Research Skills Workshops

3. Managing and Reviewing the Literature
(Science/Applied Science Stream)

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Objectives:

- to discuss methods for keeping track of your literature
- to identify the elements of a good literature review
- to examine strategies for writing a good literature review
- to help you clarify your own thoughts about the literature you are reviewing

Timetable

<table>
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<th>Time</th>
<th>Session</th>
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<tr>
<td>1.30 – 2.00</td>
<td>Overview of stages in developing a literature review</td>
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<td>2.00 – 2.30</td>
<td>Strategies for finding and managing the literature</td>
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<tr>
<td>2.30 – 3.00</td>
<td>Stages in writing a good literature review</td>
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<tr>
<td>3.00 – 3.30</td>
<td>Thinking about the literature you are reviewing</td>
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Some of the questions the review of the literature can answer

A good literature review takes significant time to develop and requires you to pass through a number of stages:

**Stage 1: Survey the literature:** (little critical analysis at this early stage)
- Survey the area historically and thematically
- Identify the key issues and major work done previously in your area
- Identify key authors
- Begin to develop a good understanding of the research area
- Understand the types of research questions commonly asked
- Understand the methodology/ies of the discipline
- Understand the methods used
- Define one or more potential topics for your research
- Generate ideas, hunches, and hypotheses as you develop your own research question/s
- Recently published review articles in reputable journals are a good place to start
- The Proceedings of a recent Conference will provide a good initial overview
- Recently completed theses provide a good overview [http://trove.nla.gov.au/]

**Stage 2: Critically evaluate the literature (as you develop your research proposal)**
- Evaluate previous research (what remains unknown or uncertain?)
- What are the research debates in the area?
- What are the strengths and weakness of various studies?
- As you critically review previous research, begin to develop your own criteria for accepting or rejecting arguments.
- Use your clearer understanding of gaps in knowledge to develop and refine your own research questions.

**Stage 3: Develop a rationale for your own research**
- Demonstrate how your project fits into established research
- What gaps in knowledge does your proposed research plan to fill?
- What hypotheses will it test? These are the ideas that distinguish your literature review from a catalogue of facts.
- How do you plan to go about testing your hypotheses? How can the literature help you plan this?

**Stage 4: Guide your research**
- evaluate methods,
- evaluate results,
- evaluate your ideas against different perspectives,
- refine your ideas,
- enhance the sophistication of your research and hence its contribution
In summary, your literature review should show that you have made sense of the material you have read, and have evaluated the quality of information in the published literature. On this basis your literature review must lead the reader to believe that the next best study in the area, is the study you are proposing.

Using the Literature in a Thesis

You will use the published literature in your thesis to demonstrate your achievement of the all the criteria for thesis examination, i.e.

- that you have made contribution to knowledge,
- that you understand the relevant literature,
- that your thesis is sufficiently comprehensive,
- that research techniques are appropriate and properly applied,
- that the results are suitably set out and adequately explained,
- that the presentation is of a standard suitable for publication.

Criteria that distinguish high quality theses from marginal theses:

(Centre for the Study of Research and Training and Impact, University of Newcastle, Australia)

<table>
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<th>High quality</th>
<th>Marginal</th>
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<tr>
<td>Literature review: Use and application</td>
<td>o Expert use of the literature in design of the study and discussion of the findings</td>
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<tr>
<td></td>
<td>o Thorough, clear and incisive reporting of the literature, comprehensive and definitive</td>
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An overview of the steps needed to make sense of the literature and to use it effectively for your research:

1. Find the relevant literature (see p. 7 & 8)
2. Read it using active reading techniques (see p.9)
3. Summarise it – what does it say? (see p. 9-14)
4. Critique it - make notes on what each piece of literature means in relation to the research ideas you are developing (see p. 9-14)
5. File it using a system of organisation that makes sense for your research (see exercise on p. 22)

Exercise 1: Collecting and organising the literature

5 minutes free writing to the prompt:

My approach to collecting and organising the literature I need for my research is
Literature searching and storage

- Where to start?
  Peer-reviewed original research articles appearing in reputable scientific journals should form the core of any good literature review. Get to know your Reference Librarian and take the time to get to know the key databases relevant to your research. Learning efficient strategies for keeping a track of the literature in your field will save you a lot of time in the long run. Use bibliographic software such as Endnote and learn to use it effectively.

