ELEC6021 research methods
October 2012

Report Writing
or
a few useful things about writing
Dr Su White
http://www.edshare.soton.ac.uk/3451/

The plan

- Agree what we want to learn
- Important report writing guidelines
- Conclusion/reflection
  but remember
  I can only talk
  you have to do

Learn to write by writing and reading example documents

What do you want to learn today?

Think about how you write:
- What can you already do well which will be useful?
- Where are your weaknesses?

Based on this reflection

write down three things you would like to get out of the session today

Activity 1

You can go back to these notes

Remember these notes when you need to double check

Look at them again with friends to understand what I have been saying 😊

You need to learn how to...

- Organise writing clearly and logically
- Understand strategies for revision at the document, paragraph and sentence levels

- Handle evidence appropriately in writing to present a structured and logical argument
- Understand grammatical and stylistic usage

- Explain concepts in formal context
- Be able to edit and refine your own written work

- Structure your work for correctly for the appropriate audience
Typical Wants

- Layout
- Proof reading
- Referencing
- IEEE conventions
  …these are minor details – check out the regulations, follow the pointers in the lecture

IEEE

IEC6021

Three things....

- Turn to a neighbour
  - Explain your writing experience
  - Discuss what you think will be important and why.

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Three things....

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Feedback

Tell the rest of the class....

- Examples of objectives
- Why does it matter?

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Sources of information

- General University notes for academic skills
  Topics include: reading academically, writing effectively, search strategies, bibliographic software, referencing your work, , giving a talk
- See http://www.academic-skills.soton.ac.uk
  Grammar: an introduction to traditional grammar
  http://www.soton.ac.uk/~wpw6/notes/grammar.htm
- Engineering Communication Centre, University of Toronto it offers a range of interactive tutorials
  http://www.ecf.utoronto.ca/~writing/interactive.html
- one is specifically a guide to writing lab reports

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Use good technical writing as a model

- What sources of technical writing can you identify?

IEC6021
This is not about

- The process of doing your research

This is about

- The process of how you record and present the process of doing your research

The good news, you already know something about this...

Focus: academic writing

What experience do you have?
- Technical reports
- Technical letters
- Conference papers
- Journal papers
- Project reports
- ?? Web pages
- Informal writing

Different formats need differing styles

What difficulties might you face?
- Foreign language
- Dyslexia
- Lack of experience
- Can’t spell
- Don’t understand grammar / rules
- Difficult to explain myself

Different people have different issues

Last week I read something in the Guardian that said that tea was nothing like as popular as it used to be. Apparently the general public think that is not particularly satisfying, and show an increasing preference for coffee. Certainly it looks that way in my office, although maybe coke is more hip. But it occurs to me that there could be a number of reasons, other than change in popularity. Perhaps the quality of the tea has changed? Or perhaps people have forgotten how to make tea properly?

Certainly one of the things that bugs me is the American custom, when you order a tea, of bringing you a cup of hot (but certainly no longer boiling) water, and a selection of tea bags; the Americans are so obsessed by choice that they have forgotten taste. So I decided to conduct a survey. I made two cups of tea for everyone in the office – one from a big pot of tea, and for the other I just hot water into the tea cups, and tea bags on the saucer. Three quarters of the people expressed a firm preference for the tea from the pot, and no-one preferred the tea bag in the cup.

This certainly shows that one of the reasons people are going off tea is that it is often badly made.

What's This?

Technical Report Writing

The purpose of a technical report is to communicate.
You wish to communicate
- what you did,
- why you did it
and
- what you have found out.

Before Getting Started

- You wish to communicate "What you have found out". If you didn’t find anything out - STOP NOW!

- Most technical reports are intended as communication of new knowledge:
  "I had this hypothesis and I tested it like this; here are my results and this is what we learn from them"

- BUT as a student you are asked to write technical reports about things that you know that the person who reads it (the marker) will already know. Don’t worry – your marker is not your audience (see later) – and your task is still to express what "you" found out.

What Sort of report are you producing?

- Lab Report
- Blog
- Magazine Article
- Essay
- Technical Report - what this lecture is about

Technical reports may be:
- Academic Papers
- Industry “White Papers”
- Description of a project undertaken

Whether they are published on paper or on-line. The rules do not change.
Who is writing this report?

