

# Writing literature reviews

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## Why do you need to review the literature for your thesis or project?

A review of the literature has the following functions:

- To justify your choice of research question, theoretical or conceptual framework, and method
- To establish the importance of the topic
- To provide background information needed to understand the study
- To show readers you are familiar with significant and/or up-to-date research relevant to the topic
- To establish your study as one link in a chain of research that is developing knowledge in your field

The review traditionally provides a historical overview of the theory and the research literature, with a special emphasis on the literature specific to the thesis topic. It serves as well to support the argument/proposition behind your thesis, using evidence drawn from authorities or experts in your research field.

### Your review of the literature may be

- stand-alone, or
- embedded in the discussion, or
- segmented into a series of chapters on several topics

The review must be shaped by a focus on key areas of interest, including research which provides a background to the topic (depending on whether it is for an Honours thesis or for a PhD). It should also **be selective**. A common mistake in writing the review is to comment on everything you have read regardless of its relevance. In your writing it is useful to **think of the review as a funnel** - start wide with the overview and then quickly narrow into discussing the research that relates to your specific topic.

- Another way of looking at the process, particularly if you are examining several topics (or variables), is to think of yourself as a film director (Rudestam and Newton, 1992). You can think of providing your audience with:
  - **long shots** to provide a solid sense of the background
  - **middle distance shots** where the key figures and elements to be examined are brought clearly into view
  - **close-up shots** where the precise focus of your work is pinpointed

'Literature' can include a range of sources:

- Journal articles
- Monographs
- Computerized databases
- Conferences proceedings
- Dissertations
- Empirical studies
- Government reports and reports from other bodies
- Historical records
- Statistical handbooks

A number of these may be on the web. You should approach such material with the same critical eye as you approach printed material.

## What are the examiners looking for?

A review of the literature should:

- Set up a theoretical framework for your research
- Show your reader that you...
- have a clear understanding of the key concepts/ideas/studies/ models related to your topic
- know about the history of your research area and any related controversies
- can discuss these ideas in a context appropriate for your own investigation
- can evaluate the work of others
- Clarify important definitions/terminology
- Develop the research space you will also indicate in the **Introduction** and **Abstract**
- Narrow the problem; make the study feasible

**Questions you need to ask yourself when you are planning and drafting your Literature Review:**

- What has been done in your field of research? What principles of selection are you going to use?
- How are you going to order your discussion? Chronological, thematic, conceptual, methodological, or a combination? What section headings will you use?
- How do the various studies relate to each other? What precise contribution do they make to the field? What are their limitations?
- How does your own research fit into what has already been done?

Adapted from *Literature Review Guide*, Gail Craswell, ANU.

## Matching introductions and conclusions

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The main aim in structuring your review of the literature is to lead your reader to the point where he/she can see no other option than the need to conduct precisely the form of research you are proposing. The introduction and conclusion to your review of the literature, as well as indicating how your research is going to bring to a satisfactory resolution unresolved questions in others' work, can also accomplish additional tasks. You can, for example, identify the key terms and concepts; you can outline the structure of the review itself - by preview in the introduction, or review in the conclusion - and you can then foreshadow the direction of the next section/chapter. (see also Giving Reader Directions).

Consider the key terms in the following introduction to the literature review in a Masters Project in Linguistics and see how the student returns to them in her conclusion.

**Example 1 Topic: "Using computer technology to focus on form in corrective feedback: A case study".**

### 2. STIMULI FOR A FOCUS ON FORM

#### 2.1 The value of corrective feedback

[Introduction]

Linguists and educationalists have for many years had conflicting views about **the value of correcting linguistic errors**[1] in the speech and writing of second language learners. With regard to the practice of correcting written errors, one extreme view is that corrections do not have a significant effect on student errors and teachers should, therefore, adopt less time-consuming efforts to direct students' attention to surface error (Robb, Ross and Shortreed 1986:91). The more moderate view does not

dismiss the value of correction as a useful teaching technique, but rather, it emphasises the importance of consistency and systematicity if the **positive effects of correction**[2] are to be realised (Cohen and Robbins 1976:60; Rivers 1981:306; Lalande 1982:140).