- As you search the literature ALWAYS record referencing details (easy if you use Endnote or Bib Tex)

- Find out leading researchers in your area and focus attention there but also think laterally

- Learn about citation searching (Web of Science)

- Cover the main ideas

- Talk to others

- Start building your own library from the start

- Begin your own list of keywords, build an index to help keep control of your references

- Download Abstracts if using bibliographic software, but also write something about the article using your own words

- Mind mapping software may be useful for organising references in relation to your research question

- **Schedule time for these tasks**
Databases
   Which databases are relevant to your field?

Library catalogues
   Not just UWA

Digital archives
   - Great for ephemeral publications; theses (e.g. http://trove.nla.gov.au/)

Citation Indexes
   - Web of Science

Google Scholar

Collegial Networks
   - Supervisors, other students, conferences, mailing lists

Others?

- Think of synonyms and alternative terminology
- Look at the terms used by authors in your field
- Look for controlled vocabulary in databases (subject headings, tags)
- Truncate your search terms to allow for variation in word length or spelling
- Think of broader terms, narrower terms or related terms and phrases depending on your initial search results

Resources at UWA

has a range of resources to help you find and manage references and also write your literature review.

http://www.library.uwa.edu.au/library_services/ask_a_librarian
Reading the literature and making notes

How to get started reading an article to review it
Adapted from http://www.wisc.edu/writing/Handbook/CriReadingBook.html

- Read with a purpose. In order to do this you must first begin with some thinking
  - Before you read write down some of the facts and arguments you already know about in this field of research (eg free-write for 10 minutes to the prompt “What I know about this topic already is…”)
  - Survey the article to make some predictions about what it may cover (what does the title promise? what does the abstract convey? What information can you glean from headings and subheadings? What is this article likely to be useful for?)

As you read individual sections:
- Think carefully about the heading and skim to get an overall sense of the section
- Look at data presented in Tables and Figures, what do you think the data show?
- Test your predictions as you read
- After you’ve finished, take notes and begin to evaluate the article
  - try dividing your page into two columns. In the left, summarize main points made. In the right, record your reactions to and tentative evaluations of that point.

Once you have read a few articles, write a summary, using your own words, of your understanding of the research area at this point. You could use the free-writing technique or make mind maps. The most important thing is to do something active with this information. This will help you build a well-supported argument for the value of your research.
Some tools to assist with critical evaluation of papers:

1. The Public Health Resource Unit in the UK has a range of Critical Skills Appraisal Tools for the following types of research:
   - Randomised control trials
   - Qualitative research
   - Economic evaluation studies
   - Cohort studies
   - Case control studies
   - Diagnostic test studies

   These are available from


3. A useful framework for reading papers and critically evaluating them.

How to Read an Engineering Research Paper:

Bill Griswold

Reading research papers effectively is challenging. These papers are written in a very condensed style because of page limitations and the intended audience, which is assumed to already know the area well. Moreover, the reasons for writing the paper may be different than the reasons the paper has been assigned, meaning you have to work harder to find the content that you are interested in. Finally, your time is very limited, so you may not have time to read every word of the paper or read it several times to extract all the nuances. For all these reasons, reading a research paper can require a special approach.

To develop an effective reading style for research papers, it can help to know two things: what you should get out of the paper, and where that information is located in the paper. First, I'll describe how a typical research paper is put together.

Despite a paper's condensed form, it is likely repetitive. The introduction will state not only the motivations behind the work, but also outline the solution. Often this may be all the expert requires from the paper. The body of the paper states the authors' solution to the problem in detail, and should also describe a detailed evaluation of the solution in terms of arguments or an experiment.
Finally, the paper will conclude with a recap, including a discussion of the primary contributions. A paper will also discuss related work to some degree. Because of the repetition in these papers at different levels of detail and from different perspectives, it may be desirable, to read the paper “out of order” or to skip certain sections. More on this below.

The questions you want to have answered by reading a paper are the following:

1. **What are motivations for this work?** For a research paper, there is an expectation that a problem has been solved that no one else has published in the literature. This problem intrinsically has two parts. The first is often unstated, what I call the **people problem**. The people problem is the benefits that are desired in the world at large; for example some issue of quality of life, such as saved time or increased safety. The second part is the **technical problem**, which is why the people problem does not have a trivial solution; that is, why a new technological or engineering solution may be required. Implicitly there is implication that previous solutions to the problem are inadequate. Occasionally an author will fail to state either point, making your job much more difficult.

