

Developing integrated research data management support in close relation to doctoral students' research practices

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ABSTRACT

The quest for open research data is the driving force behind the development of the whole area of research data management practices. We, as a university library, offer and develop support to researchers and doctoral students. Based on the result of a web survey submitted to all researchers at Malmö University, and the knowledge that doctoral students are on their way of forming their individual research practices, we have made doctoral students our first target group for specific seminars and workshops promoting conscious research data management practices. We will organise these seminars and workshops, which both take into account the general aspects of research data management and the discipline specific practices, so as to develop integrated research data management support in close relation to doctoral students' research practices.

Keywords

Research data management, training, RDM-support, doctoral students, research practices

INTRODUCTION

There are several reasons for the increased interest in making research data openly available. From the political level and from some research funders the cause is primarily driven as a question of resources: the data produced or collected by public funds is seen as a public resource that may be more beneficial to society (OECD, 2007). Another angle is the quality of the research and that it should be easy to review (Corti et al, 2014). Lastly, it would be helpful for those researchers who want to be open and receive feedback during the research, for example as part of open notebook science (Amsen, n.d.). In this poster we discuss how research libraries can get an understanding for and develop their role in relation to these different

motives. Particularly important is the focus on the local conditions and the research practices of different disciplines.

BACKGROUND

Status of RDM support in Sweden

Research Data Management (RDM) is working with research data throughout the research process, from planning and making research grant application to finishing and archiving. The largest part of the management responsibility falls to the scientists during their research work (Corti et al, 2014). RDM practices vary between the institutions, disciplines and groups of researchers (Borgman, 2015), and in Sweden no comprehensive approach has been taken on a national level for the best practice in the management of research data. In addition, universities lack solutions for electronic archiving and only in some disciplines have research data been made openly available.

In the field of RDM there are many stakeholders. Funders push the question of open research data; some publishers have policies concerning research data, publications of descriptions of open data to come (data journals), national data centres promote skill development, educational institutions create and operate data repositories in parallel with their publication repositories, as well as develop various types of support to researchers. In the European Union (EU) there is a willingness on the political level to increase the accessibility of research data and some EU-funded projects have had stipulations about data processing and data availability (European Commission, 2015; OECD, 2007). It is in this evolving field that researchers, research groups and institutions must navigate in order to meet current and future requirements.

Research and support to researchers at Malmö University

Malmö University was founded in 1998 and it is a young, modern and international university. It has about 24,400 students and offers undergraduate and postgraduate education. At the university there are about 500 professors (including Associate Professors) and more than 200 PhD

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students. Malmö University is a state-governed institution accredited by the Swedish Higher Education Authority.

Malmö University conducts multi-disciplinary research, aiming to contribute to the development of a sustainable society in order to meet the challenges of the future. As a result, our research is frequently pursued in collaboration with partners from outside the university. The researchers co-operate with the business community, with the public sector and with non-profit organisations in various areas such as research on social innovation; sustainable city-planning; biofilm and biological interfaces; and the influence sports have on our society and on public transport of the future.

The university is organised into five faculties:

- Faculty of Culture and Society
- Faculty of Education and Society
- Faculty of Health and Society
- Faculty of Odontology
- Faculty of Technology and Society

All the faculties are multidisciplinary. The range of disciplines spans from history studies to biomedicine.

Support to researchers is organised on different levels – some is close to the departments and some is brought together on a centralised level, for example the grants office and communications office. At the library, research support services constitute core services like access to information resources, information seeking support and guidance, publishing and bibliometric support as well as support in using digital tools in the knowledge production, for example reference managers.

