

# 9. BUILDING LITERACIES FOR THE RESEARCH LIFECYCLE

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## Why read this chapter?

In many universities, supervisors and higher degree researchers (HDRs) benefit from services and resources offered by their academic library. Academic librarians are experts on digital, information, and research literacies, and can help your higher degree researchers gain competency in all these areas. The following sections will introduce you to the research lifecycle and point to librarian support during the research journey. Supervisors will also gain tools and ideas for higher degree researcher supervision.

In this chapter we will overview:

1. The research lifecycle journey including its intersection with academic librarian support
2. Development of a research plan to keep an higher degree researcher candidature on target
3. Selection of bibliographic software to manage citations and to facilitate higher degree researcher-Supervisor collaboration
4. The value of data management and sharing for higher degree researcher recognition and reuse
5. Development of a publishing strategy for higher degree researcher recognition and career development
6. Development of an online presence for wider higher degree researcher engagement and impact
7. Methods for measuring higher degree researcher research impact.



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A key role of supervisors is to ensure higher degree researchers become familiar with, and apply good information literacy practices to inform their research. In developing capacity supervisors will model their own practices as researchers, and refer higher degree researchers to the resources and experts in accessible library, e-research and research services. This chapter uses a research lifecycle to illustrate and frame discussion of the range of skills required, sources of support, and strategies for building literacies.

## 1. A quick overview of library support for the research life cycle

Figure 9.1 illustrates the cyclical nature of the research lifecycle and where it intersects with academic librarian support. In some higher education institutions, elements of the research lifecycle may also be supported by their research office or other institutional units. The rest of this chapter provides an overview of the major phases of this diagram. The underlying theme is planning for higher degree researcher success.

