

# AIRS

## Advanced Information Research Skills

### AIRS Module 7

**Record**



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# Module 7: Record

## RECORDING YOUR RESEARCH

This module outlines the facilities and software available at QUT to assist you with organising and managing your source material, data and notes. By the end of this module you would have considered:

- the assistance that is available to you at QUT
- an organisational structure to manage the literature you are collecting
- file and information management features of bibliographic software
- coding the literature according to your research question concepts
- writing useful notes.

### 7.1 Seeking help from the Library and the HPC group



[QUT Library](#) and the HPC group (High Performance Computing and Research Support) are dedicated to maintaining reliable, up-to-date and convenient resources and services for researchers (see [the Library website Researchers page](#) and [HPC services](#)). You will be aware of services available to meet your ongoing research needs such as borrowing and document delivery. In this module you will learn more

about the physical spaces, one-on-one support, workshops, software and online support offered by the Library and High Performance Computing (HPC) for research students.

### Research facilities – physical spaces and other resources



[The Researchers' Centre](#) is a quiet space in both Gardens Point and Kelvin Grove Libraries specifically for Honours, Masters and PhD students. The two Researchers' Centres provide networked workstations and printing facilities.



Supercomputing facilities are provided for research students who have large computational or data processing needs. Access to supercomputing facilities can be arranged by emailing the HPC group ([hpc-support@qut.edu.au](mailto:hpc-support@qut.edu.au)) to discuss your requirements.

The [Visualisation Lab](#) provides advanced capability workstations and other specialised facilities (e.g. 3D digitisation, immersive visualisation facilities and specialised software) to assist students faced with issues manipulating data on standard PCs.

[Study Rooms](#) in the Library can be booked up to two hours per student per day and contain a variety of equipment including networked computer stations, HD TVs, group work stations, DVD players, gaming consoles, collaborative software and adaptive technology.

[QUT Printing Services](#) offers a multitude of services including printing, scanning, photocopying, poster printing, binding and laminating.

## One-on-one support

Staff at [service points](#), located on the entry level of each library branch, will assist you with selecting and using quality information resources, borrowing assistance and general questions relating to library and university services. This service is available during the Library's opening hours.

[Liaison Librarians](#) offer specialised assistance with selecting, evaluating and retrieving information within a particular field of research. They also will assist you with using specialised databases, accessing document delivery, managing your data, research impact, open access publishing, EndNote, QUT ePrints and other researcher specific questions. Contact your Liaison Librarian to arrange a consultation.

[High Performance Computing and Research Support](#) (HPC) provides the QUT research community (staff and research students) with consultations and support regarding research methodologies, research software, data visualisation and analysis, collaborative technologies and supercomputing facilities for research projects. Arrange a consultation by emailing: [hpc-support@qut.edu.au](mailto:hpc-support@qut.edu.au)

## Skills and capabilities

### Study and research skills

QUT Library offers [workshops](#) to assist you to develop and apply core academic skills such as time management, writing, editing and proofreading, referencing, taking notes and organising information for research. Enrolled IFN001 AIRS students can attend [IFN001 AIRS workshops](#).

There are a range of [Research Skills Seminars and Workshops](#) available to research students.

These include opportunities for in-depth instruction on many topics and research techniques, such as EndNote, data analysis and statistics, managing research data, IT skills, and other research support topics. Find out how to take geographically referenced information and view it in the form of maps, globes, reports and charts to enhance analysis with a class in GIS (Geographic Information Systems).

The [Research Students Centre](#) provides free training and resources for postgraduate research students, including skills development, workshops, online training and mentoring. Training is aligned with the milestones of your research degree and six key graduate capabilities. The [Research Students Training Resources wiki](#) provides access to more online training and research resources.

### Specialist research software

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The [HPC Software Catalogue](#) lists a large range of research software that is available to researchers. It includes popular research applications such as MATLAB, C/C++ and FORTRAN compilers, ARC GIS, Fluent, ANSYS, ABAQUS, NASTRAN, Gaussian, Maya, VTK, NAG libraries, Final Cut Pro and many others. The HPC group can also support additional research applications—please contact the [HPC group](#) to discuss your requirements.

#### ENDNOTE®

[EndNote](#) is bibliographic management software. You can use this program to create a database of your literature references, insert citations into documents and automatically format your bibliography. It is suitable for referencing in all styles. The Library offers [workshops](#) throughout the year.



Use SPSS for statistical analysis. Quantitative data analysis can be greatly enhanced by powerful software such as SPSS, NVivo and Leximancer. Consultations are available to assist researchers with data analysis and HPC runs [regular workshops on SPSS](#). [Contact HPC](#) to arrange a consultation.



NVivo is software that supports qualitative and mixed methods research. It can help you organise and classify qualitative data quickly. You can perform analysis and discover subtle connections. It is available via the [IT Helpdesk](#). HPC conduct [workshops](#) on NVivo.



