WRITING A LITERATURE REVIEW

Source: Language Center, Asian Institute of Technology

WHAT IS THE LITERATURE?

Although you might think of novels and poetry when you hear the word "literature," for a piece of research the meaning is more specific. In terms of a literature review, "the literature" means the works you consulted in order to understand and investigate your research problem.

How useful are the following sources?

Journal articles: these are good especially for up-to-date information. Bear in mind, though, that it can take up to two years to publish articles. They are frequently used in literature reviews because they offer a relatively concise, up-to-date format for research, and because all reputable journals are refereed (i.e. editors publish only the most relevant and reliable research).

Books: books tend to be less up-to-date as it takes longer for a book to be published than for a journal article. Text books are unlikely to be useful for including in your literature review as they are intended for teaching, not for research, but they do offer a good starting point from which to find more detailed sources.

Conference proceedings: these can be useful in providing the latest research, or research that has not been published. They are also helpful in providing information on which people are currently involved in which research areas, and so can be helpful in tracking down other work by the same researchers.

Government/corporate reports: many government departments and corporations commission or carry out research. Their published findings can provide a useful source of information, depending on your field of study.

Newspapers: since newspapers are generally intended for a general (not specialized) audience, the information they provide will be of very limited use for your literature review. Often newspapers are more helpful as providers of information about recent trends, discoveries or changes, e.g. announcing changes in government policy, but you should then search for more detailed information in other sources.

Theses and dissertations: these can be useful sources of information. However there are disadvantages: 1) they can be difficult to obtain since they are not published, but are generally only available from the library shelf or through interlibrary loan; 2) the student who carried out the research may not be an experienced researcher and therefore you might have to treat their findings with more caution than published research.

Internet: the fastest-growing source of information is on the Internet. It is impossible to characterize the information available but here are some hints about using electronic sources: 1) bear in mind that anyone can post information on the Internet so the quality may not be reliable, 2) the information you find may be intended for a general audience and so not be

suitable for inclusion in your literature review (information for a general audience is usually less detailed) and 3) more and more refereed electronic journals (e-journals) are appearing on the Internet - if they are refereed it means that there is an editorial board that evaluates the work before publishing it in their e-journal, so the quality should be more reliable (depending on the reputation of the journal).

CD-ROMS: at the moment, few CR-ROMs provide the kind of specialized, detailed information about academic research that you need for your own research since most are intended for a general audience. However, more and more bibliographies are being put onto CD-ROM for use in academic libraries, so they can be a very valuable tool in searching for the information you need.

Magazines: magazines intended for a general audience (e.g. Time) are unlikely to be useful in providing the sort of information you need. Specialized magazines may be more useful (for example business magazines for management students) but usually magazines are not useful for your research except as a starting point by providing news or general information about new discoveries, policies, etc. that you can further research in more specialized sources.

WHY WRITE A REVIEW OF THE LITERATURE?

What is a literature review?

According to Cooper (1988) '... a literature review uses as its database reports of primary or original scholarship, and does not report new primary scholarship itself. The primary reports used in the literature may be verbal, but in the vast majority of cases reports are written documents. The types of scholarship may be empirical, theoretical, critical/analytic, or methodological in nature. Second a literature review seeks to describe, summarize, evaluate, clarify and/or integrate the content of primary reports.'

The review of relevant literature is nearly always a standard chapter of a thesis or dissertation. The review forms an important chapter in a thesis where its purpose is to provide the background to and justification for the research undertaken (Bruce 1994). Bruce, who has published widely on the topic of the literature review, has identified six elements of a literature review. These elements comprise a list; a search; a survey; a vehicle for learning; a research facilitator; and a report (Bruce 1994).

The literature review is a critical look at the existing research that is significant to the work that you are carrying out. Some people think that it is a summary: This is not true. Although you need to summarize relevant research, it is also vital that you evaluate this work, show the relationships between different work, and show how it relates to your work. In other words, you cannot simply give a concise description of, for example, an article: you need to select what parts of the research to discuss (e.g. the methodology), show how it relates to the other work (e.g. What other methodologies have been used? How are they similar? How are they different?) and show how it relates to your work (what is its relationship to your methodology?).

Keep in mind that the literature review should provide the context for your research by looking at what work has already been done in your research area. It is not supposed to be just a summary of other people's work!

Here are some of the questions your literature review should answer:

1. What do we already know in the immediate area concerned?
2. What are the characteristics of the key concepts or the main factors or variables?
3. What are the relationships between these key concepts, factors or variables?
4. What are the existing theories?
5. Where are the inconsistencies or other shortcomings in our knowledge and understanding?
6. What views need to be (further) tested?
7. What evidence is lacking, inconclusive, contradictory or too limited?
8. Why study (further) the research problem?
9. What contribution can the present study be expected to make?
10. What research designs or methods seem unsatisfactory?

