Research and Writing Skills for Masters Level Students: Strategies for Completing a Research Project as a Part of a Postgraduate Degree

RESEARCH AND WRITING SKILLS FOR MASTERS LEVEL STUDENTS: STRATEGIES FOR COMPLETING A RESEARCH PROJECT AS A PART OF A POSTGRADUATE DEGREE

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RMIT Open Press
Melbourne, Australia

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ACKNOWLEDGEMENT OF COUNTRY

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This page provides a record of edits and changes made to this text from pre-publication to its latest iteration. Whenever edits or updates are made in the text, we provide a record and description of those changes here.

If you have a correction or recommendation you would like to suggest, please email us.

Version	Date	Type
V 1	2024	Research and writing skills for masters student for completing a research project as part of a po degree

ABOUT THIS BOOK

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Reviewers

Each module of this open textbook was reviewed by peers from the RMIT University Library. The authors gratefully acknowledge their feedback contributing to the development of the work.

Cover design

Cover image: created by Miranda Francis using Adobe Firefly with the prompt “research represented as a journey through nature in a forest”.

INTRODUCTION

These modules are for Masters by coursework students enrolled in a range of disciplines that may require a research component . They are designed to build capability in research information skills and in research writing.

While written with RMIT University Masters by coursework students in mind, other postgraduate students world-wide may find it useful – feel free to adopt or adapt to suit your own context.

This open book covers searching the literature to find the most relevant and current information; reviewing the literature (including a step by step guide on conducting a systematic review). We cover how to use a literature reference manager (i.e. Endnote or Zotero) to organise your reading. Latter modules provide guidance on developing a research proposal and on writing with authority on your chosen topic.

Generative AI tools may be useful to automate and streamline various aspects of research and

writing at postgraduate level. However, the AI environment is constantly changing. For up-to-date guidance on how AI can be ethically integrated into your research project at RMIT University, consult your course coordinator and the following tools:

- RMIT Learning Lab: Artificial intelligence
- RMIT Library Online Module: Generative AI for students at RMIT

STRATEGIES AND RESOURCES FOR SEARCHING THE LITERATURE

Welcome to this online module related to strategies and resources for searching the literature. The module will explore key resources to use when literature searching, and the features of developing an effective search strategy.

Learning objectives

This module will introduce you to:

- strategies and search techniques that can be used in your searches
- how to construct your search query

- selecting key resources to use in your searches, such as LibrarySearch, Databases, Google Scholar
- staying current with the literature

There are learning activities throughout this module to help you with some practical searching.

This module should take you about 30 minutes to complete.

Work through each section using the navigation footer (i.e. previous/next), or use the contents menu to select a particular section.

Photo by Erik Mclean on Unsplash

Upon completion, feedback and suggestions for improvement of this module can be provided at the end via an email link.

You may also be interested in viewing the additional resources about Literature searching in the Explore Further chapter at the end of this module. Provided is a webinar

recorded from the Library's 'PhD Up!' program (now called Research Plus) and associated library guides.

BEING CLEAR ABOUT YOUR PURPOSE

The purpose

When considering how and where to start your literature search, it is first worth thinking about why you are looking for information. What is the purpose of your search?

You may be doing a literature search:

- for a literature review as part of a research report
- for an assignment in an academic course
- to update your knowledge
- for professional development
- to support a workplace activity

Determining the reason for your literature search will help you

select the types of materials needed. The Library has a wide range of materials available including books, journals, videos, newspapers, images, standards, case studies, theses, and more. This module will introduce you to some of these types of materials. To explore these further, go to Library collections.

Literature reviews

There are two main purposes for undertaking a literature review.

1) To show awareness of the present state of knowledge in a particular field, including:

- seminal authors
- the main empirical research
- theoretical positions
- controversies
- breakthroughs as well as links to other related areas of knowledge

2) To provide a foundation for the author's research. The literature review should:

- help the researcher define a hypothesis or a research question, and how answering the question will contribute to the body of knowledge
- provide a rationale for investigating the problem and the

selected methodology
- provide a particular theoretical lens, support the argument, or identify gaps

This video provides an overview of what a literature review is. Watch this video and answer the question below.

Literature Reviews: An Overview for Graduate Students *(9:39 mins)*

One or more interactive elements has been excluded from this version of the text. You can view them online here:
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Test your knowledge

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Further information and resources on writing your literature review can be found in the Learning Lab.

PLANNING YOUR SEARCH

A literature search starts with effective planning. A literature search plan can:

Photo by Hope House Press – Leather Diary Studio on Unsplash

- ensure your literature searching is comprehensive
- prompt you to think critically
- guide your searching to focus on your research topic
- document your search processes to minimise replication
- save time

Identify the main or important aspects

It can be helpful to write down your research question and identify the important words that define your research topic before searching.

Example

Examine the relationship between social media and news corporations, discussing how this partnership influences public discourse.

The important terms to include for this research topic would be:

- **social media**
- **news corporations**
- **public discourse**

Developing keywords

The next step is to compile a list of synonyms or alternative terms. This will ensure that you will have a comprehensive search for relevant literature.

Consider variations such as:

- synonyms or alternative terms – e.g. climate change, global warming
- acronyms/abbreviations – e.g. DFT, density functional theory
- alternative spellings – e.g. aluminium, aluminum
- plurals/alternative endings – e.g. environment, environmental

For our research topic, here is the start of a list of synonyms and alternative terms.

social media	social networks
news corporations	media companies
public discourse	public opinion

Now look to developing your search strategy using some different search techniques.

DEVELOPING A SEARCH STRATEGY

There are a number of different search techniques that you can use to develop your search strategy. This chapter explains how to make your searching thorough and effective by using phrase searching, truncation, spelling variations, and Boolean operators.

Phrase searching

To specify that two or more words must appear as a phrase, use double quotes.

Example

"social media"

Truncation

To search for alternative endings of words, use truncation or stem searching. In most databases, the truncation operator is an asterisk (*).

Example

A search for **educat*** will retrieve:

- educate
- education
- educational
- educator
- educating
- educated

Spelling variations

Sometimes there are slight differences in the spelling of a word, for example, English and American variations. To facilitate

searching on alternative spellings, some databases allow wildcard searching. Wildcards take the place of one or more characters in a search term. The wildcard operator is often a question mark (?) or an asterisk (*).

Example

A search for **colo?r** will find:

- color
- colour

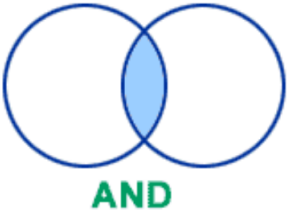
Once you have a list of keywords, synonyms, and effective search techniques you will then need to combine these into effective search statements.

Combining with Boolean

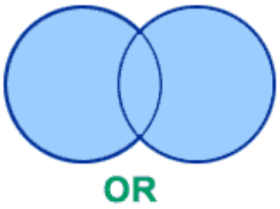
Boolean searching can be very helpful when searching databases. It allows you to combine multiple terms with connecting words, called 'Boolean operators'. Most databases

use common Boolean operators, such as AND, OR, and NOT. Here are examples of how you can use Boolean operators to broaden or narrow your search.

AND operator narrows your search

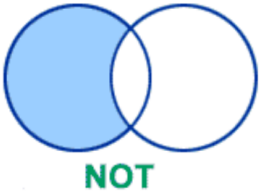


Use AND operator to find records that contain all the terms you use. This is useful if you want to find only those records that mention both terms. Searching for "climate change" AND cereals will locate records with both these terms.



OR operator broadens your search

Use OR operator to find records that contain any of the terms you use. This is useful if you want to allow for alternative terms/synonyms for the same concept. Searching for "climate change" OR "global warming" will locate records with both as well as one of these terms.



NOT operator narrows your search

Use NOT operator to exclude a term. This is useful if you don't want to find any records that contain a particular term. Use it with care to avoid excluding relevant articles that briefly mention the second term. Searching for "global warming" NOT "fossil fuels" will exclude all records that mention "fossil fuels" as well as "global warming" and "fossil fuels" together.

Watch this video to gain an understanding of how to use Boolean operators.

Boolean Operators *(3:02 mins)*

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=33#oembed-1

Boolean Operators by Lexy Spry and Emily Wixson (YouTube). Copyright © Emily Wixson.

Test your knowledge

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THE SEARCH QUERY

To construct the search query consider using some search techniques such as Boolean operators and phrase searching.

In considering the topic "**recycling of waste water in cities"**, three main aspects were identified, and a list of possible keywords (search terms) was compiled.

The search statement may look like the following example.

Example

(recycling OR reuse) AND ("waste water" OR sewerage OR "drain water") AND (cities OR urban)

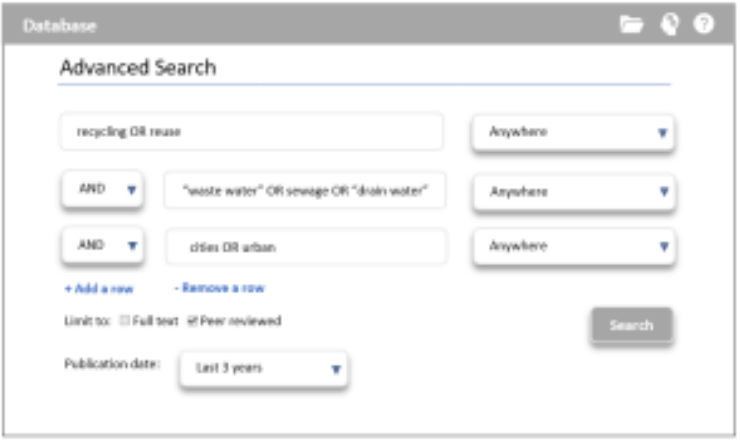
This search query has used:

- double quote marks enclosed around keywords that contain two words so they are searched as a phrase

- Boolean operator OR is used to combine keywords about the same aspect
- Boolean operator AND is used to combine keywords about different aspects

The search features of library databases make constructing your search query easier, especially when using advanced search options. For example, the Boolean operators can usually be selected from a drop-down menu. This is evident in the example below, showing the search query where the Boolean operators of AND are selected.

Note: nearly all databases have these features, but they might look different. You may need to explore to find the options you need.



Activity

Now it's your turn to develop your search query for your own research topic.

1. Write down your research topic and identify your main aspects.
2. For each aspect list some alternative search terms (synonyms).
3. Consider some different search techniques that you may need to use.
4. Create a search query that combines your topic keywords and synonyms using Boolean operators AND and OR.

REFINING YOUR SEARCH

Limits or filters

After developing your search query and executing your search, you now need to look at the search results and determine whether you have been successful in locating relevant literature. Sometimes you may find that your results are unsuitable, too broad, too narrow or off topic. You may need to adjust your search strategy, or if you feel that your results are close to what you need, using filters will enhance and refine your search further.

Most databases will give you the option to limit your results. Look for the different filtering options in the database when you are getting too many results.

Note that the types of filters available may vary according to the database you are using and the types of information available. For example, in scientific and medical databases, you can search by population or type of study. Most databases will have a search tips section that you can check to see what options are available.

For example, you may be able to specify that you want to retrieve by:

- resource type (e.g. peer-reviewed journals)
- publication date (e.g. last five years)
- subject
- journal title
- language (e.g. English only)

Details and subject headings

Check the information or record page for each item, to help determine if the source will be useful. This will often include an abstract or summary of the item (known as Description in LibrarySearch), as well as subject headings that describe the content.

Subject headings can be useful in introducing you to new concepts and terminology related to your field of inquiry. You can expand your search by incorporating these subject headings into subsequent searches or use the hyperlinked subject headings. You may also find that the description contains information to follow up on such as other works by the same author.

Test your knowledge

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SELECTING RESOURCES TO SEARCH

Define your information need

Before you set out searching for information, it's worthwhile thinking about how much and what types of information you will need. Your research question may need you to focus on scholarly and peer reviewed sources, but there may also be a requirement to search for other types of information, for example current perspectives on social media, statistics, news, or government and organisational reports (grey literature). Searching for different types of information may involve searching across a range of platforms and websites, including LibrarySearch and databases, but also using online search engines like Google to locate these sources.

For example, you could be researching the topic of the impact of the no vote in the 2023 referendum on Indigenous Australians. You could look at websites of organisations like Reconciliation Australia or the Indigenous Knowledge Institute for research and reports, for news, National Indigenous Television (NITV), and for personal perspectives search Facebook for community groups, or on X (formerly

known as Twitter) hashtags and handles, like #IndigenousVoices, BlakTwitter, and @IndigenousX.

LibrarySearch

While you may need to expand your search beyond library resources, LibrarySearch can nevertheless be an excellent place to start your search, due to the array and depth of information available. Starting with LibrarySearch also means you can access books and ebooks, which will provide in-depth and background information on a topic. A search in LibrarySearch can also provide a good indication of how much information on your topic is available. Specialised subject databases in business, architecture, psychology, legal, and fashion are not covered by LibrarySearch and need to be accessed directly.

