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# 1

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## PRELIMINARIES

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### Key Points

- A literature review is a *re-view* of something that has already been written
  - A traditional review can vary in format and style
  - A systematic review is governed by a prescribed methodology – it is a research method and is used to address a specific research question
  - It is possible to work systematically in your literature review, but that does not mean it is a systematic review
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### What is a literature review?

This book is a guide to undertaking a literature review, in which we emphasise that the literature review can be a research method in its own right. We explain that the literature review is a written product; the format varies depending on the purpose of the review. In most instances, the review will be part of a research project and dissertation, but it can be a stand-alone review, one that is not a chapter in a research dissertation or thesis. We are interested in the process of creating a review. Much more attention has been focused on improving the quality of literature reviews, as awareness of the systematic review protocol, with a defined methodology, has raised expectations of what can be achieved by all of us when reviewing literature.

Since the promotion of systematic review as a specialist review in the fields of evidence-based practice, which uses a prescribed, systematic methodological approach, we have an alternative way to review the literature. The systematic review produces an output – for example, a statement of findings to inform policy development – that may not necessarily lead into new research.

The aim of this opening chapter is to present an overview focusing on the context of doing a literature review. We consider some scenarios when you might undertake a review of literature. There is a short discussion of the relationship between a research question and a research project. Literature review is a library or desk-based method involving the secondary analysis of explicit knowledge, so abstract concepts of explicit and tacit knowledge are explored. We critically examine the notion of

peer review and challenge the faith placed on the peer review process. The chapter closes with guidance on project planning and time management.

### Why do a literature review?

As an academic task the literature review is where you show that you are both aware of and can interpret what is already known and where eventually you will be able to point out the contradictions and gaps in existing knowledge. As with any piece of research, you will have to explain why your review is important, why it is different and what it adds to knowledge. In research, we seek to be original and to make an original contribution to knowledge. In the literature review context that means creating a new dimension or fresh perspective that makes a distinct contribution. There are many reasons for carrying out a literature review, so students should ensure that they are aware of what *they* are being asked to do and ensure that their review does what is required.

Taken as its simplest, traditional form a literature review is a 're-viewing' of the literature. Every student will at some point in their academic career be asked to carry out a review of the literature, usually as part of completing a research project. Sometimes the task is just to carry out a review of the literature as a dissertation in its own right. So let's begin with definitions.

### Terminology used in this book

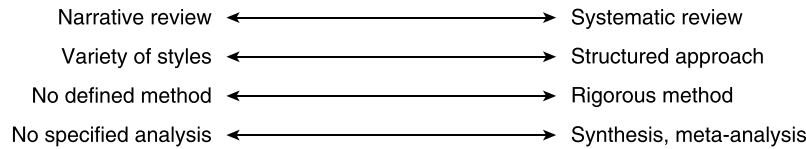
We need to have a common language to describe the different styles of literature review. Throughout the book we have labelled our two styles of review as 'traditional literature review' and 'systematic review' to differentiate them, although in practice the boundaries can be less marked. We will examine these two styles of review and then consider the word 'systematic' because this notion is often misunderstood and hence misused.

#### Task

Look at the research method textbooks you are using and see how the term 'literature review' is defined.

### Traditional literature review

A literature review is a written appraisal of what is already known – existing knowledge on a topic – with no prescribed methodology. Later in the book you will see that this basic model of a literature review can be complemented by a more scientifically prescribed model, the systematic review. Figure 1.1 represents the two types as ends of a continuum.



**Figure 1.1** A continuum of literature review approaches

How is the literature review defined in other textbooks? The two examples which follow are taken from business research textbooks. First, Jankowitz (2005) emphasises the process of building on existing work, but with a focus on *describing* and then bringing the work together in a *critical* way. This illustrates a use of the concept or term ‘critical’.

There is little point in reinventing the wheel. Whatever your epistemology, the work that you do is not done in a vacuum, but builds on the ideas of other people who have studied the field before you. This requires you to *describe* what has been published and to marshal the information in a relevant and *critical* way. (Jankowitz, 2005: 161, emphasis added)

Writing at the same time, Blumberg et al. (2005, emphasis added) discuss the literature review and here the emphasis is on individual contribution – as interpretation: ‘An academic document which must have a logical structure, the aim and objectives and purpose need to be clear to the reader – it is an appropriate *summary* of previous work. But it needs an added dimension – your *interpretation*’.

Example 1.1 provides selected sentences from an article showing how the authors classify their review as a thematic analysis and state why it is not a systematic review.

### Example 1.1

**Recognising a traditional review. Extract taken from: ‘Is the increasing policy use of Impact Assessment (IA) in Europe likely to undermine efforts to achieve healthy public policy?’ (Smith et al., 2010)**

This is an essay that provides a thematic analysis of literature concerning IA and associated tools and a related assessment of the European Union’s new integrated IA tool (2010: 478).

This essay takes a public health perspective in interpreting literature that critically examines Impact Assessment (IA) and related tools (namely cost–benefit analysis, CBA), which share the same basic elements as IA. This body of work is vast, divergent and largely theoretical, and *not, therefore, appropriate for a traditional systematic review.* (2010: 480, emphasis added)

## Systematic review

As a contrast to a traditional review, a systematic review has been defined by Petticrew and Roberts (2006: 2) as: ‘A *method* of making sense of large bodies of information, and a means to contributing to the answers to questions about what works and what does not.’

We therefore define a systematic review as a review with a clear stated purpose, a question, a defined search approach, stating inclusion and exclusion criteria, producing a qualitative appraisal of articles. Example 1.2 illustrates a systematic review.

The systematic review method is prescribed. In this book (see Chapter 7), we describe six essential stages of methodology that you should work through in undertaking a systematic review:

- 1 Define the research question.
- 2 Design the plan.
- 3 Search for literature.
- 4 Apply exclusion and inclusion criteria.
- 5 Apply quality assessment.
- 6 Synthesis.

### What does systematic mean?

Now let us consider the word ‘systematic’. To work systematically simply means to work in an ordered or methodical way, rather than in a haphazard or random way. So, as a researcher, you have to take a systematic approach to your learning and to your writing. But taking an ordered approach to doing your literature review does not mean that the review can be called a ‘systematic review’. It is possible to claim that you have taken a systematic approach to obtaining knowledge for your literature review, but without working through the six key stages of a systematic review protocol (see below) it cannot claim to be a systematic review.

### Example 1.2

#### Recognising a systematic review. Extract taken from ‘Networking literature about determinants of network effectiveness’ (Turrini et al., 2010)

##### Abstract

In fact literature on this topic has been highly fragmented, comprising a plurality of definitions, multiple theories, multiple methods and multiple explanations. This paper aims to review and classify previous theoretical and evidence-based studies on network effectiveness and its determinants. (2010: 528)

We want to emphasise again that the terminology of literature review is confusing and ambiguous because as a subject or research method in its own right it is still in its infancy, in comparison, say, with the volume of books on qualitative research. We might say that the debate is still at an emergent stage. It is only relatively recently that academic journals in some fields began to publish literature reviews, because the view prevailed that literature was not based on research. So you can expect to see inconsistency in the language that authors use. Without getting into too much detail at this point (because the detail is in Chapter 7), we use recently published articles to illustrate the differences in terminology between Examples 1.1 and 1.2.

Example 1.1 is a review of the policy use of Impact Assessment in Europe. There is no clue in the title that this is a literature review. The clue is in the abstract, which tells the reader this is a thematic analysis. 'Traditional' in this context is used because the authors report that they did not conduct a comprehensive search of a specific topic or question, but used an iterative approach to search. A thematic approach was taken to analyse the texts. So the process defines the type of review.

Example 1.2 is a systematic review. The example includes all the review method terminology that you will encounter in such an article, based on the use of a protocol. Do not be put off at this point. Throughout the book we explain the terminology. If you want more clarification now, take a look at the glossary.

So, there is no clue in the title or abstract of Example 1.2 that this is a systematic review, however the authors do provide a methodology section. The authors designed a four step procedure (although we recommend six steps) to review the literature:

- 1 They defined key terms (inclusion) and the studies that were not to be included (exclusion).
- 2 They used key words to identify and collect all existing studies, search bibliographic databases and follow up citations.
- 3 They screened titles and abstracts.
- 4 They reduced their data, generated categories and produced final interpretation criteria.

From these two examples you should get the idea and be aware of the difference between the two styles of review.

### **Different styles of review**

In order to study styles and types of literature review we have been collecting examples since 2000. An interesting outcome is that it is not always clear from the title or abstract that an article is a literature review until you skim read it,

as in Example 1.1. Those articles that do classify themselves as literature reviews can use a confusing range of terminology, which in some cases is not explicitly defined by the authors in the text. The range of labels authors choose include: 'a synthesis review', 'a narrative review', 'a critical literature review', 'a critical review', 'a review of the literature', 'a review', 'a systematic review', 'a systematic review of evidence', 'a rapid review', 'an integrated review', 'a thematic review', 'a content analysis', and 'a bibliometric overview'.

