical terms
- Brief – as short as possible, avoiding unnecessary words or sentences (repetition & redundancy)

And also:

- Effective structure – good use of sentences & paragraphs and well organised sections, chapters & thesis
- Correct spelling and grammar – more important to clearly express and logically order ideas, as once message is clearly communicated someone else can help you correct spelling and grammar
- Simple, clear illustrations – indicative of ‘higher order’ thinking / more sophisticated understanding
- Follows disciplinary conventions – before deviating from convention make sure you know what the convention is
- Interesting

[Adapted from Dr Juniper’s powerpoint presentation ‘Writing your Thesis’. See http://www.postgraduate.uwa.edu.au/students/journey/writing]

Consider the micro and macro structure of your thesis. Review how these elements link together & their internal consistency.

Sentences
Paragraphs
Sections
Chapters/Papers
Thesis
Simple writing exercises

Example: A sentence with too much information. Edit by the inclusion of full stops into manageable sentences. (Hint: Read this aloud).

The level of demand on the commitment and ability of communities to undertake coordinated and targeted action in Natural Resource Management has increased over the last two decades and there has been recognition of the need to develop community capacity to meet these new challenges yet there is little evidence of consideration of the notions of communities that can be derived from a rich, if fluctuating, history of community research.

Example: Sentences that are unnecessarily ‘wordy’. Remove any unnecessary text.

From analysing the data presented in Table 2 the results show that sample A is higher in sodium levels than sample B.

Example: Sentences that are incomplete – include information that addresses ‘So what?’ and clearly indicates what is the point of reference is.

Although many of these instruments are commonly applied to the assessment of learning in young children, they have a number of potential limitations. Childhood learning is important because….

Example: Sentences with multiple interpretations (meanings). What would be a more precise way to write these sentences?

Sample X was chilled.
Patient 3 had an incurable disease.
Writing well

Do not aim to impress....

“If the writing is clear and simple, fellow scientists will not only find your writing pleasanter to read, but they will also think you are a better scientist, have a better organised mind, and are more competent. Readers seem less and less prepared to accept the traditional smokescreen. If they can understand easily, they are more likely to be impressed with the quality of the thought behind the words”. (Turk & Kirkman, 1989, p. 18)

...aim to communicate.

“It does not matter how pleased an author might be to have converted all the right data into sentences and paragraphs; it matters only whether a large majority of the reading audience accurately perceives what the author had in mind.” (Gopen and Swan, 1990, p. 550)

Writing can be structured to support readers to predict what will come next - well written work is structured so that readers are guided in what will follow, and their expectations are actually fulfilled.

“If the reader is to grasp what the writer means, the writer must understand what the reader needs.” (Gopen and Swan, 1990, p. 550)

What does the reader need?

• Readers actively seek a basis for prediction
• Readers form expectations based both on topic and organisation
• Reader predictions are based on words that are read (from the top)
• Topic predictions may be fulfilled by word repetition, predictable word groups, disciplinary conventions
• Items that fulfil reader predictions need to be in a noticeable position; at the front of the text unit
• Readers expect to continue predicting until the final section
• Readers become confused when predictions are not fulfilled
• Unpredicted/unpredictable topics increase reader difficulty

[Adapted from Lawe-Davies, 2001]

Academic writing is very different to fiction – there should be not twists or turns of the plot and no surprise endings.
Writing sentences - important structural principles

Make your sentences accessible and clear, without minimizing the complexity of ideas conveyed.

Positioning words
- a sentence should focus on a single item
- place the object of focus at the beginning of the sentence – in the ‘topic position’
- follow the object of focus as closely as possible with its verb
- place new information you want to emphasize to the reader at the end of the sentence – in the ‘stress position’
- choose a verb to articulate action in every clause or sentence
- avoid ‘noun clusters’ or ‘stacked modifiers’

Linking sentences
- in general, provide context for your reader before asking that reader to consider anything new
- place information presented in previous sentences in the topic position to provide link between old and new sentences and set the context for the new sentence - linkage backward and contextualization forward
- use transition words to guide the reader – these words allow the reader to follow your connection of items/ideas
- try to ensure that the sentence coincides with the relative expectations for emphasis indicated by the structure

General guidelines
- make sure your sentence is complete - don’t leave the reader with a sense of ‘So what?’ Either follow with an explanation or expand sentence to explain significance of sentence.

Handouts provided at workshop:
Grammatical Terms: some definitions
Transitional Words and Other Useful Words and Phrases
Connectives
Some difficult sentences and modifications that make them more comprehensible
[Adapted from Gopen & Swan, 1999]

Example:
The smallest of the URF’s (URFA6L), a 207-nucleotide (nt) reading frame overlapping out of phase the NH₂-terminal portion of the adenosinetriphosphatase (ATPase) subunit 6 gene has been identified as the animal equivalent of the recently discovered yeast H⁺-ATPase subunit 8 gene.