In second language teaching/learning, the purpose in providing feedback such as 'correction', i.e., 'corrective feedback' (Schachter 1991:89), is to supply learners with '**negative evidence**'[3] which attempts to draw their attention to the linguistic errors made (Ellis 1994:584), or to "what is ungrammatical in their sentences" (p. 434). According to Gass (1991:140), focusing attention on form through corrective feedback is similar to grammar instruction in the way that it alerts "learners to the mismatch between their learner language form and the target language". Indeed, a number of studies investigating the effect of corrective feedback in speech (Tomasello and Herron, 1989:394; Lightbown and Spada 1990:443; Carroll and Swain, 1993:372), and in writing (Lalande 1982:145) support the view that **learners can improve their conscious knowledge of the target language**[4] through a **focus on form in the corrective feedback**[5].

#### [Conclusion]

The above discussion has highlighted the **benefits of using a concordancer as a research tool for investigating and focusing on regular patterns of language use** [1] and [4]. It reviews a range of previous applications that have used concordance data as stimuli for investigating students' linguistic errors. The technique proposed in this study extends on these previous applications by providing students with **two types of stimulus for focusing on linguistic form**[5]: 1) the **negative evidence**[3] of extensive corrective feedback, and 2) the **positive evidence**[2] of concordance data which the students generate independently from a corpus of their own reformulated texts. The next section elaborates further on the proposed technique and provides a detailed account of the method used to trial it.

Note the key terms in the Paragraphs 2 and 3 of the following introduction to the literature review in a Chemical Engineering PhD. See how the student returns to them in his conclusion.

### Example 2 Topic: "Design of high-rate trickling filters"

## CHAPTER 2

### LITERATURE SURVEY

#### [Introduction]

The technical literature of trickling filters is very extensive. This is evidenced by the literature search and critical analysis published by Dow (1971), which cited over 5,600 references in the literature published up to 1968. An exhaustive review of the literature is thus beyond the scope of this work.

The aim of this chapter is to provide, through selective reference to some of the literature, a **clearer understanding of the** different microbiological, chemical and physical **processes that occur within trickling filters**[1]. Experimental observations of various trickling filter phenomena are reviewed, and there is discussion of the **sometimes conflicting conclusions about the mechanisms of trickling filtration that have been drawn from the empirical evidence**[2].

The chapter is divided into two parts. The subject of the first is the **biological film which is the site of the biological oxidation of organic matter from the wastewater**[3], and is thus the heart of the process of trickling filtration. The formation biofilm is outlined, and the different processes which occur within it are discussed. The remainder of the chapter is devoted to a consideration of the **operating variables which determine trickling filter performance**[4].

## [Conclusion]

### Concluding Remarks

The review of literature in this Chapter has concentrated largely on **empirical observations of trickling filters**[2]. At the micro level, the **effects of oxygen and substrate limitations on the reactions occurring within the biofilm have been assessed**[3]. At the macro level, **trickling filter performance has been considered in terms of state variables such as hydraulic rate and depth of packing**[4]. Certain important concepts, such as liquid residence time, have been introduced and used to explain, qualitatively, certain aspects of filter behaviour.

**To quantify filter behaviour, it is necessary to develop a theory for the process; the theory may be a complex mechanistic model, or a simple empirical correlation**[1]. All trickling filter theories are based to some extent on empirical observation, if only for certain basic assumptions. Thus this Chapter provides a basis for the next in which the development of trickling filter theories is outlined, and various design equations are critically analyzed.

## Giving reader directions

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Reader directions are comments on the text in the text: they give signals to the reader about where the author is going, where he or she has got to, and what he or she has achieved so far. The author "intrudes" to direct the reader in some way.