- The convention is to write everything in the third person (objectively, not subjectively)
- This does not apply to Blogs and Magazine articles which are often intentionally subjective
- Can lead to unpleasant use of passive voice. Compare
  - “I did a survey of one hundred web sites to ascertain...”
  - “One Hundred web sites were surveyed to ascertain...”
  - “The author surveyed one hundred web sites to ascertain...”
- Some “expert writers” break the rules – just as some expert artists break the rules.
- You need to learn now how to write in the third person
- When you are an real expert maybe can break the rules

With thanks to nataliedee.com

Reports are not personal

- One time, I thought I would write a mystery novel. In the novel, there would be a murder and all kinds of people would try to figure out who did it. All the clues, you would find out what the narrator of the book did it.
- Then I contacted someone promoting did that already and I remembered that even an expert writer and really have mystery

Structure of a Technical Report

- (Title page)
  - Name, affiliation, date, contact details, etc.
- Declaration
  - who did the work?
- [Acknowledgements]
  - to those who have helped or influenced your work
- Contents
  - sections, sub sections and page numbers (probably not sub sub sections)
- Abstract
  - stand alone summary of report
- Introduction
  - background, context and outline of other relevant work
- Main technical sections
  - Methods (preferred method, results, discussion)
- Conclusions
  - and suggestions for future work
- References
- [Web References]
- [Bibliography]
- [Appendices]
  - anything which would interfere with the continuity of the main report (typically detail)

Remember
Your report is not a detective novel!

The Abstract

- must be stand-alone
- must not contain citations
- is a concise summary – not a précis.
- IS VERY IMPORTANT

Use four or five sentences.
1. What is the problem, and why is it a problem?
2. What is your idea for a suggested solution?
3. How did test your idea?
4. What results did you get?
5. Why is that useful?
- It’s a good idea to write the abstract before you begin (even if you re-write it after you finish)

Experimental Report Abstract

- Tea drinkers report major differences in their satisfaction with cups of tea, even when they have been made from the same tea leaves. One possible cause of this variability is the temperature of the water at the time it is poured over the tea leaves. This report describes an experiment in which one hundred tea drinkers were asked their views on teas made with water at different temperatures. The results demonstrate a significant preference for tea made with boiling water. The perceived quality of tea, particularly in the USA, would be much enhanced if caterers observed this convention.

(5 sentences, 97 words)
An Abstract for a Possible Coursework?

- You’ve been asked to write a report on Folksonomies...
- Folksonomies are internet based collections of user assigned labels, or "tags", for web resources. There is a debate within the Web Science community as to the importance of social tagging in general, and folksonomies in particular. This report surveys a range of current social tagging systems and distinguishes between true folksonomy systems such as Del.icio.us, which attempt to enhance the classification of resources, and simple tagging systems such as Flickr, which merely improve description. The report concludes by describing some research work in progress to extract semantic metadata from folksonomies in order to improve search engine performance.

(4 sentences. 97 words)

An Implementation Project Abstract

- Experts in wine tasting like to keep structured records of their tasting notes and a number of well established PC database applications exist for this purpose. However, increasingly applications tend to be web service based applications and many focus on the benefits of social tagging. This report describes the specification, design and implementation of a web based application to store wine descriptions according to a standard ontology, which allows users to enter their tasting notes as tags. The report concludes by evaluating the new features that are facilitated by this novel implementation.

(4 sentences. 95 words.)

Introduction and Conclusion

- Again they should (as a pair) be stand-alone. (Not everyone wants to read the detail)
- The Introduction should motivate why you have done the work, and demonstrate your awareness of related literature. What are your objectives?
- The conclusion should:
  - make it clear what the “take away message is”.
  - Demonstrate analysis and synthesis that you have undertaken
  - Explain any limitations in your work
  - Detail future work to be undertaken
- On analysis and synthesis.
  There is no room for “I think…”, “I believe”. Technical reports should take an objective and scientific standpoint.

Citations, References and Bibliography

- Learn how to format a reference and how to cite it.
- There are two major formats which you are likely to use or encounter.
- Harvard – Cite with Name and Date
  - Much preferred for technical reports
- IEEE – Cite with Number
  - Much more compact so used in paper based IEEE and ACM journals
- References are a list of the items which have been ‘cited’ in the document
- Bibliographies are reading lists, that provide more background on the area, but which you have not specifically cited

Citing in IEEE notation

[http://www.southampton.ac.uk/library/infoskills/references/ieee.html](http://www.southampton.ac.uk/library/infoskills/references/ieee.html)

Citing in Harvard notation

[http://www.southampton.ac.uk/library/infoskills/references/harvard.html](http://www.southampton.ac.uk/library/infoskills/references/harvard.html)
You must usually use IEEE conventions

References
Should provide a replicable audit trail
So...
They need to be complete and in a standard format

1 http://www.jssst.info/info/IEEE-Citation-StyleGuide.pdf

Citation On-line and of the On-line

In these days when
1. Many of the papers you cite are available on-line
2. Your paper will in all likelihood be read on-line
   in addition to the normal reference, it is customary to hyperlink your
   references to the on-line version—making it much easier for your
   readers to follow.