The smallest of the URF’s, URFA6L, has been identified as the animal equivalent of the recently discovered yeast H⁺-ATPase subunit 8 gene. This URF has a 207-nucleotide (nt) reading frame that overlaps, but is out of phase, with the NH₂-terminal portion of the adenosinetriphosphatase (ATPase) subunit 6 gene.

Example:
Recently however, immunoprecipitation experiments with antibodies to purified, bovine heart rotenone-sensitive NADH-ubiquinone oxido-reductase (also known as Complex I), as well as enzyme fractionation studies have indicated that six human URF’s (that is, URF1, URF2, URF3, URF4, URF4, and URF5) encode subunits of Complex I which is a large complex that also contains many subunits synthesized in the cytoplasm.

Recently however, several human URF’s have been shown to encode subunits of rotenone-sensitive NADH-ubiquinone oxido-reductase (also known as Complex I). Complex I is large and that contains many subunits synthesized in the cytoplasm. Six subunits of Complex I were shown by enzyme fractionation studies and immunoprecipitation experiments to be encoded by six human URF’s (URF1-5).
Example – modifying sentences by adding verbs to articulate the action being described in the text:

Transcription of the 5S RNA genes in the egg extract is TFIIIA-dependent. This is surprising, because the concentration of TFIIIA is the same as in the oocyte nuclear extract. The other transcription factors and RNA polymerase III are presumed to be in excess over available TFIIIA, because tRNA genes are transcribed in the egg extract. The addition of egg extract to the oocyte nuclear extract has two effects on transcription efficiency. First, there is a general inhibition of transcription that can be alleviated in part by supplementation with high concentrations of RNA polymerase III. Second, egg extract destabilizes transcription complexes formed with oocyte but not somatic 5S RNA genes.

In the egg extract, the availability of TFIIIA limits transcription of the 5S RNA genes. This is surprising because the same concentration of TFIIIA does not limit transcription in the oocyte nuclear extract. In the egg extract, transcription is not limited by RNA polymerase or other factors because transcription of tRNA genes indicates that these factors are in excess of available TFIIIA. When added to the nuclear extract, the egg extract affected the efficiency of transcription in two ways. First, it inhibited transcription generally; this inhibition could be alleviated in part by supplementing the mixture with high concentration of RNA polymerase III. Second, the egg extract destabilized transcription complexes formed by oocyte but not by somatic 5S genes.
Example – Effective Transitions & Signposts

Consider the first 3 paragraphs of Matthew Simpson’s high quality PhD Thesis *An Analysis of Unconfined Ground Water Flow Characteristics near a Seepage-Face Boundary*

**Paragraph 1**
Ground water flow occurs under conditions that are usually classified as being either confined or unconfined. Confined ground water flow is... Conversely, unconfined flow...

- The structure is clearly signposted by the use of “either - or” and “conversely”, and repetition, in correct order, of the terms “confined” and “unconfined”

**Paragraph 2**
The ...quantification of unconfined flow processes... The justification for ignoring the vertical processes is that the horizontal length scale of a typical unconfined aquifer is much larger than the vertical, i.e. L>>H in Fig 1-1. Therefore...

- Repetition of key words provides a link between paragraphs
- An argument is signposted, and the reader is referred to a Figure that makes the point visually. The consequence of the argument is also explained.

**Paragraph 3:**
Several analysts have expressed reservation about horizontal flow modelling strategies; for example...Although these reservations have been voiced, other researchers have shown that...Therefore...

- A point is made and an illustration signposted. The words “although” and “other” indicate that controversy is being discussed. The word “therefore” signposts an outcome of the controversy or a conclusion.
Writing paragraphs - important structural principles

Good, focussed writing is underpinned by a clear paragraph structure. Paragraphs ‘break up’ the information you want to present to your reader, structuring it in such a way that guides the reader through a series of related ideas.

Academic paragraphs follow what is known as a ‘general-to-specific’ sequence whereby they begin with a general (or topic) sentence and become increasingly focused on information which contributes to your argument.

A clear topic sentence is essential to a good paragraph. Topic sentences tell the reader what your paragraph is about, and help prepare them for what you will then say.