Leximancer can assist with analysing textual data. Concepts are represented visually. It is available via the [IT Helpdesk](#). HPC conduct [workshops](#) on Leximancer.



[Key Survey](#) is an online survey creation tool available for QUT staff and students, that allow you to easily create and distribute surveys, store response data, create and analyse robust and customisable reports, and export survey data to many formats (including PDF, XLS, CSV and

SPSS). Consult this [checklist](#) and other [support material](#) to help you get started.

## Data mining / machine learning

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- Salford Predictive Miner (including CART, MARS, Random Forests and TreeNet)
- GeneXproTools (Gene Expression Programming).

Salford Predictive Miner (SPM) and GeneXproTools are two data mining software packages that are useful for classification or regression analyses. The algorithms (including CART, MARS, GEP, RF and TreeNet) are fast, easy to use and optimise, and highly accurate. Consultations are available to assist researchers with their use and HPC conduct some [workshops](#) on these algorithms (in first semester of each year). [Contact HPC](#) to arrange a consultation.

## Online research support

[The Library Website](#) provides access to resources used in the Library's Research Support Training Seminar Series.



[QUT cite|write](#) is an introductory guide to citing, referencing and academic writing and is suitable for understanding and applying basic referencing and citing rules. However, as a researcher with more advanced requirements for publishing and attribution, you will need to refer to specific style guides for your discipline, such as the [APA Style Guide](#) (for psychology or social sciences), the [ACS Style Manual](#) (for chemistry and related sciences), the [IEEE Editorial Style Manual](#) (for electrical engineering and computer sciences), or the [MLA Handbook](#) (for languages and linguistics).



[Learning and assessment \(on QUT Students\)](#) provides information, resources and activities that will assist you to develop effective research and study skills and behaviours.



[Study Smart](#) is a learning tool to establish undergraduate level information search, evaluation and management.

### Activity – engage with QUT Library or HPC services

Book a study room, enrol in a class, access an online resource or make a one-on-one appointment to further your research skills.

## 7.2 Bibliographic management

A research thesis demands that you read and record a great deal of information in print and electronic form. As you progress through your research, you will gather hundreds or even thousands of references that you will need to cite and acknowledge in your writing. You must have a system to record, store and easily retrieve these references, and it is important that you establish this system early in your research.

Bibliographic management tools are designed to assist researchers to track and recall references to relevant literature. Most bibliographic management tools also allow you to automate in-text citations and automatically populate a bibliography at the end of your document. Correctly using a bibliographic management tool will save you a significant amount of time with writing your thesis, and formatting papers for publication. This section introduces you to common bibliographic management tools.

### Bibliographic management software

Certain bibliographic management tools are more appropriate for specific research needs. There are a range of web-based open source tools; some will also provide mobile interfaces. Most of the common tools will allow you to save, share and access your reference lists on multiple platforms and devices. QUT Library has a [guide to bibliographic management software](#) that discusses many other programs including Zotero and Mendeley. Wikipedia also has a [comparison entry](#) on the major different software available, including Papers, RefWorks and CiteULike. Two of the most commonly used tools at QUT are [EndNote](#) and [BibTeX](#).

Comparisons of Bibliographic Software					
	Endnote [& EndNote Web as indicated]	Mendeley	BibTeX	Zotero	Papers
Free of charge	✗ But QUT has a site license. So there is no cost to individual staff and students whilst at QUT.	✓	✓	✓	✗ But offering a free 30 day trial
Software based on desktop or Web	EndNote: On desktop Endnote Web:	Desktop & web component	On desktop	Desktop (& can be synchronised on Zotero server)	On desktop
Referencing Styles	Over 4500 styles	Over 1000 styles	Most journals or publishers that support LaTeX have a customized BibTeX bibliographic style files. 44 are exemplified in this FAQ.	Over 1000 styles	Over 1600 styles
Direct Export from Database	Over 50 databases allow direct export of records into Endnote including online searching of the QUT Library Catalogue	Direct export from about 12 database vendors and web sites.	Google's system for searching scholarly literature provides BibTeX format citations if you enable the option in 'Scholar Preferences'.	100s of web resources allow direct export of records.	Direct export from many popular databases including IEEE Xplore, PubMed, Scopus, Web of Science, Google Scholar and more...
Word Processing integration	MS Word	MS Word, Open Office, Google docs	LaTeX, plus there are additional programmes to enable compatibility with MS Word	MS Word, Open Office and Google Docs	MS Word, Pages, Mellel, Open Office and Google Docs
Mobile & iPad	✓	✓	✗	✗	✓

## EndNote

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**ENDNOTE**<sup>®</sup> QUT has an institutional licence for [EndNote](#). This licence permits current staff and students to download the software to personal computers and devices and to use the software at university, the workplace and at home. EndNote works with MS Word.

