AIRS 3
Advanced Information Research Skills

Record    Manage    Collaborate
By the end of this workshop you will be able to:

1. Develop a systematic approach to coding the literature, note taking and managing notes.
2. Identify advantages and disadvantages of bibliographic management software.
3. Apply data management strategies to organise information proficiently, ethically and legally.
4. Commence your data management plan.
5. Identify a conference to attend with networking benefits.
Assessment:

**Resource Log** (1,500-2,000 words)

Tasks:

1. Your research question
2. Your search strategy
3. Keeping useful notes
4. Data management
5. Publishing
6. Sustain
7. Research Impact
# Research support

**Processing and analysing your data**

**High Performance Computing Team**

**Search training events**

**HDR Skills Audit**

**Graduate Research Skills Program Calendar**

**People to help and advise**

**Personalise your learning journey**

**Software**

Go to ITassist to install available software

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Record

Bibliographic management

1. Install and use bibliographic management software
2. Code literature according to research question concepts and write useful notes
3. Organise your literature efficiently for later use
What is Endnote?

- Software that allows you to find, import, export, store, organise & use references to information sources

- A program that creates files of references called EndNote Libraries

- Your research database of academic and professional literature

- Storage for full text PDF, figures, pictures, tables, etc.
Discussion

What do you use?
Endnote Support

- Hands on workshops
- Installation assistance from the IT Helpdesk
- Extended help from Liaison Librarians
- Online tutorials from Lynda.com
Software comparisons

Reference management tools
A number of reference management tools are in use by researchers at QUT. The main ones are EndNote, BibTeX, Mendeley and Paperpile.

EndNote
EndNote is free for QUT students and staff, and provides comprehensive functionality, especially when writing journal articles and theses. QUT Library provides workshops for researchers to help develop all the basic skills necessary to collect and organise references and PDFs.

BibTeX
BibTeX is a program and a file format used to describe and process lists of references, which primarily used for LaTeX documents.

Mendeley
Mendeley is a free reference manager and academic social network to help organise your research.
Coding the literature: skim, scan, select

Find relevant research

Read effectively

Write effective notes

Leo Reynolds, 'pile of books'

http://www.flickr.com/photos/lwr/407713692/
Coding the literature

Constrain your research with a research question.

Scan, skim and read literature and code it for relevance to your thesis.

Alter and narrow the scope of your research question as you progress.

The categories you use to code your literature come from the terms of your research question.
Sample bodies of literature

Sample research question:

“What factors characterize a successful mentoring relationship for minority students?”

1. Characteristics of successful mentoring
2. Characteristics of successful academic mentoring of minority students
3. Characteristics of successful academic mentoring of university students
4. Factors that affect the completion of graduate degrees
Create your codes

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

Add tags to bibliographic software

Use codes to:

Write notes directly onto a .PDF or book

Structure writing sections

Resource Log Question 3
Activity (5 mins)

Create codes based on your research question

Discuss your coding system with your neighbour and start to document your codes in your resource log.
Devise a note-taking system

Duffield, Lee R. (2011) Successes and stresses: A case study on relations between international higher degree students in Australia and their universities. In International Unity in Diversity Conference, Rydges Southbank Townsville Hotel, Townsville, North Queensland

Research support (code)

“in Australia, where general academic work is done only in English, supervising ISS who are NESB speakers can take more time, even for students with advanced English skills” (Duffield, 2011, p.8).

- This article argues that students with a non English speaking background can take more time to complete their doctoral studies
  - Yet, students can finish on time if adequate research support is offered by a University and the student is proactive about asking for help (see Peacock & Firth, 2008).
Note-taking software

**Evernote** for note-taking and archiving text, websites, pictures, voice memos and handwritten notes. You can photograph a concept map and store it with keywords, tags etc.

**Papers** stores .pdf documents, allows you to write notes on each page and bookmark notes. Your .pdfs become a database of references.

**Scrivener** works like an electronic ‘index card’ system. You can move notes and ideas around, trying different logical structures and connections.