In a study by Tenopir et al. (2014), the most common support from libraries were finding and citing datasets, which can be seen as connected to other types of information seeking support already part of the librarians' area of expertise. However, a range of support services related to research data was identified as part of, or planned for, libraries in the study, such as preparing data management plans and the preparation and description of research data to be deposited in repositories or archives (Tenopir et al., 2014). Nielsen and Hjørland (2014) highlight the potentials for the libraries to play a role in curating data but they also question whether libraries will take the lead in some areas, pointing out the need for very domain specific knowledge in order to select, organise and use research data. This shows that RDM needs a shared effort and that RDM support to researchers demand various expertise and a range of support functions that are involved in the management of research data: in making it available or archiving it and in long-term preservation (see also Verbaan and Cox, 2014). At Malmö University this means that the archive, the library, the IT department, the university lawyer and the information security officer need to work together.

THE QUEST TO DEVELOP RDM SUPPORT

The Malmö University Library's mission includes monitoring and disseminating information on the

development of scientific publishing and research information, including RDM. The goal is to develop adequate support in higher education and, in particular, to identify what the library's support to university researchers should contain.

The library's interest in research data management is based on the development of the library's current activities. To describe the research data in the form of catalogue records or metadata is a key part of the library's activities, as well as making available different types of collections. Support for the publication has become an integral part of the research support, and it is partly linked to publishing open access. Accessibility and findability via search systems are central to the reuse of the publications. The same processes apply to the making available of data, and research issues are partially interlinked.

FROM A GENERAL UNDERSTANDING OF RDM ISSUES TO AN INTEGRATED SUPPORT – WORK IN PROGRESS

Our starting point was to increase the knowledge of and understanding for the different aspects of a full-fledged RDM support. As presented above, it is a new area in the library sector overall and to be able to develop the services in relation to researchers, librarians at Malmö University need a common ground. The common store of knowledge was obtained by following an online course developed by University of Edinburgh (University of Edinburgh, 2014).

Learning more about research data and the related aspects, from law to metadata standards and safety issues, made clear that the disciplinary differences and research practices also have to be included in the development of support for the future. From a general knowledge of the phases of research data management a deeper knowledge on a domain specific level has to be provided for.

PhD students are on their way to become researchers following an education at the same time as they are performing research. A project at the library has analysed what needs the PhD students have and RDM was found to be one area needing strengthening, as the PhD students' different practices have to be taken into consideration (Gullbekk, Rullestad, Calvo, 2013). Additionally, to learn more about the specific needs of Malmö University's researchers, a survey of the current state of handling research data as well as attitudes concerning RDM was conducted. The PhD students were treated as faculty researchers in the survey. The results showed the diversity of research practices between the disciplines at Malmö University.

A WEB SURVEY

A questionnaire was sent to all university researchers (n=601) in December 2015. The response rate was 27% (n=164). A commitment to the issues is visible in the comments submitted. The current state is that a majority of respondents are using open or shared data. In addition, a majority informally shares research data, but only a few have made data openly available, via for example a data archive.

The survey tool Sunet Survey (Survey & Report from Artologik) was used and the survey, as well as the

invitation, was bilingual (Swedish/English). Two direct-addressed mailings were made: an invitation to the survey as well as a reminder six days later.

Survey questions

Ten survey questions were designed to cover different aspects of research data to give an overview. At the same time, the goal was to keep the number of questions in the survey down and thus make it easy to answer in order to increase the response rate. In addition to issues surrounding the research data, there was background and follow-up questions to provide the answers with a context.

Results

The answers have shown the broad character of research at the university. Collection methods are plentiful and the respondents often used both quantitative and qualitative methods. A majority see themselves as very central in the data collection on all types of methods, even on typical quantitative methods. It allows one a close connection to the research data at hand. Many have been using open or shared data. 66 per cent have shared research data, mainly informally, but only six per cent have made data available through a data centre or data archive.

In order to make the research data you are working with open, in what areas would you need more knowledge or more support?	Share
Rights and licenses for open research data	57%
IT support for e.g. database solution, storage or backup	47%
Making research data available (general)	44%
Services for making available research data within your subject	43%
Archiving of research data	41%
Journal requirements regarding open research data	38%
Current and coming demands from research financiers on open research data	37%
Support concerning data management plans	35%
Practical questions/support for making available research data in 2016	31%
Support in data processing and organising data during the research process	27%
Other	11%

Table 1. The need of RDM knowledge or support (n=161).