Starting with the top level this can apply to:

The whole thesis (*the focus of this thesis is...*)

Another chapter (*the physical properties are presented and analysed in Chapter 5*)

The current chapter (*the rest of this chapter will examine...*)

Another section (*in the previous section, it was demonstrated...*)

The current section (*the following case study will illuminate...*)

Passage immediately preceding or following (*the objectives are as follows:...*)

### More specifically, these reader directions can function to:

#### 1. Preview

**Example 1:** *These two techniques are discussed below.*

**Example 2:** *In the first section of this chapter, the achievement in this area between 1996 and 1998 will be presented and discussed in detail.*

#### 2. Review

**Example 1:** *In the preceding section, the results of tests performed on interfaces comprising concrete and either Johnstone or Gambier Limestone were outlined.*

**Example 2:** *The applications of educational technology elaborated on in the previous chapter has indicted an irreconcilable difference between...*

#### 3. Overview (provide purpose statements)

**Example 1:** *It is now appropriate to consolidate these ideas and to examine POSTGRES in greater detail in relation to its support for rules and objects.*

**Example 2:** *This discussion of constructivism has underlined the necessity to consider collaborative learning as a means of providing multiple perspectives. That approach will now be examined in relation to...*

## Citing previous research

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When you cite the work of other authors, you may choose to focus either on the *information* provided by that author, or on the *author him- or herself*. The first focus is called **information prominent** because the information is given primary importance:

**Example 1:** " *For viscoelastic fluids, the behaviour of the time-dependent stresses in the transient shear flows is also very important (Boger et al., 1974).*"

In the second type, **author-prominent** citation, the author's name is given more emphasis. It serves as the subject of the sentence, followed by the date or citation number in parentheses, and then by the information. Such citations can be either **strong** or **weak**, depending on how much emphasis is placed on the identity of the author:

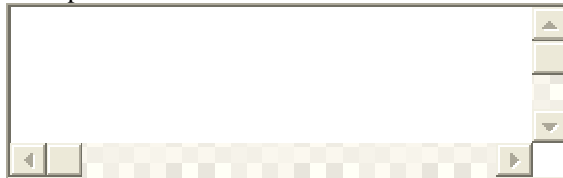
**Example 2:** " *Close (1983) developed a simplified theory using an analogy between heat and mass transfer and the equivalent heat transfer only case.*" ( **strong**)

**Example 3:** " *Several authors have suggested that automated testing should be more readily accepted (Balcer, 1989; Stahl, 1989; Carver and Tai, 1991).*" ( **weak**)

### Exercise 1

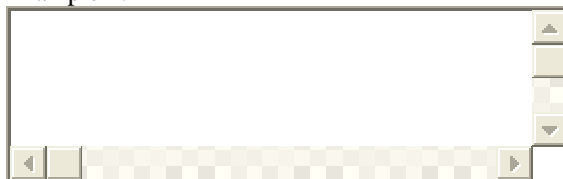
Try making Example 1 author-prominent, and Examples 2 and 3 information-prominent. How does the emphasis change in each one?

Example 1:



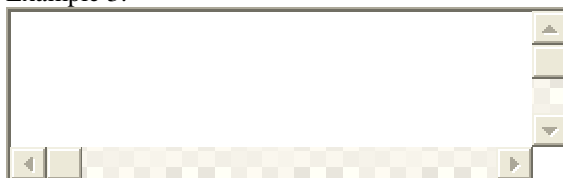
Show Answers

Example 2:



Show Answers

Example 3:



Show Answers

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## Exercise 2

In some disciplines, information-prominent citation is the norm. In the following drafts of an Engineering PhD student's paper (for a journal), the student is summarising a large amount of material. After discussion, he was able to reconceive the introductory paragraph as a number of topics (investigated by different authors) supporting a clear topic sentence. This enabled him more easily to identify for the reader how his own contribution was significant.