A number of sources may only be available on-line. A good rule
of thumb is— if you can identify the provenance (author(s) name, and
a name for the on-line publication, date of publication) then
cite and reference it in the normal way. (Stating date accessed)

If it is just a “web page”, then it should not be in your references.
Maybe it should be a footnote— or if you have lots then consider
a “Web Page References” section.

Academic Integrity and Plagiarism?

Plagiarism is using someone else’s work,
but not indicating that it is not your own

Avoiding Plagiarism

If you cut and paste words from anywhere else, and you do not attribute
those words to the original author/webpage then that is plagiarism.

Plagiarism is cheating and an attempt to defraud, and

1. We run programs to identify plagiarists
2. ECS and the University have disciplinary procedures for people identified as cheats.
   https://secure.ecs.soton.ac.uk/ug/handbook/0809/SectionA07DM3.doc (section 5.1)
   http://www.calendar.soton.ac.uk/section/01/academic-integrity-procedures.html

If you do cut and paste then you should quote e.g., As Doolittle (1966), says “the rain in Spain stays mainly on the
plain”. For quotes of larger than a paragraph, indents are often used.

Remember:

1. If you can’t identify the provenance, don’t use it.
2. If you do cut and paste then you should “quote” those words to the original author/website
   then that is plagiarism.
3. ECS and the University have disciplinary procedures for people identified as cheats.

Some Links

ELEC 6021 Research Methods

08/10/2012
Work and improve over time

- Have a plan
- Do good work
- Record your work
- Analyse the results
- Capture the whole process
- Meet your deadlines

Some aspects will apply equally to:
- Every written task
- Use opportunities to refine your process
- these are skills for life

Record an Audit Trail

- They need to be: complete and in a standard format
- They need to contain: enough detail to locate the same source again

References
- Provide an audit trail
- Acknowledge others’ work
- Are concise
- Should be replicable

List references
- consistently,
- correctly,
- completely

Do not include: ISBN
Library call numbers

Work smarter not harder

One touch
- Write your bibliography as you go
- Always get full references
- Record how and when
- Collect to a standard format

Information needed

- Gather information before and during writing
- Begin to organise information as you obtain it
- Information from others: record full bibliographic details
- Information you generate: keep a complete logbook record

Keep track of your sources

With notes, copies of articles, useful diagrams, etc.

NB
- Authors, complete name of work, editors if any, publisher, year/month of publication, volume no., page numbers
- URL plus any clues as to original paper source.
- If class notes, is there a printed textbook?
- If a self-contained paper, look for any and all clues to find the original citation (e.g. author’s publication list on Web page).

Learning and help

- We will each need different kinds of help
- We each learn and work in different ways

Learning by doing (read and write - lots)
- Language Support
- Learning Differences Centre
- Assistive technology centre
- Self help (books, guides, the web)
- Peer help (colleagues, friends)
Important Guidelines

Some details of what you have to know

Presenting results 1
- what's best? - graph, table, histogram, bar chart, scatter gram
- does data highlight the scientific goal?
- do labels reflect the scientific goal?
- is the caption complete?

Presenting results 2
- So what exactly is figure 1?
- If you know tell me PLEASE

Presenting results 3
- May be easier to draw by hand then scan
- Figures are labelled to form a cross reference
- Describe the important features of your illustration in the results section of your report
- Can the reader find all your results easily?

Design of figures
- What needs to be in a graph?
  Axes must be labelled with
  * Entity being measured (e.g. amplitude, frequency, no. errors, time...)
  * Units of measurement
  * Values in units along axis

  Meaning of curves or symbols must be shown: use legends or labels, caption
  Captions must be fully informative

Citations and references (again)
- there are standards...
  You are expected to use numeric referencing
  Use that single standard throughout your report
- ensure that all your references are complete – could a reader go to the source unaided?
- some tools enable automatic formatting of citations e.g.: endnote and bibtec
Revision

Reread it

Imagining yourself as the audience.