Content available from LibrarySearch includes:

- books and ebooks
- journal articles
- conference papers
- trade magazines
- videos

- news reports

Log into LibrarySearch to access other functions, including:

- search history and saved searches
- favourites (which can be organised with labels)
- your account information (including loans and reserves)

Watch this video for a brief introduction to LibrarySearch.

What is LibrarySearch? *(1:07 mins)*

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https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=44#oembed-1

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Library subject guides

The Library's subject guides are also good starting points for research when searching in a specific subject area. As well as including the most relevant databases, subject guides also include relevant websites, journals, books, ebooks, and videos. Many subject guides include links to key organisational and professional websites for the discipline. Depending on your area of study, subject-specific formats of information are also available, including images and artworks, map and mapping tools, and statistics.

Watch this video for a brief introduction to '*What's a Library Subject Guide?*'.

What's a Library Subject Guide? *(1:13 mins)*

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https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=44#oembed-2

What's a Library Subject Guide? by RMIT University (YouTube). Copyright © RMIT University Library.

The following image shows how to locate subject guides from the Library homepage.

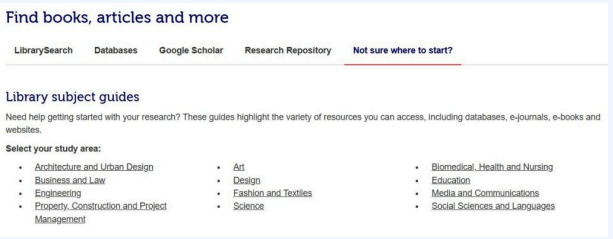

Image: Screenshot of Find books, articles and more showing Library subject guides study areas. RMIT University Library homepage. 16 December 2024. Copyright © 2024 RMIT University.

Format-specific guides

Explore format-specific and instructional guides such as:

- Company and Industry information
- Standards
- EndNote Desktop guide
- e-Books guide

Research guides

There is also a range of Research guides that include:

- Theses
- Literature reviews
- Systematic reviews
- Reference managers

Activity

1. Go to the Library homepage and find a subject guide relevant to your research area.
2. Does that subject guide list any databases that might be useful for your research topic?

SEARCHING LIBRARY DATABASES

Databases

While LibrarySearch is a good starting place, you will need to move beyond this to comprehensively retrieve relevant literature. As mentioned, the library subject guides include key databases for a discipline, but they can also be explored and accessed via the RMIT Library home page. There are many databases available, some of which are subject-specific, some based on format (like company reports, videos or standards) and others are multi-disciplinary, meaning they contain information across a range of topics.

Databases are excellent tools for researching journal articles, as well as other scholarly content. They often have a specialised focus – for example, by subject, resource type, or geography. You can explore the different types of databases on offer from the Librarythat include videos, images, theses, standards, and more.

To access the list of popular databases, select the Databases tab in the 'Find books, articles and more' on the Library's homepage.

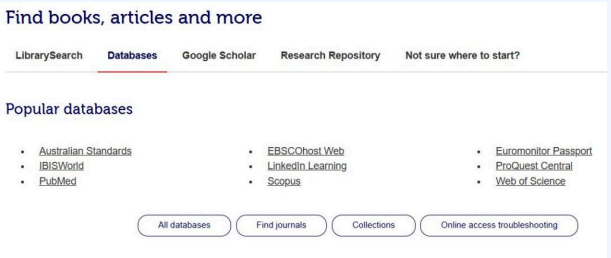

Image: Screenshot of Find books, articles and more showing the list of popular databases. RMIT University Library homepage. 16 December 2024. Copyright © 2024 RMIT University.

Watch this video for a brief introduction to Library databases.

What's a library database? *(1:56 mins)*

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Test your knowledge

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https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=52#h5p-6

Searching databases

Like LibrarySearch, results in databases can be sorted and filtered in a variety of ways – for example, by the level of content (scholarly, peer-reviewed). Many databases will include the same functions for searching but may differ depending on the type of information the database includes.

A large database that covers a range of subject areas

including business, science, health, and social sciences is ProQuest.

Watch this video to learn how to do an advanced search in the ProQuest database.

ProQuest Advanced Search *(2:14 mins)*

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https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=52#oembed-2

ProQuest Advanced Search by ProQuest (YouTube). Copyright © Proquest.

Finding the full article

Databases will often give you direct access to the full text online, but if you cannot see a link to the online article, try the 'Find it' button link. This will open a new browser window that will search all databases to which RMIT University Library has access.

If not held at RMIT

If you cannot find the article online it may be available in print, or you can request the article via the Library's Document Delivery Service.

Activity

The activity uses the ProQuest database. You may wish to practice searching one of the databases you selected earlier, from your subject guide.

1. Go to the Library homepage and select the Databases tab.
2. Select ProQuest Central from the 'Popular databases' list.
3. Note the Basic and Advanced Search options. Select Advanced Search.
4. Search the database using your search query keywords and try to use a simple Boolean search, e.g. (waste water OR effluent) AND

(recycling AND cities).
5. Next to the search box from the drop-down menu select 'Anywhere except full text'. Also, select options to limit to peer-reviewed articles and publication date of 'Last 3 years'.
6. Note options for Source/Document type.
7. Select search.

Citation databases

Scopus and Web of Science are two large citation databases that can be important starting points for subject areas, particularly in the sciences. These databases also display citation data that enables you to track the development of a research idea forward through time.

Use this link to access the video, How to create citation overviews tutorial, (link opens in a new tab) providing instruction on Citation overview in Scopus.

The citation overview tool in Scopus displays trends for a set of documents. It shows all publications citing a specific document (or set of documents), allowing discovery of the overall impact of publications in a research areas of interest.

Watch this video to learn how to use the Web of Science Citation Report.

Web of Science: Create Citation Reports *(1:57 mins)*

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https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=52#oembed-3

Create Citation Reports in Web of Science by Web of Science (YouTube).

FURTHER RESOURCES

Google and Google Scholar

Photo by Mitchell Luo on Unsplash

Many people begin their research with Google, and sometimes Google Scholar. Google can be useful to get an overview, background information, or to define terms. We all Google – but are you doing it effectively?

Using Advanced Google or Google Scholar improves your chance of obtaining relevant information. Researchers are expected to use scholarly information and Google alone is insufficient.

Google Advanced lets you choose combinations of words – e.g. all these words, exact phrase or word etc., and narrow results by language, region, last update, site or domain, file type, etc.

The following table provides a comparison of the difference in features between Google and Google Scholar.

Features	Google	Google Scholar
Easy-to-search interface	Yes	Yes
Coverage	Many sources, good definitions, background information, government/ company reports, but uncontrolled content.	Indexes scholarly sources, but with uneven discipline content.
Format	Varied, news, company reports, trade and government publications, grey literature.	Scholarly material, articles, conference papers, book chapters, patents.
Search results with basic filtering	Yes, with Advanced Google.	Limited
Search alerts	No	Yes
Search metrics	No	Yes
Author profiles	No	Yes
Full-text access	Yes, depending on sources.	Yes, but payment may be required.

Features	Google	Google Scholar
Export citations to reference managers	No	Yes

Best practice tip

Sign in to Google Scholar via the Library webpage to access full text that RMIT holds in linked databases.

See the image below for where to find Google Scholar on the RMIT Library homepage.

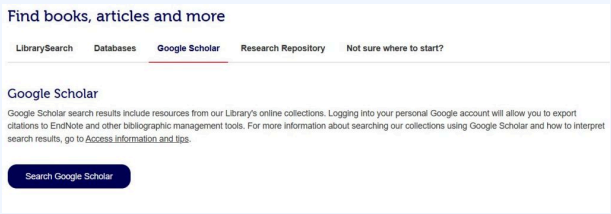


Image: Screenshot of Find books, articles and more showing

Google Scholar tab. RMIT University Library homepage. 16 December 2024. Copyright © 2024 RMIT University.

Activity

Search Google Scholar using some of your search query keywords.

As you search make note of the following:

1. The different types of resources in your results list
2. Can you follow a link to the full text of the article or resource?
3. Look for where to refine your search by date or relevance, and also where you can include (or exclude) patents and citations

There are also further tools in Google Scholar to find related

material. These are located under each of the titles listed in your search results.

Can you find the Cite, Cited by, Related articles, and Save links?

See if you can also find where to save an alert for your search. Saving an alert will provide an email feed for any new papers on your topic, as they are added to Google Scholar.

Test your knowledge

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=49#h5p-5

Grey literature

Grey literature encompasses a range of materials that are generally not published via traditional channels, like journal articles, and may not be indexed in library databases. Using grey literature will broaden your search to include more local knowledge, fill research gaps and various perspectives of individuals and organisations.

Examples of grey literature include:

- conference papers and proceedings
- datasets
- government and NGOs' documents, reports and working papers
- fact sheets, bulletins
- policy statements
- research data
- standards
- statistics
- theses

You can use Google Advanced Search features including fields

(for example title or author), site or domain (for example site:gov.au) or document type (for example pdf).

Other sources for grey literature include conference sites, repositories, news and newspaper sites, and policy and data sites, like the Australian Policy Observatory or the Australian Bureau of Statistics. RMIT's Library's Library guide on Grey Literature is a great place to find more information and other sources for grey literature. Always ensure the quality, credibility, and reliability of these sources.

Research Repository/Theses

The RMIT Research Repository is an open-access institutional repository providing free, searchable access to research publications authored by RMIT University staff and students.

Most theses submitted at RMIT University can be found in the RMIT Research Repository.

Theses can be invaluable sources for in-depth and significant research related to your field of study. The RMIT Theses research guide is a great starting point for resources that will allow you to access Australian and international theses.

Activity

- Search the RMIT Research Repository.
- Enter your search term, for example, climate change.
- Limit your search results to ‘Dissertations & Theses’.
- The ‘Refine your results’ enables further selection of:
    - Resource type
    - Research unit
    - Author.
- Identify a relevant thesis to your topic.

STAYING CURRENT WITH THE LITERATURE

Another useful feature of different databases includes the ability to set up 'search alerts', which allows you to receive alerts of new articles that meet your search criteria. This is an excellent way to keep up-to-date with your research.

It is also possible to set up alerts for:

- the latest tables of contents for specific relevant journals
- citation alerts whenever a particular article is cited by someone
- upcoming conferences and calls for papers
- websites, social media, and Google

See the library guide to Alerts: staying current with the literature for more details and examples.

Conferences

Rice University Stock Photography by Ed Schipul (CC-BY-3.0)

Conferences are an important part of staying current with intellectual and academic developments and discussions. There are diverse websites that will alert you of upcoming conferences. Papers are sometimes available via conference websites or accessible via databases.

The Alerts library guide lists a number of conference directories.

EXPLORE FURTHER

Photo by Joseph Chan on Unsplash

Congratulations on completing this module. We have explored the purpose of a literature review, some of the key resources for searching the literature, and some aspects of developing a search strategy.

The module also included information on staying current with new literature published in the area and searching for theses and conferences.

Further assistance

For more assistance with your writing, see an Academic Skills Adviser in the Library.

Additional information and resources are available in the guides:

- Literature reviews
- Alerts: staying current with the literature
- Theses

Information and resources on writing your literature review can be found in the Learning Lab.

Learn more

You may also be interested in viewing the following webinar Strategies and resources for searching the literature (64 mins.) recorded from the Library's PhD Up! program (now called Research Plus). The webinar content complements this online module.

Generative AI tools may be useful to automate and streamline various aspects of research and writing at postgraduate level. However, the AI environment is constantly changing. For up-to-date guidance on how AI can be ethically integrated into your research project at RMIT University, consult your course coordinator and the following tools:

- RMIT Learning Lab: Artificial intelligence
- RMIT Library Online Module: Generative AI for students at RMIT

Feedback

Your comments and suggestions on how we can improve this module will be appreciated. Please email us.

What's next?

You have completed this module on Strategies and Resources for Searching the Literature. To choose another module to complete go to https://rmit.pressbooks.pub/researchwritingmasterstudents/

CONDUCTING A SYSTEMATIC REVIEW

Photo by Florian Schmetz on Unsplash

Welcome to this online module on how to conduct a systematic review. The module provides an overview of the key components and the process you need to follow when conducting a systematic review. Briefly covered are developing the research question and the protocol, aspects of searching, performing the analysis, and reporting findings.

Learning objectives

The module will help you:

- understand what a systematic review is
- know the difference between a systematic review and a literature review
- know the various steps involved in conducting a systematic review
- develop your research question and protocol
- learn about resources and strategies when searching the literature
- to understand the selection and evaluation processes of the included studies

The course materials include information, videos, and learning activities that explore key features of conducting a systematic review.

This module should take you about 30 minutes to complete.