Endnote is fully supported at QUT. QUT Library conducts workshops throughout the year, and your Liaison Librarians can provide individual assistance with setting up your Endnote library. The QUT [IT Helpdesk](#) provides assistance with installation and technical issues, and Information Technology Services (ITS) offer advanced [MS Word courses for research students who are writing a thesis](#).

To use Endnote:

- [Download EndNote software](#)
- [Enrol in EndNote workshops at QUT Library](#)
- Look at the [EndNote Training YouTube channel](#)
- Seek complete discipline or database specific help via your [Liaison Librarian](#)

### Activity – use a bibliographic management tool to start a library

Decide what bibliographic management tool to use. If you already know what you want to use or are already using one that you are happy with, go to step 5. Otherwise, follow the process below:

1. Find out what your supervisor or research student peers use to manage their references.
2. Ask them why they use that particular tool and see if it matches your own needs.
3. Refer to QUT Library's [guide to referencing software](#).
4. Install the bibliographic management tool you have chosen.
5. Import references into your bibliographic management tool to create a reference database.
6. Choose the bibliographic referencing style appropriate to your thesis.
7. Insert an in-text citation with your bibliographic management tool.



Watch the video: [EndNote X7 Overview](#)

## Bibtex

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[BibTeX](#) is used by researchers in science and engineering as it is tailored to capture references involving complex mathematical formula. While BibTeX synchronises with the LaTeX word processing software, there are plug-ins available for Microsoft Word.



## 7.3 Coding the literature

Once you have a bibliographic management system in place, you can begin your reading and coding the literature for relevance to your research question. This section will help you create a code to skim, scan and select literature efficiently and effectively.

### Background reading

Foss, S.K. & Waters, W. (2007). *Destination dissertation: a traveler's guide to a done dissertation*, pp. 75–112. Maryland, MD: Rowman & Littlefield Publishers, Inc.

Wallace, M. & Wray, A. (2011). *Critical reading and writing for postgraduates*. London: Sage.

### How to start

Students often think that a research topic is established *after* reading the literature. However, reading the literature is best done *after* defining a research question. A well written research question helps you to quickly read and scan the literature for new ideas or 'research gaps' while remaining focussed on your topic. You may alter and narrow the scope of your research question as you progress through the research process while remaining confident that you are answering your question directly.

### Categorising your literature

The categories you need to code your literature come directly from the terms of your research question. The key terms of your research question become the major areas of your literature review. The categories of literature need to form a logical sequence of ideas that lead to a coherent, well-argued position.

*Example:* The bodies of literature relevant to answering the research question: 'What factors characterise a successful mentoring relationship for minority students?' would include:

- factors of successful mentoring
- factors of successful academic mentoring of minority students
- factors of successful academic mentoring of university students
- factors that affect the completion of graduate degrees (you would include this body of literature because you are defining *successful* in the question as completion of degree)

Then you need to establish a system for coding reference material for each category. Coding allows you to categorise literature according to themes and sub-themes, such as relevant topics, points of view, research inter-relationships, or new or challenging ideas and theories. Using the coding system helps you avoid writing notes on areas of interest that aren't directly relevant to your research question.

To begin, establish a coding system that is meaningful to you as you plan the first version of your literature review outline (headings, paragraphs etc.). Consider using:

- a word or short phrase
- a numerical code
- an icon
- an acronym
- an abbreviation

You can also use software such as [Leximancer](#) to help you with coding your literature. Leximancer examines a body of text and produces a ranked list of terms based on frequency and related occurrence. These terms are then visually represented to show connections between concepts.



Watch the video: [Introduction to Leximancer](#)

### Activity – coding your literature

1. Identify the categories of literature you need to cover in your literature review from your research question. Add these to your resource log.
2. Determine a code that delineates each of these categories.

## 7.4 Keeping useful notes

Notes allow a researcher to quickly remember, access, and utilise ideas with academic integrity. Notes consist of four components:

1. A summary, direct quote or paraphrase of the author's words/ideas
2. Your own comments, ideas, analysis reflections, reactions to these words
3. Bibliographic reference
4. A code that connects the note to a concept from your research question.

In this section you will learn about methods to read and keep useful notes. You can effectively use one or more of these techniques depending on your preferences. Read about different note-taking methods used by other research students: [What is the best way to take notes for your PhD?](#)

### Reading

Good note-taking relies on efficient reading techniques, particularly skimming, scanning and in-depth reading.

#### Skimming

Skimming is used to quickly get the main ideas and logic of a text. To skim, look quickly over the page noting the abstract, headings, and words in italics, diagrams, introduction, discussion and

summaries. Summaries are often indicated with words such as:

- this paper/research will
- in summary
- to summarise
- therefore
- in conclusion.