WRITING YOUR OWN LITERATURE REVIEW

It's easy to write a bad literature review and difficult to write a good one. The main mistake that a lot of people make is to write a literature review that looks like this:

II LITERATURE REVIEW

Until recently many researchers have shown interest in the field of coastal erosion and the resulting beach profiles. They have carried out numerous laboratory experiments and field observations to illuminate the darkness of this field. Their findings and suggestions are reviewed here.

JACHOWSKI (1964) developed a model investigation conducted on the interlocking precast concrete block seawall. After a result of a survey of damages caused by the severe storm at the coast of USA, a new and especially shaped concrete block was developed for use in shore protection. This block was designed to be used in a revetment type seawall that would be both durable and economical as well as reduce wave run-up and overtopping, and scour at its base or toe. It was proved that effective shore protection could be designed utilizing these units.

HOM-MA and HORIKAWA (1964) studied waves forces acting on the seawall which was located inside the surf zone. On the basis of the experimental results conducted to measure waves forces against a vertical wall, the authors proposed an empirical formula of wave pressure distribution on a seawall. The computed results obtained by using the above formula were compared well with the field data of wave pressure on a vertical wall.

SELEZOV and ZHELEZNYAK (1965) conducted experiments on scour of sea bottom in front of harbor seawalls, basing on the theoretical investigation of solitary wave interaction with a vertical wall using Boussinesque type equation. It showed that the numerical results were in reasonable agreement with laboratory experimental data.

Have another look at the questions a literature review should answer. See if you can answer the following questions about the literature review above:

Which of the questions does this literature review answer?
This literature offers a summary of previous research, so it answers question 1. It simply tells the reader what was discovered in previous research.

Which of them doesn't it answer?
This literature review doesn't answer any of the questions from 2 to 10. It doesn't evaluate the research it summarizes, nor does it show the relationships between the different theories, views and approaches it describes.

Which method has the writer used to organize the literature review?
The writer has organized this literature review around the researchers, and has presented it chronologically (arranging the work by when it was published). Notice that by organizing it around the researchers (the summaries are listed after the names of the people who did the research) and not around the research (e.g. around key concepts) the writer emphasizes the people and not their work.

Is it a good literature review? Why?

We don't believe that it is a good literature review. It only gives a summary of previous research but it does not use the literature to explain more about the writer's own research problem. Also, it is not critical: after we read it we still do not know which theories or findings are important, which are inconclusive, what the shortcomings are, etc.

The main problem with this literature review is that it does not show how previous research relates to the writer's own research problem, or the relationship between different research already carried out. Given the organization the writer has used, this literature review could not be effective literature review because there is little scope for showing relationships, drawing comparisons, or making evaluations.

HOW CAN I WRITE A GOOD LITERATURE REVIEW?

Remember the purpose: it should answer the questions we looked at above. Look at how published writers review the literature. You'll see that you should use the literature to explain your research - after all, you are not writing a literature review just to tell your reader what other researchers have done. You aim should be to show why your research needs to be carried out, how you came to choose certain methodologies or theories to work with, how your work adds to the research already carried out, etc.

Read with a purpose: you need to summarize the work you read but you must also decide which ideas or information are important to your research (so you can emphasize them), and which are less important and can be covered briefly or left out of your review. You should also look for the major concepts, conclusions, theories, arguments etc. that underlie the work, and look for similarities and differences with closely related work. This is difficult when you first start reading, but should become easier the more you read in your area.

Write with a purpose: your aim should be to evaluate and show relationships between the work already done (Is Researcher Y's theory more convincing than Researcher X's? Did Researcher X build on the work of Researcher Y?) and between this work and your own. In order to do this effectively you should carefully plan how you are going to organize your work.

A lot of people like to organize their work chronologically (using time as their organizing system). Unless developments over time are crucial to explain the context of your research problem, using a chronological system will not be an effective way to organize your work. Some people choose to organize their work alphabetically by author name: this system will not allow you to show the relationships between the work of different researchers, and your work, and should be avoided!

When you read for your literature review, you are actually doing two things at the same time (which makes things more difficult for you!):

1. You are trying to define your research problem: finding a gap, asking a question, continuing previous research, counter-claiming;
2. You are trying to read every source relevant to your research problem.

Naturally, until you have defined your problem, you will find that there are hundreds of sources that seem relevant. However, you cannot define your problem until you read around your research area. This seems a vicious circle, but what should happen is that as you read you define your problem, and as you define your problem you will more easily be able to decide what to read and what to ignore.

TRAPS

Some traps to avoid:

Trying to read everything! As you might already have discovered, if you try to be comprehensive you will never be able to finish the reading! The idea of the literature review is not to provide a summary of all the published work that relates to your research, but a survey of the most relevant and significant work.