As for the support or the knowledge that is lacking, more than half of the respondents state rights and licenses surrounding open research data, but all possible answers are chosen in to a fairly large extent (Table 1). The conclusion is that we need more information and knowledge about all aspects of making data and about data management at large.

Some of the comments in the survey show the range of opinions in regards to managing research data and making it available openly. One researcher says:

I like the idea and am open to it if ethical.

And another states quite the opposite:

The idea is alien to me.

A third think it is problematic:

When working qualitatively, it is deeply problematic, because the material is strongly connected to the research questions and probably very difficult to interpret for others who do not have the same ontological and epistemological inputs. Moreover, it is ethically questionable, and therefore no option for my research.

The current situation demands various strategies to meet the researchers' needs in their practices as they are situated in their disciplines. To start with, we have decided to address doctoral students in particular as they are forming their personal research practice and have not yet formed research data management habits.

APPROACHING DOCTORAL STUDENTS

We have identified the doctoral students as a target group for the introduction of RDM. They are not only part of a discipline; they are socialised into a cultures that differ for each research area (Peixoto, 2014). But, at the same time, there are some general themes in RDM, and we will attempt to balance the general with the specific for each research area.

The strategy is divided into two parts. The first part is to get to know the field of RDM by way of a seminar on the subject and a workshop on how to find relevant datasets for the individual dissertation project. The second part is to address existing PhD student courses on research methods (quantitative/qualitative) or ethics and integrate elements of RDM in these courses. In Sweden, a PhD student has to take a number of PhD student courses as part of their dissertation project – some courses may be mandatory and others are optional.

As shown by the answers to the survey question in Table 1, there are several RDM issues to address. Potential workshops for the doctoral students are:

- Finding, re-using and citing open research data. Extending practices of searching and citing to include data, and promoting the use of open data as a data source.
- Active data management plans (DMP) as a personal information management tool (PIM) (e.g. Jones, 2008) for increased control, efficiency and quality, for example based on Michener's ten rules for creating a good data management plan (Michener, 2015).
- Structured practices for organising research data during the research process, including data security, naming files, documentation and backup practices.

- Depositing research data to local archives and publishing datasets for dissemination, including data preparation and a final DMP.

As a complement to this strategy containing seminars and workshops, we will give personal support in and supervision of RDM matters. We will develop workshops and other activities continuously. During autumn, we will approach the PhD students taking a research ethics course and offer them a workshop introducing RDM.

CONCLUSION

The goal is to base the RDM support on the actual needs of the research in the different research practices at Malmö University. No two research practices are the same, as the research areas at the university range from humanities and design to odontology and biomedicine. This presents us with a challenge: How do we support the whole range of doctoral students? The answer must be that we, the staff of the RDM-support, have to have a good general understanding of the different research practices and how to communicate with doctoral students and supervisors in different fields of research.

We will start by focusing on doctoral students as one identified target group, primarily divided into groups based on faculty, in order to address different research practices. Differences have become clear from the survey about research practices. The need for support has to be realised in relation to distinct research practices and the different phases that PhD students are in. This integrated support will both broaden and deepen as we give RDM support to the PhD students throughout their dissertation projects.

The situation today with very little formal RDM training and few researchers disseminating research data in data archives is a far cry from the goals of the EU where “all” publicly funded data are open. Our work in developing this integrated research data management support in close relation to doctoral students’ research practices is a small step, but it is an important one for our PhD students and their RDM practices. Our new experiences will increase the knowledge, which will be nationally shared, about how to address PhD students on data management topics. We will also investigate how we, as a library, can work together with other support functions, e.g. IT-department.

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