Roles and Jobs in the Open Research Scholarly Communications Environment: Analysing Job Descriptions to Predict Future Trends

Nancy Pontika

CORE, Knowledge Media Institute, The Open University, Milton Keynes, UK
pontika.nancy@gmail.com, orcid.org/0000-0002-2091-0402

Abstract

During the past two-decades academic libraries updated current staff job responsibilities or created brand new roles. This allowed them to adapt to scholarly communication developments and consequently enabled them to offer efficient services to their users. The global calls for openly accessible research results has shifted the institutional, national and international focus and their constant evolvement has required the creation of new research positions in academic libraries. This study reports on the findings of an analysis of job descriptions in the open research services as advertised by UK academic libraries.

Method: From March 2015 to March 2017, job advertisements relating to open access, repositories and research data management were collected.

Results: The analysis of the data showed that the primary responsibilities of the open research support staff were: to ensure and facilitate compliance with funders' open access policies, maintain the tools that enable compliance, create reports and collect statistics that measure compliance rates and commit to continuous liaising activities with research stakeholders.

Discussion: It is clear that the open research services is a complex environment, requiring a variety of general and subject specific skill sets, while often a role may involve more than one area of expertise.

Conclusion: The results of this study could benefit prospective employees and universities that wish to embed open research skills in their curriculum.

Keywords: scholarly communications; skills; competencies; open access; research data; repositories

1. Introduction

The advent of technology and the World Wide Web has significantly changed the information landscape and the services around it. In one of these fields, library science, changes occurred during the emergence of electronic publishing, whereby information was hosted and disseminated in a new medium and a number of new tools were integrated with the existing physical library (Peek & Newby, 1996) forming the digital library (Borgman, 1999; Schwartz, 2000). Following the changes in the library environment new skills and qualifications were required from the librarians (Ashcroft, 2004; Biddiscombe, 2001; Kwasik, 2013; Sharp, 2001) who had to adjust to the new conditions, while modernised library titles were formulated, such as the "modern librarian" (Gerolimos & Konsta, 2008), "digital librarian" (Choi & Rasmussen, 2009), or "cybrarian" (Marion, 2001).

Another consequence of technology and electronic publishing was open access; Suber (2012) describes open access as "digital, online, free of charge, and free of most copyright and licensing restrictions." The impact of open access was significant to academic and research libraries, especially when funders and institutions demonstrated their active support with the creation of open access policies. According to ROARMAP[1] there are currently more than 80 open access policies introduced by funders and over 730 from institutions (Picarra, 2012), with the majority of them requiring both the open access availability of the research outputs and a level of compliance monitoring from the academic institutions (Pontika & Rozenberga, 2015). Funders extended their research support agenda and, apart from the mandated policies on open access, have also introduced terms in their policies around research data as well (Cox & Pinfield, 2013).

All these aforementioned developments introduced the use of the institutional repository (thereafter called only repository) in the academic libraries (Jones, Andrew, & MacColl, 2006), which would serve as the medium where

the open access content should be stored both for dissemination and preservation purposes. In an effort to adjust to this fast shaping environment and be aligned with their role as experts in accessing knowledge (Ottaviani & Hank, 2009), academic libraries introduced new roles and offered new services. These relate to open access, research data management (RDM), and the implementation and integration of the repositories that would host research outputs and their affiliated data.

This research paper discusses and reveals the skills required in the UK Higher Educational Institution job market as they were advertised between the years 2015 and 2017. Even though there is published research that discusses how the library profession has transformed drawing conclusions from job descriptions (Blumenthal, Martinez, Murthy & Silver, 2006; Bychowski et al., 2010; McMullen & Felicia, 2013), there is no research with a focus on the range of specialisations in scholarly communications, i.e. open access, institutional repositories and research data management. Instead, the focus is on other fields, for example digital librarians (Choi & Rasmussen, 2009; Park, Lu & Marion, 2009) or digital curators (Kim, Warga & Moen, 2013).

2. Literature Review

Even though no study describes the role of the repository manager, as this is shaped via advertised job descriptions, there is available literature on the requirements of the repository manager role. For example, Swan (2011) states that the role of the repository manager is to collect, curate and disseminate research outputs, show the university's research outputs to the world and demonstrate its impact. For the past ten years there has been a growth in the number of repositories – from 128 in December 2005 to 2,253 in December 2012 (Pinfield et al., 2014) – as these can successfully communicate the amount and quality of research conducted in a university to the outside world and serve as an active circulator of content (Walters, 2007). Since repositories began, efforts were made by SHERPA services to define skills of repository managers by (Robinson, 2008). SHERPA defined the capabilities of a repository manager, as developing strategies and workflows, managing collections and coordinating activities, whilst offering further information on technical matters, metadata, storage, preservation, content, liaising, advocacy and training skills.