## Scanning

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Scanning is used for finding particular words or phrases in a text. Use scanning to quickly locate specific information or concepts relevant to your research question before reading in more depth. Move your eyes quickly over the page and look at the first sentence of each paragraph to:

- identify new concepts or terminology so you can check their meaning
- find information on a specific topic
- find key words that indicate the scope of the text
- look at the first sentence of each paragraph to get a feel for the content.

The main thesis of an article often uses words such as:

- core
- central
- major
- significant
- underpinning
- most important
- crucial

As you scan the document, highlight and code sections that are directly relevant to your research question.

The fast reading techniques of skimming and scanning will save you a lot of time and frustration as you explore and categorise literature for your research. Practising these techniques will make you a more efficient and effective researcher. For more fast reading resources see books in the QUT Library catalogue on [postgraduate reading techniques](#).

## In-depth reading

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In-depth reading is when you read every word in a section of reading such as a journal article or book chapter. In-depth reading allows you to analyse information more carefully and write detailed and comprehensive notes. Limit in-depth reading to critically important texts that will substantially impact your argument.

## Writing notes

Writing notes can be done directly onto a book or document, or using specific software on your computer or mobile device. You may need to use a variety of methods depending on the resources you are annotating. Be diligent and consistent with your note-taking and note management to ensure you can track and use prior research to meet your current writing needs.

Establish a system of organising your written annotations.

### LATCH

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Dr Inger Mewburn has an excellent blog post on how to '[tame the literature dragon](#)'. She recommends coding each piece of information via Location, Alphabet, Time, Category and Hierarchy (LATCH). The LATCH system is described in more detail in the book [Information Anxiety 2](#) by Richard S. Wurman (the creator of TED Talks).

- Location - How is the author situated in the debate being considered?
- Alphabet - Keep your information in alphabetical order.
- Time - Order your notes in the order that the referenced articles were published.
- Category - Sort notes by themes that can be used as sections within a chapter of your thesis.
- Hierarchy - Order your categories to establish the logic of your literature review. Each category will play a different critical role in how you present your ideas.

A literature grid or source grid can help you keep track of your key sources and help to identify strengths and gaps of each paper that you read. It's a good place to keep a record of direct quotes and the associated references.



[Example Literature Grid \(Word DOC, 13.5KB\)](#)

### Directly onto hardcopy

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As you read your own copy of a book or printed article, code the text with the system you have chosen and write notes in the margins or on the back of the page. Be sure to code each comment and then copy those comments into a blank document (with full reference including page number) for future use.

### Software and mobile apps

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Using an electronic system for making and recording notes allows you to manage your notes more efficiently through the use of tags, keywords or metadata. Establish a consistent format to allow you to easily distinguish your own thoughts and ideas from quotes or ideas of others.

Many bibliographic management tools (e.g. [Endnote](#), [Mendeley](#), [Zotero](#)) also include ways to keep notes on each reference. Using these tools in combination with specific note-taking tools can be a useful strategy for managing your notes from reading the literature and notes from attending research seminars or meetings with your supervisor or research team.



[Evernote](#) is designed for note-taking and archiving text, websites, pictures, voice memos and handwritten notes. You can photograph a concept map from a whiteboard or notepad and then store it electronically with keywords, tags etc.



[Scrivener](#) works like an electronic 'index card' system. It allows you to move your notes and ideas around, trying different logical structures and connections.



[Papers](#) (Mac, PC and iOS) stores all your PDF documents and allows you to write notes on each page and bookmark those notes. Your PDFs become a database of references that you can keep with you and access easily any time, synchronised across your computers and mobile devices.



Microsoft OneNote acts as a notebook divided into various sections, and within each section you can create any number of pages. Use OneNote with various software packages, access, edit and manage your notebooks anywhere anytime using multiple devices.

For more ideas, ask your supervisor and peers how they manage their notes.

### Activity – making useful notes

1. Choose one of the note-making strategies listed above.
2. Skim and scan quickly through ten references, coding and writing brief notes for later use.
3. Keep your own ideas clearly separated from the authors'.

When you are ready to start writing, it can be useful to print your notes and cut them up into sections. Then, get a big piece of cardboard or paper to arrange these sections graphically into sub-sections and to write your own ideas around them in the empty space. Physically moving sections spatially can generate new ideas about how ideas fit together or relate to one another. Use the critical thinking template from [QUT cite|write](#) to conceptualise your argument and the logical structure of how your notes provide evidence for answering your research question.

### Summary

Skim your reading to quickly understand the main ideas and logic of a text, and scan your literature to locate specific information or concepts relevant to your research question before reading in more

depth. Code your literature using keywords, symbols or numbers that assist you to group ideas as you read and take notes. Establish a system of recording and managing your notes that suits you, and apply that system diligently and consistently throughout your research.