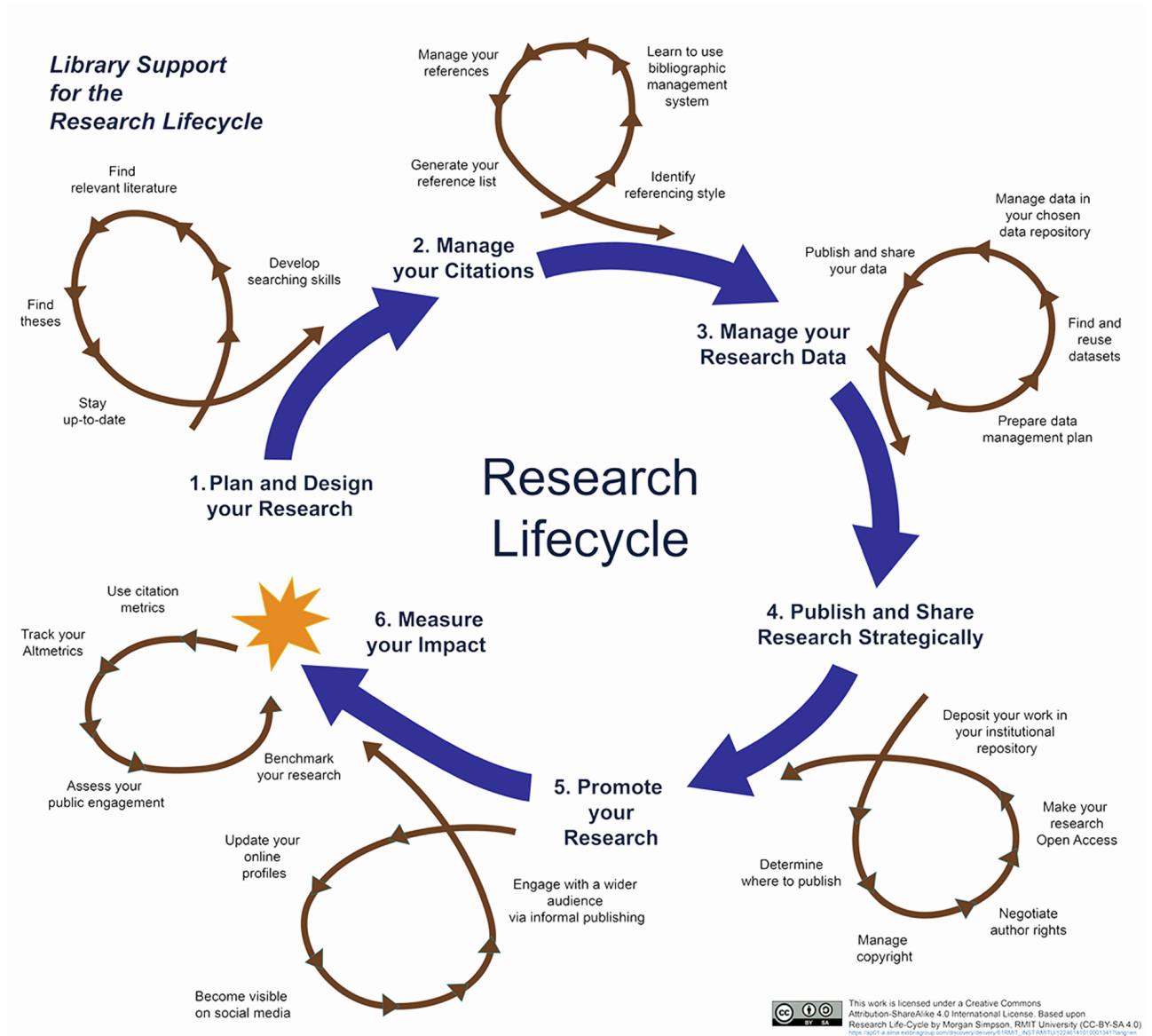


Figure 9.1. Library support for the research life cycle by Claire Ovaska, used under CC BY-SA 4.0 is a derivative of “Research Life-Cycle” by Morgan Simpson, RMIT University

## 2. Plan and design your research

A higher degree researcher research project is a significant undertaking and it is helpful if supervisors emphasise the importance of having a detailed research plan. A plan will enable your higher degree researcher to monitor their own progress and steer their project towards timely completion. We have seen many instances of unnecessary stress for higher degree researchers and supervisors — and requests for extensions — because of inadequate planning.



A comprehensive research plan:

- clarifies the research question
- establishes the overall research design: components may require different designs, analyses, and timeframes
- identifies potential challenges: such as ethics approval, data collection, and research site access
- maximises resources: including time, funding, and personnel
- provides milestones: facilitating timely completion, identifying areas for improvement, and detailing work to be done.

## Research parameters

Higher degree researcher research plans should follow discipline parameters and these can vary widely. A creative arts higher degree researcher might create a literature review, a major creative work, and an exegesis, while a medicine higher degree researcher might produce a systematic review and conduct a clinical trial. Having research parameters will minimise duplication of effort across the project.

## Research outputs

What is the publication plan for articles, chapters, and books arising from the research project? What are the requirements of the targeted journals? If your higher degree researcher is part of a team, then who is responsible for what output?

## Notes, collaboration, and data storage

How will your higher degree researcher take, store, and share their research notes? What text, images, videos, documents, audio files or other data needs to be recorded? Your higher degree researcher's understanding of what needs to be kept will help identify storage options.

- Storing your research: refer to *Managing your data* section of this chapter
- Collaboration tools: may include Open Science Network, Google Docs, Electronic Lab Notebook, Evernote, and Trello

## Developing a research question and searching strategy

It can be helpful if supervisors and higher degree researchers make a joint appointment with their librarian to discuss search strategies. Librarians are searching professionals with academic database expertise, supervisors are seasoned researchers in the field, while higher degree researchers are probably not clear on what resources they need. We have found that when everyone meets together, the higher degree researcher leaves with a clearer sense of the task at hand. Appointment discussion points could include:

- What and how many databases need to be searched?
- Do relevant databases use subject headings or keywords?
- Are there discipline registries to be searched?
- Is there relevant grey literature?
- What primary, secondary, or tertiary sources need to be found?
- What publication types or sources are acceptable?
- What is required by targeted journals?