### Earlier draft

Network planning problems are too complicated to be solved by a single technique. Therefore the tool which incorporates multi techniques is highly desirable. Many attempts have been made to realize a hybrid system. Stonebraker [2] described attempts to integrate knowledge base of rules with database of facts. Martini et al. [2] integrate rule-based expert system and operations research methods. Integration of rulebased features and object-oriented paradigm can be found in Bahr et al. [3]. Allemang [4] described combination of generic procedural form and case-based reasoning.

### Later draft

Many attempts have been made to realise a hybrid system using multiple techniques. There have been attempts to explore an integration of rule systems into database systems, the use of mathematical models combined with rules and a combination of rules and an object-oriented modelling [3,4,5]. Another method that has also been combined into a hybrid system is case-based reasoning [6]. The integration of methods described in previous papers seems to offer only ad hoc solutions. None of them was based on a unified mechanism. In contrast, this paper describes a network planning tool that uses a fundamental mechanism within a constraint-based planning engine. This mechanism allows a tight integration of planning rules, optimization algorithms, casebase and database modules into a planning system. Therefore, it ensures higher efficiency.

What are the specific changes he makes?

Comments

## Answer: Exercise 1

### Author-prominent and Information-prominent Examples

**Example 1** Boger et al (1974) claim that for viscoelastic fluids, the behaviour of the time-dependent stresses in the transient shear flows is also very important.

### Author-prominent and Information-prominent Examples

**Example 2** A simplified theory has been developed using an analogy between heat and mass transfer and the equivalent heat transfer only case (Close, 1983).

### Author-prominent and Information-prominent Examples

**Example 3** It has been suggested that automated testing should be more readily accepted (Balcer, 1989; Stahl, 1989; Carver and Tai, 1991).

## Answer: Exercise 2

[a] Many attempts have been made to realise a hybrid system using multiple techniques. There have been attempts to explore an integration of rule systems into database systems, the use of mathematical models combined with rules and a combination of rules and an object-oriented modelling [3,4,5]. [c]

Another method that has also been combined into a hybrid system is case-based reasoning [6]. The integration of methods described in previous papers [b] seems to offer only ad hoc solutions. None of them was based on a unified mechanism. In contrast, this paper describes a network planning tool that uses a fundamental mechanism within a constraint-based planning engine. This mechanism allows a tight integration of planning rules, optimization algorithms, casebase and database modules into a planning system. Therefore, it ensures higher efficiency.[d]

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[a] Note the topic focus on the "attempts" - the research which has been done.

[b] The disadvantage with previous research is identified.

[c] The first paragraph is developed by listing the possible techniques

[d] The second paragraph identifies the contribution of the current paper

## Ordering citations

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All approaches to ordering citations should move toward the specific focus of the author's own study:

- distant to close
- chronological
- different categories of approach
- a combination of the above

### Example 1

**The general text for the area of information retrieval is more than 10 years old** (Salton and McGill, Introduction to Modern Information Retrieval, 1983). Yet, the methods of information retrieval mentioned are still relevant today. Van Rijsbergen (1979) describes probabilistic retrieval, which is the model that the Bayesian network implementation of information retrieval system is based on. Of the implementations of such systems, Turtle's (1990) implementation **appears to be the most well-known and demonstrates superior performance** compared to Boolean and vector space methods. Ghazfan et al. (1994) have produced **a different implementation which has not been tested in an actual information retrieval system**. It is the purpose of this investigation to obtain performance results in an actual information retrieval system.

Note how this example moves from distant to close (in terms of relevance and applicability as well as chronologically). It moves from 1) the broader historical context to 2) the implementation which demonstrates superior performance, and then to 3) the implementation which provides the model to be tested for the study.