### Task

Take a look at any issue of the *International Journal of Management Reviews* and explore the wording of the titles. They are all reviews of one sort or another, but this is not necessarily flagged up in the title and it is not always clear until you read the abstract and the article itself what type of review it is. Example 1.3 illustrates the variety of possible review designs, the keywords emphasised in bold.

### Example 1.3

Various types of review design, from the contents page of the *International Journal of Management Review* (vol. 10, issue 1, March 2008)

- The structure and evolution of the strategic management field: **a content analysis** of 26 years of strategic management research (Furrer et al., 2008).
- **Literature review** of theory and research on the psychological impact of temporary employment: towards a conceptual model (De Cuyper et al., 2008).
- **A review** of the theories of corporate social responsibility: its evolutionary path and the road ahead (Lee, 2008).

### Two styles or approaches

In the following section we examine the two styles of review in more detail, with most emphasis on the traditional review.

#### Traditional literature review

Traditional reviews are usually critical, not purely descriptive, but there are other types of reviewing; the type (or purpose) is often indicated in the article title. The approaches most often used are listed here, and a published example of each one follows in Chapter 7.

- A *traditional review* usually adopts a *critical approach*, which might assess theories or hypotheses by critically examining the methods and results of single primary studies, with an emphasis on background and contextual material.
- A *conceptual review* aims to synthesise areas of conceptual knowledge that contribute to a better understanding of the issues.
- A *state-of-the-art review* brings readers up to date on the most recent research on the subject. This might be a seminal work, so it could be a useful beginning to your research project.
- An *expert review* is just that, written by an acknowledged expert. This may be heavily influenced by the writer's personal selection of material.
- A *scoping review* sets the scene for a future research agenda. This is comparable to what you have to do for your research project. The review documents what is already known, and then, using a critical analysis of the gaps in knowledge, it helps to refine the research questions, concepts and theories to point the way to future research. It is also used as the first step in refining the questions for a subsequent systematic review. It is our contention that you should undertake a scoping review before attempting a systematic review.

These types of traditional review are often based on a personal selection of materials because the writer believes the original authors have some important contribution to make to current knowledge. What you, as a writer of such a review, have to do is to weave those contributions together in a logical, systematic way, to develop an argument or tell a story. This approach offers the scope to be reflective, but it may produce a one-sided or even a biased argument (see Chapter 4). On the other hand, one value of traditional reviews is that they often provide insights that can be neglected or passed over in the steps towards exclusion and quality control that are required in the systematic review model. This traditional review is the style of literature review that most undergraduate and postgraduate students will be asked to do.

### The systematic review

Systematic reviews are a useful tool for those seeking to promote research knowledge and put it into action. As with traditional reviews, they can help to identify gaps in knowledge as well as clarify where no further research is needed for the time being.

The appeal of this style of review lies in its claim to be a more neutral, technical process, which is rational and standardised, thereby demonstrating objectivity and a transparent process to the reader. These features sit easily in a scientific framework but less so in a more open qualitative, interpretative paradigm common in the social sciences.

So, you need to select the review approach which is most appropriate for your research.

## A critical approach

One concept we have emphasised so far is that literature reviews should take a critical approach. We return to this in Chapter 4. The academic task of doing a literature review requires you to think, and to think for yourself, but to do both critically. In a popular column in the *Education* section of *The Guardian*, 'How to be a student No 61', Swain (2009: 12) offers a useful simplified explanation of what is required from defined critical thinking: 'Proper thinking is about forming an argument or a critical analysis that you can back up with evidence and reinforce with appropriate examples'. Some students find developing critical thinking challenging because their education so far has been based on hearing, reading, learning and repeating in examination. Professors and teachers, and the knowledge of professors and teachers, are respected but rarely challenged. At postgraduate level, it can come as a shock to be asked to modify that reverence for current wisdom and see that 'facts' do not exist in themselves and that experts are not always 'right'. This can be very demanding.

Criticism involves analysis of positive as well as negative features. It means recognising the strengths and the weaknesses of research that others have undertaken and being able to articulate why and how you think their ideas or theories might be improved. Critical thinking requires the development of a wide range of skills, but these are skills for life and hence it is worth investing time to learn them.

## Knowledge and literature

Another core idea that we have used so far is that literature review is a secondary analysis technique; it is a secondary analysis of knowledge. But what do we mean by knowledge? What is knowledge? Modern technology enables us to access more information. At the same time, it has meant a wider involvement and sharing of knowledge between academics and non-academics, between readers and authors. Just think of how online encyclopaedias have changed the way knowledge is produced by experts and added to by non-experts. More and more organisations in both the public and private sector are now knowledge-based businesses. Figure 1.2 represents two types of knowledge: explicit knowledge and tacit knowledge.

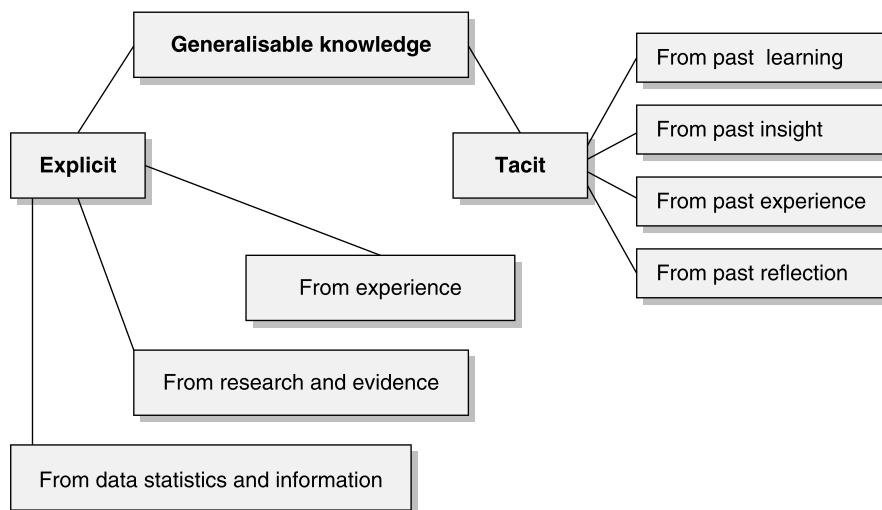
Explicit knowledge is formal knowledge that has been articulated, codified and stored in an accessible format. It can be readily transmitted to others, through, for example, encyclopaedias. It is systematic and can be shared and communicated. Explicit knowledge is mostly based on empirical research findings and is in the public domain. It is the literature that you will review. Libraries are reservoirs of knowledge and information and now the internet



brings that store of knowledge to your desk. So we will all need to know how to access knowledge using modern technology and be able to judge the validity and reliability of knowledge for ourselves. Your library information manager can be really useful in helping you to navigate through the constantly evolving way that academic knowledge is managed and accessed (Wade et al., 2006).

By comparison, tacit knowledge is informal knowledge that sits in your head. It is unwritten (so no one else can access it), and often unspoken. This is a type of knowledge that we all have; it is based on our past learning from experiences, insights, intuition, observation, and it includes our beliefs, values and emotions. This is valuable knowledge that postgraduates bring to their studies which can help them take a critical approach to what is being taught.

Researchers draw on these two dimensions of knowledge through reflection and eventually interpret the work of others using their tacit knowledge reserves.



**Figure 1.2** Types of knowledge — explicit and tacit

### Why and when will you need to review the literature?

Literature reviews come in all shapes and formats, which we have tried to categorise as two main styles, with a subset of types, to make it simpler to understand. A literature review can have many different purposes and be written from a particular perspective. For instance, the review can be based on empirical primary research, on research methods, on theories or practical interventions, or it can be a conceptual review. It makes sense, before you start new research, to find out what other researchers have already done, because all

academic work begins by looking at what is known already. A literature review might appear as the introduction to a report of new primary research or it might be an independent, stand-alone review of a topic. The following list gives a flavour of the types of situation when a review might be needed, recognising that each institution will have its own requirements.

There are six different scenarios when reviews are undertaken:

- In a research proposal (approximately 3,000 words), where the literature review would take approximately one-third of the total word count. This is a preliminary taster of the longer review you will write in your dissertation.
- In an undergraduate or postgraduate Masters research project you might have to review two different bodies of knowledge: (a) policy or theory, and (b) existing research.
- In a doctoral dissertation.
- In a journal article publishing research findings, which begins with 'stringing' of the literature review, meaning a stringing together of published material without providing any in-depth analysis (the journal prescribes the word limit).
- In a review in its own right.
- In an evidence-based policy development document.

The purpose of the review in all but the last scenario is to provide a background to and often a rationale for further research.

### **The research question and the literature review**

Whatever form of research you are doing – whether it is a stand-alone review or the preliminary part of a complete research project – you have to begin with a research question. The research question provides the structure for the whole of the literature review. Defining your research question is a crucial step that points the way for your research investigation. If you have no research question, you do not know where you are going and there is a risk that your research will be unfocused. Therefore, automatically, a good research question will help to keep you focused.

- The research question will guide your literature search – it leads into the relevant literature.
- If the literature review is to inform a research project, then the question will be focal for the research design.
- The research question will inform what data you need to generate, how and from where, and finally, how you analyse the data.