2. **What is the proposed solution?** This is also called the **hypothesis** or **idea**. There should also be an argument about why the solution solves the problem better than previous solutions. There should also be a discussion about how the solution is achieved (designed and implemented) or is at least achievable.

3. **What is the evaluation of the proposed solution?** An idea alone is usually not adequate for publication of a research paper. What argument and/or experiment is made to make a case for the value of the ideas? What benefits or problems are identified? Are they convincing?

4. **What are the contributions?** The contributions in a paper may be many and varied. Ideas, software, experimental techniques, and area survey are a few key possibilities.

5. **What are future directions for this research?** Not only what future directions do the authors identify, but what ideas did you come up with while reading the paper?

As you read or skim a paper, you should actively attempt to answer the above questions. Presumably, the introduction should provide motivation. The introduction and conclusion may discuss the solutions and evaluation at a high level. Future work is likely in the concluding part of the paper. The details of the solution and the evaluation should be in the body of the paper. You may find it productive to try to answer each question in turn, writing your answer down. I recommend that you keep a notebook on all the papers you read. You should use my **standard one-page form** that you can fill out for each paper. In practice, you are not done reading a paper until you can answer all the questions. I will be asking you these questions in class.

Also, you should be aware of the context of the paper in relation to the other papers in the class. Often a paper will represent a generalization, new direction, or contradiction to earlier papers.

If you find that filling out this form doesn’t work for you, you can try writing a 250 word abstract of the paper--not rewriting the abstract at the front of the paper, but *your* abstract, capturing the above five issues from your perspective. I often
find it useful to write an abstract because it develops the logical connections between the above five issues.

If you are somewhat lost on a particular paper, and sometimes if you are not, it can pay to write down *questions* you have about the paper. Perhaps the paper was vague on key issues, or ignored issues that you think are important. If you come to class with such questions, you are prepared to counter or preempt my own questions.

Reading a book is somewhat different. Although you want to answer the above questions for a book, it may not do the book justice given the amount of detail in each chapter. You may want to fill out the above questions on a chapter-by-chapter basis, and then produce a summary form for the entire book when you have finished reading it. However, each chapter will have a particular slant that may make certain questions irrelevant. Also, a book is often not oriented towards explaining the solution to a research problem. However, engineering books are invariably oriented towards problem solving of one kind or another.

I have a habit of writing on papers directly, less with books simply because they cost so much. A well-annotated paper is worth its weight in gold, as it not only contains the content of the paper, but your assessment of its value to you.
Reading a Research Paper: checklist

Title:
Authors:
Published in:

- What is the motivation for this work? What is the particular problem being addressed? What is the context in which this problem has arisen?

- What is the proposed approach for dealing with the problem or issue? How is this approach an improvement to previous methods of dealing with this problem/issue? How is the approach implemented?
o **What is the evaluation of the approach taken or solution proposed (both the author’s and yours)?** What questions do you have or don’t you understand? What would you need to know before you would adopt this approach or accept these findings? Is the approach really going to work, who would want it, what will it take to give it to them, and when might it become a reality?

o **What are the paper’s contributions (author’s and your own opinion)?** Ideas, methods, research results, research techniques etc.

o **What are future directions for this research (author’s and yours)?** This might be driven by limitations in the present research, or by critiques made by others of this research.
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<th>Twelve guidelines for good academic referencing</th>
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<td>1.</td>
<td>Reproduce the correct reference</td>
</tr>
<tr>
<td>2.</td>
<td>Refer to the correct publication</td>
</tr>
<tr>
<td>3.</td>
<td>Do not use “empty” references</td>
</tr>
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<td>4.</td>
<td>Use reliable sources</td>
</tr>
<tr>
<td>5.</td>
<td>Use generalizable sources for generalized statements</td>
</tr>
<tr>
<td>6.</td>
<td>Do not misrepresent the content of the reference</td>
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<tr>
<td>7.</td>
<td>Make clear which statement the references support</td>
</tr>
<tr>
<td>8.</td>
<td>Check out the original – don’t copy another’s references</td>
</tr>
<tr>
<td>9.</td>
<td>Do not cite out of date references</td>
</tr>
<tr>
<td>10.</td>
<td>Do not be unduly impressed by top academic journals</td>
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<tr>
<td>11.</td>
<td>Do not try to reason away conflicting evidence</td>
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<tr>
<td>12.</td>
<td>Actively search for counter-evidence</td>
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Structuring your Literature Review

In writing a review of the literature, you must situate your research question or hypothesis in the context of previous work. This should be done in such a way as to explain and justify the decisions you are making. What is required to accomplish this is a step-by-step explanation of your decisions, punctuated by references to studies that support your ongoing argument.