Work through each section using the navigation footer

(i.e. previous/next), or use the contents menu to select a particular section.

Upon completion, feedback and suggestions for improvement of this module can be provided at the end via an email link.

You may also be interested in viewing the additional resources about Systematic Reviews in the Explore Further chapter at the end of this module.

Please note that the examples used in this module are related to the discipline of health sciences, but the principles of this research methodology may be applied to other areas.

ABOUT SYSTEMATIC REVIEWS

Image by Gerd Altmann from Pixabay

A systematic review is a secondary research method that identifies and evaluates evidence from existing data in primary research studies.

Commonly, systematic reviews are commonly used in healthcare research to assess the evidence on whether a medical intervention is effective in treating a certain condition. Systematic reviews are also used in other disciplines such as science and engineering.

Definition

As defined by the Cochrane Collaboration a systematic review is:

"A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies."

Features of a systematic review

A systematic review is a rigorous and structured approach to synthesising research evidence. Here are the key features:

1. It addresses a **research question** that is clearly defined and specific.
2. It follows a **rigorous and reproducible**

methodology by adopting a clearly **pre-defined protocol**.

3. It is an **exhaustive search** of the literature that is carried out in accordance with the protocol.
4. All evidence is considered and only excluded if it does not meet the **eligibility criteria**.
5. The included studies are **critically analysed**, especially for the risk of bias.
6. Data from the included studies are systematically **extracted** and **synthesised**.

Postgraduate coursework

Postgraduate study often involves a review of the literature. This type of review is known as a traditional or narrative review, or simply a literature review.

The following table outlines the different features of a systematic review and a traditional literature review.

Features	Systematic review	Literature review
Aim	Tightly specified objectives to answer a specific research question	Gain a broad understanding and description of a field
Scope	Narrow focus	Big picture
Planning the review	Transparent process with documented audit trail defined in a protocol	Nothing defined, allows for creativity and exploration
Searches	Rigorous and comprehensive search for ALL studies, explicit search strategy across numerous sources	Searching is probing, moving from study to study, following-up leads
Study selection	Predetermined criteria for including and excluding studies uniformly applied	Selection is variable as determined by the reviewer
Appraisal	Checklists to assess the quality of studies	Based on the reviewer's opinion
Synthesis	Tabular format with short summary answers	Discursive
Methodology	Must be presented for transparency	Not necessarily provided
Inferences	Based on all available evidence	Based on a sample of the evidence
Timeline	Months to years (average 18 months)	Weeks to months
Authors	Three or more	One or more

Features	Systematic review	Literature review
Value	Connects practising clinicians to high-quality evidence; Informs evidence-based practice	Provides a summary of literature on a topic

Watch the following short video to learn about the difference between a systematic review and a meta-analysis.

Systematic review vs Meta-analysis *(5 mins)*

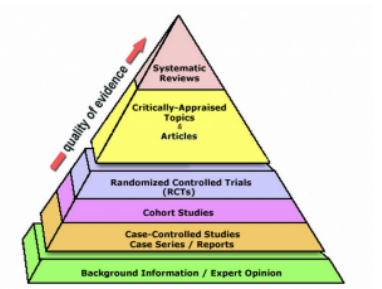
One or more interactive elements has been excluded from this version of the text. You can view them online here: https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=64#oembed-1

Systematic review vs Meta-analysis by Research Masterminds (YouTube). Copyright © Research Masterminds.

Some brief information about other types of reviews, such as scoping reviews, rapid reviews, and meta-analyses is available from the library guide: Systematic Reviews.

Benefits of a systematic review

A systematic review has several advantages, including:



- Being considered the highest level in the hierarchy of literature evidence.
- Provides a definitive answer to a specific research question.
- The methods used to find and select studies reduce bias and are more likely to produce reliable and accurate conclusions.
- Summarises findings from multiple studies, reducing bias when drawing conclusions and making the findings more reliable.
- Findings might be applied to everyday practice or to inform policy.
- Identifies knowledge gaps that call for more research.

Benefits for postgraduates

Conducting a systematic review provides several benefits.

- It contributes to your postgraduate assessment.
- The paper can be published.
- It contributes to your research knowledge of the topic.

Test your knowledge

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=64#h5p-7

DEVELOPING THE RESEARCH QUESTION

A systematic review is an in-depth attempt to answer a specific, focused question in a methodical way.

A clearly defined research question should accurately and succinctly sum up the review's line of inquiry.

Photo by Tingey Injury Law Firm on Unsplash

In developing the research question ensure that it is not just a topic, but a properly formulated question that is answerable.

Consider whether your question will focus on diagnosis, intervention, prognosis, or etiology? Is there a study design (e.g. Randomised Controlled Trials) that would provide the best answer?

A good question will combine several concepts. Identifying the relevant concepts is crucial to the successful development and execution of your systematic review. Your research question should provide you with a checklist of the main concepts to be included in your search strategy.

If appropriate, use a framework to help you develop your

research question. A framework will assist in identifying the important concepts in your question.

One technique often used to help formulate a clinical research question is the PICO model.

P = Population / Patient / Problem
I = Intervention / Indicator
C = Comparison / Control
O = Outcome

There are other frameworks such as SPICE, SPIDER, and ECLIPSE. More information on these frameworks is available from the library guide: Systematic Reviews.

Test your knowledge

If you were undertaking a systematic review and researching the effectiveness of acupuncture for

treating allergic rhinitis what would your research question be?

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=67#h5p-8

Think about one of your research questions. How might you adjust the question by applying the use of the PICO framework?

Best Practice Tip

Prior to commencing the systematic review, first, determine if a similar review has been recently done.

You could do this by searching relevant subject databases such as CINAHL and limit your search to "systematic review"

or by checking registers of systematic reviews such as PROSPERO

WRITING THE PROTOCOL

Photo by Laura Chouette on Unsplash

A protocol should be prepared *before* a review is started and used as a guide to carry out the review.

The aim of the protocol is to minimise bias by having pre-defined eligibility criteria of what *will*, and *will not*, be included in the review.

The research protocol is a planning document that will:

- describe the rationale for the review
- set out the review objectives
- detail the sources and search strategy used to locate studies
- detail how studies will be selected based on the defined eligibility criteria for the

inclusion/exclusion of studies
- detail how the studies will be critically analysed
- provide the basis of how the findings will be reported

The protocol is developed in conjunction with determining search terms.

A protocol promotes research integrity, accountability, and transparency of the completed review.

Photo by Markus Spiske on Unsplash

Best Practice Tip

It is recommended that you use a standard such as the 27-item PRISMA checklist to develop your protocol. This document will then serve well as a guide to what should be included when the findings of the systematic review are reported.

What is PRISMA?

PRISMA is the Preferred Reporting Items for Systematic reviews and Meta-Analyses. PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses.

Test your knowledge

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=71#h5p-9

PLANNING YOUR SEARCH STRATEGY

Planning your search is critical to the success of the systematic review with the following iterative steps included:

1. Where to search, locating the appropriate sources to search, which will work, which won't.
2. How best to effectively search, to develop the search terms and how they will be combined.
3. Testing that your search strategy will yield the anticipated results to answer the research question.

Sources to search

Photo by Jan Antonin Kolar on Unsplash

The search for literature for a systematic review should be rigorous and comprehensive to find ALL information available on a particular topic. It is therefore important to widely and thoroughly search published and unpublished research.

There are several types of sources that you can search, including; databases, grey literature, trials, and reference lists. You can also try hand-searching.

Postgraduate students

As a postgraduate student, you will most likely only use databases for your systematic review, although

talk to your teacher about the best sources to search.

Databases – It is important to search across a range of databases as no one database covers all the related literature. It is not acceptable to search just one database. The decision regarding which databases to search depends on the topic of the review. The database searches need to be comprehensive and reproducible.

Grey literature – This is not controlled by commercial publishers but rather is produced by organisations, governments, and industry. Grey literature is less likely to exhibit publication bias and so can provide balance.

Trials – Many clinical trials are unpublished, so when appropriate it is important to include unpublished and ongoing studies to minimise bias.

Hand searching – Not all trial reports are included in bibliographic databases, and trials may not be easily identified in database search results when accessing the titles and abstracts. Hand searching is a manual page-by-page examination of relevant journals and conference proceedings in order to identify published trials.

Reference lists – It can be fruitful to search the reference lists of relevant systematic reviews and meta-analyses, as well as

other key identified studies. Using this search method would be done in the preliminary stages to help determine that search results did contain these papers.

Planning your literature search

The planning phase of developing, testing, and revising your search queries is crucial to the success of the systematic review.

Do you have a set of relevant papers already that you want to include in your systematic review?

It is useful to build a 'sample set' of relevant references before you develop your search strategy. The 'sample set' may include:

Photo by Andrew Neel on Unsplash

- key papers recommended by your teacher
- references used in similar systematic reviews

The 'sample set' of references will enable you to:

- help identify relevant search terms
- test that your search strategy will retrieve these references

(and subsequently other relevant references on your research topic)

Developing, testing, and revising your search strategy

The search strategy needs to include a detailed list of **search terms** for each concept to ensure all relevant studies are captured for the review. Search terms will be made up of keywords or phrases, as well as database subject headings. Each database uses a different criterion to classify articles, so the subject headings will differ between them.

When using multiple databases, you are likely to encounter a large volume of resources. When planning your searches, you should continually adjust search terms and/or selection criteria in order to make sure you have a comprehensive body of references.

It is recommended that you **test your search terms** to determine if all the subject headings and words/phrases will return useful results. Test your search strategy in a key database. Does it retrieve any papers from your 'sample set' that are contained in that database? Are the results of the search relevant to your topic? What proportion are irrelevant? Identify any terms that are retrieving large numbers of irrelevant papers.

Documenting your search

It is essential that you thoroughly document your search process in enough detail to ensure that it can be reported correctly in the review. An Excel spreadsheet is one tool that you could consider using to document your searching.

For each database search, you should record:

- the date the search was run
- the name of the database
- the name of the database provider (e.g. ProQuest or EBSCO)
- your search strategy – include the keywords you used and how these were combined in the search
- any filters or limitations used, such as years, language, etc.
- the number of studies identified

PLANNING YOUR SEARCH TERMS

Define your research question

If you were researching the effectiveness of acupuncture for treating allergic rhinitis, you might begin with a research question that looks like the following.

Example research question

How effective is acupuncture in treating allergic rhinitis?

This question could be improved by utilising the PICO framework to look like this:

Improved example research question

In patients with allergic rhinitis is acupuncture more effective in decreasing pain symptoms than pharmacological treatment?

P (problem) = In patients with allergic rhinitis

I (intervention) = is acupuncture

C (comparator) = compared with pharmacological treatment

O (outcome) = more effective in decreasing pain symptoms?

Compiling a list of search terms

Let's look at two of the concepts from the research question:

1. **allergic rhinitis**
2. **acupuncture**

When you start compiling a list of possible search terms you need to think of your own keywords, as well as the thesaurus (i.e. subject) terms used by *each* of the databases you will be searching.

Here are some keywords and thesaurus terms for allergic rhinitis and acupuncture. The thesaurus terms are MeSH (Medical Subject Headings) as used by the PubMed database. Thesaurus terms for other databases would be added to the list.

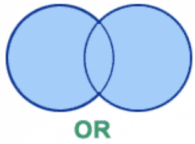
Concepts	Allergic rhinitis	Acupuncture
Keywords	allergic rhinitis hayfever hay fever pollinosis rose cold rose fever perennial hayfever seasonal hayfever	plum blossom ear acupuncture ear acupressure auricular therapy moxa laser acupuncture seven star needle electro-acupuncture electro acupuncture TENS transcutaneous nerve stimulation transcutaneous electrical nerve stimulation electro-stimulation electro stimulation pharmacopuncture point injection
MeSH (Medical Subject Headings)	rhinitis, allergic rhinitis, allergic, seasonal rhinitis, allergic, perennial respiratory hypersensitivity	acupuncture meridians electroacupuncture moxibustion auriculotherapy acupressure acupuncture, ear acupuncture therapy acupuncture analgesia acupuncture points transcutaneous electric nerve stimulation

COMBINING YOUR SEARCH TERMS

Combine with Boolean operators

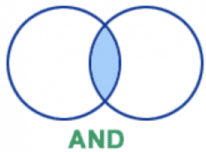
To combine the different search terms the Boolean operators of OR and AND need to be used.

OR operator broadens your search



Use the Boolean operator **OR** to combine keywords related to a single concept. This **broadens your search**, increasing the number of results. This means that each search term listed for allergic rhinitis would be combined with an OR, and similarly for acupuncture.

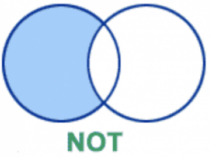
AND operator narrows your search



Use the Boolean operator **AND** to combine keywords related to different concepts. This **narrows your search**, decreasing the number of results. The search results for allergic

rhinitis would be combined with an AND with the search results for acupuncture.

