Supporting high quality research in a remote region – a collaborative journey

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Abstract:

This paper will trace the journey of two librarians supporting researchers at their respective organisations in northern Australia. The librarians are both working towards advancing high-quality research to meet the emerging requirements of this remote part of the world. It will take into account the unique nature of the region that they work in, which presents distinct challenges, and offers opportunities for collaboration.

Based in the Northern Territory, an area one sixth the total land area of Australia with just one per cent of the total Australian population, the librarians have the challenge of servicing isolated communities that are geographically dispersed over a wide area.

The services currently being provided by each of the librarians at their respective institutions – Charles Darwin University and Northern Territory Department of Health – will be highlighted and mapped against the research life cycle. The research focus of the Department of Health is naturally specialised while the key research themes of the University are broader and disparate but with a focus on the health and medical sciences, the environmental sciences and Indigenous knowledge. Some examples of collaborative projects with STEM researchers will be outlined, and gaps in the services being provided identified. Research data curation and management is emerging as an area where more work needs to be done in tandem with the wider research community.

The paper will also appraise the role of the librarians at the two different institutions and review areas of responsibility, as well as consider how they could better work together to streamline services. Their current skills and competencies will be analysed, and future areas of development to better carry out their roles within the research life cycle, will be considered. The long-term aim of this study is to discover how to better service the research community in this unique part of Australia.

Keywords: Research support ; STEM ; Northern Australia ; Remote region ; Research life cycle

Introduction

Over the last decade, the role of the library in supporting research has changed dramatically worldwide. Essentially, it is the changing priorities of academic and research institutions that has led to libraries responding by developing new roles and services to better support their researchers. While libraries have long realised the need to provide high quality information services to their research community, it was national trends that provided the catalyst for them to look at ways of creating new roles to better provide research support (Mamtora, 2011).

In recent years, the Australian Government has introduced a number of key initiatives to assess the quality of research being carried out at universities such as the Commonwealth Government's Research Quality Framework (RQF) – an exercise to measure the quality and impact of research being carried out in Australia. This was later replaced by the Excellence for Research in Australia (ERA) initiative, a new way of assessing research quality using metrics and expert review (DIISR, 2008). These initiatives were crucial as they determined the level of funding universities received from the federal government for research activities, and were the trigger that set off the change in direction that was to come. The focus in universities therefore, even more than before, was on increasing the quality and quantity of publications.

Change was signalled in the level and extent of services being provided by those areas of universities providing research support, including the libraries. Librarians became more involved in supporting staff endeavours in all aspects of the research life cycle from beginning to end – from initiating and planning, to developing, publishing and promoting it, and assessing the impact of its research.

At the same time the direction of health and hospital research in Australia was influenced by a number of factors, one of those being the rise of evidence-based practice, a way of approaching clinical care that incorporates using best available current research. In addition to this, the evolution of the Commonwealth Government's National Health and Medical Research Council (NHMRC) has been a key driver of the health research agenda due to its funding for hospital research and development of national guidelines. This increasing emphasis on both undertaking and utilising health research in clinical care has had an effect on the information support services provided by government health libraries.

Background

Australia is the world's sixth largest country. The country comprises six states and two mainland territories of which the Northern Territory (NT), where we are based, is one. The NT is 1.4 m sq kilometres in area, being one sixth the total land area of Australia with a population of close to 250,000, or just 1% of the total Australian population. The population is spread thinly across this vast area with concentrated groups based in the cities of Darwin and Palmerston in the north and Alice Springs in the south. However, 30 per cent of the population is Indigenous compared with around 3 per cent of the general Australian population (cdu.edu.au/about/university-profile).

The institutions

Charles Darwin University – role and research focus

Charles Darwin University (CDU) is the major tertiary institution in the NT. It is made up of 22,000 students, half of whom are engaged in external study mode and are dispersed over its wider region and beyond, both interstate as well as overseas. (CDU, 2017). Casuarina Campus is the University's main campus based in Darwin with a number of smaller campuses and centres scattered throughout its vast area.