## Examples of practice

Help your higher degree researchers understand the importance of planning their research journey with stories (good and bad) from your own career, or from your institution or discipline.

## 3. Manage your citations

Effective management of citations ensures higher degree researchers can provide clear evidence for their arguments and hypotheses, and avoid plagiarism. Referencing done by hand is time consuming and prone to transcription errors. Using citation or bibliographic management software means that with a few clicks your higher degree researcher can insert citations throughout a document in a preferred referencing style and save citations for future use. The most popular examples are EndNote, Zotero, Mendeley, and RefWorks. Each has its strengths and weaknesses, but they all make referencing easier.

Benefits

Using bibliographic software:

- builds a persistent library of research materials
- enables importing of citations from academic databases
- tags, labels, and groups references for your research
- saves, manages, and annotates PDFs
- reduces the potential for plagiarism
- manages referencing style compliance.

Watch this video [1:31] to find out more about the benefits of using citation management tools.



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## Choosing a citation manager

An important part of the research plan is to identify which citation software will be used. All parties need to be familiar with the software to use it effectively and efficiently. Also consider possible collaborations and the software used by colleagues. We have seen instances where the higher degree researcher and supervisors are familiar with different citation systems (or not familiar with any at all), causing work to be lost or rendered inaccessible.

Fee-based citation software may be available through your university library, while others are freely available online. Once you have decided which program to use, we recommend supervisors and higher degree researchers attend training on how to use it (unless you are an expert user). If your library or institution does not offer training, go to the software's website for download instructions and training.

## Top tips for citation manager success

- Expect that learning new software will take time
- Take advantage of online tutorials, instructions and troubleshooting information
- Integrate citation manager use into your research habits
- Check the software is producing the required referencing style correctly
- Check imported citations for missing information or mistakes.

## Examples of practice

Help your higher degree researchers understand the importance of managing their references with stories (good and bad) from your own career, or from your institution or discipline.

For more citation management resources refer to the reading list.

## 4. Manage your research data

Managing research data effectively and sharing it with others can unlock many benefits for researchers, and is an expectation for higher degree researchers today. It is helpful if supervisors encourage higher degree researchers to develop a research data management plan (DMP) early on to safeguard their data, and to determine responsibilities and actions required. Connect with your academic library, research office, or data management experts for more information.

### Benefits

#### Published data:

- is another way to get noticed
- may be cited by other researchers
- can lead to collaboration
- facilitates transparency, trust, and respect
- may be required for project, journal, or funder compliance
- can be reused in future projects
- supports fair and inclusive access to research.

## Research data management planning

Developing a data management plan (DMP) is the first step. A DMP establishes a link between the project and the data, and can inform research activities. Your higher degree researchers will need to consider and document:

- Responsibilities relating to data management
- Ownership and intellectual property considerations
- Data collection and analysis methods
- The kinds of data that will be generated and its organisation
- Data documentation (metadata)
- Data storage, backup, and collaboration needs
- Changes to the research project
- Measures to protect sensitive data
- Post-project data access, retention, and disposal
- Requirements for implementing the DMP



### DISCOVER, REUSE & CITE

Figure 9.2. Research Data Management – Discover, Reuse & Cite by Gaalen Pinnock is used under CC BY-SA 4.0

If your institution doesn't support DMPs, supervisors can direct higher degree researchers to open-source tools such as DMPTool which provide templates and guidance for developing robust plans.

## Data sharing and publishing

When it comes time for higher degree researchers to share their data, generalist repositories such as the Open Science Framework and Zenodo are freely available, and well-known. However, your higher degree researcher may need to deposit their data with your university, national or discipline-specific repository, or as recommended by a specific journal or funder. Supervisors can also suggest FAIRsharing and Re3Data registries to identify a suitable data repository.