NOT operator narrows your search



Use the Boolean operator **NOT** operator to exclude a term. This is useful if you don't want to find any records that contain a particular term. Use it with care to avoid excluding relevant articles that briefly mention the second term. Searching for allergic rhinitis NOT children will exclude all records that mention children as well as allergic rhinitis and children together.

Test your knowledge

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can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=82#h5p-10

The search query

The search features of library databases make constructing your search query easier, especially when using advanced search options. For example, the Boolean operators can usually be selected from a drop-down menu. Some databases allow you to enter the search terms on separate lines of an Advanced or Basic search form. Concepts can be entered on separate lines that are then combined using the OR and AND operators.

Best Practice Tip

If there are many synonyms and subject headings for a single concept, you may find it helpful to break this concept into a couple of separate searches that you can then combine using

OR. The first concept is **allergic rhinitis** and the second concept is **acupuncture**.

Search line	Terms combined	Notes
1	"Allergic rhinitis" OR hayfever OR "hay fever" OR pollinosis OR "rose fever" OR "perennial hayfever" OR "seasonal hayfever"	Concept 1 keyterms
2	"Rhinitis, Alllergic"[Mesh] OR "Rhinitis, Allergic, Seasonal"[Mesh] OR "Rhinitis, Allergic, Perennial"[Mesh] OR "Respiratory Hypersensitivity"[Mesh]	Concept 1 MeSH headings
3	1 OR 2	All Concept 1
4	"plum blossom" OR "ear acupuncture" OR "ear acupressure" OR auricular therapy OR moxa OR "laser acupuncture" OR "seven star needle" OR "electro-acupuncture" OR "electro acupuncture" OR TENS OR "transcutaneous electrical nerve stimulation" OR "transcutaneous nerve stimulation" OR "electrostimulation" OR pharmoacupuncture OR "point injection"	Concept 2 keyterms
5	"Acupuncture"[Mesh] OR "Meridians"[Mesh] OR" Electroacupuncture"[Mesh] OR "Moxibustion"[Mesh] OR "Auriculotherapy"[Mesh] OR "Acupressure"[Mesh] OR "Acupuncture, Ear"[Mesh] OR "Acupuncture Therapy"[Mesh] OR "Acupuncture, Analgesia"[Mesh] OR "Acupuncture Points"[Mesh] OR 'Transcutaneous Electric Nerve Stimulation"[Mesh]	Concept 2 MeSH headings
6	4 OR 5	All Concept 2

Search line	Terms combined	Notes
7	3 AND 6	Combined concepts

Our search query using the PubMed database and the listed keywords and MeSH terms for allergic rhinitis, and similarly for acupuncture, would look like the following.

Example search query

"Allergic rhinitis" OR hayfever OR "hay fever" OR pollinosis OR "rose fever" OR "perennial hayfever" OR "seasonal hayfever" OR "Rhinitis, Alllergic"[MeSH] OR "Rhinitis, Allergic, Seasonal"[MeSH] OR "Rhinitis, Allergic, Perennial"[MeSH] OR "Respiratory Hypersensitivity"[MeSH] **AND** "plum blossom" OR "ear acupuncture" OR "ear acupressure" OR auricular therapy OR moxa OR "laser acupuncture" OR "seven star needle" OR "electro-acupuncture" OR "electro acupuncture" OR TENS OR "transcutaneous

electrical nerve stimulation" OR "transcutaneous nerve stimulation" OR "electrostimulation" OR pharmoacupuncture OR "point injection" OR "Acupuncture"[MeSH] OR "Meridians"[MeSH] OR "Electroacupuncture"[MeSH] OR "Moxibustion"[MeSH] OR "Auriculotherapy"[MeSH] OR "Acupressure"[MeSH] OR "Acupuncture, Ear"[MeSH] OR "Acupuncture Therapy"[MeSH] OR "Acupuncture, Analgesia"[MeSH] OR "Acupuncture Points"[MeSH] OR "Transcutaneous Electric Nerve Stimulation"[MeSH]

The library guide Literature reviews has a page that addresses planning your search. It covers identifying the main aspects/concepts of your topic, compiling a list of search terms, utilising different search techniques, and the search query.

ANALYSING SEARCH RESULTS

Once the search results are obtained the analysis phase of the systematic review commences where each paper must be judged on validity and quality. The decisions on which papers to include and exclude are based on the eligibility criteria specified in the protocol.

Best Practice Tip

It is recommended that you use the PRISMA flow diagram to record the number of search results from each database and the changes to those numbers as the screening process is conducted. This diagram should be included in the reported findings of the systematic review.

What is PRISMA?

PRISMA is the Preferred Reporting Items for Systematic reviews and Meta-Analyses. PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses.

Screening papers

Photo by Nong V on Unsplash

The screening process of a systematic review will usually involve more than one reviewer, with the reviewers assessing each paper against the eligibility criteria for inclusion or exclusion from the review as defined in the protocol.

Each reviewer will need to provide a rationale for how the papers match the eligibility criteria or have some value to the systematic review. This is done separately by each reviewer to ensure minimal bias. The results are then compared.

The screening is done incrementally in two phases. An agreement must be reached by all reviewers, at each phase, on which papers are to be included and excluded.

Phase 1 – **Titles and abstracts** of each paper are assessed against the eligibility criteria.

Phase 2 – The process is repeated where the **full text** of each of the remaining papers are assessed against the eligibility criteria.

The remaining papers are those that will contribute to the systematic review.

Critical appraisal

The critical appraisal process examines the validity and applicability of the studies. It is important to critically evaluate the literature to:

- assess the benefits and strengths of the research against flaws and weaknesses
- decide whether studies have been undertaken in a way that makes their findings reliable
- make sense of the results
- know what these results mean in the context of the clinical decision being made
- assess the usefulness of the evidence for clinical decisions

There are several **checklists** available to assist in the process of determining the quality of the studies. A checklist should be chosen to assess sources of bias that are likely to affect results in relation to the research question.

Take a look at the following sites for examples of critical appraisal tools that can be used to assess the quality, validity, and bias of papers.

- CASP (Critical Appraisal Skills Programme) Checklists

- Joanna Briggs Critical Appraisal Tools
- Risk of bias assessment tools from the University of Bristol

SYNTHESISING THE DATA

Synthesis is a stage in the systematic review process where extracted data, that is the findings of individual studies, are combined and evaluated.

The general purpose of extracting and synthesising data is to show the outcomes and effects of various studies, and to identify issues with methodology and quality. This means that your synthesis might reveal several elements, including:

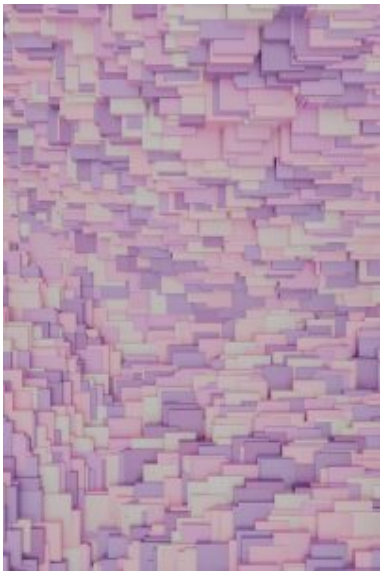


Photo by Pawel Czerwinski on Unsplash

- overall level of evidence
- the degree of consistency in the findings
- what the positive effects of a drug or treatment are, and what these effects are based on
- how many studies found a relationship or association

between two components, e.g. the impact of disability-assistance animals on the psychological health of workplaces

There are two commonly accepted methods of synthesis in systematic reviews.

1. Qualitative data synthesis
2. Quantitative data synthesis (i.e. meta-analysis)

The way the data is extracted from your studies, then synthesised and presented, depends on the type of data being handled.

Qualitative data synthesis

In a qualitative systematic review, data can be presented in a number of different ways. A typical procedure in the health sciences is **thematic analysis**.

Thematic synthesis has three stages.

1. the coding of text 'line-by-line'
2. the development of 'descriptive themes'
3. and the generation of 'analytical themes'

If you have qualitative information, some of the more common tools used to summarise data include:

- textual descriptions, i.e. written words
- thematic or content analysis

Example qualitative systematic review

A good example of how to conduct a thematic analysis in a systematic review is the following journal article on cancer patients. In it, the authors go through the process of:

1. identifying and coding information about the selected studies' methodologies and findings on patient care
2. organising these codes into subheadings and descriptive categories
3. developing these categories into analytical themes

What Facilitates "Patient Empowerment" in Cancer Patients During Follow-Up: A Qualitative Systematic Review of the Literature

Quantitative data synthesis

In a quantitative systematic review, data is presented statistically. Typically, this is referred to as a **meta-analysis**.

The usual method is to combine and evaluate data from multiple studies. This is normally done in order to draw conclusions about outcomes, effects, shortcomings of studies and/or applicability of findings.

Remember, the data you synthesise should relate to your research question and protocol (plan). In the case of quantitative analysis, the data extracted and synthesised will relate to whatever method was used to generate the research question (e.g. PICO method), and whatever quality appraisals were undertaken in the analysis stage.

If you have quantitative information, some of the more common tools used to summarise data include:

- grouping of similar data, i.e. presenting the results in tables
- charts, e.g. pie-charts
- graphical displays, i.e. forest plots

Example of a quantitative

systematic review

A quantitative systematic review is a combination of qualitative and quantitative, usually referred to as a meta-analysis.

Effectiveness of Acupuncturing at the Sphenopalatine Ganglion Acupoint Alone for Treatment of Allergic Rhinitis: A Systematic Review and Meta-Analysis

About meta-analyses

A systematic review may sometimes include a meta-analysis, although it is not a requirement of a systematic review. Whereas a meta-analysis also includes a systematic review.

A meta-analysis is a

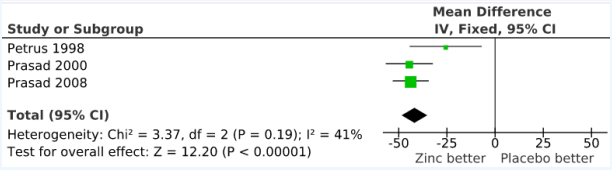
Photo by Luca Bravo on Unsplash

statistical analysis that combines data from previous studies to calculate an overall result.

One way of accurately representing all the data is in the form of a **forest plot**. A forest plot is a way of combining the results of multiple studies in order to show point estimates arising from different studies of the same condition or treatment.

It is comprised of a graphical representation and often also a table. The graphical display shows the mean value for each study and often with a confidence interval (the horizontal bars). Each mean is plotted relative to the vertical line of no difference.

The following is an example of the graphical representation of a forest plot.



Watch the following short video where a social health example is used to explain how to construct a forest plot graphic.

Forest Plots: Understanding a Meta-Analysis in 5 Minutes or Less *(5:38 mins)*

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=90#oembed-1

Forest Plots – Understanding a Meta-Analysis in 5 Minutes or Less by The NCCMT (YouTube). Copyright © National Collaborating Centre for Methods and Tools (NCCMT).

Test your knowledge

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=90#h5p-11

REPORTING THE FINDINGS

Photo by Bernd Klutsch on Unsplash

While the writing process for a systematic review is generally like writing any other kind of review, there are several aspects to note.

In writing the systematic review you should provide an **answer to the research question**.

Careful **documentation of the methodology** is important as it should outline the search process and the selection process. A reader should understand why sources were chosen, how they were assessed, and how conclusions were reached.

The **structure** of the systematic review will differ from the traditional (or narrative) literature review as it should **reflect the stages outlined in the protocol**. Refer to the 27-item

PRISMA checklist to see what should be addressed in the protocol.

The value of a systematic review is the **critical reflection and interpretation of the findings**.

Reporting the findings of the systematic review will differ slightly if it is to be presented as part of coursework, a thesis, or as a manuscript for publication.

Examples

The following examples are available from the RMIT Research Repository.

Dissertation / Thesis

- Ear-acupressure for allergic rhinitis

Articles

- Ear-acupressure for allergic rhinitis: A systematic review
- Acupressure for respiratory allergic diseases: A systematic review of randomised controlled

trials

Activity

To see how a systematic review is written check out examples of published papers and/or completed theses.

1. Find a systematic review by searching a database and examine how the review has been written. For example, search the PubMed database on your topic and filter results by 'article type' selecting 'systematic reviews.'
2. Find a systematic review paper by searching with the words 'systematic review' in the RMIT Research Repository. Consider

adding an additional topic word.

3. Postgraduates may like to ask their supervisor if they can recommend a completed thesis that includes a systematic review.

You can search the Research Repository for a thesis with a systematic review if an author's name is unknown. In the search box include a topic along with the words 'systematic review' and select 'thesis' from the item type filter on the left hand side .