CDU set up the Institute of Advanced Studies (IAS) in 2004 with a view to becoming the regional leader in research in the areas of social, cultural, environmental, intellectual and economic development of northern Australia and surrounding areas, particularly the 'near north' – the islands of eastern Indonesia, and Timor Leste. The research is heavily focused on issues related to Indigenous Australia and the unique environment and ecology of the wet tropical north and the dry arid centre. CDU's aim at the time was to "increase and focus research activities within the institution to maximise the benefit to both the region and the wider academic community" (Mamtora, 2011, p. 88).

The Menzies School of Health Research (MSHR), one of Australia's leading medical research institutes was set up in the NT in 1985, and at this point, was made part of the IAS. This formalised the relationship with CDU through their postgraduate courses and higher degrees by research. A number of Menzies researchers are also employed as health professionals by the NT Department of Health. These researchers are world renowned for their studies into life-threatening illnesses in the tropics. This has assisted in strengthening the social and economic development of northern Australia and the Asia–Pacific region.

Excellence for Research Australia

As mentioned earlier, the Excellence in Research Assessment (ERA) is conducted by the Australian Research Council and compares Australia's university research effort against international benchmarks, creating incentives to improve the quality of research and identifying emerging research areas and opportunities for further development. It is carried out every three years and in the latest round, has once again demonstrated that CDU's work in the following STEM areas is performing well above world standard: Medical and Health Sciences, Clinical Sciences, Environmental Science and Management, and Ecology; Environmental Sciences, Ecological Applications, Biological Sciences, Zoology, Agricultural and Veterinary Sciences, Medical Microbiology, Paediatrics and Reproductive Medicine, Public Health and Health Services; and Information and Computing Sciences. It is remarkable that a small university such as CDU is "delivering world-class advances in science and knowledge' (CDU, 2019).

Role of the Research Services Coordinator

It was during the time of change in the research landscape that CDU Library established a dedicated research librarian position, one of the first universities in Australia to do so. The research librarian was given the title of Research Services Coordinator (RSC), with their role being essentially to meet the information needs of the University's wider research community, regardless of where they were based – on or off campus, within the NT or elsewhere.

This was considered a challenge in itself, to discover who the researchers were, and where they were based, and to be able to extend the service to them. Research-specific University-wide mailing lists are a great help as the type and level of support available can be promoted through the lists. For example, there are mailing lists for Menzies researchers, researchers in the Environmental Sciences, as well as Higher Degree Research (HDR) students. HDR students can undertake their research, full-time or part-time, internally or externally and can be based anywhere. For example, CDU has or has had PhD students based in Vietnam, in Adelaide, in Alice Springs, as well as in Aboriginal communities in the NT such as Yulara and Papunya, as well as in Darwin. Whilst the Research Office is able to help in providing names of research students and their area of research interest, it is more difficult to identify their physical location. Current statistics show that 28 per cent of all HDR students are enrolled as external students, and require online assistance.

Support is provided through formal workshops face-to-face or in the form of individual consultations by request, and at all stages of the research lifecycle from supporting researchers at the early stages of developing the research question or narrowing the topic; through to introducing a wide range searching for literature and managing the references; helping find quality journals to publish the research in, and avoiding the predatory ones; to disseminating the research results in variety of different ways; and to measuring the impact of the research (see Table 1).

Naturally, with such a widely-dispersed University community, support has to be provided through a wide range of different mediums: face-to-face, online, email, and phone. A calendar of workshops is put in place at the beginning of the year and additional workshops added during the course of the year as and when required. When these workshops are offered on campus, they are recorded and the recording is made available to all researchers regardless of location, thereafter. In addition, short, online video clips that supplement the workshop content are made available from the Library's web page.

Promoting the Library's services is a continual process, nevertheless, it is not surprising to occasionally hear a researcher express their surprise and claim not to have received an email, or know about a particular service. Therefore, marketing the services has to be done in as many different ways as possible and on an ongoing basis.

THE RSC works closely with the Research Office, Colleges and research centres for opportunities to present at any research forums, such as: the biannual Induction session for new HDR students; research forums, staff meetings and so on. The RSC serves on the annual CDU HDR Conference organising committees, providing support in a number of different ways including presenting as well as chairing sessions. In addition the RSC has a regular column in the monthly newsletter of the Office of Research and Innovation and has been invited to contribute to the forthcoming newsletter.

The RSC has been invited to participate in collaborative research projects with teams of researchers such as contributing to systematic reviews. However, being a solo support librarian, it is not always possible to participate due to having to continually juggle the workload to provide effective assistance.