**OneNote** available with Microsoft Office
Information management workflow

Differs according to discipline & nature of research…

- Use bibliographic software to build your library of references
- Organise filing with naming system
- Use the grouping function to organise references
- Classify records/references with Labels & Research Notes
- From the concept map, transfer headings into Word
- Paper outline as list or concept map
- Take notes - using program such as Evernote

Workshops: [https://www.library.qut.edu.au/events/categories/research/](https://www.library.qut.edu.au/events/categories/research/)
Break
Manage

Managing research data

Defining data

QUT Data Management Planning Tool (DMP)

Storage documentation & metadata
### Resource Log Questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Describe your data. Include the format and scope of your research data</td>
<td>3 marks</td>
</tr>
<tr>
<td>b) Outline your plans to securely store and back-up your data</td>
<td>3 marks</td>
</tr>
<tr>
<td>c) Identify and discuss three types of contextual information (metadata) that help to make data F.A.I.R.</td>
<td>3 marks</td>
</tr>
<tr>
<td>d) Discuss the administrative, commercial, legal and/or ethical considerations related to storing and sharing research data</td>
<td>3 marks</td>
</tr>
<tr>
<td>e) Identify how long your data is legally required to be retained after completion of your research project/thesis. Refer to Research Students – Managing Research Data webpages and provide your reasoning as to how this applies to your research data.</td>
<td>3 marks</td>
</tr>
</tbody>
</table>
Research data lifecycle

Adapted from UK Data Service Research Data Lifecycle https://www.ukdataservice.ac.uk/manage-data/lifecycle
“Research which is supported by public funding, and higher degree research student projects, must use the QUT online research data management planning tool.” QUT MOPP 2.8.7

Link - http://qut.to/hgkw1

The Research Integrity Online module explains your responsibilities.
QUT support for managing research data

https://qutvirtual4.qut.edu.au/group/research-students/doing-your-research/managing-research-data

Managing research data

Research data is a valued asset and output for QUT, its researchers and the broader community. Effective data management enables:

- the verification of findings
- reproducibility and transparency
- protection against loss
- protection of sensitive or confidential information
- data reuse (for yourself and others)
- compliance with codes of conduct
- statutory retention, funding body and QUT policy compliance.

The following pages contain information to help you manage your research data throughout its life cycle.

Tools & resources

- Data Management Planning Tool (DMP Tool)
- Research Data Storage Service (ROSS)
- QUT Research Data Finder (RDF)
- Hacking Hour @QUT

Contacts

Office of Research Ethics and Integrity
Phone: 3138 4692
Email: onreanquiries@qut.edu.au
Research ethics, data privacy and confidentiality advice.

High Performance Computing
Email: hpc-support@qut.edu.au
Storage, processing, analysing and archiving facilities and resources.

Liaison Librarians
Data management planning, finding datasets, library and information data support.
<table>
<thead>
<tr>
<th>Data Class</th>
<th>Process</th>
<th>Content examples</th>
<th>Data examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Generated by lab equipment</td>
<td>Gene sequences; chromatograms</td>
<td>Laboratory notes; specimens; samples; methodology; slides; artefacts</td>
</tr>
<tr>
<td>Computational/ Simulation</td>
<td>Generated from computational models - the actual model (and its metadata) may be more important than the output data</td>
<td>Climate models; economics prediction models</td>
<td>Methodology; data files; models; algorithms; scripts; workflows; standard operating procedures and protocols; simulation software</td>
</tr>
<tr>
<td>Observational</td>
<td>Recordings of specific phenomena at a specific time or location</td>
<td>Seismic data, medical imaging, opinion polls, climate data, interview or survey results</td>
<td>Transcripts; audio or video recordings; field notebooks; diaries; photographs; films; slides; questionaries; test responses; codebooks; text documents</td>
</tr>
<tr>
<td>Derived</td>
<td>Produced via processing or combining of other data</td>
<td>Data mining; compiled databases; GIS</td>
<td>Database contents; spreadsheet data; data files</td>
</tr>
<tr>
<td>Reference</td>
<td>Extracted from reference datasets</td>
<td>Genbank, HILDA, ABS CURF datasets</td>
<td>Spreadsheets; data files; contents of an application (schemas, input, output; log files for analysis software)</td>
</tr>
</tbody>
</table>
Activity: Identifying the Data (5 mins)

- A Focus Group
  - Participants provide some demographic and personal information via an online survey tool
  - They sign a release and consent form
  - They engage in semi-structured conversation, responding to a pre-defined set of discussion topics. This is video-recorded and audio-recorded.
  - They follow a usability test procedure on a website, which includes eye tracking software
  - They complete a feedback questionnaire