For some students the research question may already be pre-set by your supervisor. It may be a problem related to work experience that you would like to

pursue, but in most cases you will be expected to come up with some ideas for yourself. The best way to approach the question is to start with a general topic of interest. Explore, read widely, then select aspects of that topic that really interest you. Then focus down to formulate your research question. This will not be a simple one try and it is there. You will probably have several variations of your question. You may get ideas from reading what others have done already, since most research articles end with a sentence identifying gaps for future research.

There are standard features that your question should have:

- It must be clear: that is, it must be clear to you and your supervisor what you are asking.
- It must be doable: that means feasible, that you have the resources, the idea is not too big or vague in scope, and it is doable in the time that you have.
- It should connect with established theory and research.
- It should have the potential to make a contribution to knowledge.

Once you have formulated a draft research question, then do some preliminary searching. Find out how much literature there is and what it is saying. If your research question is too vague, it will not lead you into a coherent body of literature. Write the question down and then work through, as shown in Table 1.1.

If the research question were 'How can we improve household waste recycling?', the literature search has to look for examples of how we currently dispose of household waste and the problems that householders experience. On the basis of the findings, that is what is already known, you would design your research plan.

**Table 1.1** Working through formulating a research question on recycling

What is the purpose of the review?		
What style of review will it be?		
Definition: How is recycling to be defined?		
Research question: What are the barriers to recycling?		
<i>Questions to ask</i>	<i>Refine the question</i>	<i>Decision to make</i>
Where, location?	Where?	Include all or narrow the scope
What sort of waste?	Food, paper, plastics, electrical goods, clothing textiles, furniture, other household goods	Just paper and plastics
Define how the recycling is to take place	Kerbside recycling, composting, black bin recycling, bins at community sites (civic amenity), charity bags, charity shops, giving things away for someone else to use	Just kerbside collection

So the final question could be: *What are the barriers to recycling household waste in the USA?*

Once you have a research question the process of review falls into place.

- 1 Formulate your draft research question.
- 2 Search for information, using key words.
- 3 Skim, scan, read, reflect and search some more, defining key concepts.
- 4 Obtain articles and read some more.
- 5 Reassess your question.
- 6 Formulate the final research question.

## What is appropriate literature?

Unless your research topic is very new, it will be impossible to review every article, so you will need to select the most significant and relevant to your question. You might also need to access government or company reports, as appropriate to your topic. There are topics where you may need to be more adventurous in your choice of material, maybe looking at the work of different academic disciplines, because some of the best advances in knowledge come from bringing two or more separate fields of study together to create a new perspective. A hierarchy of sources of knowledge on environmental studies and recycling, for example, might look like that shown in Figure 1.3, which lists a range of relevant environmental knowledge sources from the top peer-reviewed journals down to the special interest trade magazines.

### Peer review

Many teachers advise their students to access material only from peer-reviewed and highly rated top journals, but there are some circumstances when non-academic peer-reviewed information, known as grey literature, may be needed (Wade et al., 2006). The notion of peer review is based on a belief in the reliability of the peer review process, but you should be aware that there are some limitations and drawbacks to it.

If you are looking for insights and current topical issues, you can find them in specialist practitioner trade journals, newspapers and magazines – often half- or quarter-page snippets of information – because again these are current events happening. This type of material may not be included in your final literature review, but it adds to your working background knowledge and enables you to rapidly oversee the research field, set the scene, see

who the movers and shakers are and give you ideas for new research projects. Eventually, with time, you will develop the experience and self-confidence in your own knowledge to be able to judge the quality of a source of information.

Source	Type of source	Rating
Business Strategy and Environment	Peer reviewed journal	Quality assured
Environment and Behaviour	Peer reviewed journal	Quality assured
Journal of Environmental Planning and Management;	Peer reviewed journal	Quality assured
Journal of Environmental Management	Peer reviewed journal	Quality assured
Resources, Conservation and Recycling	Peer reviewed journal	Quality assured
Chartered Institute Waste Management	Professional journal	Written articles, but not a rated journal
Journal of Waste and Resource Management Professionals	Trade journal	News and comment
Recycling Waste World Recyclingwasteworld.co.uk	Weekly trade magazine	News and comment
MRW MRW.co.uk	Trade magazine	News and comment
Letsrecycle.com	Blog	News and comment
Environwise	Weekly newsletter	News and comment
Local Authority Recycling Advisory Committee	Newsletter	News and comment

**Figure 1.3** Potential sources of knowledge in environmental studies

When we submit work to an academic journal it is sent out to two or three appropriate reviewers, who assess the quality of the work and its contribution to knowledge. This is a helpful process because reviewers usually suggest ways in which the paper can be improved or where points need to be clarified.

The downside of peer review is that being judged by experts who have established perspectives and paradigms can act as a barrier to publishing new and unconventional ideas. What is known as ‘group think’ or consensus among academics can arise, which can be difficult to break down. The result is that there is less likely to be what is known as a paradigm shift, or a fresh movement away from accepted thinking towards a new direction. This is one form

of what might be called publication bias, but another form of publication bias is when researchers themselves do not share their findings and ideas with the wider research community, they keep negative or uninteresting findings in their filing cabinet. The effect is to skew knowledge in favour of positive findings only, instead of having a balanced presentation. The peer review process of the past (150 years ago) tells us that Darwin's theory of evolution and natural selection would not have been published if subjected to review by his peers because it challenged the current paradigm, that is, the set of beliefs most people held at that time about the theory of evolution.

When we are teaching, we say that peer-reviewed journals are the best source to use because they are peer reviewed and therefore have gone through a vetting and improvement phase. Thus quality is assured. However, sometimes that process falls down, as in the case of the famous MMR paper in *The Lancet*, which was later withdrawn by the journal (Murch et al., 2004). It is notable that poor work is less frequently challenged in non-clinical research fields and it is less likely that papers will be withdrawn after publication. The standard of journal rankings is also a benchmark against which to assess work, although the benchmarking system and listing is open to challenge.

#### A note on peer review and journal ratings

As academics, we are encouraged to publish our research in highly rated journals. We then pass on this advice to postgraduate and doctoral students who need to publish their work. The first point here is to understand how journals become rated. Plos Medicine Editors (2006) [Public Library of Science, an open access journal] discuss the contentious nature of the impact factor game. For those who are interested, the impact factor is calculated by the equation shown in Figure 1.4. Later, Plos Medicine Editors (2007) write that 'even though the scientific skill of peer review is ill-defined, somehow peer review has become a badge of respectability among journals'.

$\text{Journal } X\text{'s 2005 impact factor} = \frac{\text{Citations in 2005 (in journals indexed by Thompson Scientific) to all articles published by } Journal X \text{ in 2003–4.}}{\text{Number of articles deemed to be 'citable' by Thompson Scientific that were published in } Journal X \text{ in 2003–4.}}$ <p>Note: 'Thompson are the sole arbiter of the impact factor game.' (Plos Medicine Editors, 2006: 2).</p>
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**Figure 1.4** The formula for calculating an impact factor

Clearly, the impact factor depends on which journals and which article types Thompson Scientific deem as citable and the fewer the better (the lower the denominator, the higher the impact factor). A journal's impact factor can be boosted by the publication of review articles or the publication of a few highly cited research papers. But this measure does not tell you anything at all about the usefulness of any specific article in that journal, just that the balance is in favour of good articles in the opinion of reviewers and editors.

The second important point to make is that when undertaking a critical literature review we should be accessing all knowledge in all journals, regardless of impact status because our search is about knowledge. There might be an equally good paper in a lower rated journal which could not get past the strict publication criteria and the sheer volume of articles that are submitted. There is also a time factor. Sometimes a paper can take two or three years to be published in highly rated journals, so some authors deliberately seek to publish in lesser rated journals so that their work can be in the public domain. Readers have to judge the relevance and quality of the article for themselves. Only you can judge the relevance of an article to your literature review topic. In later chapters we introduce some of the standard tools which have been developed to assist in assessing quality.

### **Choosing which style of review: a traditional narrative review or a systematic review?**

How do you know which type of review you should do? This depends on the assignment that you have been given.

The current zeitgeist in public policy and research favours systematic review over traditional review. It could be argued that the advance of online publishing has made it easier to track and obtain articles than when we had to identify them manually and send for a paper copy through interlibrary loans. The desk technology and computer software enhances the number crunching potential, thereby making it easier for reviewers to code and rank articles. This becomes almost a form of literature audit. In Chapter 7, Example 7.7 is a meta-narrative mapping systematic review which illustrates this point. It really depends on what you want from your review. Make sure that you do the right kind of review for your purpose.

#### **The challenge to traditional review**

*The A-Z of Social Research* (Miller and Brewer, 2003) contains a section on literature searching and systematic review, but not on traditional review.

Unfortunately, it is difficult to find any written support for the traditional review against the powerful surge of the proponents of systematic review. Advocates of systematic review are dismissive of traditional reviews (sometimes labelled traditional narratives), stating that they lack transparency of method and therefore cannot be replicated (Petticrew and Roberts, 2006). But as teachers, we know that at the beginning of their research many students have not yet developed sufficient working knowledge of their topic and are therefore not ready to undertake a systematic review. Hence our motivation in writing a textbook that tries to give preference to neither one nor the other, but rather shows them as being of equal value but different or sequential processes. So our advice is, if you have time, begin by doing a traditional (scoping) review before attempting to produce a systematic review.