## Example 2

The situational approach was **very much a product of the 1960s**, one of its pioneering achievements being Neile Osman's work with Australian immigrants (Osman, 1959). As a movement, however, it **did not really survive the attack made on it by Wilkins in the early 70's** (e.g. Wilkins, 1973). Wilkins' main objection therefore is that the situational approach is superficial. [...] Widdowson, for instance, observes that 'The danger of such analysis is that ...' Recent work by Ventola (1983; 1984), Martin (1985), Coupland (1983) and others opts for [...] **Current trends are towards** reconstructing accounts that include...

Speech community has been an evolving concept [...] and the variety of [...] criteria has been discussed by Hudson (1980), Saville-Troike (1982) and especially by Braithwaite (1984). **At the outset, a speech community was seen** as being composed of those who share similar linguistic rules (Bloomfield, 1933) [...] **Later, Labov will emphasize** 'shared norms' [...] (Labov, 1966:7). **Finally, there are those such as Hymes** who argue for multiple criteria.

Note how this example too is structured chronologically, but its real achievement (as well as covering a great deal of ground very concisely) is to compare and contrast a number of scholars, applying a clear and consistent personal perspective.

## Use of tenses

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The verb tenses you use in your lit review reveal more to your reader than just the time frame. They can also tell your reader:

- whose idea is being put forward (yours or someone else's)
- something about your attitude toward the ideas you are reporting on (if you have attributed them to an author/theorist)
- how general or specific your point/description is

In brief, tenses are used in the following ways (note that this is a simplified description of tense use):

The present tense is used for:

a generalisation (in overviews, statements of main points, etc.) OR a generally accepted scientific fact

**Example:** " *This thesis **investigates** the second approach.*"

a statement made by you as a writer

**Example:** " *Non-standard applications such as CASE, CAD/CAM **are** now **emerging**.*"

a statement reporting the position of a writer and your support or lack of support for this position

**Example:** " *Therefore, this sequential approach **is** impractical in the real world where projects **are** typically large (Radice, 1988) and the activities from one stage may be carried out in parallel with the activities of another stage.*"

The past tense is used to:

describe the contents, findings, or conclusions of past research. It emphasises the completed nature of a past activity. It is often referred to as the 'reporting' tense, and is traditionally used by scholars to report all past findings, including even very current research in some cases.

**Example:** " *This model **was** not popular in the software industry until it was later refined by Boehm (1976).*"

The present perfect tense is used to:

indicate that research in the area is still continuing, or that the research has immediate relevance today

**Example 1:** " *Several researchers **have studied** distributed database design.*"

**Example 2:** " *Fricke (1983) **has illustrated** that black liquor shows three rheological behaviours.*"

generalise about past literature

**Example:** " *Software **has been tested** manually for most of the last four decades.*"

present a view using an information-prominent citation

**Example:** " *The services that **have been identified** for the future B-ISDN include [7] [77] [78].*"

Thus, you can use tenses to indicate more than chronology. You can use the **past tense** in reporting others' research to indicate that that research is of secondary importance to your current work. You can use the **present perfect** to indicate that the research is of more direct and primary importance. You can use the **present tense** to indicate your general position relative to reported research.

## Paraphrase or quotation?

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You will need to introduce the work of others to your reader, and you can do this in different ways. You can:

- directly quote the words of other researchers, making sure you integrate the quote properly, or
- paraphrase other researchers' ideas by expressing the ideas in your own words

Direct quotation is thus found more commonly in humanities and social science writing, and not so frequently in the science and technology disciplines. For the most part, you should **aim to paraphrase**. Rarely is the original text written with your particular focus as its main concern. Your examiner will be looking to see how well you can utilise the sources for your own ends.

Direct quotations are commonly used to highlight:

- author's definitions of important terms
- assumptions underlying the author's choice of words
- particularly illustrative examples of an author's specific view, difficult to paraphrase
- particularly well-expressed opinions, revealing insights which a paraphrase could not capture

When you use direct quotation, it needs to fit grammatically with the rest of your sentence.