## Examples of practice

Help your higher degree researchers understand research data management and data sharing with stories (good and bad) from your own career, or from your institution or discipline.

For more data management resources refer to the reading list.



## 5. Strategically publish and share your research

Publishing and sharing research results and new knowledge is a responsibility of all researchers. A combination of scholarly and informal publishing could lead to improved research **engagement** and **impact** by deliberately targeting key academics, government, and industry groups as well as the wider community. Another consideration is the enormous change that academic publishing has experienced in recent years. We have seen the rise of new technologies, publishing via Open Access, predatory publishing, research funding pressures, and more. Today's already time-poor researchers cope with so many demands on their time that it is important to have a plan or strategy to follow. Supervisors and higher degree researchers are encouraged to connect with their academic librarian for assistance related to the content of this section.

### Benefits

Publishing and sharing strategically can:

- increase engagement, reuse and citations for research outputs
- highlight research output distinctiveness making it stand out
- strengthen future grant, job, and promotion applications.

### Strategy and being distinctive

Ideally, higher degree researcher research publishing choices should work to increase audience engagement and impact and contribute to career growth. This requires the development of a publishing strategy that is personally catered to them. Questions to pose to your higher degree researchers could include:

- Who should you collaborate with (locally, nationally, and internationally) to build your career? How can you make that happen?
- Which government, industry, or community groups should you aim to publish with?
- What is the audience for this research and how can it make a difference?
- How much should you publish? How do you need to organise yourself to make this happen?
- What is unique about your research? How could you capitalise on your distinctiveness?
- How can you vary where you publish to attract new audiences and increase impact?

Understandably, a researcher's publishing strategies will evolve over time to allow for changing

opportunities and circumstances. Supervisors could suggest higher degree researchers revise their strategy at least once a year. Alternatively, revision will be useful in the lead up to performance appraisals, job applications, promotion rounds, or grant applications.

## Deciding where to publish and which conferences to attend

Deciding where to publish requires consideration. Where established researchers publish may vary significantly from where a novice researcher can publish. Higher degree researchers should ask themselves some questions and develop a shortlist of journals, book publishers, and conferences:

- Should I publish Open Access articles to maximise citations and engagement? Does my funder require me to?
- What are the key scholarly journals, publishers, or conferences in my reference lists?
- What journals, publishers, or conferences do my supervisors recommend? Which ones are favoured by my discipline?
- How can I reach my desired audience?
- Who should I meet and network with at conferences?
- What is the scope of my shortlisted scholarly journals, book publishers, or conferences?

## Due diligence: Predatory journals, book publishers and conferences

Higher degree researchers should be aware of the increasing number of predatory publishers to be avoided. Predatory publishers have taken advantage of the Open Access, author-pays, academic publishing model to make enormous profits. These predatory and deceptive publishers are known to:

- make dubious claims about the quality or credentials of a journal, conference, or publisher
- provide limited editorial support
- fail to meet established peer review standards
- charge an article processing fee disproportionate to the work they undertake
- falsely claim that the publication is included in reputable indexes (e.g., Scopus or Web of Science)
- adopt a journal or conference name that is easily mistaken for that of a respected entity
- publish journals that include material from multiple, unrelated disciplines
- solicit research outputs or conference attendance by emailing authors
- have shallow websites with few policies and guidelines.

Higher degree researchers also need to become familiar with current predatory publishing practices. Good journals can be hijacked by profiteers, while some predatory journals have become more acceptable over

time. Shifts in journal quality could arise from a change in journal ownership, editorial board changes, or from a decision to do better.

## Quality checks

When deciding where to publish a manuscript or which conference to attend, there is no single indicator of quality that Supervisors and higher degree researchers can check. It is essential that researchers use multiple indicators and conduct multiple checks.

Watch this video [1:44] **!Think ✓ Check > Submit** about journal checks. These principles also apply for choosing conferences and book publishers.