The main challenge to the traditional style is based on a critique of the process. Critics assert that the design and method for a traditional review is too open and flexible. One key difference is that in a traditional review there is no obligation to provide a method report; you only have to tell the reader the purpose of the review, you do not have to tell the reader how you identified sources, what you included and what you excluded and why.

## Project management

Doing a literature review is time consuming. So be prepared to allocate sufficient time to do it. For any research study it is good practice to draw up a time plan. A Gantt chart is a time plan for a research project. This is a schedule of work which shows the various steps of an entire research project broken down into tasks. Figure 1.5 shows the Gantt chart of a three month long commissioned research project. The research and review phases are shaded. Planning and time management are important skills for researchers. The Gantt chart is a flexible tool because it helps you manage the process. You will find that your research will not match the time plan exactly, but it will help you to complete on time.

Finally, this introductory overview is a good place to suggest that you should set up a system for recording and storing your work. If you are working on paper, you need to establish a system for keeping your work in order. Some people prefer coloured card folders for different themes, topics or issues. In addition, the use of colour highlighter pens helps when you need to re-find sections or sentences or references in the material. Remember, you can adapt your method of data storage and analysis retrieval to suit your own learning style. If your work is stored electronically, set up a system of folders and files that enable you to work effectively.



		2009											
		Feb				March					April		
No.	ACTIVITY/TASK	2	9	16	23	2	9	16	23	30	6	13	
<b>1</b>	<b>Commissioning and monitoring</b>												
a	Internal contract meetings		■										
b	Contract strategic development		■										
c	Scoping/negotiation with client		■										
d	Supervision and project management		■	■	■	■	■	■	■	■			
<b>2</b>	<b>Conceptualisation and design</b>												
a	Project Conceptualisation and design		■	■									
b	Focus group design		■	■									
<b>3</b>	<b>Fieldwork</b>												
a	Recruiting participants, venues				■	■							
b	Focus groups						■	■					
<b>4</b>	<b>Data processing</b>												
a	Focus group write ups						■	■	■				
<b>5</b>	<b>Reporting</b>												
a	Report writing/editing										■		
b	Client meetings/presentation										■		

**Figure 1.5** The Gantt chart for a three month research project using focus groups

## Summary

In this introductory chapter we have concentrated on 'knows what' rather than 'knows how'. The terminology to describe literature reviews is confusing and contradictory so we have tried to establish a common terminology as we explain the traditional literature review and the systematic review, using examples to illustrate the difference. We have labelled them as two styles of review. Within each style there are various types of review. We have told you that you should rely most on peer-reviewed academic journal articles, although there are also occasions when you may want to use information from a wider spectrum. There are flaws in the peer review system, limitations of which you should be aware. The remainder of the book is more about how to do a literature review.

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# 2

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## SEARCHING FOR INFORMATION

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### Key Points

- Identify a range of information sources to discover where key information is available
- Develop online searches by identifying keywords and creating complex searches
- Search online and keep a record of your results
- Review your search

#### Be aware

- Sources of information are often written or compiled for a specific purpose and therefore may have limited content which may become outdated over time
  - Seek advice from your academic supervisor and the Information Specialist in your library at different stages in your search, to cross-check the appropriateness of your approach
  - Schedule time specifically for searching for information – it is worthwhile spending time at the outset to be sure you have a good range of materials
- 

### Introduction

This chapter introduces you to the main approaches to searching for information for your review. It emphasises working with your library and subject librarian. Not every academic library is the same, so invest some time in learning how yours operates. We have deliberately kept the guidance general, in the knowledge that working with online resources is a dynamic process. Most research methods textbooks will explain about ‘the search’, but the limitation of these books is that the information becomes out of date very quickly. Thus the emphasis in this chapter is on making the best use of your librarian to ensure that you use the most up-to-date and appropriate resources for your search. How much time and effort you can devote to your search depends on the reason for your review, as discussed in Chapter 1.

We begin at the beginning, with key words, and a reminder to record your search.

## Developing online searches by identifying keywords and creating a search record

### Identifying keywords

Subject librarians often refer to 'keywords' when searching databases. When you type in a search, rather than typing in a phrase or sentence, you will need to identify some keywords from your research topic. This enables the database to search for these words to retrieve relevant records. You might readily identify some keywords from your search topic – these are known as 'natural language' words. Natural language keywords are useful when searching the title, abstract and actual text of the article, allowing you to second-guess the words that you think will appear in these fields. However, at times, you will retrieve articles where your keywords appear in the article but the context is incorrect and therefore your search results will not be relevant.

In contrast, keywords used in databases are more deliberately selected and consist of a selection of 'controlled vocabulary' words assigned to articles by authors and database compilers. Controlled vocabulary keywords identify topics central to the article, rather than just words that appear within the article. So a good approach is first to 'guess' keywords from your understanding of the field and then review the keywords actually used in all relevant articles. This helps you to refine the keywords. It is therefore important to ensure that you become aware of the range of designated keywords for your topic in order to retrieve relevant articles. Your own natural language 'guessed' keywords may match the database keywords and help you retrieve articles. You can then refer to the additional designated keywords attached to the article to search for related articles. Many databases, such as ISI Web of Knowledge (see Figure 2.1) have a 'browse' facility so that you can browse words in the database. These are words in the database indexes linked to articles. Instead of typing in a keyword, you can browse the index and link to the related articles.

The following tips can help you to identify keywords:

- Select words from your research statement or research question.
- Identify similar and related words, for example, synonyms, broader terms or narrower terms (use a dictionary or a subject thesaurus to do this).
- Identify keywords and subject terms from the databases you are searching by browsing the online subject terms.

### Constructing your search statement using your keywords

You can use the Boolean operators AND/OR/NOT to improve your search results.

### Using AND

When you use AND you will be looking for articles containing two or more words within each article. For example, *employee AND motivation* would retrieve articles with both words in the article. You would use AND when you are searching for concepts and want to be more specific in your search (to narrow it down). You can also use AND to search for words within different fields, for example, a search for *employee* in the title field of the article AND *motivation* in the full-text of the article.

### Using OR

When you use OR you will be looking for articles containing either one word or the other word. For example, *employee OR personnel OR staff*. You would use OR for similar concepts and alternative words or synonyms (to broaden out your search).

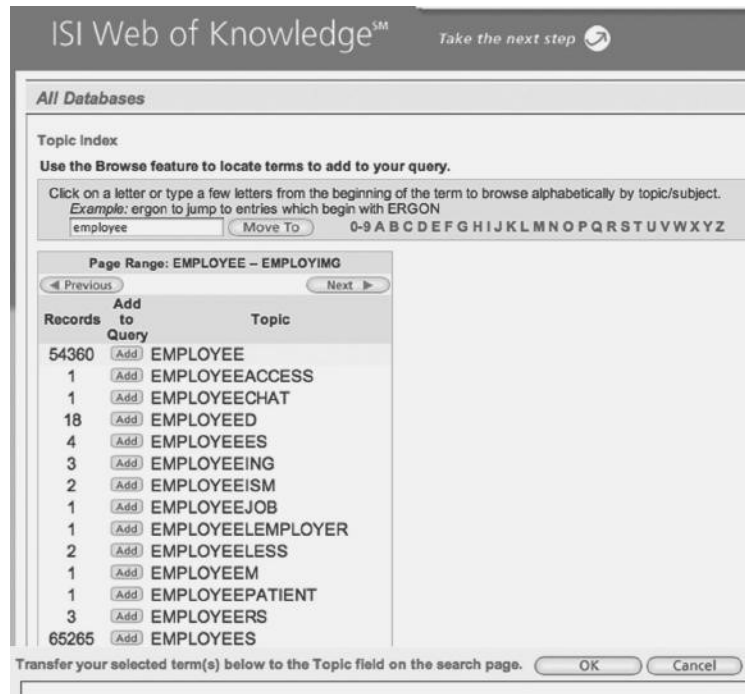
### Using NOT

When you use NOT you will be looking for one term but not the other. So, for example, you might search for *broadband NOT wireless*. You would use NOT to exclude irrelevant results (to narrow down your search).

You can use the Boolean AND/OR/NOT operators together to search for specific concepts and synonyms at the same time. To do this effectively and undertake more advanced searches, check the help files of the database you are using. Each online database will have its own rules and helpful tips and tricks for improving your search strategy. Some databases will have a wildcard such as an \* that you can use to truncate words. For example, *manag\** would search for all alternative endings of the word, including *manager, management, managing*. Many databases also have a facility to search for words in proximity of each other, such as in the same sentence or within one or two words of each other. This can be helpful when the results you retrieve from a search using AND are too general.