Step one:
From your readings, you must select those studies that are critically relevant to your research for inclusion in your literature review.

In the first instance it is helpful to set forth the broad pattern of knowledge as it exists in the area in order to appeal for the reader’s acceptance of the logic you are about to present. So set the scene, then pose your research question and the specific hypothesis through which the question will be answered.

Step two:
Organize the literature review into sections that present themes or identify trends, including relevant theory. You are not trying to list all the material published, but to synthesize and evaluate it according to the guiding concept of your thesis or research question. Here is where you can really show the reader that you have evaluated the quality of the information.

Step three:
Identify the line of argumentation you want to pursue. Now you need to marshall evidence for this argument from the material that you have selected and grouped thematically. Without referring to the specific details in the articles, summarise in one or two paragraphs the combined findings of each cluster of studies. As you present your argument, identify gaps in the research that your study will fill. Also show how your study will extend the knowledge that has already been established.

Step four:
Write a conclusion that summarises and reiterates your argument.
Your Literature Review should address the following issues:

What is the topic and why is it important?
Where did the problem come from?
What is already known about it?
How has this problem been approached in the past?
What remains unknown about this problem? Why?
What controversies are there in the literature about this problem?
What might account for the differences in findings or opinions?
What do you propose to do to resolve this problem further?
Why is your proposed approach likely to be useful?

A good review

- leads the reader to the frontiers of knowledge in the area
- formulates hypotheses
  (“the ideas that distinguish it from a catalogue of facts” Lindsay 1995, p. 70)
- discusses how these hypotheses might be tested
- Shows…that you have integrated the material you read and that you have evaluated the quality of information. After finishing the literature review (readers) should understand the research questions, procedures, and findings that characterise the field. They should also know the weaknesses of past studies and what has to be done to move the field forward. If you have organised the review skilfully you will have led the reader to the conclusion that the absolutely best next study to be done in the area is the one you are proposing. (Cone and Foster 1996, p. 104)


(Learning, Language and Research Skills Library, Student Services – PR 100)
**Exercise:**
You have been given 3 excerpts from literature reviews that vary in quality. Use the quote below as a means by which to evaluate these excerpts.

“A modern review is judged solely on the quality of its ideas and opinions. The purpose of a review is not to present a catalogue of names, dates and facts, but to present reasoned arguments about the field under review based on as many names, dates and facts as are necessary to support those arguments.” (Lindsay, D. (1995) A Guide to Scientific Writing, Longman p. 69)
Thinking about the literature you will review

Exercise:
Complete the following Table in relation to your understanding of the literature on your research problem.

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<th>Known</th>
<th>Unknown</th>
<th>Controversial (why?)</th>
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Some useful prompts to focus your thinking when writing Introductions and Literature Reviews

• My research is important/relevant because…

• My understanding of what we know about my research question (from the literature) is…

• When reading the literature relevant to my research topic I wonder about…

• What remains unclear about this field of research is…

• What I propose to do in this study is…
  This will add to knowledge in the area because…

• My hypotheses are…
  The information that I have based these hypotheses on is…

• The questions I seek to address are…
  The answers to these questions are not already available in the literature because…
An exercise to help you structure your literature review:
Adapted from Cecily Scutt’s ‘Reviewing the Scholarly Literature’ presented at the UWA Postgraduate Research Writer’s Retreat, Albany 2010

The process of listing, grouping, ordering and linking keywords can help you draft a rough structure for your literature review. The central organising principle of the review is your topic, and the information you have gained from reading the literature should be ordered according to this.

1. **Listing.** Find a large piece of blank paper and write your topic down the bottom. Fill the reminder of the page with the keywords related to your topic. You will find your project title, topic, and methods will prompt you to think of keywords. You can also use keywords from papers you have read and the keywords you have used to manage your references. You may find additional key words as you think about the gaps in knowledge you have identified and plan to fill.

2. **Grouping.** Organise your keywords into groups according to your topic. You can do this by using a highlighter to colour related keywords. Or you can draw rings around related keywords. Or you can cut up your paper and physically group the keywords. Give each group a name/theme. Aim for mutually exclusive groups (each keyword appears once, in one group only).