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Use these checklists to determine the quality of a journal, conference, or book publisher:

- !Think ✓ Check > Submit (journal articles)
- !Think ✓ Check > Attend (conferences)
- !Think ✓ Check > Submit (books and chapters)

## Informal platforms and informal publishing

Social media platforms and informal publishing can be useful for building professional networks, facilitating wider academic and community engagement, and publicising research. Personal preferences and your experience of disciplinary practices will help your higher degree researchers determine which social media platforms to use. LinkedIn, Twitter, blogs, Facebook, Threads, Weibo, YouTube, and TikTok are popular options. Regular engagement is essential for success. Informal publishing on research news sites such as ScienceDaily or The Conversation is another way to promote research.

How we work at The Conversation explains how *The Conversation* publishes globally, and the process for making articles available for republishing by major news outlets (e.g., ABC News, CNN, BBC, The Jakarta Post, and The Guardian). Timing is everything for your higher degree researcher to make a successful pitch, such as in the lead up to relevant a current affairs event, or prior to your higher degree researcher announcing a research breakthrough.

### HDR Activity 1

Reflect on your career goals (or who do you want to emulate) and how your research outputs could help you achieve this goal. Note your ideas and revisit and revise them from time-to-time.

## Examples of practice

Help your higher degree researchers understand the importance of developing a publishing strategy and share stories (good and bad) from your own career, or from your institution or discipline.

For more publishing resources refer to the reading list at the end of this chapter.

## 7. Building a professional online identity

Building a professional online identity facilitates being noticed beyond your immediate sphere. Online profiles have become tools to improve and demonstrate engagement and impact. Encouraging your higher degree researchers to build and maintain key online profiles is a valuable part of their career strategy. This section provides information and tools to help your higher degree researchers establish professional online identities. You can also connect them with your academic library or research office for assistance.

### Benefits

A solid and professional online identity can:

- support job, promotion, or grant applications
- promote achievements and research outputs
- facilitate citation and other metrics
- facilitate professional and community engagement
- connect with collaborators
- avoid misattribution of research outputs

- disseminate research to broader audiences.

## Apply these ideas in practice

Most higher degree researchers will arrive with an existing online footprint that they are probably taking for granted. On commencement of their studies, they need to reflect on this aspect of their lives by:

- considering what online profiles are best suited to supporting their research and career journey
- considering what online profiles they are prepared to keep current
- taking advantage of all editable fields to evidence the breadth of their activities and interests
- considering privacy issues for professional and personal online identities.

### HDR Activity 2

Search for yourself online:

- note positive material for sharing or reuse
- clean up undesirable content
- update social media profiles or close unwanted accounts

It is recommended that higher degree researchers repeat this activity at least once a year.

## ORCID

ORCID profiles are free and belong to their creators. The most important role for an **ORCID** profile is disambiguating individual researcher's names and outputs from others with similar names. This is critical in an era where algorithms match authors with research outputs. As a result, many employers, publishers, and funding bodies now ask researchers for their ORCID numbers. This disambiguation purpose means your higher degree researchers should only have one profile over the life of their careers (removing additional or duplicate profiles).

Your higher degree researchers can find out more with the following video describing ORCID [4:16]



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### HDR Activity 3

Search ORCID for your name spelled out in full, then try your initials and surname. Were you surprised at how many researchers have your exact or similar names to you?

### HDR Activity 4

Create and/or update your ORCID profile. If necessary, reset your login details to regain access.

## Google Scholar

Google is the world's most used search engine, so it makes sense for higher degree researchers to set up a free Google Scholar profile. They can enhance their profiles by adding a photograph, research keywords, and a link to an ORCID profile. Once set up, they require little maintenance and will provide your higher degree researchers with comprehensive citation data.

## Other online profiles

Your higher degree researchers may be interested in other online profiles to build their network and share research outputs. Platforms such as ResearchGate and Academia are primarily used for scholarly networking. LinkedIn showcases professional activities and facilitates networking. Other popular options include Twitter, blogs, Facebook, Weibo, Instagram, Snapchat, Threads, YouTube, and TikTok.