### Searching online and recording

It is always good practice to keep a record of your search activity and results. It can be a challenge to keep track of which information sources you have searched, how you have searched them and what results you have obtained. Keeping a record of searches enables you to follow up leads and it will save time in the long run. Otherwise you may find yourself repeating searches you have already undertaken. If you want to re-run searches at a future date, then you can also use the online search and save facilities within databases. As these facilities vary, it is important to refer to the online help files within databases



**Figure 2.1** Browse facility on ISI Web of Knowledge

Certain data included herein are derived from the **Web of Science**® prepared by THOMSON REUTERS®, Inc. (Thomson®), Philadelphia, Pennsylvania, USA: © Copyright THOMSON REUTERS® 2010. All rights reserved.

to see how to do this. Alternatively, you may want to replicate successful searches using alternative information resources. If you set up an online or paper-based folder for your literature review, then you can keep a research record, as shown in Table 2.1, to refer to, alongside saved articles or print-outs. This is good practice for all literature reviews, but if you are doing a systematic

**Table 2.1** An example of a research record on 'employee and motivation'

Information source	Date searched	Searches used/scope of search	References	Comments/follow up
Business Source Premier (EBSCO Host)	12 July 2009	Employee AND Motivation AND review (limited to full text peer-reviewed academic articles)	4 key references	Need to try some alternative searches relating to employee satisfaction Also need to try on ABI/Inform Proquest
ABI/Inform	13 July 2009	Employee AND Satisfaction AND motivation	8 key references	Check for duplicates Follow up citations

review (see Chapter 7), the search strategy and the criteria for inclusion in your review is key to the quality of the data, and therefore each stage of the process must be recorded.

When you review the information and articles that you have found, you can refer to your research record to double-check that you really have undertaken a thorough search for your literature review. You can show your research record to your academic supervisor who may have additional ideas.

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**Tip**

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Cross-reference your research record with the checklist in Table 2.2.

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**Table 2.2** Search checklist

- 
- Have I searched all the appropriate resources?
  - Are there any gaps in the information sources searched?
  - Have I used complex search statements as required by individual databases?
  - Could any improvements be made to the searches?
  - Have I identified all the relevant references?
  - Have I used both full-text and bibliographic databases?
- 

Some researchers use bibliographic referencing tools to collate their research. These are computer software tools such as Endnote™ or Reference Manager™, which are specifically designed for managing your references. Therefore, if you are undertaking research in the long term, you should find out what is available through your institution and obtain training so that you can use them effectively.

### Review your search

You will know that your search is near completion once you have accessed many different information sources, tried several complex search statements, and the same key relevant articles keep appearing. Once you have the references that are relevant to the topic of your review, you will need to read them and decide which are appropriate for inclusion in your review. You will need to make reasoned decisions about which articles to exclude: perhaps on the basis of criteria relating to geography, time span, language, subject area covered and research methodology. For example, you may choose to limit your review to material published in the last ten years if the topic is recent.

### How many references should I have?

Often students will ask how many references are required for their review, but I am afraid there is no right or wrong answer to this question. The point of a review is to provide a valid summary of the material on a given topic. Therefore, the number of references to include depends very much on the topic and the body of literature that exists on that topic. It is best to consult with your academic supervisor if in doubt.

In the process of writing your review, new articles may be published. You can keep up to date by setting up email alerts using the online databases, so that you receive emails when articles are published in particular journals, about particular topics or by specific authors. You will need to refer to the help pages of the individual databases to set the alerts up, as keeping up to date will be an important part of your ongoing research. You can also set up alerts to receive contents pages of journals. The contact details are listed later in this chapter. Now we will work through the many sources where you might obtain key information for your literature review.

### The range of information sources available for complex searches

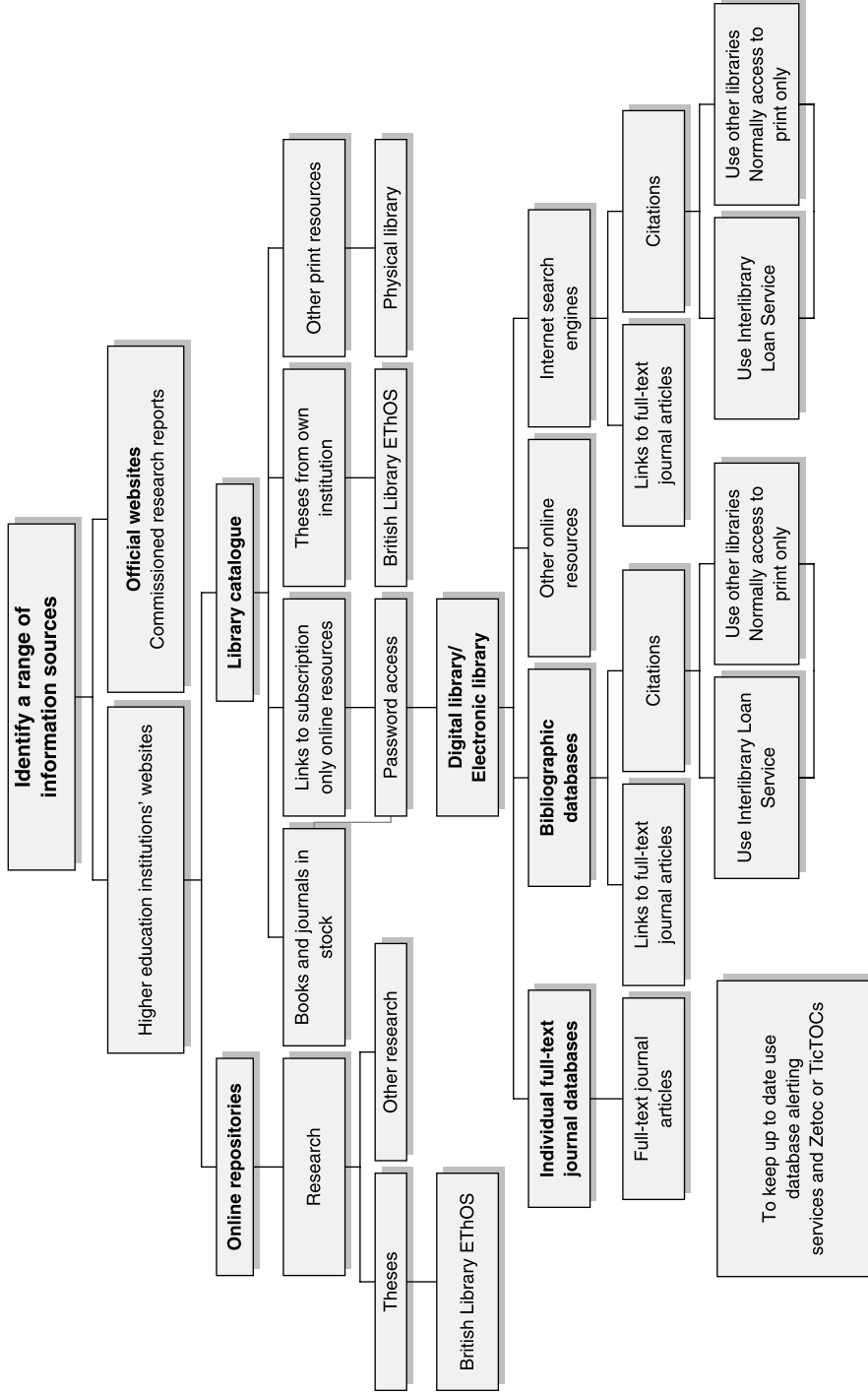
In the following sections we work through the range of resources available to you. This guidance will be particularly useful for postgraduates working on a doctoral thesis or undertaking a systematic review. As Wade et al. (2006: 92) noted, 'information retrieval is an essential component of the systematic review process, analogous to the data collection phase of a primary research study'.

Your approach to searching for information may combine any number of the following resources, as shown in Figure 2.2:

- Library catalogue.
- Digital library/electronic library.
- Individual full-text journal databases.
- Official websites.
- Online repositories.
- Bibliographic databases.

### Getting started

All searches start with a topic. This may be given to you in the form of a research question by your supervisor, or you may have identified a potential



**Figure 2.2** Resources to search for information



area of interest from general reading. You should realise that the exact topic of interest might become refined as you progress from general reading to a purposeful literature search, depending on the information you uncover.

Once the topic of your literature review has been established and you are ready to undertake a rigorous literature search, you will need to identify a range of resources to search for information. Remember that while a Google search in English on the internet will provide you with general information about your topic published by anyone, anywhere in the world, your library service will have search tools providing exclusive access to additional literature. These subscription-only tools enable sophisticated searching of all types of subject information. The range of library materials can be extensive, including academic, professional and trade journals, research reports, company information, government and official information, legal information, books, market research, financial and economic data, trade and press information, patents and standards, theses, directories and abstracts and bibliographies. If you restrict your search to the internet, you will miss out on content available in print in the library or online via your electronic library. Make the most of these tools while you have the chance, so that at a later date you can demonstrate your information research skills and knowledge in the workplace, where access to resources could be more limited due to much higher subscription costs for non-academic institutions.