Reading but not writing! It's easier to read than to write: given the choice, most of us would rather sit down with a cup of coffee and read yet another article instead of putting ourselves in front of the computer to write about what we have already read! Writing takes much more effort, doesn't it? However, writing can help you to understand and find relationships between the work you've read, so don't put writing off until you've "finished" reading - after all, you will probably still be doing some reading all the way through to the end of your research project. Also, don't think of what you first write as being the final or near-final version. Writing is a way of thinking, so allow yourself to write as many drafts as you need, changing your ideas and information as you learn more about the context of your research problem.

Not keeping bibliographic information! The moment will come when you have to write your references page . . . and then you realize you have forgotten to keep the information you need, and that you never got around to putting references into your work. The only solution is to spend a lot of time in the library tracking down all those sources that you read, and going through your writing to find which information came from which source. If you're lucky, maybe you can actually do this

before your defence - more likely, you will unable to find all your sources, a big headache for you and your committee. To avoid this nightmare, always keep this information in your notes. Always put references into your writing.

LITERATURE REVIEW: AN EXAMPLE

Here is an example of using the literature to explain and define a problem. This example is taken from an introduction because most thesis literature reviews tend to be too long for us to easily look at. Although your literature review will probably be much longer than the one below, it is useful to look at the principles the writers have used.

On the optimal container size in automated warehouses
Y. Roll, M.J. Rosenblatt and D. Kadosh, Proceedings of the Ninth ICPR

Automated storage and retrieval systems (AS/RS) are being introduced into the industry and warehousing at an increasing rate. Forecasts indicate that this trend will continue for the foreseeable future (see [1]). Research in the area of AS/RS has followed several avenues. Early work by Hausman, Schwarz and Graves [6, 7] was concerned with storage assignment and interleaving policies, based on turnover rates of the various items. Elsayed [3] and Elsayed and Stern [4] compared algorithms for handling orders in AR/RS. Additional work by Karasawa et al. [9], Azadivar [2] and Parry et al. [11] deals with the design of an AS/RS and the determination of its throughput by simulation and optimization techniques.

Several researchers addressed the problem of the optimal handling unit (pallet or container) size, to be used in material handling and warehousing systems. Steudell [13], Tanchoco and Agee[14], Tanchoco et al. [15] and Grasso and Tanchoco [5] studied various aspects of this subject. The last two references incorporate the size of the pallet, or unit load, in evaluation of the optimal lot sizes for multi-inventory systems with limited storage space. In a report on a specific case, Normandin [10] has demonstrated that using the 'best-size' container can result in considerable savings. A simulation model combining container size and warehouse capacity considerations, in an AS/RS environment, was developed by Kadosh [8]. The general results, reflecting the stochastic nature of the flow of goods, are similar to those reported by Rosenblatt and Roll [12]. Nevertheless, container size was found to affect strongly overall warehousing costs.

In this paper, we present an analytical framework for approximating the optimal size of a warehouse container. The approximation is based on series of generalizations and specific assumptions. However, these are valid for a wide range of real life situations. The underlying assumptions of the model are presented in the following section.

Notice how the writers have:

- **Grouped** similar information: "Steudell [13], Tanchoco and Agee[14], Tanchoco et al. [15] and Grasso and Tanchoco [5] studied various aspects of this subject."
- Shown the relationship between the work of different researchers, showing similarities/differences: "The general results, reflecting the stochastic nature of the flow of goods, are **similar** to those reported by Rosenblatt and Roll [12]."

- indicated the position of the work in the research area history: "**Early** work by Hausman, Schwarz and Graves [6, 7] . . . "
- Moved from a **general** discussion of the research in AS/RS to the more **specific** area (optimal container size) that they themselves are researching i.e. they relate previous work to their own to define it, justify it and explain it.

HERE IS AN OUTLINE OF THE SAME PIECE OF WRITING

On the optimal container size in automated warehouses

Y. Roll, M.J. Rosenblatt and D. Kadosh, Proceedings of the Ninth ICPR

1. Forecasts of increasing rate of AR/RS introduction [1]

2. Storage assignment/interleaving policies (Hausman, Schwarz, Graves [6,7])

3. Comparison of algorithms for handling orders (Elsayed [3], Elsayed & Stern [4])

4. Design of AS/RS & determination of throughput (Karasawa et al. [9], Azadivar [2], Parry et al. [11])

5. Optimal handling unit (Steudel [13], Tanchoco & Agee [14])

   a. with pallet size/unit load (Tanchoco et al. [15], Grasso & Tanchoco [5])

   b. "best-size" gives savings (Normandin [10])

   c. simulation model (Kadosh [8])

   d. stochastic flow (Kadosh [8], Rosenblatt and Roll [12])

6. Summary of previous research: "container size was found to affect strongly overall warehousing costs."

7. Present research: "an analytical framework for approximating the optimal size of a warehouse container."

From this outline, it is clear that the writers are organizing their information around ideas (in this case **research**) not around the **researchers**. This enables them to focus on the research itself, to show how different research is related, and how it all relates to their own research.