EXPLORE FURTHER

Photo by Erwan Hesry on Unsplash

Congratulations on completing this module. We have explored the benefits of conducting a systematic review and looked at the differences between a traditional literature review and a systematic review.

Various aspects of a systematic review were briefly examined, including; the research question and PICO; developing a protocol and PRISMA; resources and strategies for searching the literature; eligibility criteria for screening results; critical appraisal tools to assess the quality of studies; synthesizing data; and writing the review.

Further assistance

For more assistance with your writing, see an Academic Skills Adviser in the Library.

Library guide – Additional information is available from the online library guide Systematic Reviews.

Cochrane handbook – The Cochrane Handbook for

Systematic Reviews of Interventions details systematic reviews more thoroughly, including meta-analysis. It is the official guide and describes in detail the process of preparing and maintaining Cochrane systematic reviews on the effects of healthcare interventions. The *Handbook* includes guidance on the standard methods applicable to every review (planning a review, searching and selecting studies, data collection, risk of bias assessment, statistical analysis, GRADE and interpreting results), as well as more specialised topics (non-randomized studies, adverse effects, complex interventions, equity, economics, patient-reported outcomes, individual patient data, prospective meta-analysis, and qualitative research).

Learn more

A short video Introducing systematic reviews (14 mins) is available (Microsoft Stream, login required).

You may also be interested in viewing the following webinar Systematic Reviews (60 mins) recorded from the Library's PhD Up! program (now called Research Plus). The webinar content complements this online module.

Generative AI tools may be useful to automate and streamline various aspects of research and writing at postgraduate level. However, the AI environment is constantly changing. For up-to-date guidance on how AI can be ethically integrated into your research project at RMIT University, consult your course coordinator and the following tools:

- RMIT Learning Lab: Artificial intelligence tools
- RMIT Library Online Module: Generative AI for students at RMIT

Feedback

Your comments and suggestions on how we can improve this module will be appreciated. Please email us.

What's next?

You have completed this module on Conducting a Systematic Review. To choose another module to complete go to https://rmit.pressbooks.pub/researchwritingmasterstudents/

CHOOSING A REFERENCE MANAGER

Photo by Thought Catalog on Unsplash

Welcome to this online module choosing a reference manager. As a postgraduate, you may choose to use a reference manager to organise your references.

A reference manager is a software tool designed to help you collect, store and manage your references for your academic work. The reference manager facilitates the process in various documents, such as essays, theses, reports, and manuscripts for publication.

The module will explore the features of three popular reference managers – Endnote, Zotero and Mendeley – and help you decide which one is best for your research practices.

Learning Objectives

On successful completion of the module, you will be able to:

- understand why you might want to use a reference manager during the course of your research
- learn some of the common features of all reference managers
- understand the features that differentiate three common reference managers: EndNote, Zotero, and Mendeley
- gain insight into how other researchers at RMIT have used these tools

This module should take you about 30 minutes to complete.

Work through each section using the navigation footer (i.e. previous/next), or use the contents menu to select a particular section. There are learning activities throughout.

Upon completion, feedback and suggestions for

improvement of this module can be provided at the end via an email link.

You may also be interested in viewing the additional resources about reference managers at the end of this module.

WHAT TO CONSIDER

Endnote, Zotero and Mendeley have common features as well as differences. Before you decide what reference manager to use, think about what features will be important to you.

Photo by Max van den Oetelaar on Unsplash

If you try one and decide you do not like it, it is good to know that you can transfer your references to another reference manager – you might want to try more than one before you decide.

Questions to ask

Use these questions to decide what is most important for you and your research.

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https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=102#h5p-12

ENDNOTE

EndNote is the most commonly used reference manager at RMIT University. RMIT University pays for an institutional licence for all staff and students, and one of the main benefits of using EndNote is the support available from the Library.

Features of EndNote

In addition to the main features common to all reference managers, EndNote:

- provides unlimited storage for full-text documents and associated files
- works with a wide range of word processing applications including MS Word (Windows and Mac), OpenOffice and Apple Pages. EndNote also works reasonably well with Google Docs
- has a 'Find full text' function as well as the ability to attach full-text documents
- has good tools for editing existing referencing styles or creating new ones
- allows for the transfer of a Mendeley or Zotero library via a RIS, XML or BibTeX file using the import

functionality

EndNote also provides an online version called EndNote Online. EndNote Online has limited functionality, for example, you can't edit styles or use term lists for journal abbreviations. However, you can use EndNote Online to sync between devices and share groups, or your Library with others. Storage capacity for EndNote Online is dependent on your account type.

How to use EndNote 21 in seven minutes: Windows

(7:52 mins)

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=104#oembed-1

How to use EndNote 21 in seven minutes: Windows by EndNote (YouTube). Copyright © Clarivate.

How to use EndNote 21 in seven minutes: macOS

(7:52 mins)

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=104#oembed-2

How to use EndNote 21 in seven minutes: macOS by EndNote (YouTube).

Resources

There are a number of resources for EndNote available. These include:

- RMIT University Library guide – EndNote Desktop guide
- RMIT University Library website – Reference management tools

ZOTERO

As an open source software Zotero is widely used and has extensive support and documentation available online.

Features of Zotero

Zotero has:

- 300mb of free storage (additional storage can be purchased)
- full integration of web and desktop versions
- excellent citation capture from webpages, including a preserved snapshot of the webpage as an HTML file
- many library sharing and collaboration options with various permissions levels, from fully public libraries (anyone with the link can edit your shared library) to closed groups (invited people only can view the shared library)

Zotero is used by many researchers at RMIT University. Here's a short video of Dr Stephen Rowley speaking about aspects of Zotero that he finds useful.

Dr Stephen Rowley talks about Zotero *(6:11 mins)*

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https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=106#oembed-1

MENDELEY REFERENCE MANAGER

Mendeley Reference Manager, often called Mendeley for short, is a freely available reference manager.[1]

Mendeley Reference Manager includes a desktop version which can be installed on Windows, iOS and Linux. For each version there are online guides and a support hub available. It is also available as a web-based application, with synchronization done automatically when online, so your library is accessible even when away from your own devices.

1. In 2022, Mendeley Reference Manager for Desktop replaced a prior version known as Mendeley Desktop. In this module, the current Mendeley Reference Manager is the focus. More information can be found in our Reference Manager Library Guide.

A citation application for Microsoft Word, called Mendeley Cite, can be used in tandem with Mendeley. It allows you to add references from your Mendeley library without leaving the document.[2]

The new Mendeley Reference Manager *(2:24 mins)*

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=109#oembed-1

The New Mendeley Reference Manager by Mendeley (YouTube). Copyright © Elsevier.

2. Mendeley Cite replaces the prior application known as Mendeley Desktop Citation Plugin. More information on Citation Plugin can be found on the Mendeley support site.

Features of Mendeley Reference Manager

- Easily search your library and organise references into collections.
- Use Mendeley Cite with Microsoft Word for seamless integration of your library with your written work.
- Import references directly from the web using the Mendeley Web Importer plugin for Chrome and Firefox.
- Add, read, organise and annotate PDFs on both the web and desktop applications.
- Access 2GB of free storage (upgrades are available for a fee).
- On a free account, create up to five private groups with 25 members each for collaboration, PDF sharing, and shared annotations.
- Transfer your library to another reference manager via an RIS, XML or BibTeX file, using the desktop version.
- Install the software on Windows, iOS and Linux platforms.
- Use the web version available on Chrome, Firefox, Microsoft Edge, and Safari.
- RMIT staff and students can access the Mendeley Institutional Edition (MIE) which has increased storage and collaboration capacity. More information is available in our Reference Managers library guide and on the Library's Reference management tools webpage.

However, Mendeley Reference Manager has limited functionality with some word processing applications such as Google Docs and Apple Pages. You cannot search for new resources from within the application. And while its group functionality allows for sharing of PDF documents, you cannot create open groups or libraries accessible to anyone.

Mendeley is used by some researchers at RMIT University. Here is a short video of Professor James Harland speaking about the aspects of Mendeley he finds useful.

James Harland on Mendeley *(2:16 mins)*

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=109#oembed-2

SUMMING IT ALL UP

You have seen the differences between three major reference managers. No particular reference manager is ideal for everyone, so making a right choice depends on what you need.

Here is a quick quiz to help you decide which is best for you. There are nine multiple choice questions, based on the content you have read so far. The quiz will give you immediate results, and will continue automatically as you answer.

Activity

An interactive H5P element has been excluded from this version of the text. You can view it online here:

https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=111#h5p-13

EXPLORE FURTHER

Congratulations on completing this module!

We have explored three different reference managers and identified the similarities and differences between them. We've also heard how academics use these tools.

Photo by Austin Park on Unsplash

We hope the information has helped you decide which reference manager you'd like to use.

Further assistance

See our Reference Managers Library guide and Reference management tools website for more information.

Get help from a librarian or an academic skills advisor.

Learn more

This video will give you a brief overview of the features of

Endnote, Zotero, and Mendeley. Choosing a Reference Manager – EndNote, Zotero, Mendeley (17 mins). Please note: you will need to log into your RMIT account to view this video.

Generative AI tools may be useful to automate and streamline various aspects of research and writing at postgraduate level. However, the AI environment is constantly changing. For up-to-date guidance on how AI can be ethically integrated into your research project at RMIT University, consult your course coordinator and the following tools:

- RMIT Learning Lab: Artificial intelligence tools
- RMIT Library Online Module: Generative AI for students at RMIT

Feedback

Your comments and suggestions on how we can improve this module will be appreciated. Please email us.

What's next?

You have completed this module on Choosing a Reference Manager. To choose another module to complete go to https://rmit.pressbooks.pub/researchwritingmasterstudents/

HOW TO WRITE AN EFFECTIVE RESEARCH PROPOSAL

Welcome to this RMIT University Library module which provides you with key information, strategies and resources for developing an effective research proposal.

The module is aimed at Masters by Coursework students who are seeking to understand why and how to write a research proposal as part of their coursework.

This module should take you about 30 minutes to complete.

Work through each chapter using the navigation footer (i.e. previous/next) or use the contents page to select a particular section.

We hope you find this module useful and stimulating.

Learning objectives

On successful completion of the module, you will be able to:

1. determine the purpose and importance of the research proposal
2. create effective research questions
3. identify they key components which structure a research proposal, and
4. familiarise yourself with writing the "what", "why" and "how" sections of your proposal.

Upon completion, feedback and suggestions for improvement of this module can be provided at the end via an email link.

WHAT IS A RESEARCH PROPOSAL?

Photo by Firmbee.com on Unsplash

As a postgraduate student you may be asked to write a research proposal to support a project that is part of your course. A research proposal is useful because it gives you the opportunity to get valuable feedback about your intended research aims, objectives and design and helps you articulate what you're interested in doing research on. A research proposal maps out a proposed central research problem or question that you plan to investigate and suggests an approach to its investigation.

Although you may be given specific requirements that you need to be aware of, all research proposals include the following:

- **What** you propose to research
- **Why** the topic needs to be researched
- **How** you plan to research it

Purpose and audience

Before writing a research proposal, it is important to think about the **purpose** and **audience** of this type of text.

Purpose

There are 2 key purposes of a research proposal:

1. To allow experienced researchers (your teachers and examiners) to assess whether:

- the research question or problem is feasible (that is, can be answered or solved)
- the scope is appropriate for MA by coursework (as opposed to a PhD)
- you've understood the relevant key literature and identified the gap for your research
- you've chosen an appropriate methodological approach

2. To help you clarify and focus on what you want to do, why you want to do it, and how you'll do it. The research proposal helps you position yourself as a researcher in your field. It allows you to:

- systematically think through your proposed research, argue for its significance, and identify the scope
- show a critical understanding of the scholarly field around your proposed research
- identify the gap in the literature that your research will address
- justify your proposed research design
- identify all tasks that need to be done through a realistic timetable
- anticipate potential problems
- hone organisational skills that you will need for your research
- become familiar with relevant search engines and databases
- develop skills in research writing

Audience

The main audience for your research proposal may be your teacher and/or a client.

Your audience may or may not have a strong disciplinary understanding of your proposed research area. It is therefore

important to create a clear context, rationale and framework for the research project you plan to undertake. Limit jargon and specialist terminology so that non-specialists can comprehend it. You need to convince the reviewers that your proposed research is worth doing and that you will be able to effectively 'interrogate' your research questions or address the research problems through your chosen research design.

You are expected to demonstrate:

- a clearly defined and feasible research project
- a clearly explained rationale for your research
- evidence that your research will make an original contribution through a critical review of the literature
- written skills appropriate to postgraduate research study

DEVELOPING A RESEARCH QUESTION

Your research questions are perhaps the most important part of your study. It's worth investing time to develop robust questions that will guide your research.

Identifying an effective research question

While the criteria for an effective research question may vary considerably, generally, a research question should be:

- **Focused**: The scope should be narrow enough to complete your research within the available timeframe and resources.
- **Analytical**: Your research questions must be complex, requiring interpretation and analysis rather than simple fact-checking.