What might be the datasets generated?  What might be the file type or format of each dataset?  How might each of these datasets need to be managed?
<table>
<thead>
<tr>
<th>What might be the datasets generated?</th>
<th>What might be the file type or format of each dataset?</th>
<th>How might each of these datasets need to be managed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Audio files and transcripts; Video files</td>
<td>Paper, .xls, .doc, .mov, .aup, .mp3, .prproj, .mp4, .pdf, .csv, .nvp, .twb, .tde, .spo</td>
<td>• Saved in a non-proprietary format</td>
</tr>
<tr>
<td>• Survey forms; Hand written feedback forms - scanned, transcribed</td>
<td></td>
<td>• Filed in an archive box, labelled and locked. Location recorded. Scanned copies</td>
</tr>
<tr>
<td>• Statistical information - transcribed into a spreadsheet</td>
<td></td>
<td>• De-identified</td>
</tr>
<tr>
<td>• Software report/heatmap</td>
<td></td>
<td>• Saved to encrypted hard drive; saved to a password protected networked drive</td>
</tr>
<tr>
<td>• Nvivo report</td>
<td></td>
<td>• Compressed</td>
</tr>
</tbody>
</table>

- Accompanied by an index; a file hierarchy or relationship schema; a copy of the software; the survey instrument; the questionnaire; the discussion topics; a glossary
Collecting Data - Research Methodologies

- Read classic and cutting edge books
  - Books
- Watch methods come alive
  - Video
- Find quick answers and definitions
  - Reference
- Learn about quantitative methods
  - Little Green Books
- Learn about qualitative methods
  - Little Blue Books
- Learn from stories of real research
  - Cases
- Practice data analysis
  - Datasets
- Design a research project
  - Project Planner

http://libguides.library.qut.edu.au/databases/srmo
Collecting Data – using existing data

Find existing research datasets

To support your project, you can access licensed research data sets through the QUT Library.

Access research datasets

The library also curates published datasets and repositories that support the social sciences and research in the science, technology, engineering, mathematics and medical fields.

Datasets for research in social science

Datasets for Health and STEM

To request access to additional datasets, contact the Research Data Librarian.

https://qutvirtual4.qut.edu.au/group/research-students/doing-your-research/managing-research-data/find-existing-research-datasets
Stage 2/Research Proposal

- Includes a data management plan in Appendices
- Requirements of the first milestone are available from the Research students page QUT Research Students Centre wiki:

The document requires indication of the following:

- I have not yet considered data management issues but will do so before confirmation
- I have read the data management planning information and discussed the need to complete the Data Management Plan (online) with my supervisor
- I have read the data management planning information, discussed it with my supervisor, and have completed the Data Management Plan (online)
Activity (10 mins)

Data Management Planning (DMP) Tool

https://dmp.qut.edu.au/

Access the tool, and create a new Data Management Plan.

Complete as much of Section 1 as you can.
# Data Storage Options at QUT

<table>
<thead>
<tr>
<th>Storage option</th>
<th>For research data</th>
<th>Master copy?</th>
<th>For students</th>
<th>Very large data (&gt;500GB)</th>
<th>Sensitive data</th>
<th>Share data with QUT</th>
<th>Share data with non-QUT</th>
<th>Remote access to data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Data Storage Service (RDSS)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>AARNet’s CloudStor</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>QCIF’s QRISdata</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Syncplicity</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

H: drive / U: drive folders (except U:\Research) ✗

OneDrive / Google Drive / Dropbox ✗

Portable storage (e.g. USB / CD / DVD / external hard drive) ✗

[http://qut.to/8c9ob](http://qut.to/8c9ob)
3-2-1 storage rule + example

Tracy uses QLD Department of Transport data. A month of data files produced hourly in .csv file format will be provided by encrypted USB. The raw data needs to be saved and kept only on QUT network storage, for security, processing and analysing purposes. She also needs to share derived data results with her industry partner, QLD Transport, at particular stages of the project.

3-2-1 Solutions

- **Master**: Tracy saves the .csv files from USB via QUT computer to her RDSS raw data folder upon receipt. Tracy doesn’t use these files, but makes copies of them for processing.

- **Working**: Tracy saves a copy of the master .csv files to QUT RDSS, in a working data folder. Tracy uses these copies for processing and analysis. Derived data results can be shared securely with industry partner via AARNet’s Cloudstor FileSender.

- **Backup**: RDSS research data is backed up to removable tapes, which are duplicated and housed in two security compliant geographically dispersed data centres.
Links:


- Self-install software on a QUT computer via IT Assist icon at the bottom of your screen


- QUT hands-on training: [https://unihub.qut.edu.au/students/events/](https://unihub.qut.edu.au/students/events/)

- Online training via Lynda.com: [https://libguides.library.qut.edu.au/databases/lynda](https://libguides.library.qut.edu.au/databases/lynda)
# Make Sure Your Data is F.A.I.R.