3. **Ordering.** Arrange your groups according to their distance from your topic. More general themes will be assigned greater distance from your topic, more specific themes will be closer. Then logically order your keywords within your groups. Finally, list your groups and keywords as headings and subheadings, respectively, according to the order you have assigned them.

4. **Linking.** (Optional) A review has a narrative structure that links the information in your review together. Include in your ordered list a description of how your headings and subheadings link together. This can be used the basis for linking one section of your review to the next.

Be flexible in thinking about the structure of your literature review. Your topic may change and/or shift in focus, and you will be adding to your review throughout your studies. Regrouping and/or reordering is very common when developing a review.
How to Read a Paper

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ABSTRACT
Researchers spend a great deal of time reading research papers. However, this skill is rarely taught, leading to much wasted effort. This article outlines a practical and efficient three-pass method for reading research papers. I also describe how to use this method to do a literature survey.

Keywords: Paper, Reading, Hints.

1. INTRODUCTION
Researchers must read papers for several reasons: to review them for a conference or a class, to keep current in their field, or for a literature survey of a new field. A typical researcher will likely spend hundreds of hours every year reading papers. Learning to efficiently read a paper is a critical but rarely taught skill. Beginning graduate students, therefore, must learn on their own using trial and error. Students waste much effort in the process and are frequently driven to frustration. For many years, I have used a simple approach to efficiently read papers. This paper describes the ‘three-pass’ approach and its use in doing a literature survey.

2. THE THREE-PASS APPROACH
The key idea is that you should read the paper in up to three passes, instead of starting at the beginning and plowing your way to the end. Each pass accomplishes specific goals and builds upon the previous pass: The first pass gives you a general idea about the paper. The second pass lets you grasp the paper’s content, but not its details. The third pass helps you understand the paper in depth.

2.1 The first pass
The first pass is a quick scan to get a bird’s-eye view of the paper. You can also decide whether you need to do any more passes. This pass should take about five to ten minutes and consists of the following steps:
1. Carefully read the title, abstract, and introduction
2. Read the section and sub-section headings, but ignore everything else
3. Read the conclusions
4. Glance over the references, mentally ticking off the ones you’ve already read

At the end of the first pass, you should be able to answer the five Cs:
1. Category: What type of paper is this? A measurement paper? An analysis of an existing system? A description of a research prototype?
2. Context: Which other papers is it related to? Which theoretical bases were used to analyze the problem?
3. Correctness: Do the assumptions appear to be valid?
4. Contributions: What are the paper’s main contributions?
5. Clarity: Is the paper well written?

Using this information, you may choose not to read further. This could be because the paper doesn’t interest you, or you don’t know enough about the area to understand the paper, or that the authors make invalid assumptions. The first pass is adequate for papers that aren’t in your research area, but may someday prove relevant. Incidentally, when you write a paper, you can expect most reviewers (and readers) to make only one pass over it. Take care to choose coherent section and sub-section titles and to write concise and comprehensive abstracts. If a reviewer cannot understand the gist after one pass, the paper will likely be rejected; if a reader cannot understand the highlights of the paper after five minutes, the paper will likely never be read.
2.2 The second pass
In the second pass, read the paper with greater care, but ignore details such as proofs. It helps to jot down the key points, or to make comments in the margins, as you read.

1. Look carefully at the figures, diagrams and other illustrations in the paper. Pay special attention to graphs. Are the axes properly labeled? Are results shown with error bars, so that conclusions are statistically significant? Common mistakes like these will separate rushed, shoddy work from the truly excellent.

2. Remember to mark relevant unread references for further reading (this is a good way to learn more about the background of the paper). The second pass should take up to an hour. After this pass, you should be able to grasp the content of the paper. You should be able to summarize the main thrust of the paper, with supporting evidence, to someone else. This level of detail is appropriate for a paper in which you are interested, but does not lie in your research speciality. Sometimes you won’t understand a paper even at the end of the second pass. This may be because the subject matter is new to you, unfamiliar terminology and acronyms. Or the authors may use a proof or experimental technique that you don’t understand, so that the bulk of the paper is incomprehensible. The paper may be poorly written with unsubstantiated assertions and numerous forward references. Or it could just be that it’s late at night and you’re tired. You can now choose to: (a) set the paper aside, hoping you don’t need to understand the material to be successful in your career, (b) return to the paper later, perhaps after reading background material or (c) persevere and go onto the third pass.