- Does information come in the right order?
- Are all parts present?
- Is it complete?

NB: See notes for extra help

Review, Revision and Proof Reading

WHAT:
Check systematically for errors of any sort in a document

HOW:
Read through more than once, each time checking for a different type of error
Use friends to help in this process

Further work

- This class was just one of many beginnings
- It's up to you now to do the work
- Over the next week look at your action list – and initiate the actions!!
- Whenever you write remember what the process is about

Learning is a continuous process

- Train yourself :-)

Recap on links

- The Student Portal SUSSED has links to library, academic skills and student resource network
  http://sussed.soton.ac.uk/
- Electronic Journals and other online academic resources via the Library
  http://www.silent.ac.uk/library/
- Academic Skills Web Site http://www.academic-skills.soton.ac.uk/
- In particular look at the guides entitled
  - "Developing your Academic Skills"
  - "Gathering information and Using the Library"
  - "Referencing your Work"

Appendix

This part of the slides contains basic advice on style and grammar
It also contains exercises to go with the presentation which you can also complete right now
Writing and study skills

General University guidelines on academic skills

- Topics include: independent learning, your learning style, getting the most from lectures, reading academically, writing effectively, writing your dissertation, search strategies, bibliographic software, referencing your work, working in groups, giving a talk, preparing for exams. See http://www.academic-skills.soton.ac.uk

Guidelines on spelling and punctuation, with exercises (the Aries project) http://www.arts.gla.ac.uk/SESLL/STELLA/ARIES/

Style - 1

- Use the third person
- Passive voice: “The transducer was calibrated…”
- Neutral, informative tone
- Avoid colloquialisms:
  - POOR: “The final design was brilliant!”
  - GOOD: “The final design had the best signal-to-noise ratio”
- Be specific; refer to figures by number, not pronoun
- Be concise
  - Can you use more shorter sentences?
  - Can you say it in less words

Style - 2

- Use figures, diagrams, equations when they’re more concise and accurate than words would be
- Choose figures carefully;
- Make points not decoration

Style - 3

Use standard mathematical notation;

- variables should have a single-character name
  - POOR: Imp = V/I
  - GOOD: Z = V/I
- Define variables
- Specify units
- Use SI units

Capitalize and space numbers and units correctly:

6 kHz not 6KHz
50 mm 8.3 μFd, 60 dB not 60 Db

A bit about grammar

- Create complete sentences.
  - POOR: “A run-on is more than one sentence, it is often created by using a comma instead of a full stop or semi-colon, and did I remember to tell you about punctuation in general?”
  - POOR: “Being as how it crashed.”
- Watch for tricky subject-verb agreement:
  - “The set of numbers is…”
  - “These data are…”

A bit more about grammar

Avoid ambiguous pronouns:

“…obtained by Magnetic Resonance Imaging (MRI). The MRI scanner was 1.5 T…”

“This was then run through the other one.”

Define acronyms, abbreviations at first occurrence; use them for essential terms
Examples Citing References

In text, pick the most graceful way to refer to reference(s) needed

"...as shown by Atal and Hanauer[1]."

"...Linear prediction is a commonly-used method[1,2,3]."

"...Smith used ultrasound to image the tongue[3]; this was further developed by Storey et al.[4,5,6] and subsequently by Storey et al.[7]."


How can you build on this lecture?

Think again!
- What do you find easy?
- What do you find difficult?
- Write down a list of three aspects of writing skills which you think that it is important you improve
- Make a plan of how you will make these changes

Conclusions and reflections

What are you going to take away?

Think about the skills you need to develop

Reminder
- What do you find easy?
- What do you find difficult?
- Write down a list of three aspects of writing skills which you think that it is important you improve

Acknowledgments

- Parts of this set of materials were drawn from related examples drawn up by colleagues particularly Hugh Davis, Christine Shadle, and Peter Gregson, with guidance from Simon Cox
- I have also drawn from materials at the University of Toronto’s Centre for Engineering Communication
References

- For background and related material and references please see the courses page
  https://secure.ecs.soton.ac.uk/module/1213/ELEC6021/resources
- Notes specific to this lecture are at EdShare

http://www.edshare.soton.ac.uk/3451/

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Further Reading

- See the set of notes in EdShare
- http://www.edshare.soton.ac.uk/3451/