Steps to writing good academic paragraphs

- Select a topic for your paragraph and a key question that your paragraph will answer. For example the topic may be “features of good academic paragraphs” and a key question might be “what are the features?”
- Decide on the answer to your question. You may need to do some mind mapping or even free writing to sort out your thoughts first.
- Use your own words to write a sentence that is a simple and direct answer to the key question. For example “Good academic paragraphs contain a clear topic sentence, cohesive support, convincing argumentation, and good expression.”
- Write a cohesive set of supporting sentences. They should be well ordered and contain appropriate transition signals.
- Make your answer as convincing as possible through effective argumentation - use evidence (research data, statistics, expert opinion) and logic. Explain, exemplify and justify your answer.
- Check your paragraph for good expression, grammar, spelling, punctuation, capitalisation and referencing.
Various Eulerian link-node models have been developed for the simulation of transport for water quality modelling. For example, Tim et al (2003), Jin et al (1998), Lung and Larson (1995), Gu and Dong (1998) used WASP5 for water quality modelling in rivers and lakes. Barnell et al (2004) and Melching et al (1994) used QUAL2E for river water quality modelling. However, the Eulerian models contain an undesirably large amount of numerical diffusion in the advection simulation (refs) and are found unsatisfactory for transport and water quality modelling. Also, due to the limitations in time steps, Eulerian models may not be suitable for long term simulations of large river systems. In the Lagrangian frame, as the control volumes are moved with the mean flow velocity, numerical diffusion associated with advection is totally eliminated and accurate modelling of transport and water quality may be achieved. Further, a Lagrangian model allows a large time step so that a long term simulation may be achieved.

Can you list the points the author is making?

What is he arguing?

How might you restructure this to make his arguments clearer to the reader?

Example:
Read through O’Beirne’s Abstract for the UWA PhD in Physiology “Mathematical modelling and electrophysiological monitoring of the regulation of cochlear amplification.
Consider how he has structured his paragraphs & used signposting to guide the reader through the text.
Structuring Introductions – 3 Essential Moves

1. Establish a research territory by:
   Showing that the research area is important, problematic or relevant in some way and introducing previous work in the area

   “How students perceive their learning environments has long been accepted as having a significant influence on the quality of the students’ learning outcomes (Doyle, 1997; Fraser, 1989; Ramsden, 1992; Walberg, 1971). Over the past quarter century an extensive empirical base...has been developed...The ultimate aim of most of this research has been to…”

2. Establish a context in which your research makes sense by:
   Defining a problem or question that needs to be answered

   “Although...[past work described in the preceding paragraph]... is psychometrically sound, [it has] a number of potential limitations. First, there is always a concern that.... Second, the instruments [used in measurement] focus on just one type of learning environment...... Third [these instruments] ... may deny the complexity of classroom life. And fourth, the instruments do not investigate why...”

3. State what you will do in relation to the problem or question by:
   Outlining the objectives of your research, what do you propose as the solution to the problem identified above, and
   Indicating the structure and scope of the paper.

   “This paper reports on the use of the Perceptions of Learning Environments Questionnaire which uses a semi-structured ...format to gather student perceptions...This seeks to address the limitations of existing instruments outlined above. The outcomes of the data collection reported here are used to produce student views of good and bad teaching which are then evaluated in terms of contemporary ideas about effective teaching.”

[Examples taken from Clarke, 1995].
Exercise:
Write three well structured introductory paragraphs on the topic “What is good academic writing?” Once you have finished, share what you have written with others at your Table, and give constructive feedback to develop a piece of well written text.
References

- Flesch, R.F. 1962. *The Art of Readable Writing* (available from the Humanities and Social Science Library, 808.042 Art)
- Harvey, G. 1998 *Writing with Sources: a guide for students* Hackett Publishing Company
- How to recognise plagiarism [http://www.indiana.edu/~istd/sitemap.html](http://www.indiana.edu/~istd/sitemap.html)
- Murphy, E. 1985. *You Can Write* Longman
Final words…..

Useful as general rule of thumb but not a guiding principle:

- Paragraphs on average are ~ 100 words long (50 – 250 words)
- Sentences on average are ~ 25 words long
- Sentences/ paragraphs that are too long may indicate a lack of focus - rambling
- Sentences/ paragraphs that are too short may indicate underdeveloped ideas - bitty

Grammar
See StudySmarter

Spelling
Don’t rely on your spellchecker


More about spelling checkers

Eye have a spelling chequer.
It came with my pea sea.
It plainly marques four my revue.
Miss steaks eye kin knot sea.

I have a spell checker, it came with my PC, it plainly marks for my review, mistakes I cannot see.
PhD theses examples:


Jones, Christopher. 2007. Laser scanning confocal arthroscopy in orthopaedics: examination of the chondrial and connective tissues, quantification of chondrocyte morphology, investigation of matrix induced autologous chondrocyte implantation and characterisation of osteoarthritis. ADT WU2008.0061


Stanwix, Paul. 2007. Testing local Lorentz invariance in electrodynamics. PhD Physics, UWA.