2.3 The third pass
To fully understand a paper, particularly if you are reviewer, requires a third pass. The key to the third pass is to attempt to virtually re-implement the paper: that is, making the same assumptions as the authors, re-create the work. By comparing this re-creation with the actual paper, you can easily identify not only a paper’s innovations, but also its hidden failings and assumptions.

This pass requires great attention to detail. You should identify and challenge every assumption in every statement. Moreover, you should think about how you yourself would present a particular idea. This comparison of the actual with the virtual lends a sharp insight into the proof and presentation techniques in the paper and you can very likely add this to your repertoire of tools. During this pass, you should also jot down ideas for future work.

This pass can take about four or five hours for beginners, and about an hour for an experienced reader. At the end of this pass, you should be able to reconstruct the entire structure of the paper from memory, as well as be able to identify its strong and weak points. In particular, you should be able to pinpoint implicit assumptions, missing citations to relevant work, and potential issues with experimental or analytical techniques.

3. DOING A LITERATURE SURVEY
Paper reading skills are put to the test in doing a literature survey. This will require you to read tens of papers, perhaps in an unfamiliar field. What papers should you read?

Here is how you can use the three-pass approach to help. First, use an academic search engine such as Google Scholar or CiteSeer and some well-chosen keywords to find three to five recent papers in the area. Do one pass on each paper to get a sense of the work, then read their related work sections. You will find a thumbnail summary of the recent work, and perhaps, if you are lucky, a pointer to a recent survey paper. If you can find such a survey, you are done. Read the survey, congratulating yourself on your good luck.

Otherwise, in the second step, find shared citations and repeated author names in the bibliography. These are the key papers and researchers in that area. Download the key papers and set them aside. Then go to the websites of the key researchers and see where they’ve published recently. That will help you identify the top conferences in that field because the best researchers usually publish in the top conferences.

The third step is to go to the website for these top conferences and look through their recent proceedings. A quick scan will usually identify recent high-quality related work. These papers, along with the ones you set aside earlier, constitute the first version of your survey. Make two passes through these papers. If they all cite a key paper that you did not find earlier, obtain and read it, iterating as necessary.

4. EXPERIENCE
I’ve used this approach for the last 15 years to read conference proceedings, write reviews, do background research, and to quickly review papers before a discussion. This disciplined approach prevents me from drowning in the details before getting a bird’s-eye-view. It allows me to estimate the amount of time required to review a set of papers. Moreover, I can adjust the depth of paper evaluation depending on my needs and how much time I have.
5. RELATED WORK
If you are reading a paper to do a review, you should also read Timothy Roscoe’s paper on “Writing reviews for systems conferences” [1]. If you’re planning to write a technical paper, you should refer both to Henning Schulzrinne’s comprehensive web site [2] and George Whitesides’s excellent overview of the process [3].

6. A REQUEST
I would like to make this a living document, updating it as I receive comments. Please take a moment to email me any comments or suggestions for improvement. You can also add comments at CCRo, the online edition of CCR [4].

7. ACKNOWLEDGMENTS
The first version of this document was drafted by my students: Hossein Falaki, Earl Oliver, and Sumair Ur Rahman. My thanks to them. I also benefited from Christophe Diot’s perceptive comments and Nicole Keshav’s eagle-eyed copy-editing.

This work was supported by grants from the National Science and Engineering Council of Canada, the Canada Research Chair Program, Nortel Networks, Microsoft, Intel Corporation, and Sprint Corporation.

8. REFERENCES


Additional Resources:

Study Smarter
www.studysmarter@uwa.edu.au
Free workshops on Referencing and Critical Thinking
http://www.student.uwa.edu.au/learning/studysmarter/online-campus/workshops
And many online services
http://www.student.uwa.edu.au/learning/studysmarter/online

Science Communication and Research Skills
http://www.science.uwa.edu.au/students/scores :
Available online for all UWA staff and students. Contains tutorials that are grouped into 5 modules as follows:

• Module 1 - Prepare to Write
• Module 2 - Write Scientifically
• Module 3 - Collaborate
• Module 4 - Deliver Your Presentation
• Module 5 - Beyond Your Degree

Academic Conduct Essentials
http://www.ace.uwa.edu.au/