This first stage in your research process is also your opportunity to reflect on whether you have previously used any resources provided by your library service, and if so whether or not you think these resources will be useful for your current literature review. If you have not previously used any resources, then ask your Information Specialist in the library for some guidance to get you started. Save yourself time by arranging an early consultation with your librarian – they will be able to provide you with advice to speed up your searches (as well as any passwords that are required), and help you to avoid the pitfalls of browsing the internet and the time-wasting that this can entail. As there may be valid reasons at a later date for searching the internet, they will also be able to advise you on *effective* internet search strategies (for example, using Google Scholar) to complement searches using recommended library resources.

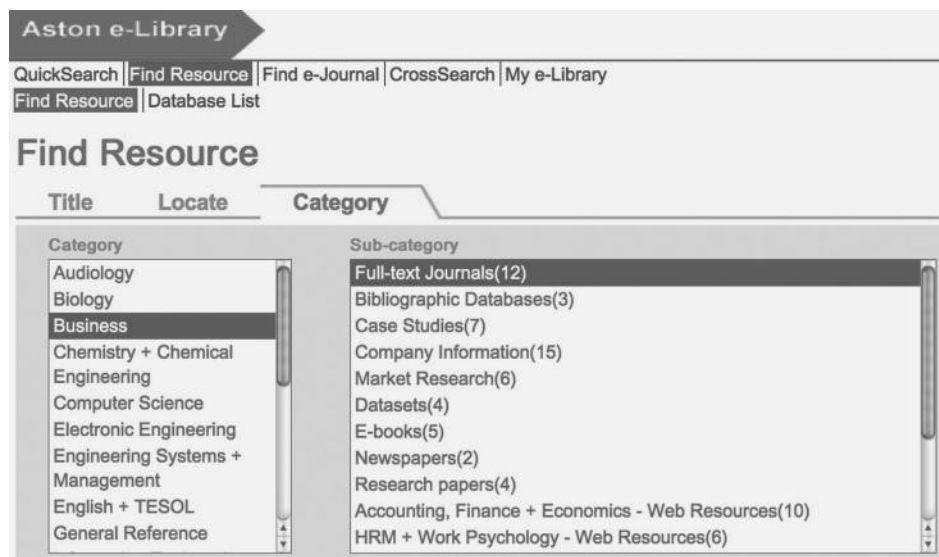
Useful preparation for a thorough review is to start with a quick online search. Take one or two keywords from the title of your research topic and search on electronic resources you have used before. If you have access to a digital or electronic library search facility, then you can search one or several electronic journal databases in one go, by simply typing in a couple of keywords from the title of your research topic into the search boxes. Even if you only obtain details of one key article from this initial search, you can then use this to identify further articles by searching for:

- further papers written by that same author
- keywords the author has identified in their abstract
- articles in the reference list
- related articles listed in the publisher's database
- keywords attached to the article.

A review article which discusses previous published research about your topic can be particularly useful. These are things to look for in a key review article:

- Where do the important authors in the field work?
- What is the history of the topic?
- What is of current interest?
- Citations – who are the key authors in the field?
- Which journals publish this topic?

If you have not already identified a peer-reviewed article, your academic supervisor should be able to recommend one. Identifying a key article would be a very quick and easy start to your literature review. However, if you do not find any suitable articles from your first search, step back from the resources you have previously used and find out about the full range of online and print resources available to you (see the screen shot in Figure 2.3). Even if your topic is very specialised or narrow, it is good to identify and develop an understanding of the broader area of the research field involved. This will

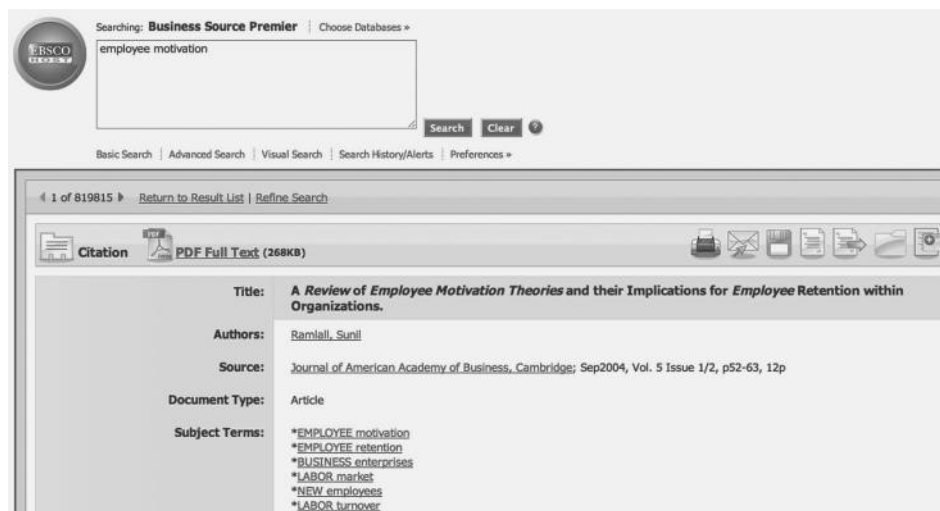


**Figure 2.3** Range of information resources available

Software by Ex Libris UK Ltd. Used with permission. Screen image courtesy of Aston University.

help you place the results of your literature review in a wider context. You can then narrow down the search to your particular area of interest.

If you do not have a lead-in article or if you get too few results or too many irrelevant results, then you will need to develop your search strategy by selecting many resources and using several complex search statements. This will help you to understand more about the topic you are researching and is also good practice in searching online resources, where typing in one or two keywords will be required rather than using a phrase or sentence (see Figure 2.4 which shows a screen shot of key words 'employee motivation').



**Figure 2.4** Scanning an article for keywords from subject terms  
Screen shot reproduced with the kind permission of Ebsco Industries, Inc.

You should also be aware that correct spelling is of paramount importance so that there is a correct matching of your keyword with keywords in the database. You may need to rethink the keywords, or reconsider your topic. If you have a relatively 'new' topic, then there will not be a lot of material published yet in academic resources, so you may need to look at professional journals, as suggested in relation to environmental issues in Table 1.1. It is only once you have conducted a thorough search, and revised and revisited it several times, that you will know whether there is a considerable amount of research in the area of your review, or very little. It is a time-consuming process, but one that is essential as the basis for a thorough literature review.

### Library catalogue

Many students approach a search for information by starting with the library catalogue. The library catalogue is an online index of all the materials held in

your library. You will be able to use your library catalogue to search and locate print and electronic books available to you as well as reports or projects held in your library. You could identify a relevant key textbook in your research area and check the references lists provided within the book to identify experts and journal articles.

The library catalogue is not the best tool to identify journal articles for your literature review. If your supervisor has recommended a specific journal to refer to, then you can use the library catalogue to search for the title of the journal and then physically locate the print journal and index in the library. If the journal is available online, you may be provided with an online link from the library catalogue, so that you can search for articles online within that specific journal. If you access the journal, you can scan the contents pages yourself to look for likely titles and authors.

However, a library catalogue can have its limitations. Many library catalogues list the books, journals and other resources that are held within your library but may not allow you to search for or access their content. Some library catalogues not only contain lists of resources, but provide a link to your digital or electronic library and this would enable you to search for journal articles on a specific topic (see Figure 2.5).

**Aston University** **The Library Catalogue**

**Keyword** | **Title** | **Author** | **Class No.**

**Reading Lists** | **Advanced Search**

Type the keyword(s) in the box below then press Enter or click the Submit button.

**Sorted By:** ▾ **View Entire Collection** ▾

Type the keywords you want to find. For example:

- E-commerce
- French politics
- Java programming
- Ophthalmology

You can also search for authors alongside title keywords, for example:

- McMurry Chemistry
- Hill Jones strategic management

**Useful Links:**

- ▷ My Library Record
- ▷ Recommend a book to purchase
- ▷ Staff - Request an Inter Library Loan online via your Library record
- ▷ Students - Request an Inter Library Loan
- ▷ Comments and Suggestions
- ▷ Library Homepage
- ▷ Search the OAIster digital resources catalogue

**Aston e-Library**

**Library Matters**

**MARs** | My Aston Resources

**Figure 2.5** Aston University Library Catalogue and link to Aston e-Library

Software by Innovative Interfaces, Inc. Used with permission. Screen image courtesy of Aston University.

### Digital library/electronic library

If you choose to search for journal articles from your library's digital or electronic library, then this will normally enable you to search across a number of different information resources, which have been pre-selected by your library staff. This can be really useful for initial undergraduate research for assignment topics, but because the databases have been pre-selected and the search tools are limited, only a few of the most relevant articles from each database will be retrieved.

Look at Figure 2.6. It shows the screen shot of a search for 'employee motivation' across several business journal databases. The central column shows the search as it takes place and the right-hand columns state the number of articles found and those retrieved. Beware: many may not be the most relevant. This approach, while being a quick starting point, will not be comprehensive enough for a literature review.

The screenshot shows the Aston e-Library QuickSearch interface. At the top, there is a navigation bar with 'Aston e-Library' and several menu items: 'QuickSearch', 'Find Resource', 'Find e-Journal', 'CrossSearch', and 'My e-Library'. Below this is a search bar with 'Search' and 'Results' buttons. The main heading is 'QuickSearch'. The search query is 'Search for "employee motivation" in "Business + Economics"'. Below the query is a table with columns for 'Se', 'Database Name', 'Status', 'View retrieved', and 'Cancel'. The table lists several databases and their search progress.