Northern Territory Department of Health – role and research focus

The Northern Territory (NT) Health Library supports the research and information needs of nearly 7000 staff located in six hospitals and 74 primary health clinics across the Territory (NT Government, 2018). The main branch of this Library Service is located on the Royal Darwin Hospital (RDH) campus. The library collects resources and provides information services for staff working in clinical areas as well as for those undertaking policy writing and undertaking research projects. There are five branches of this library service in the hospitals throughout the Territory, with only three of them staffed. So there is a need for both electronic access to resources via the library website as well as for virtual training and support.

Training and research support services are offered by two librarians: a Health Services Librarian, who has a health professional background; and a Clinical Librarian (CL). They both have extensive training and literature searching experience. Due to budget cuts and resignations, these two librarians are providing the support that used to be provided by a team of five.

As with CDU Library, assistance is provided via workshops (mainly small group) and individual consultations via a number of different media – via phone, face to face, email and online via videoconferencing (see Table 1).

In recent years there has been an increasing emphasis on undertaking hospital research that is of a high level of evidence using clinical trials (also known as randomised controlled trials). This research is used to test new drug therapies and interventions. The emphasis on clinical trials has stemmed from the Australian Government, the NHRMC and the Council of Australian Governments (COAG) revitalising a clinical trials' agenda. Currently, a National Clinical Trials Governance Framework is being developed (Australian Government, 2016). Commonwealth funding support has been an outcome of this and has assisted with the development of a local Clinical Research and Innovation Unit based at Royal Darwin Hospital. This team supports the governance processes of the research being undertaken. The HSL works closely with the Director of this team who promotes the library's services to clinical trial teams when they need to find background literature for writing their ethics proposal and study literature review.

In addition to this, one of the strategic directions in the latest NT Health Strategic Plan is to "embed research" (NT Health, 2017-2018), which includes providing the support structures to achieve this. This provides a more focused direction for the library as there are a number of health professionals wishing to undertake research projects with an aim of them being published, but have limited skills in this area. The HSL and CL have recently increased support in this area to make a difference to skill levels of staff in the research space.

External Partnerships

An example of partnerships with health professionals is the HSL and the CL being involved with the development of a program supporting research projects. This includes participating in a one-day workshop called the "Research Toolbox" that is scheduled twice a year. The event is run by a Flinders University academic, the Executive Director of Clinical Innovation and Research (a former nursing academic), together with the HSL and CL. With a focus on the research lifecycle, the workshop covers a range of topics such as writing a research

proposal, applying for ethics approval, and for research funding. Specifically, the two librarians deliver a 1.5 hour session covering the following:

- Using the PICO tool (Population and Problem/ Intervention/Comparison/Outcome) to assist with turning their research question into keyword format
- Systematic searching of the key research databases (includes Medline)
- Providing a search strategy handout with examples and hands-on practice time for their own research topic
- Creating a personalised database account to save searches and create search alerts
- An overview of reference management software

The workshop has now been run three times and has been refined after feedback from the first two. A planning meeting is scheduled prior to each workshop to determine changes that need to be made.

The number of participants for each workshop has been between 10 and 15. The last workshop was also offered to nurses and midwives (five attended).

Table 1 Support provided by the RSC and HSL

Stages of the Research Lifecycle	RSC Support	HSL
Developing the research question	**Workshops and Consultations (F2F and Online)** Literature Searching Setting up alerts **LibGuides** Research Support Finding Theses **Online clips** Introduction to Subject Guides Introduction to Databases Finding eJournals Finding Theses	**Workshops and Consultations (F2F and Online)** Literature Searching Setting up alerts Completing ethics application **LibGuides** Research Toolkit Finding Theses **Online Tutorials webpage** Help guides and video clips of a range of health databases
Literature searching	**Workshops and Consultations (F2F and Online)** Literature Searching Setting up alerts **LibGuides** Finding Theses Literature Review Research Data Management **LibGuides** Finding Theses Setting up alerts Using the Interlibrary Loan Service **Online clips** Introduction to Databases Finding eJournals Setting up Alerts	**Workshops and Consultations (F2F and Online)** Literature Searching (includes an Advanced Search Strategies workshop) Setting up alerts Critical Appraisal Evidence-Based Practice **LibGuides** Literature Review Finding Health Statistics **Online Tutorials webpage** Help guides and video clips of a range of health databases