- **Effectively expressed**: Use clear, specific, and concise language to make the research question accessible to the reader.

Strategies for developing effective research questions

Formulating research questions is a crucial step in the research process. It involves creating clear, focused, and researchable questions that guide your investigation. Here are some key points to consider:

- Your question should address a specific aspect of your topic.
- It should be possible to answer the question using primary and/or secondary sources.
- Ensure the question can be answered within the given timeframe and practical constraints.
- The question should be detailed enough to provide a thorough answer.

To develop effective research questions, you may like to try one of the following two key strategies:

I) Convert your topic into one or more research questions by:

1. breaking down your topic into its different features
2. choosing a feature that interests you to narrow down your topic's scope
3. brainstorming and reading literature around this feature to refine it further
4. convert this focused feature into question form

II) Formulate a problem statement and then convert it into question form. Use the following template as a guide to writing your problem statement:

1. I am examining ...
2. Because ...
3. It matters because ...

The following presentation shows how to use the above discussed strategies for developing robust research questions. Work through each section of the webinar. Feel free to pause the video at suitable points and complete the included activities.

Presentation on developing research questions *(12:54 min)*

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=121#oembed-1

Developing your research questions by RMIT University (YouTube).

STRUCTURING KEY SECTIONS OF A PROPOSAL

All research proposals need to cover the following three main areas:

- **What** you propose to research (written as question/s)
- **Why** the topic needs to be researched (address what's missing in the literature)
- **How** you plan to research it (often called a 'study design')

The structure of a research proposal can vary significantly across these three areas. Check with your teachers for their preferred format, as some schools may provide a template.

Reflection

Think about how you might go about justifying your research.

- What key literature is your proposed research situated within?
- How will your research build on this?
- Who will benefit from your research and how?
- Are there industry stakeholders?
- Why should they care about your research?

Sentence frames commonly used to justify your research

Here is a list of phrases commonly used when writing about the rationale for your research.

- *Although much previous research has ..., this proposed*

study will ...

- *Previous research has ... However, these studies do not explain ...*
- *This issue will be addressed in the proposed research by ...*
- *This practice-led research approach will ...*
- *By demonstrating that ... I will address the issue of ...*
- *This study will build on and contribute to ...*
- *The proposed research differs from previous studies by ...*
- *There is an absence in the existing literature of ...*
- *It is hoped that this research will inform ...*
- *Although studies in ... have analysed ..., there has been little research on...*
- *The proposed research seeks to address the limited literature on...*
- *Relatively little literature exists on ...*
- *The proposed research will have importance in terms of*

real-world applications such as ...

- *Research has generally concentrated on ..., with very little addressing the issues in this proposed research.*

- *The main contributions of this study will be ...*

For some general RMIT discipline-based guidelines, consult RMIT's discipline based guidelines to writing research proposals (DOCX, 1 page).

WRITING YOUR RESEARCH PROPOSAL

Writing the 'what' of your proposed research

The purpose of this part of your research proposal is to generally describe **what** your research is about.

The **what** of your research establishes how your research is situated within your discipline or field. It provides fundamental information, such as:

- the context for the research, which can be:
  - the key ideas, theories and concepts,
  - the major issues and debates,
  - the key players and seminal texts or key artists, and
  - the questions that have been asked around this topic.
- your research questions, problems or hypotheses
- the scope of the proposed research (i.e. what you will and what you won't do)

The **what** of your research proposal may also include:

- the aims and/or objectives of your research
- an introduction to the theoretical framework within which your research sits
- a statement of the problem grounded in the context or theoretical framework and a resulting argument for your research to be conducted
- definitions if needed

Writing the 'why' of your proposed research

A key requirement of your research proposal is to justify that your research is worth doing. Your review panel will be looking for a succinct and convincing argument about what sets your proposed research apart from others, and why *not* doing this research leaves an important problem unaddressed.

Ways of justifying your research include showing that your project will make a significant and substantial contribution in terms of:

1. how it fits within an existing body of scholarship/literature/practice
2. how it builds on and adds to this body of knowledge
3. what the value of your research is and for whom (e.g. a particular community, industry, etc.)

Critical engagement with the literature is crucial in order to justify your research. You must demonstrate that you understand:

- the main concepts and themes, underlying principles, and established theories related to your research
- areas of controversy and contention
- the key scholars and seminal research related to your topic

Writing the 'how' of your proposed research

This part of your research proposal involves describing **how** you plan to find answers to your research questions or resolve the research problems. In other words, it entails describing the design of your research.

A challenge in this section is providing the right amount of information—not too little or too much. You need enough detail to convince the review panel that the research is feasible and to justify your research design components.

Reflection

Which of these questions will you need to answer in your research design (i.e. the 'how' section of your research proposal)?

- What is your chosen research design and rationale?
- What theories, concepts or models inform your research design?
- What are the step-by-step methods or process used?
- What constitutes your creative practice?
- How will you engage with your creative practice (e.g. reflection, testing, theorising)?
- What type of data will be collected?
- What are your sources of data?
- Where and how will the data be collected?
- How will the data be analysed?
- What are the strengths and limitations of your methodology?
- What resources are required (equipment,

other)?
- How reliable and valid are your methods?
- What ethical issues relate to your research methods, and how will you address these?

Sentence frames commonly used to discuss study design

- *The theory that will guide this study is ...*
- *This methodology appears to be the most appropriate in order to achieve the objectives of the research.*
- *In this research, I will relate the objects or artefacts to ...*
- *My research involves creative and practice-based enquiry, which ...*
- *This practice-led research draws upon ...*
- *Experiments will be conducted using ...*
- *Data collection will take place in ...*

- *Data will be obtained by ...*
- *Data will be analysed by ...*
- *The analysis will involve ...*
- *Various methods have been used to ...*
- *The rationale for this chosen study design is ...*
- *The study will apply previously developed techniques for ...*

EXPLORE FURTHER

Photo by Jason Leung on Unsplash

Congratulations on completing this module. We have explored the purpose, and key component structures of research proposals. We have also discussed some strategies for writing effective research questions as well as the 'what', 'why' and 'how' sections of a proposal.

Further assistance

For more assistance in planning or writing your research proposal, consult the following resources:

- How Research Questions Can Make or Break Your Project (8:36 min) by Professor James Arvanitakis (YouTube)
- Research Questions Hypothesis and Variables: Connecting the Dots (7:55 min) by Associate Professor Ron Wallace (YouTube)

- The Manchester Academic Phrase Bank

For more assistance with your writing, see an Academic Skills Adviser in the Library.

Generative AI tools may be useful to automate and streamline various aspects of research and writing at postgraduate level. However, the AI environment is constantly changing. For up-to-date guidance on how AI can be ethically integrated into your research project at RMIT University, consult your course coordinator and the following tools:

- RMIT Learning Lab: Artificial intelligence
- RMIT Library Online Module: Generative AI for students at RMIT

Feedback

Your comments and suggestions on how we can improve this module will be appreciated. Please email us.

What's next?

You have completed this module on the Research Proposal. To choose another module to complete go to https://rmit.pressbooks.pub/researchwritingmasterstudents/

HOW TO WRITE A LITERATURE REVIEW

Welcome to this module created by the RMIT University Library.

The module is aimed at Masters by Coursework students who are seeking to understand the purpose of a literature review and how to write one.

The course materials include information, videos and learning activities which explore key features of writing a literature review. It should take you about 30 minutes to complete.

Work through each chapter using the navigation footer (i.e. previous/next) or use the contents page to select a particular section.

We hope you find this module useful and stimulating.

Learning objectives

On successful completion of the module, you will be able to:

1. understand the purpose of a literature review,
2. understand how to organise your ideas as you review literature, and
3. understand how to write your literature review, including how to structure and style your literature review.

Upon completion, feedback and suggestions for improvement of this module can be provided at the end via an email link.

WHAT IS A LITERATURE REVIEW?

Photo by Mariia Zakatiura on Unsplash

A literature review is a critical analysis of the literature related to your research topic. It evaluates and critiques the literature to establish a theoretical framework for your research topic and/or identify a gap in the existing research that your research will address.

A literature review is **not** a summary of the literature. Although you may find yourself making summaries of what you read, you also need to engage deeply and critically with the literature.

Your literature review should show your understanding of the field related to your research topic and lead to presenting a rationale for your research.

A literature review could be a stand-alone assignment or part of a research project or short thesis.

A literature review focuses on:

- the context of the topic
- key concepts, ideas, theories and methodologies
- key researchers, texts and seminal works
- major issues and debates
- identifying conflicting evidence
- the main questions that have been asked around the topic
- the organisation of knowledge on the topic
- definitions, particularly those that are contested
- showing how your research will advance scholarly knowledge (generally referred to as identifying the 'gap')

THE PURPOSES OF A LITERATURE REVIEW

Literature reviews play a crucial role in placing your work within the framework of existing knowledge, assisting in justifying your research and its relevance. Literature reviews serve a number of purposes.

To identify Gaps:

Literature reviews identify gaps in the existing research, highlighting areas that need further investigation.

To support Your Argument:

Literature reviews support your research by showing how it fits into the broader academic conversation.

To show awareness of the present state of knowledge in a particular field, including:

- seminal authors
- the main empirical research
- theoretical positions
- controversies
- breakthroughs as well as links to other related areas of knowledge

To provide a foundation for the author's research. To do that, the literature review needs to:

- help the researcher define a hypothesis or a research question, and how answering the question will contribute to the body of knowledge;
- provide a rationale for investigating the problem and the selected methodology; and
- provide a particular theoretical lens, support the argument, or identify gaps.

Activity

Before you continue with this module, complete the quiz below to evaluate your understanding of literature reviews.

An interactive H5P element has been excluded from this version of the text. You

can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=607#h5p-16

THE PROCESS OF WRITING A LITERATURE REVIEW

Writing a literature review is a complex and non-linear process. It usually involves reiterations of all or any of the following steps:

Photo by Christin Hume on Unsplash

1. conducting a Library search for sources
2. taking notes while critically reading and analysing the literature
3. structuring the literature review
4. writing the literature review (following the conventions in your field)

Conducting a Library search for sources

One of the first and important steps in carrying out a literature

review is to conduct an effective Library search which will help you identify the most relevant sources for your research topic.

If you need some assistance with searching the literature strategically, you might want to work through the Strategies and Resources for Searching the Literature module in this collection. Amongst other things, this module will help you to effectively:

- form key words or descriptors for your topic
- create a search query
- find different and relevant types of resources
- use more advanced searching techniques

Taking notes

Taking effective notes is another key part of the process of writing up your literature review.

There is a variety of techniques that one can use to take notes. These include:

- highlighting and writing notes in margins
- drawing a diagram or a mind map
- using the Cornell note-taking system

In this module, we will focus on using an annotated bibliography as a note-taking technique.

Using an annotated bibliography to take notes

An annotated bibliography can be a useful way of taking notes as you read the literature and think about what you are reading. It allows you to collect both a summary of the key points from different readings as well as a critical assessment of the literature. It also allows you to provide comments about how a text relates both to your own research and to other literature.

An annotated bibliography has two main sections:

1. **a reference** (bibliographic information or citation) in your chosen citation style
2. **an annotation** (description and comments on the source). The annotation usually provides:
    - a summary of the key points or arguments the source makes;
    - a reflection on how the source contributes to your field of

knowledge and how it might be useful in your own research; and
    - a critical analysis or evaluation of the ideas presented.

What to include in a summary?

- Begin each entry with a summary or description of the source.
- Take notes in your own words on:
    - research aim
    - methodologies used
    - main arguments and findings
    - scope and limitations of the study
- Use these notes to create a coherent summary of 50–100 words or a few sentences.

How to reflect on the relevance of a source to your own research?

Writing a reflection for your annotated bibliography includes

writing a few sentences explaining in what ways the source is useful for, or relates to, the overall theme of your research. This section of the annotation will be particularly helpful when you come to building an argument for your research in your literature review.

Ask yourself:

- What does this source contribute to the ideas I am developing in my research or to the argument/s I am making?

It is worth mentioning that while your reflection states your personal ideas and evaluations, it should still be objective and unemotional.

What to include in a critical analysis?

In providing a critical analysis, you need to focus on the value of the material and sources you have read.

Ask yourself:

- What are the strengths and limitations of the source in terms of aim, methodology, and findings?
- Are the findings sound, logical and well researched?
- Is the source original, important and of a high standard?
- How does this source add to the research in the field?
- Where is its place — and relationship — in the wider field of research and scholarly discussions?

Activity

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=139#h5p-17

ORGANISING IDEAS IN THE BODY OF YOUR LITERATURE REVIEW

Photo by Jaeyoung Geoffrey Kang on Unsplash

As discussed in the previous section, the body of your literature review needs to provide an account of the major themes, arguments and debates found in the literature and to articulate how these relate to each other and to your own research.