1. *Aid agencies have been known to take the view that such communities consist of "helpless victims with no capacity or expertise for responding to their own needs" (Leung et al., 1994).*

You can see that the quotation is the grammatical continuation of that part of the sentence used to introduce it.

2. *Hancock (1987) more recently summarized the concept as follows:*

*During disasters, "charitable" advertising may succumb to the temptation of making appeals for public money which can function to humiliate the supposed beneficiaries and misrepresent them as passive victims.*

With 'as follows', no grammatical constraints apply to the quote, whereas an expression such as 'Hancock (1987) can be criticized for [...]' must be followed by a verb ending in '-ing' (e.g. 'comparing') or a noun phrase (e.g. 'his neglect of ...').

In some cases you will need to modify the quote using square brackets [like this] to include a verb ending or to change a pronoun to make it follow grammatically. Omitted information is indicated by '[...]':

3. *The system was designed to show "how expert systems [could be used to] help in the decision making for investments in real estate" (Ostler and Branard, 1996, p. 77).*

A variety of constructions is available. The important thing to consider is how you put this all together to give a picture of your own research in relation to others'. You will be showing your attitude toward that research, whether you consider it outdated or still viable, close to your own perspective, etc.

## Reporting words

The following section lists some useful expressions for critically presenting other writers' ideas.

Reporting verbs or expressions are used to report on what other authors have done: whether they have made claims, argued a case, established findings, drawn conclusions, etc. Note the differences in these verbs: your choice of word will reveal to your reader your attitude toward the status of the author's theories/research; it will also indicate whether or not you consider her/his claims to be substantiated.

Assign the following reporting words to the most appropriate category:

Reporting verb	Answer	Categories
Account for	1	<p>Note: In the following, "author" indicates the source (not "you as the writer").</p> <p><b>Group 1</b> Author's argument (author making a point to develop or justify his/her argument)</p> <p><b>Group 2</b> Author's emphasis (author drawing reader's attention to a particular point)</p> <p><b>Group 3</b> Author's references to other authors (author positioning him/herself against other authors)</p> <p><b>Group 4</b> Author's omissions (author not fully arguing a point)</p> <p><b>Group 5</b> Author's admissions (author conceding a point of potential weakness)</p>
Acknowledge	5	
Argue	1	
Assume	4	
Challenge	3	
Claim	1	
Contend	1	
Dispute	3	
Draw attention to	2	
Emphasise	2	
Establish	1	
Find	1	
Focus on	2	
Hold the view	1	
Insist	2	
Maintain	1	
Note	2	
Observe	2	

Point out	2
Propose	1
Prove	1
Recognise	5
Recommend	1
Reiterate	2
Reject	3
Remark	2
Stress	2
Suggest	1
Support	3
Take for granted	4
Underline	2

## Indicating your own position

There are a number of ways of indicating your position in relation to previous research. The following is a sample of the kinds of evaluative expressions which may be used to indicate your own views of the authors you cite.

The research:

- disregarded X
- neglected to consider X
- overlooked X
- underestimated X
- has been limited to X
- overestimated X
- suffered from X
- requires excessive amounts of (time/storage, etc)
- has taken no account of X.

Which of the following adjectives have you seen used in your discipline - and in what way? Some may have positive OR negative connotations depending on the discipline and what it values.

The research/theory is:

- incomplete
- efficient
- questionable
- useful
- simple
- reliable
- too general
- robust
- inconclusive
- unsatisfactory

- comprehensive
- complex
- over-simplified
- cumbersome

You can expand your repertoire of evaluative expressions by reading articles or other theses attentively.

## Plagiarism

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Plagiarism means taking the ideas or words from other writers without acknowledging them. Along with fabricating results, it is considered to be one of the worst academic sins! When you submit your thesis you must be very confident that all sources are acknowledged; hence the Declaration Statement. This is why you must use a method of notetaking which allows you to easily distinguish your own work from that of others.