Stages of the Research Lifecycle	RSC Support	HSL
Managing References	**Workshops and Consultations (F2F and Online)** Managing Information with EndNote **LibGuides** EndNote Managing Your References Mendeley Zotero **Online clips** Using EndNote	**Workshops and Consultations (F2F and Online)** Managing Information with EndNote (generally one-to-one) **LibGuides** Referencing
Conducting the Research	**LibGuides** Literature Review Research Methods Research Data Management	**LibGuides** Literature Review
Disseminating the Research Identifying journals and avoiding predatory ones Self-archiving in repositories – research and data	**Workshops and Consultations (F2F and Online)** Publishing for Impact Open Access Publishing Social Media for Researchers **LibGuides** Publishing Open Access Research Data Management Researcher Identifiers	**Consultations (F2F and Online)** Open Access Publishing Interpreting author guidelines Journal suggestions **LibGuides** Research Toolkit
Measuring Research Impact Grant applications Applications for academic promotion	**LibGuides** Measuring Research Impact	**LibGuides** Research Impact

Skills and competencies

In an earlier paper, Mamtora had outlined the core skills of communication, training and evaluation as being requisite for research librarians based on her experience of CDU at the time (2013). Haddow and Mamtora saw the ERA research evaluation exercise as further impacting on the role of the research librarian with researchers being required to provide support at all stages of the research cycle, with an increased focus on the areas of metrics and research impact and research data management (2017).

The seminal Research Libraries U.K. report, in a detailed analysis, had identified a number of skills for librarians to better support the needs of researchers (2012).

For the purposes of this paper, the two authors have adapted this list to map the key skills required to carry out their own roles, and the level of each skill, so as to identify gaps and consider potential areas of future collaboration between their institutions.

Table 2 Key skills required for roles

Key Skills	RSC Skill Level	HSL Skill Level
Excellent knowledge of bibliographic and other finding tools in the discipline subject	Moderate	Strong
Excellent skills to design information literacy training (both face-to-face and online) to meet the identified needs of different types of researchers	Strong	Moderate
Outstanding skills in information discovery, literature searching, etc.	Strong	Strong
Knowledge to advise on citing and referencing, and the use of bibliographic management software	Strong	Strong
Ability to pro-actively advise on and market appropriate library services to researchers	Strong	Strong
Ability to gain an appreciation of individual researcher/project needs, including effective listening skills	Strong	Strong
Good knowledge of data sources available in the discipline/subject	Moderate	Strong
Excellent knowledge of content available in the discipline/subject	Moderate	Strong
Awareness of current and changing local research interests	Moderate	Moderate
Understanding of a typical researcher's experience, including their workflow, and how researchers access and use information, within a discipline/subject and at different stages of the researcher's career	Moderate	Low
Ability to synthesise, analyse and provide digests of "discovered" information	Moderate	Moderate
Knowledge to advise on data management and curation, including ingest, discovery, access, dissemination, preservation, and portability.	Moderate-Low	Low
Ability to advise on current trends, best practice and available options in research publication and dissemination methods and models nationally and internationally, including scholarly communication and open-access publishing	Strong	Moderate
Sufficient knowledge to support researchers in complying with the various mandates of funders, including open access requirements	Strong	Moderate
Understanding of the national research assessment processes such as ERA	Moderate	Low
Understanding of research impact factors and performance indicators and ability to advice on citation analysis, bibliometrics, etc.	Strong	Moderate-Low
Understanding of author rights, copyright legislation and IP issues, and plagiarism to advise or refer as appropriate	Moderate-Low	Moderate-Low
Ability to advise on the value of social media communication tools	Strong	Moderate
Awareness of the whole research process from grant applications through to publications	Moderate	Moderate
Ability to advise on preserving research outputs	Low	Moderate
Advise on use of metadata	Moderate	Moderate

Addressing the skills gap

The geographical location of the two institutions discussed in this paper inhibits easy access to training and education to develop the specific skills required to provide research support; and their small size means there are limited funds for what is a costly exercise. Nevertheless, the librarians have done well over time in trying to bridge the gap and acquire the appropriate requisite skills. A fair amount of self-learning and on-the-job training takes place, but is supplemented with workshops, conferences and other PD events around the country where the opportunity arises. Different opportunities arise for each of the two librarians.