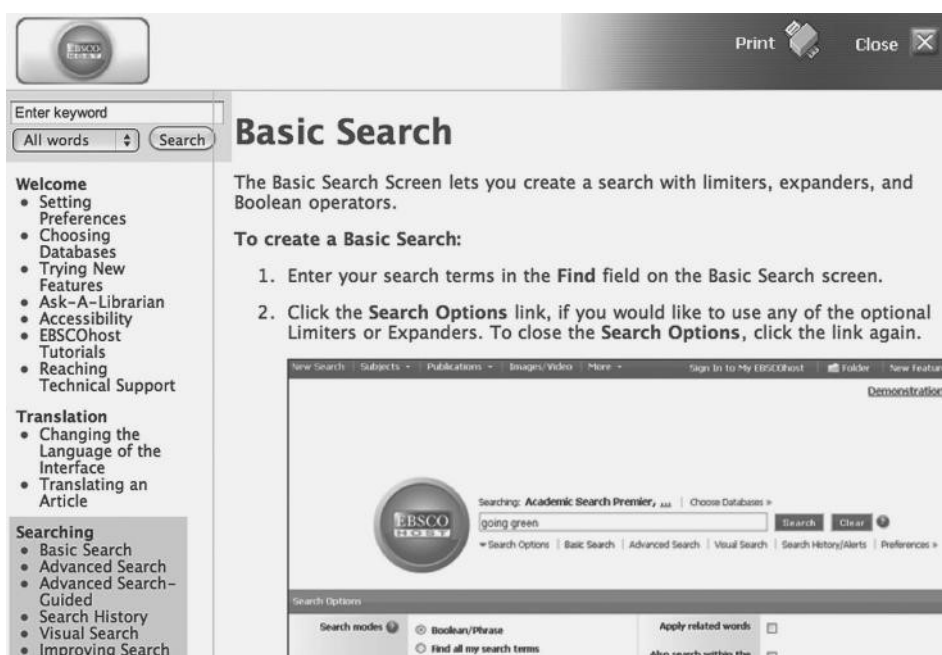
Se	Database Name	Status	View retrieved	Cancel
	ABI/INFORM Global (ProQuest)	FETCHING	9627	
	ABI/INFORM Trade & Industry (ProQuest)	DONE	2692	30
	Business Source Premier (EBSCO)	SEARCHING		
	Emerald Fulltext	DONE	9435	30
	JSTOR Business	DONE	4734	30
	ScienceDirect	SEARCHING		
	SwetsWise	DONE	246	30
	EconLit with Full Text (EBSCO)	SEARCHING		

**Figure 2.6** Aston e-Library QuickSearch results

Software by Ex Libris UK Ltd. Used with permission. Screen image courtesy of Aston University.

There are complex search tools available within individual databases that help improve your search results. At postgraduate level, for a Masters or doctorate level review, it is therefore worth investing the time and energy to select and search each database individually. It is important to access individual databases via your electronic library rather than through a web search so that you are 'authenticated' as a library user.

To access your electronic library, you will be asked for a username and password, and this will ensure that you can access subscription-only services off-campus, where available. You can identify relevant databases through your electronic library via a list of databases in different subject areas. This will include information about scope and coverage for each resource. You can ensure that you are searching each resource in the most effective way by referring to the online search tips within the chosen database, for example see Figure 2.7. This will take longer than searching across several resources in one go, but the results will be superior because search tools that cover several online resources will not retrieve all published articles in your field of interest. They work on ranking systems that only retrieve the most relevant results based on a match of the keywords you have used.



**Figure 2.7** EBSCOhost online help pages

Screen shot reproduced with the kind permission of Ebsco Industries, Inc.

### Individual full-text journal databases

Full-text journal databases provide you with quick and easy access to journal articles available in full text online, for specific publications. They are purchased by libraries to provide users with full access to the article. You will also often be able to follow the references of relevant articles, through to further full text articles, either on the same database or through another online service. You can

search for keywords within the title of the article or within the abstract or the full text of the article. Once you find a relevant article, the full-text journal databases will also provide you with links to related articles, based on the keywords or references of the relevant article. Look for the cited references list attached to a relevant article. This will be in the brief search results or in the web page view of the article, rather than the portable document file version. This will often contain hypertext links to the referenced articles (see Figure 2.8).

The screenshot shows the EBSCO database interface. At the top, it says "Cited References for: ASTON UN" and "A Motive To Serve: Public Service Motivation in Human Resource Management and the Role of PSM in the Nonprofit Sector." Below this, there are tabs for "Cited References", "Citing Articles", and "Related Records". The "Related Records" tab is active, showing a list of three records. Each record has a checkbox, a title, author information, and publication details. Below each record, there are options to "Add to folder" and "Find it Aston". The first record is "Public service motivation and job performance: evidence from the federal sector; Alonso, P.; Lewis, G. B. The American Review of Public Administration; 2001 Vol. 31, p363-380, 18p. Document Type: Article Citation; (AN ARPA.CA.CFC.ALONSO.PSMJPE) [Citation Record] Database: EBSCO Publishing Citations". The second record is "Individual conceptions of public service motivation; Brewer, G. A.; Selden, S. C.; Facer, L. F. Public Administration Review; 2000 Vol. 60, p254-264, 11p. Document Type: Article Citation; (AN PAR.FJ.BED.BREWER.ICPSM) [Citation Record] Database: EBSCO Publishing Citations". The third record is "Public Service Motivation: Building Empirical Evidence of Incidence and Effect; Crewson, Phillip E. Journal of Public Administration Research and Theory; 1997 Vol. 7 Issue 4, p499-518, 20p. Document Type: Article Citation; (AN JPART.G.DII.CREWSON.PSMBEE) [Citation Record]".

**Figure 2.8** Using Cited References list from relevant article to locate further journal articles  
Screen shot reproduced with the kind permission of Ebsco Industries, Inc.

Databases which give you access to full texts of published articles provide easy access to information, *but* you must realise that the databases are themselves limited in scope. They do not provide comprehensive and complete coverage of all information available in a given area. For example, Emerald provides you with electronic access to Emerald journals only, and Science Direct hosts Elsevier journals.

Thus, most full-text journal databases will provide the content of a predefined set of journals and these may or may not include articles about your topic. These services can contain an extensive range of journals or a smaller offering of journals, depending on the service, but do not expect any one service to contain all the articles of literature in your area of interest. In addition, your library may only purchase a subset of the material that is available through any one publisher. That is why it is important for you to be aware of the scope and limitations of all databases and for you to be prepared to search several in your subject.

There are some potential problems if you limit your search to full-text journal electronic databases:

- The databases may not contain the most recent issues of the journals you are interested in – your search would not be 'up to date'. If this is the case, check to see if your library has a subscription to the journal of interest as you will access recent editions in this way.
- The databases may not contain all the relevant journals for your field. You may have to search more than one database or locate libraries which subscribe to the journals you need.

It is important to check the journal coverage of an online service regularly. This is because the content can change over time and journals occasionally move from one publisher to another following an acquisition. You can check by looking at the information provided by your library or by looking at the information about the database online. Questions to ask yourself about the coverage of a database might include:

- What type of information is included and how can it be searched?
- Which publications or publishers are included in this service?
- What is the span of years included in this service?
- How current is the information and how often is the service updated?
- What is the geographical coverage?
- What full-text content is available to me via my library subscription to this service?

To summarise, full-text journal databases can be effectively searched individually, but they are not comprehensive. Different databases will complement the content of other databases.

Some online journal databases (for example, Sage or Taylor & Francis) will include abstracts and the full text of all published issues of specified journals, available *either* in print or online. Other online journal databases may include abstracts and the full text of the online editions available through that service only. In order to search for earlier articles from previous issues of journals, which may be available online through other services, or in print only, then additional services may be needed which go much further back in time. Examples of such services are:

- JSTOR ('Trusted Archives for Scholarship'), which only publishes archival issues and therefore will not allow you to search for the most up-to-date information.
- Bibliographic databases, such as ISI Web of Knowledge. This includes the frequently used Science Citation Index Expanded which provides citations of articles from the 1900s.



We have mentioned the problems with ensuring that your search identifies up-to-date references, but you may also find difficulties in accessing important articles from the past if you limit your search to online digital resources. Online publishing of journals commenced in the early 1990s and although earlier issues of articles are being digitised, there may be many excellent articles that predate the 1990s which are only available in print. If these articles are not available in your library, you will need to use the interlibrary loan service to request a print copy.