THE BASICS OF GOOD WRITING

So you're going to sit down at your computer, go through your notes, and in a few hours produce a piece of research writing. Right? Wrong!

It is impossible to start from nothing and produce a good piece of writing, because it is very hard to organize your material and write at the same time. If you are working out which piece of research to talk about next and worrying about verb agreement, you are less likely to produce a good piece of writing. Here are some suggestions:

Plan your writing. Before you start writing, find a way to organize your material so that you know what you are going to write about, in what order, and what you're going to say. Try writing an outline. Trying writing your ideas down on the back of an envelope, or a piece of old paper. It doesn't have to be beautiful, it just has to help you think about what you are going to say. Use whatever method works for you, no matter how strange!

Ignore the language! When you plan your writing, don't worry about the language. Concentrate on what you are going to say. Write in notes so that you don't have to think about verb agreement. Don't waste time worrying about spelling. You can think about all these aspects of writing after you've decided what you are going to say. If you spend a lot of time fixing all the prepositions and conjunctions in an early draft you are not going to be willing to cut out paragraphs or sentences that you later realize aren't necessary, or to change them substantially. So don't put a lot of effort into proofreading until you are sure that what you want to say is the best you can come up with, then you can spend more time on fixing up the writing so that the punctuation, spelling, etc. is correct.

Write and rewrite! More experienced writers rewrite more times and more substantially than less experienced writers. Are you surprised? Good writing takes time for everyone. The better a writer you become, the more you will see that the first thoughts/ideas/writing that comes out of your head and onto the page can be improved. So give yourself time to rewrite so that your readers see the best of your thoughts and writing, not the best you could come up with at the last moment.

Find readers! Ask people to read what you've written. Ask friends, ask professors, ask your writing advisor in languages. But don't wait until your writing is "perfect" because then if people suggest changes you won't want to make them! Give people drafts and let them know what sort of feedback you want: comments on organization? on ideas? on your language? on the technical aspects of what you've written?

Keep writing! Good writing takes practice. The only person who can make you a better writer is you. So work at it, show your work to other people, and rewrite, rewrite, rewrite.

There are plenty of writing handbooks and guides available. They can give lots of useful hints and tips, but if the methods they suggest do not work for you then use a different method: there is no one way to write. Of course, the way you write depends very much on what suits you, and what suits the particular piece of writing you are working on.

HOW TO WRITE A LITERATURE REVIEW: SOME LINKS

The Literature Review: A Few Tips on Conducting It: http://www.utoronto.ca/writing/litrev.html

The Literature Review: http://www.library.cqu.edu.au/litreviewpages/

How to Write a Literature Review: http://library.ucsc.edu/ref/howto/literaturereview.html

How to Write a Literature Review:
www.unc.edu/depts/wcweb/ handouts_pdf/Literature%20Review.pdf

Writing at University. Literature Review:
http://www.canberra.edu.au/studyskills/writing/litreview.html

The Literature Review: http://www.deakin.edu.au/library/litrev.html

Research and Writing: using the literature: http://www.clet.ait.ac.th/EL21LIT.HTM

Academic Writing: Reviews of Literature
http://www.wisc.edu/writing/Handbook/ReviewofLiterature.html

Dissertation Doctor (Humorous, Human Interest Side - but some good advice as well)
http://www.dissertationdoctor.com/

Writing the Literature Review: http://www.ems.uq.edu.au/phdweb/phlink18.html

The Literature Review: A Few Tips On Conducting It: http://members.dca.net/~areid/litview.html

Writing a Psychology Literature Review: http://depts.washington.edu/psywc/handouts/litrev.html

How To Write A Literature Review: http://www.sportsci.org/jour/9901/wghreview.html

The Masters Project and Literature Review:
http://www.mcb.co.uk/imc/coursewa/mba/projectguide.htm

Evaluative Or Integrative Literature Reviews - short and to the point:
http://www.tele.sunyit.edu/litrev.htm

How to Write a Literature Review: http://helena.upa.pdx.edu/MB/litreview.html

Helpful Hints In Writing A Literature Review - prescriptive but some sensible advice
http://www.educ.drake.edu/nri/syllabi/reha222/Paperhints

Doing a Literature Review: Some Basic Principles:
http://www2.auckland.ac.nz/mch/hrmas/litreview.htm