Collaboration between the two authors presents a further opportunity to mutually share knowledge and develop skills. They are working together to identify areas where they can support each other where one has a stronger skill set, or experience, over the other. The RSC needs to support researchers in all discipline areas at the University so may be able to learn from the HSL for specialised support to researchers in the health and medical area where her skills will be stronger. In any case, as the main site of the University's Menzies School of Health Research is located on RDH campus where the NT Health Library is based, the two librarians are potentially supporting the same set of researchers. So it follows that a more integrated approach to providing support could be developed. The HSL could turn to the RSC in relation to publishing trends, with open access requirements and with designing information literacy training. The HSL runs training for small, specialised groups and provides more individual support while the RSC runs workshops more frequently for bigger groups and has a teaching qualification.

One of the ways the HSL has developed the skills and knowledge to assist staff throughout the research process has been by leading a small research project that has been published in the Australian Journal of Advanced Nursing (Purnell, Majid and Skinner, 2017). For this project she undertook a systematic search to find literature, wrote a literature review and submitted an ethics application with details of the study. The idea for the project occurred after the librarian had worked closely with a Paediatric Clinical Nurse Educator at RDH where they had run a Journal Club for paediatric nurses for three years. A survey was written and undertaken once they had ethics approval and the project was published as a correlation study with assistance from a CDU academic.

Challenges

An area that both authors have identified for development is that of providing support to researchers with their research data. At CDU, until two years ago, the Digital Collections Coordinator was overall responsible for managing the repository and developing research collections including datasets. As part of this role he developed the research data management policy and accompanying procedures. On his departure two years ago, the position was not filled and a gap emerged in the support being provided. Basic enquiries were dealt with by the RSC, sometimes with assistance from the Research Office, but no promotional work was done, nor further datasets added to the small collection that had been been set up in the institutional repository. At the end of 2018, staff of the Australian Research Data Commons (ARDC) provided face-to-face training on campus for researchers and support staff alike, including library staff and research office staff. More recently, a stakeholder group comprising representatives from the Library, the Research Office and IT has been set up with a view to a coordinated approach to research data curation and management at the University.

The challenges of providing support to researchers long distance has already been touched upon. CDU uses Blackboard Collaborate as its web conferencing tool in an attempt to provide an equivalent level of service to those based off-campus but which presents other issues related to hardware, software and bandwidth. Other university-supported tools Zoom, Webex and Skype technologies are also available as alternative mediums based on user preference.

The HSL is used to delivering classes and individual support virtually but still encounters issues at times with technical problems. The Department has a number of virtual tools that are promoted for use, such as Skype and Cisco Jabber. However, most departmental staff do not have Skype automatically enabled when they commence and this also needs manager approval for activation. Cisco Jabber needs to be loaded onto individual PCs if not using video-conferencing facilities, and this costs work areas so also needs manager approval. Other tools experience slowness with screen sharing, such as Webex.

Other services have been identified as a need, such as assisting with data management planning, but at this stage the Health Library does not have the staffing to support this area, apart from offering the library's repository as a storage space for NT Health data.

Conclusion

The support being provided to the NT research community through both CDU as well as the NT Department of Health has grown by leaps and bounds in recent years. The role of the librarian has been transformed with support being provided at all stages of the research lifecycle. In an area as vast and remote as the NT, with all the challenges this presents, the two librarians have come together in appraising their roles, and the services being provided with a view to a collaborative approach to further enhancing the nature and level of support being provided.

This paper has sought to survey the role of two librarians at different institutions with the challenging goal of supporting high impact research in STEM disciplines in a remote region of Australia. The HSL has strong skills in health-specific resources as required by her role whereas the RSC needs to be across a wide range of discipline areas and her focus tends to be more on educating the researchers so that they can work independently. Nevertheless, it would be beneficial to gain better insight into health databases and the process of preparing for systematic reviews. On the other hand, the RSC will be able to provide support to the HSL in the areas of scholarly communication and open access publishing, as well assisting to design training workshops for a range of researchers. These librarians have taken the initiative to map their roles to the level of skills and capabilities they currently possess. This is with a view to identifying key areas for improvement where one can support the other so they can both continue the lifelong learning journey that is required in the library profession.

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