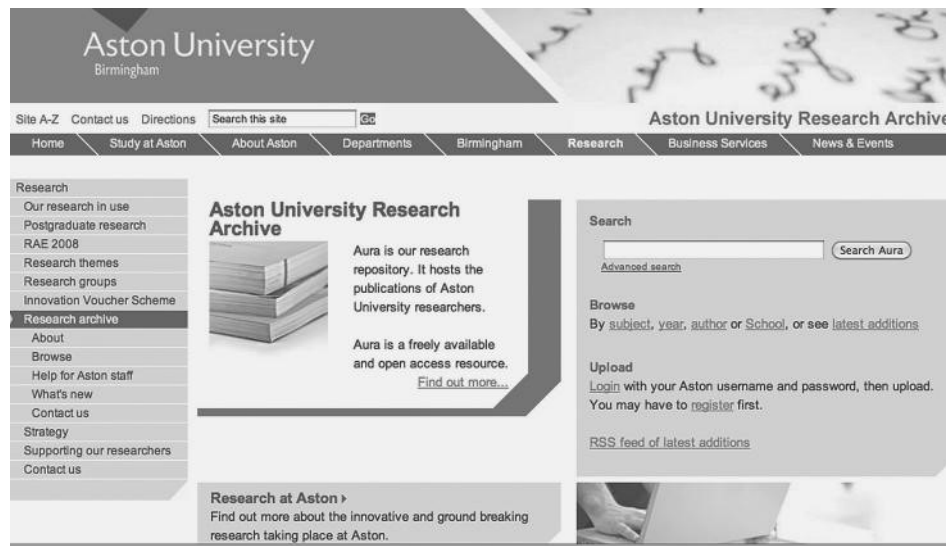
### Official websites and online repositories

The biggest potential disadvantage of searching the internet for research information is the difficulty in critically evaluating the material found. This can be counteracted by using an academic search engine, such as Google Scholar (<http://scholar.google.com>) Scirus ([www.scirus.com](http://www.scirus.com)) or Scientific WebPlus (<http://scientific.thomsonwebplus.com/>), which can be used for scientific information. These search engines allow you to focus your internet search on the academic research available online although you will still need to evaluate the resources you find. As these search engines will also search content in subscription-only databases, make sure you log-in to your own electronic library services before you do an internet search so that you can follow links to full-text articles where they are available.

Articles within subscription full-text journal databases normally have the advantage of being verified through a quality-control peer review process. This helps to ensure the academic level and reliability of the research articles published within these databases. However, official websites and well-regarded open access websites can also be searched for additional papers or documents. Some examples include:

- Government websites (using advanced internet search options to limit to domain name .gov), for example: *defra.gov*
- Cordis: the gateway to European research and development ([www.cordis.europa.eu/home\\_en.html](http://www.cordis.europa.eu/home_en.html))
- BioMed Central: the open access publisher ([www.biomedcentral.com/](http://www.biomedcentral.com/))
- HighWire Press at Stanford University ([www.highwire.stanford.edu/](http://www.highwire.stanford.edu/)).

Many academic institutions also provide open access repositories to share academic research output (see Figure 2.9 for an example). This can be an additional source of information once you have identified experts in the field and their institutional affiliation. To access these papers, you would need to access the web pages of the institution and then search for the institutional repository. As the repositories are generally 'open access' they are freely available for



**Figure 2.9** Aston University Research Archive: Aura  
Software by EPrints Services, screen image courtesy of Aston University.

universal searching. Alternatively, you could search the Registry of Open Access Repositories: ROAR (<http://roar.eprints.org/>) to locate repositories worldwide.

### Bibliographic databases – why they are essential

Bibliographic databases are a further key source of information. They provide a search interface for articles, keywords and references covering many publishers across a wide geography and a wide time span. Whereas full-text databases provide access to specific articles hosted by content aggregators or individual publishers, bibliographic databases cover the content of many publishers. Their main advantage is the wealth of data included in the databases and their citation-linking facilities, which enable researchers to link to referenced articles. The content of bibliographic databases can be specific to particular disciplines or multidisciplinary. For example, PsycINFO covers psychology across 49 countries, including journals, books and dissertations. PubMed covers biomedical and life sciences journals and includes more than 19 million citations. ISI Web of Knowledge includes several databases and is multidisciplinary.

The Journal Citation Reports within Web of Knowledge provides information about the most frequently cited journals and the highest impact journals in a field. The Journal Citation Reports includes science, technology and the social sciences and is a useful source for finding out which journals are the most important in your area of research.

Bibliographic databases should be used because they extend your search beyond your own library subscriptions to include all research published worldwide. They can also provide links through to the full-text articles if they are available to you through your library subscriptions. If your library has linking tools, through ISI Web of Science, you can link to the article you have located, to referenced articles and to articles which have cited your located article. This enables you to trace research backwards in time and forwards in time – an incredibly useful feature for ensuring you know about the most up-to-date research. This is also very useful when researching the background to a topic or following a particular theme and its development. This may seem quite a lot to absorb, so take a look at Table 2.3, which summarises the options discussed so far.

**Table 2.3** A summary of the range of options discussed

Source	Pros	Cons
Library catalogue	Can search for print and electronic books. Can also search for recommended journals.	Cannot always search for journal articles about particular topics. Often limited to full-text library content.
Digital library/ electronic library	Very quick and easy to use. Can search across a number of different resources and link to full-text articles.	Search options are limited. Only brings back details of a limited number of articles. Full-text articles may not always be available.
Individual full-text databases	Self-contained resources with full-text articles always available.	Only provide a subset of published literature on a topic. Limited by content provided in each database. May not include earlier print issues of journals.
Official websites	Alternative source for official statistics, reports and commissioned research.	Need to identify which sites to use.
Repositories	May include papers not previously published.	Repositories are still being developed and as yet there is no central search facility for content.
Bibliographic databases	Can be discipline-specific and offer broad range of content coverage. Provide abstracts, links to citations and references for extending research.	Do not provide full-text (although may be able to link to full-text articles). Coverage is wider than library subscriptions so may have to order additional items via interlibrary loan or by visiting another library.

### What do you need from a resource to make it appropriate for locating journal articles for your literature review?

Having described the range of options available, you should consider key features to look for. An information resource appropriate for locating journal articles should include the following features:

- Up-to-date (current, but archival access to earlier publications may also be important).
- Peer-reviewed (reputable).
- Comprehensive (covering a wide range of material in your subject area).
- Filtered (for academic-level research).
- Categorised (by type of information).
- Accessible from home (with password access to subscribed content).
- Quick and reliable search facility with linking options (for example, to cited articles, related articles, the full-text article).
- Easy to use (this might include option to save searches and set up alerts if new material is published by authors of interest or about a topic of interest).
- Ranking features (for example, the option to rank and sort results by relevance, date, subject).

### Keeping up to date

As well as using the alert facilities within specific databases, there are services that are specifically aimed at keeping researchers up to date.

- **Zetoc** (<http://zetoc.mimas.ac.uk/>). Zetoc is freely available to UK higher education institutions, the NHS and other organisations and provides access to the British Library's Electronic Table of Contents of around 20,000 current journals and 16,000 conference proceedings. The database covers the period from 1993 to date. The advantage of Zetoc is that you can set up email alerts.
- **ticTOCs**: Journal Tables of Contents Service ([www.tictocs.ac.uk/](http://www.tictocs.ac.uk/)). ticTOCs is a completely free service for anyone and it provides the facility for you to set up online feeds for e-journals from over 350 publishers. Doctoral students will find the table of contents (TOC) service invaluable. Just sign up to the relevant journals and the update comes direct to your computer.

### PhD theses

Unpublished research can often be found in PhD theses. You can search for theses published at your own institution on your university's library catalogue. Your university library may be able to provide you with access to the complete thesis in hard copy, or online if it is available electronically. To discover new theses written in your area of interest, then once you have identified experts, you can search their institutions' library catalogues or institutional repositories for possible PhD topics written under the experts' supervision.

To search UK theses across several higher education institutions in one go, you can use Index To Theses in Great Britain and Ireland (<http://www.theses.com/>) (a subscription-only service). This service provides information about UK theses going back to 1716 and up to the current date. Alternatively, you can use the British Library's Electronic Theses Online Service (EthOS) (<http://ethos.bl.uk/>) for full-text electronic access to more recent theses. For international theses, you

can search Proquest Dissertations and Theses Databases (a subscription-only service) covering theses from 1861 onwards.

Once you have located information about a thesis you are interested in, you may be able to request access to a hard copy via interlibrary loan from the institution or an electronic copy via EThOS. However, it is worth noting that both Index to Theses and the Proquest service may not be completely comprehensive as they rely on individual institutions submitting information. In addition, the British Library's EThOS service ([www.ethos.bl.uk/](http://www.ethos.bl.uk/)) only provides electronic access to theses from those institutions that participate in the service.

#### Materials not available in your own library

If your library does not have the specific resources you require, then you may be able to use interlibrary loan services or you may be able to visit other libraries to access the information that you need. Make sure you speak to someone in your own library to find out the next steps for obtaining information available elsewhere.

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#### Summary

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This chapter began with an introduction to the keyword phase of information search and advised you to keep a record of the search activity. This advice will be important to everyone who has to undertake a literature search. The literature search is so important for the quality of your review that we have explained in detail the many options that are available to you. For most of our readers, this information should complement the advice given by your own institution. Nevertheless, this chapter represents the first building block in your literature review process. Chapters 3 and 4 present the next building blocks, offering guidance on reading and making notes.