Since this usually involves reading through and taking notes on a large amount of sources, you will need a strategy that can help you organise the different ideas you have drawn from the literature.

One such important organisational strategy is the use of matrices.

Using matrices to organise the literature

Matrices are particularly useful for capturing key information from the texts that you have read and therefore providing an overview of this information.

They can help with identifying patterns such as:

- which texts deal with which key identified themes
- a text's main points and how these fit under key identified themes
- a text's main points and how they can be used/incorporated in your writing
- a text's main points and whether they support or refute a particular argument

Below are examples of matrices which capture information in the literature according to each of the above four organisational patterns.

Identifying texts dealing with key identified themes

Topic: Prenatal influences on the child				
Concepts > Texts	Harmful substances and diseases	Maternal age and physical characteristics	Domestic violence	Prenatal healthcare
McDonald (2011)	Yes	Yes		
Smith (2009)	Yes		Yes	
Langley (2011)				Yes
Seddon (2012)			Yes	
Anderson (2010)	Yes			Yes
Etc.				

Identifying a text's main points in relation to key identified themes

Topic: Prenatal influences on the child				
Concepts > Texts	Harmful substances and diseases	Environmental dangers	Prenatal health care	Etc.
McDonald (2011)	Tobacco = retarded foetal growth & increased infant mortality			
Smith (2009)		Impact involves interaction of many factors		
Langley (2011)	Tobacco: Generally agrees with Jones but disputes causal influence – too many variables	Challenges in identifying exposure to toxins		
Seddon (2012)	Alcohol: Effects of foetal alcohol syndrome			

Topic: Prenatal influences on the child				
Concepts > Texts	Harmful substances and diseases	Environmental dangers	Prenatal health care	Etc.
Anderson (2010)		Useful table of toxicants and associated foetal impact	Frequency of prenatal examinations – benefits and problems	
Etc.				

Identifying a text's main points in relation to their incorporation in your writing

Topic: Issues in measurement of teaching quality		
Texts	Main points	Comments/use in my writing
Keogh (2011)	Learning performance = index measuring result of learning and quality of teaching	But what does 'quality' of teaching mean?
Brown (2009)	Identifies several criteria of quality of teaching	Contrast 2nd criterion with Keogh's ideas; differences are contentious
Morgan (2011)	Etc.	Etc.

Identifying a text's main points in relation to supporting or refuting an argument

Topic: Does meditation improve the immune system?		
Texts	Support	Refute
O'Dwyer & Jones (2010)	Single case report Healing was more rapid when subjects meditated	
McKenzie (2011)		Two-group design No difference observed
Peters et al. (2009)	Two-group design Meditation group significantly reduced infection rates	
Etc.		

Reflection

Consider the different matrices presented above. Which of these ways of organising your ideas might be useful for you at the moment? (Keep in mind that different approaches might be more useful for you at different stages of reviewing the literature.)

If you would like to further explore the use of matrices as an organisational tool, take a few minutes to choose one of the above matrix types and begin organising the themes, ideas or arguments from the literature you are reading according to it.

WRITING A LITERATURE REVIEW (STYLE)

In this section, you will learn about the conventions (or 'style') common to all literature reviews. All literature reviews aim to establish the researcher's voice and present a critical stance on the topic being investigated.

Developing a researcher voice

When you write your literature review, you are synthesising and expressing your understanding of existing research, and indicating to the reader how much you accept, question or reject the claims your sources make. The writing therefore needs to show the position you are taking towards the sources you are citing in your literature review.

Writing with authority

Writing with authority is important in all academic writing because you are trying to persuade your reader to accept your

argument/s or position in regards to the topic. In a literature review, you are wanting to show confidence in your stance on the existing research as well as in the argument you are developing regarding the gap you have identified in the literature and the need for your research to fill this gap.

In short, your writing needs to:

- be very clear about the message you want to convey
- convince others that you are 'right' or that your reasoning is sound and that your ideas 'make sense'
- predict how your audience will receive your message, or which parts of your claims may be contested

Expressing a critical stance

A literature review is CRITICAL in stance, not purely descriptive. Your choice of words will:

- reveal to the reader your attitude towards the research you are citing
- indicate whether or not you consider their claims to be substantiated
- position your work in relation to the literature
- develop an 'authoritative' or a 'researcher' voice

Activity

Consider the language that expresses authority in the following passage:

The value of skills and attributes often identified as 'generic' or 'transferable' is that they **are believed to be** readily deployable in new contexts, such as the workplace. **However, how transfer occurs or even whether it occurs is a contentious issue**

within the research literature (Blume, Ford, Baldwin & Huang, 2010; Detterman, 1993; Jackson, 2015; Oates, 1992). It is **particularly elusive** in psychological research which has **attempted to demonstrate** how skills or abilities developed in one context are deployed in another, quite different context. **As Schoenfeld (1999 cited in Hager, 2006) argues** transfer, "seems to vanish when experiments try to pin it down" (p 20). **Despite the difficulty** of demonstrating that transfer occurs, **it does appear** that certain conditions may indeed make transfer more likely. Conditions **which have been suggested** include directing attention to transfer by making it explicit, providing multiple examples and opportunities for practice, ensuring similarity between contexts (Anderson, Reder & Simon, 1996) as well as ensuring that opportunities for transfer are authentic not contrived, and that a supportive environment exists (Tennant, 1999). In addition, **it is also important** to train learners to learn by facilitating an awareness to the cues for transfer (Anderson et al, 1996) thereby facilitating lifelong learning. **Most importantly** a positive 'transfer climate' is necessary with supportive supervisors and adequate peer support (Holton, Bates, Seyler, Carvalho, 1997).

To convey authority, your writing will need to make claims about the literature you are reviewing and the key arguments and ideas related to your area of research. To do this you need to understand the difference between a claim and a regular sentence. A 'claim' in academic writing will provoke, analyse or interpret rather than merely describe or present facts. Claims can (and should be) supported or refuted by logic and/or evidence, data and argument. Claims will often appear in topic sentences, thesis statements, and introductory and concluding sentences. See the example given below:

Activity

An interactive H5P element has been

excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=151#h5p-19

Reporting verbs

One way of signalling your critical stance on a source is through the use of attributive or reporting verbs. Reporting verbs refer to, or report on, a particular piece or body of literature. Their effective use helps in not only signalling the relevance of the sources to your writing but also strengthening your argument and indicating your stance towards a piece or body of literature.

The table below lists some common attributive/reporting verbs and indicates the stance they usually convey. This can be a neutral stance, a distancing or disagreeing stance, or a stance that implies agreement with the ideas or findings from a source.

Verbs that typically express a neutral, distancing or agreement critical stance		
Neutral	Distancing	Agreement
Suggest	Allege	Argue
Indicate	Declare	Establishe
Describe	Speculate	Affirm
Observe	Contend	Confirm
Comment	Claim	Show*
Maintain	Assert	Convince
Report	Postulate	Demonstrate
Show*		Emphasise

*Note that the verb 'show' can indicate either a neutral or agreement stance, depending on the context in which it is used in a sentence.

Using tense in reporting verbs

Indicating your critical stance can be achieved through not only your choice of reporting verb (as suggested above) but also the tense you use on that verb. This is because the tense used in reporting verbs signals more than simply when something happened: It can show if you think the ideas of the reported research are current or still relevant today.

Here are some general patterns of tense use in reporting verbs. However, remember, reporting verb tense is complex

and can vary, so check the literature in your field for guidance. Also remember that the patterns of tense use described here apply only to reporting verbs and not to all verbs that may be found in your literature review.

Examples

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=151#h5p-21

EXPLORE FURTHER

Photo by Austin Park on Unsplash

Congratulations on completing this module. We have explored the nature and functions of a literature review; the process of conducting a literature review, including taking notes using annotated bibliographies; different options for placing your literature review within your thesis; how to structure your literature review, including using matrices to organise ideas within its body; and how to style your literature review through language expressing authority in argument and a critical stance on the literature.

Further assistance

For more assistance with your writing, see an Academic Skills Adviser in the Library.

Literature reviews is a complementary Libguide to this online module.

The module Strategies and Resources for Searching the

Literature explores key resources to use when literature searching and the features of developing an effective search strategy.

Further information and resources on writing your literature review can be found in the Learning Lab. You may also be interested in exploring some more learning activities related to writing fundamentals in the Learning Lab.

Learn more

You may also be interested in viewing the following two webinars recorded from the Library's PhD Up! program (now called Research Plus).

1. Literature reviews: Structure(60 mins)
   This workshop discusses the nature and purposes of literature reviews and will help you develop the necessary strategies for structuring this important section of your research. It includes hands-on activities, excerpts of sample literature reviews, and strategies for ensuring effective literature review structures.
2. Literature reviews: Style (60 mins)
   This workshop will introduce you to key writing style features of literature reviews and will help you develop the necessary strategies for forging your academic identity through your writing style. It includes hands-on activities, excerpts of sample literature reviews, and

strategies for establishing your own critical voice.

Generative AI tools may be useful to automate and streamline various aspects of research and writing at postgraduate level. However, the AI environment is constantly changing. For up-to-date guidance on how AI can be ethically integrated into your research project at RMIT University, consult your course coordinator and the following tools:

- RMIT Learning Lab: Artificial intelligence
- RMIT Library Online Module: Generative AI for students at RMIT

Feedback

Your comments and suggestions on how we can improve this module will be appreciated. Please email us.

What's next?

You have completed this module on Writing the Literature Review. To choose another module to complete go to https://rmit.pressbooks.pub/researchwritingmasterstudents/

HOW TO WRITE ABOUT YOUR RESEARCH

Welcome to this RMIT University Library module which provides you with guidance and strategies to help you in your journey towards undertaking a research project.The module is aimed at Masters by coursework students who are undertaking a research project as a part of their assessment.

It is designed to take you about 30 minutes to complete.

Please begin by taking a moment to read the learning objectives listed below.

Learning objectives

On successful completion of the module, you will be able to:

- formulate a research question
- understand the importance of premises and claims
- position yourself in your research
- identify an effective thesis statement

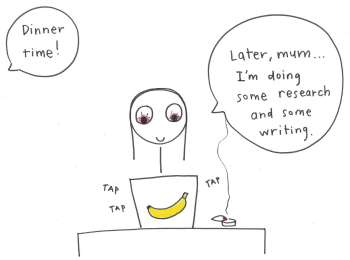
Work through each chapter using the navigation footer (i.e. previous/next) or use the contents page to select a particular section.

Upon completion, feedback and suggestions for improvement of this module can be provided at the end via an email link.

WHAT IS RESEARCH WRITING?

The prominent socio-linguist and educator, Ken Hyland (as cited in Epting, 2018) stated that in academia, "we are what we write" (p. 561). As new researchers preparing to join the research community we learn that writing both communicates particular content and embodies the "routines of [our] social communities" (Hyland as cited in Epting, 2018, p. 561). This means that writing for research is an act of 'becoming' a researcher and a crucial step in take an esteemed place in a research community.

It is important that as an aspiring researcher you too engage in the norms and conventions that define research in your field.



Cartoon by Studio tdes on thedailyenglishshow

FORMULATING RESEARCH QUESTIONS

The role of researchers in any field of study, is to produce new knowledge either in areas where there is a lack of knowledge or by bringing a new interpretation to bear on established understandings in a particular field. In order to do this, a researcher (or a team of researchers) will pose a research question.

Photo by Tingey Injury Law Firm on Unsplash

Beginning with a research question is important because it focuses your work and helps keep a researcher on track. A research question is just that; *a question that exists in relation to a gap in what we know or understand of a particular topic*. Research questions can have different forms, but the function is the same.

Examples

Consider these common research question forms.

- Does vitamin D enhance immune system function? (does X impact on Y?)
- Why do so few women seek a career in the construction industry? What are the main barriers to career advancement? (reason plus explanation)
- Can nanotechnology replace traditional methods of prototyping in industry? (can X influence Y to benefit z)
- How can AI improve interventions during disaster management efforts especially during a bushfire? (can A enhance B, especially C)

Before formulating a research question to guide your work, you should understand how premises and claims shape the

questions we ask. This is because good research questions are informed by sound premises and claims. This is discussed further in the next section.

WHAT IS A PREMISE?

In the previous section we saw that research has to be based in researchable questions, and that these can take many forms. In this chapter, we consider how research questions and the arguments or theses they give rise to are based in premises.

In academic research it is useful to think of a premise as a 'position' or 'belief' that leads to a particular conclusion.

Example:

"Marriage and the nuclear family is the backbone of a civilised society."