## Examples of practice

Help your higher degree researchers understand the importance of developing a professional online identity and share stories (good and bad) from your own career, or from your institution or discipline.

For more professional online identity resources refer to the reading list.

## 8. Measuring research impact

The need to measure research performance is intrinsic for contemporary higher education institutions, and this has traditionally been achieved through research metrics. This is problematic as no one metric can sum up the contribution of a researcher or research output, or account for differences between disciplines and career stages. Some higher degree researchers may be able to use bibliometrics to gauge their productivity, citations, and collaborations. However, alternative metrics and qualitative evidence are probably better suited to evidencing impact for emerging researchers. Here we provide information and tools to help your higher degree researchers craft their impact narratives. You may also want to connect with your academic library or research office resources and experts.



### Benefits

Building an impact narrative can:

- support publishing decisions
- support job, promotion, and grant applications
- identify potential collaborators and workplaces.

## Bibliometrics

Bibliometrics refers to quantitative analysis of journals and article citation data and is rooted in formal academic publishing. Bibliometrics inform (and often confuse) researchers, higher degree researchers,

and stakeholders. Broadly, journal level metrics are used as indicators for the prestige or quality of a journal, and not individual researchers or outputs. They may provide useful data for deciding where to publish. Scimago is Elsevier's free journal-ranking product. Article level metrics can be used to assess the **productivity**, apparent **quality**, and **collaborations** of researchers and research groups, but they are less useful for assessing fledgling higher degree researcher researchers. Researchers can access free citation data by setting up a Google Scholar profile.

Find out more

Are your higher degree researchers confused about metric terms such as Field-Weighted Citation Impact (FWCI) and h-index? Direct students to the Metrics Toolkit for clarification.

### HDR Activity 5

Help your higher degree researchers understand the **responsible use of metrics** for research assessment. Have them:

- read Harnessing The Metric Tide for key principles, page 24
- watch the Leiden Manifesto [4:28] for using research metrics for research evaluation
- read the Declaration on Research Assessment (DORA) recommendations for research evaluation stakeholders
- reflect on their learnings.

## Alternative metrics

Alternative metrics are used to gauge research impact beyond traditional academic publishing, and could be useful for higher degree researchers who are gaining publicity and/or are active social media users. Alternative metrics track research outputs via a **DOI** or other persistent identifiers in a variety of social and news media sites, policy documents, blogs, Wikipedia, and more. higher degree researchers could manually record their views, downloads, mentions, followers, sales, etc. Alternatively, Altmetric collates



many alternative metrics in a neat package. It is a paid platform but it does offer some free functionality for individuals and institutions.

Your higher degree researchers can find out more about Altmetrics video [2:59]



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## Other sources of evidence

Higher degree researchers can look beyond metrics to other sources of evidence to support job, promotion, and grant applications. Evidence alternatives could include letters of appreciation, awards, positive reviews, and more. Encourage your higher degree researchers to develop a system so that their qualitative evidence is stored and accessible for future use.

## Examples of practice


Help your higher degree researchers understand the value of measuring research impact and share stories (good and bad) from your own career, or from your institution or discipline.

For more research benchmarking resources refer to the reading list.

## Conclusion

In this chapter we have covered major phases of the research lifecycle that your higher degree researchers will navigate during their studies. The long list of ‘things’ they need to consider and achieve may seem daunting, but our central message is the value of planning. Project planning, citation management, data management, publication strategies, research promotion, and career planning are all crucial. Though never easy, solid planning contributes to lasting success. Remember, you and your higher degree researchers are not alone. If you reach out to your library or research office, you’ll find partners dedicated to higher degree researcher success.

Additional Resources

While most of these sources and additional readings are freely available, some are not. The lock icon  beside an entry indicates that the source *may* be available from your library.

Auckland University of Technology. (2023). *Which reference manager? Comparison of EndNote, Mendeley and Zotero*. <https://aut.ac.nz.libguides.com/managingreferences>

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