<table>
<thead>
<tr>
<th>F</th>
<th>Findable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Accessible</td>
</tr>
<tr>
<td>I</td>
<td>Interoperable</td>
</tr>
<tr>
<td>R</td>
<td>Re-useable</td>
</tr>
</tbody>
</table>

Publishing Data

Data Repositories

Multidisciplinary
- FigShare
- Dryad

Discipline Specific
- DataONE
- GenBank
- PANGAEA
- Scientific Data (Nature's data journal)
- Australian Data Archive (social sciences)
- TERN (terrestrial ecosystem data)

Data Repositories at QUT

Find more via the Research Students – Publish & share research data pages

https://researchdatafinder.qut.edu.au/
Documentation and Metadata

Examples:

- Endnote labels to categorise books and articles
- iTunes music genres, Flickr aperture settings
- Library subject headings
- #hashtags on Twitter
- Grocery shop aisle signs

Metadata
Metadata

Helps to manage and re-use data

Some types of metadata:

- **Descriptive metadata** – text describing the who, what, why, when and how of the dataset
- **Provenance metadata** - data source, version tracking & transformations.
- **Technical & Structural metadata** - file types, software, file size & contents; and how components of a set relate.
- **Rights and Access metadata** – preservation/confidentiality requirements, access restrictions & timelines; ownership and licensing of the data.
Types of Metadata – Activity 5 mins

Explore a Research Data Finder record with your neighbour and work together to identify how the record meets F.A.I.R. data principles using the metadata types below.

- Descriptive metadata
- Provenance metadata
- Technical & Structural metadata
- Rights and Access metadata

*Hint: Some records do this better than others……..*

https://researchdatafinder.qut.edu.au/
# Data Retention

<table>
<thead>
<tr>
<th>Description (nature of research)</th>
<th>Retention Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research data which does not result in a patent</td>
<td>Retain for 5 years after last action.</td>
</tr>
<tr>
<td>Research data which results in a patent</td>
<td>Retain for 7 years after expiry of patent.</td>
</tr>
<tr>
<td>Clinical trials</td>
<td>Retain for 15 years after completion of clinical research/trial AND 10 years after last patient service provision or medico-legal action.</td>
</tr>
<tr>
<td><strong>Significant</strong> - research data which is of high public interest or significance to the discipline such that it has or will change a commonly held view or approach.</td>
<td><strong>Permanent</strong></td>
</tr>
<tr>
<td>Factors which may determine significance include projects which:</td>
<td></td>
</tr>
<tr>
<td>• are controversial</td>
<td></td>
</tr>
<tr>
<td>• are subject of extensive debate</td>
<td></td>
</tr>
<tr>
<td>• arouse widespread scientific or other interest</td>
<td></td>
</tr>
<tr>
<td>• have the potential to cause major adverse impacts on the environment, society or human health</td>
<td></td>
</tr>
</tbody>
</table>

The Queensland State Archives University Sector Retention and Disposal Schedule specifies the statutory retention periods for research data (see section 601.2/A50).
Data management training

• Datasets for Research
• File and Data Management 101
• Research Data Management Drop-In

https://unihub.qut.edu.au/students/events/search
Collaborate

Collaborating with other researchers

Finding potential collaborators at QUT, Australia and worldwide

Online tools for data sharing and collaboration
Building your academic profile

- Create a profile

- Create content (e.g. social media, digital repositories of work, open education resources, content curation)

- Become a player in your field – professional associations, conferences, webinars

- Get Published & get ranked (see AIRS 4)
Activity (10 mins)

1. Go to Google Scholar Citations & create a profile

2. Search [QUT Staff Profiles OR QUT ePrints](http://eprints.qut.edu.au) to identify potential collaborators at QUT
Networking – in person & online

Supervisor

Faculty events and conferences

Peers

GRE+D

Industry engagement

hdr.intern@qut.edu.au
Activity (5 mins)

1. Search *Conference Alerts* for suitable academic conferences.
2. Set up an alert for conferences in your field.

http://conferencealerts.com/  
https://thinkcheckattend.org/
What’s next?... AIRS 4

By the end of the next workshop you should be able to:

1. Develop knowledge of tools to assist in making decisions about where to publish.
2. Determine the research impact of information using Bibliometric and Altmetric tools.
3. Recognise your existing skills and find training and development opportunities to prepare for your career after your research degree.
AIRS 3
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