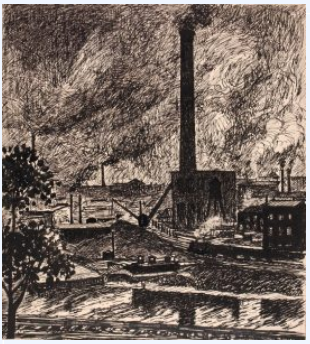
This idea may be popular or even fashionable in society at any given time, and it is a *premise* that many people ascribe to (as evidenced by the number of marriages and families). However, the *belief* that it is the best way or only way to organise society has been challenged time and again (most recently in the movement for equal marriage rights). It is also a premise, which when scrutinised (i.e. through the lense of divorce rates increasing across the latter half of the 20th century) often leads observers to a very different conclusion.

There are many examples of 'premises' such as the one given in the statement above, which when tested or analysed closely, may or may not stand up to their underlying beliefs.

What's so important about a premise?

According to the San Jose State University Writing Center, "the most important part of any premise is that your audience will accept it as true. If your audience rejects even one of your premises, they will likely also reject your conclusion, and your entire argument will fall apart."

For instance, if your audience accepts climate change and the premise that the world is experiencing the effects of man-made climactic change, the following statement will be easier to accept: ***Since the beginning of the industrial revolution, the earth has experienced a warming of 1 degree every 20 years.***



Industrial Scene by H. Lyman Saÿen

However, if your audience does not accept the premise (perhaps they are executives from the fossil fuel sector) you will need to work harder to get your conclusions accepted.

Premises are fundamental to understanding how arguments work, because arguments and the 'claims' they give rise to are always predicated in one or more premises. The next section considers what makes a good claim.

WHAT IS A CLAIM?

A claim is a statement that presents an idea or series of ideas as arguments. Arguments therefore consist of claims, or another way to put it is, to say that claims are the building blocks of a good argument.

In research, claims will be the backbone that form a thesis or a hypothesis (here the term 'hypothesis' refers to the argument that is evidenced within the scope of the work).

Example:

'Traditional classroom teaching is boring'

For example, claiming that traditional classroom teaching is boring is not a good claim because it lacks definition (what does 'traditional classroom teaching' actually mean? and how do we measure

'boring')? It may also be a 'sweeping statement' (meaning it's far too general in scope). However, claiming that "traditional teaching methods, like didactic instruction, do not provide sufficient interaction with students and lead to poor learning outcomes" is a good argumentative claim, because it can be investigated and measured.

Function of claims

The function of claims in academic writing is to provoke, analyse, or interpret rather than merely describe or present facts (Heady, 2013). They can do this by affirming, acknowledging, confirming, or refuting the proposition being made. In this way, claims do the job of building an overall argument or thesis in a piece of work (i.e. each claim progresses the key argument). It is for this reason that claims will appear in topic sentences, thesis statements, introductory and concluding sentences/paragraphs.

Characteristics of a good claim

In order to make effective claims it is important to understand the difference between **statements** and **sentences.** While a statement is also a sentence (in that it is a grammatical unit with subject, verb, object clause), not all sentences are statements (in other words, not all sentences consist of a stance or a position).

Claims are statements

Photo by Karsten Winegeart on Unsplash

Which of the following sentences is a claim, rather than a simple sentence?

1. Bulldogs are a common breed of dog. They originated in the British isles.

2. Fat is one of three macronutrients, the others being carbohydrate and protein.

3. Fat has been misrepresented as a leading cause of heart disease. New research challenges this finding.

It would be correct to say that item 3 above is the

only claim here. This is because it takes a stance about the subject (which is regarding the relationship of dietary fat to heart disease). Items 1 and 2 are statements of 'fact' (unless you think where bulldogs originated is contestable!)

POSITIONING YOURSELF AS A RESEARCHER

An important skill that all researchers develop is the ability to present research as an ongoing discussion amongst a group of scholars. When researching you will need to read widely and it may seem to you that your peers are often discussing the same thing. Sometimes the authors of these sources will explicitly know each others' work and reference one another in their own texts. This is common in research writing, where explicit conversations between different scholars are expected and valued.

Note the way these researchers position themselves in relation to the work of others in their field

Photo by Ethan on Unsplash

Critical literacy is **not synonymous** with critical thinking, **although** critical thinking is clearly part of critical literacy **[a]**. Critical thinking can be described as independent thinking that uses information as the starting point (Klooster, 2001) **[b]**. It often begins with questions, builds on reasoned arguments and can involve social thinking. **While this view** of critical thinking is participatory and metacognitive, **it remains** personal inquiry and **does not necessarily** require the reader to question the purposes of the text **[c]**. To be critically literate, **one must** move beyond individual response and personal discovery **to interrogate** the curriculum and the everyday world (Cardiero-Kaplan, 2002) **[d]**. Harste (2001) **asserts that readers must** question, redesign, and create alternate worlds **[e]**. **They should disrupt** the commonplace, interrogate multiple viewpoints, focus on sociopolitical issues, and take action to

promote social justice (Lewison, Seely Flint, Van Sluys, 2002) **[f]**.

In the passage above about 'critical literacy' the writers signal their approach to the topic by contrasting two very similar concepts. Statement [a] tells us what the concept isn't (note the use of the phrase 'not synonymous with') and go on to provide a nuanced definition with the use of 'although'. Statement [c] signals the limitations of our understanding of 'critical thinking' (note the use of 'it remains' and 'does not necessarily') and prepares the reader for the writers' position presented in the statements [d], [e], and [f]. (Also note, the use of other writers to give weight to these writers' position).

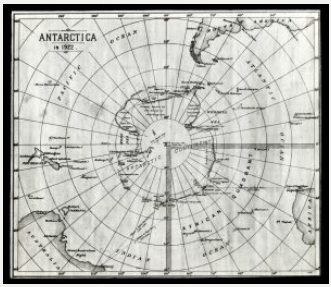
Identifying the 'gap'

Research involves highlighting the questions that remain unanswered in your area of research. This is often referred to as 'identifying the gap' in the literature and tells the reader what areas need further

investigation in your research area. Identifying 'the gap' in your research is fundamental to finding **your position** in an ongoing conversation by deciding how much you accept, question, or reject the claims that your sources make.

When you start to write about that research, you need to figure out how to signal that position, as you quote, summarize, or paraphrase from your sources.

Read the text below and note the way the gap helps the researcher position themselves in the research field.



Antarctica 1922, State Library Victoria Digital Image Pool

This research project sets out to discover if an experience of Antarctica, specifically mine, could be interpreted through the creation of souvenirs and jewellery. Although Antarctica is considered to be a very remote place it has a long and significant history of science and exploration and most recently has become the destination for tourism **[a]**. However, unlike most tourist destinations Antarctica has not been memorialised through jewellery and souvenirs in the way of historic tourist locations in the world **[b].** Throughout Antarctica's history explorers have painted images and more recently documented it through photography **[c]**. Whalers and fishermen have made their own representations of this isolated and uninhabited continent, however, none of these matches the proliferation of souvenirs that have been produced to provide memories and reminders of Europe for example during the times of the Grand Tour or the commonly available souvenirs of popular resorts, sites and locations today **[d]**.

Excerpt from Kirsten Haydon's dissertation Antarctic landscapes in the souvenir and jewellery (used with permission)

WHAT IS A THESIS STATEMENT?

A thesis statement is an essential component of all academic and research writing.

A thesis statement:

Photo by Will van Wingerden on Unsplash

- occurs early in a piece of written work (introduction)
- tells the reader what the purpose and scope of the work will be
- provides more than a mere description of the topic
- puts a 'wager' (i.e. a bet) on the topic by telling us what the significance of the research will be
- defines what will be investigated and what they think will be found (note, it's OK if the hypothesis is disproven once the data is in)

Descriptive thesis statements

Beware thesis statements that are too descriptive because they "do not investigate anything, critique anything, or analyze anything [...] they also do not invite support and argument from outside of the central text" (UW Expository Writing Program, 2007, p. 2). The problem with thesis statements that

are merely descriptive is that they lack a stance or an argument. They are therefore difficult to support with evidence and to build an argument for.

Examples

The examples below would **not** make good thesis statements because they are too descriptive.

a) Shakespeare was a famous playwright during the Elizabethan era. He wrote numerous plays and poems.

b) Almost one in two marriages in Australia end in divorce. That means the divorce rate is almost 50%.

c) Covid-19 was a virus that caused an epidemic in the early 2020's.

Check your understanding

Where is the thesis statement in the passage below?

My intention was to investigate and portray Antarctica through my own and others' personal experiences, through historical examples of jewellery and souvenirs and through experimentation in the studio-based manufacture of new jewellery and souvenirs**[e]**. The objects produced through this research would reference the valued jewellery and souvenirs now displayed in museums as historical artefacts which were once personal mementos**[f]**. I was particularly interested in the potential of these objects to represent personal narratives and experiences of the past **[g]**. In this research project I have explored some of the ways in which I can make objects, specifically jewellery and souvenirs that draw on this rich heritage to present Antarctica in an innovative way **[h]**.

Excerpt from Kirsten Haydon's dissertation Antarctic landscapes in the souvenir and jewellery (used with permission)

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://rmit.pressbooks.pub/researchwritingmasterstudents/?p=176#h5p-25

WRITING WITH AUTHORITY - BOOSTING AND HEDGING

Two very important rhetorical devices that research writers use to establish authority (and to sound like an expert) are called 'boosting' and 'hedging'.

Boosting

Photo by Jason Rosewell at Unsplash

According to Pat Thomson, boosters are a linguistic means of presenting the newsworthiness of research. They are statements that are intended to persuade. Boosters say – you can trust this, this is good stuff, this matters!!

Boosters are a kind of rhetorical assertiveness. They signal 'Look at what I've done and how important it is'. For this very reason, it is sometimes difficult for students new to research to use boosters, perhaps because they feel anything like an expert.

Hedging

It is important that as research writers, we make claims that are reasonable and measured (that is, well thought out). One of the ways in which researchers signal 'caution' is through the use of language called hedging. Hedging is considered the opposite of boosting.

As Pat Thomson points out, in academic texts, hedges guard against criticism. They show that the writer is not claiming to have the final word and that there is still room for discussion and

new work. Hedges are a way to demonstrate rigour and precision – the researcher shows that they know the kind of claim that follows from the actual research that has been done. Using hedges also creates trust between the reader and the text; readers know that the writer/researcher has carefully considered their work, and is not simply advocating, preaching or ranting.

In practice, boosting and hedging occur together – often in the same sentence!

In practice, research writers become skilful at using both techniques to establish authority and credibility. See how these strategies are used together to create a sense of authority in the text below:

While the debate about generic skills and attributes is ongoing and while **the case is yet to be made [a]** for the transferability of skills, **it seems increasingly likely [b]** that only participation in work-based learning can develop the competencies that are required for effective practice. **This study has shown [c]** that students understand the value of employability skills and enjoy participating in work-based learning experiences such as that afforded by professional placements. **However, this study has also shown [d]** that i**n order for [e]** those experiences to optimise skill development, placements **need to be** well-supported and supportive **in order to [f]** foster the confidence which seems to play a key role in skill development.

In the passage given above, [b] is a boosting statement that shows the writer's position in the debate relating to developing generic skills at university (i.e. generic skills for employment are developed in work experience). It is followed by [c] which makes a strong statement for what the study shows. This is followed by some hedging [d] that provides further conditions

for the statement made in [c] to be true and applicable to other similar cases (i.e. that work experience needs to be well-supported in order to effectively help students develop work skills). This is an example of how boosting and hedging work together to create a 'research voice'.

EXPLORE FURTHER

Photo by Austin Park on Unsplash

Congratulations on completing this module. We looked at the way researchers use premises and claims to build arguments in academic writing. We also covered the importance of positioning your own work by identifying the gap in the field and we looked at the significance of thesis statements and why they are essential in research.

Remember, research is an opportunity to add something new to your field of interest. That's exciting!

Further assistance

For more assistance with your writing, see an Academic Skills Adviser in the Library.

The module Developing an Effective Research Proposal explores formulating research questions in more depth.

Further information and resources on developing academic writing can be found in the Learning Lab. You may also be interested in exploring some more learning activities related to writing in the Learning Lab.

Learn more

For more on how to write an argument in research writing, consult the following resources:

- Thesis Whisperer How to Create Authoritative Voice in your Writing.
- Virginia Wesleyan University How to Create a Strong Thesis Statement
- Washington University Claims, Claims, Claims

Generative AI tools may be useful to automate and streamline various aspects of research and writing at postgraduate level. However, the AI environment is constantly changing. For up-to-date guidance on how AI can be ethically integrated into your research project at RMIT University, consult your course coordinator and the following tools:

- RMIT Learning Lab: Artificial intelligence tools

- RMIT Library Online Module: Generative AI for students at RMIT

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Feedback

Your comments and suggestions on how we can improve this module will be appreciated. Please email us.

What's next?

You have completed this module on How to write about your Research. To choose another module to complete go to https://rmit.pressbooks.pub/researchwritingmasterstudents/