### Example

#### The original author wrote:

" [Microsoft's chairman has explained the] *company's strategy to make Windows the universal client operating system in the enterprise.*"

#### The student wrote:

" *The company's strategy is to make Windows the universal client operating system in the enterprise by the Window Open Services Architecture (WOSA) [Semich, 1992].*"

The student has copied word for word from the original author's article. Although the student acknowledged the author, he didn't put the excerpt in quotation marks or adequately paraphrase the original wording. This is still not acceptable, and may be considered plagiarism.

## Signalling your position

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### The I vs We debate

In a thesis, the relevance and importance of you as the author can change from section to section. The way your identity intrudes into the text depends to a large extent on accepted use in your particular discipline. Take your cues from the way this is done in published articles in your field (although note the different vehicle and audience), and seek the advice of your supervisor.

" I" or " we" is commonly found in mathematical writing, but is usually advised against for industrial or civil engineering. " I" and " my" can commonly be intrinsic for psychoanalytic writing, for instance - and case-study writing in a number of disciplines - but not for psychology. You will find " we" in history theses, and even " nous" in French.

Traditionally in much academic writing, it is not generally accepted to write: "I think..." or "It is my opinion...", because this detracts from the supposed objectivity of scholarship. It is true that too much insertion of yourself in your writing swings the focus away the material you are investigating and on to you. However, under the influence of a number of (post-)modern philosophers and other theorists, this may even be desirable in some disciplines. It is a debate that is still in flux within the academic community.

It sounds awkward to style yourself as " the author", " the present writer", or " the researcher". There are more graceful ways of expressing your own opinion. If you are uncertain how to avoid an over-personalised tone in sections of the thesis where you do not want this, or too much passive voice, you can use the following expressions to make your position clear in relation to your sources:

## Showing support or agreement

**Example:** " *The following discussion is based on the work in Murray et al.(1990).*"

**Example:** " *From the above discussion, it is clear that the design of moment connections involving solid members offers considerable insight into...*"

**Example:** "The characteristics of vapour flows in falling film evaporators *are well described by Stenhede (1982).*"

## Showing disagreement

**Example:** "Bruegge et al. (1992) review OMT; *however, their paper is from a project management and team communication perspective and is not relevant to the argument presented here.*"

**Example:** " *Neither mathematics nor the classic Newell and Simon (1972) descriptions of human problem solving are particularly useful in domains where absolute correctness, resolution, proof and related concepts are inappropriate.*"

## Active or passive voice?

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Some academic writers feel that the use of the passive voice (verbs which do not indicate who or what is doing the action) can lead to writing in which sources or agents are not clear. Certainly, repeated use of the passive results in texts which are 'flat' and tedious to read.

The difficulty with endless passive sentences is that the reader tends to lose sight of any agent, and the writing becomes dominated by **things** instead of people. You may see passive voice dominating in published articles, but this is often for reasons of space. Do not be afraid to use active voice - especially in your Discussion section, where it is sometimes important to indicate that it is **you** thinking certain things and having particular opinions. In Methods sections of many theses (in Medicine, for example), it is acceptable to break the monotony of many passive voice sentences with some active voice.

Compare the two texts below and decide which you think is preferable.

### Passive voice text

*The systems most favoured for investment **were shown to be** planning, design and production. Many manual systems **were reported** as being current investments across the sector. Only the largest firms, however, **were interested** to any degree in integrated systems. Textile and clothing firms **were seen to be** investing in automated production, design, planning and reporting technologies.*

### Active voice text

*In terms of current investments, manufacturers **favoured** planning, design and production systems, with many firms **showing** a strong interest in manual systems. According to the literature, only the largest firms however, **showed any degree of interest** in integrated systems. Textile and clothing firms, in particular, **have invested** in automated production, design, planning and reporting technologies.*

## Useful references

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Australian Government Publishing Service (1992). **Style Manual for Authors, Editors and Printers**. 4th ed. Canberra: AGPS.

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