An early study (Allard, Mack, & Feltner-Reichert, 2005) investigated the most prominent topics examined in the repositories' literature and where the librarian's role fits in it. The findings from the literature review illustrated that a clear connection between the repository and the library cannot be assumed, but librarians had often mentioned that their tasks not only revolved around working with repositories but had leading roles in offering repositories' training in their own institution. A study (Wickham, 2010) conducted in the UK, showed that there are three main job roles specific to repositories, the (a) repository manager, (b) repository technical developer and (c) repository administrator. During the first years of the development of repositories there was a great need for technical staff, who would develop and install the repositories, but later on the role of the repository manager or administrator became more popular. Staff holding these roles would integrate the repository to the institution's daily workflows by collecting new records, adding them into the repository, controlling the metadata and managing copyrights.

An investigation into Italian repositories (Cassella & Morando, 2012) and the skills of their library staff indicated that the repositories' landscape is rich and requires a large variety of skills, different or specialised than the "traditional" librarian. A similar conclusion emerged from a survey conducted the same year, with Australian and New Zealand repository managers (Simons & Richardson, 2012). The results revealed a disparity in training that current repository staff had received during their first period of managing a repository, indicating that the library staff had inadequate skill sets for the role they were holding.

Two studies also looked at how the roles of existing librarians progressed and how their traditional duties shifted to serving the purposes of the new repository infrastructure in academic libraries. Chan, Kwok, and Yip (2005) showed how reference librarians were given early repository manager responsibilities, such as evaluating repositories prior to the adoption and installation of a repository, development of documentation and guidelines, metadata record checking and collecting research outputs for the enrichment of the repository. Similarly, the University of Oregon libraries (Jenkins, Breakstone, & Hixson, 2005) integrated into the duties of the reference librarians the selection of the repository software that would best fit the institution's needs and its actual design.

Researchers have always produced data, to support their research results. Only recently though – primarily due to funders' research data policies (UKRI, n.d.) – institutions realised the strategic importance of the data produced by researchers (Whyte & Tedds, 2011) and established services to support RDM (Jones, Pryor, & Whyte, 2013). Even though discussions have taken place evaluating whether a library could be the appropriate unit to provide this type of service (Gabridge, 2009; Henty, 2008; Monastersky, 2013), the nature of data processing – which entails familiarity with metadata, retrieval and curation- gave the library the advantage of taking the lead. Tasks such as organising research workflows, providing consultation, offering training to researchers and drafting policies (Lewis, 2010) were traditionally library staff roles.

Nonetheless, the RDM role is complex and the types of support extend to many levels. Auckland (2012) surveyed UK liaison librarians and discovered gaps in the skills of the existing staff that related to offering recommendations on preservation and curation and organising advocacy strategies. A US survey (Tenopir, Birch, & Allard, 2012), had similar results, and exposed a library inefficiency to prepare services in RDM, publish guidelines and offer technical services.

A case study with a UK focus (Cox & Pinfield, 2013) surveyed libraries investigating the type of RDM services, future concerns and fundamental provisions. The results showed that approximately one third of the institutions had an RDM policy in place, the majority of which were developed after an appropriate collaboration with the library's RDM services staff. This clearly demonstrates that academic institutions recognise the connection between RDM and the research services staff. With regards to the skills of staff, only one third of the respondents felt confident that they had a sufficient skill set. The participants mentioned that even though their skills fulfilled some RDM needs, around half of them mentioned that they were doubtful about their capabilities and identified gaps in the overall skills spectrum preventing them from successfully committing to and performing the role.

This research attempts via an analysis of UK job advertisements to offer an understanding of the emerging trends in the roles and jobs of the open scholarly communications environment and to list the essential and desirable requirements of these jobs, so that professionals can equip themselves with appropriate knowledge and skill sets.

3. Method

During the period March 2015 to September 2017, seventy-one UK job adverts relating to open research scholarly communications services were collected. The selection was done manually from job advertising sites, such as Jobs.ac.uk, CILIP Lisjobnet and the *Times Higher Education.* The author subscribed to these services and she received an email each time a position relating to open research services and scholarly communications was published. In addition, the author was a member of some open access and repositories lists, such as the 'Jisc-Repositories,' 'GOAL,' 'OAGoodPractice' and 'UKCoRR-Discussion' – a closed UK only list with members from UK research repositories teams.

To ensure that the jobs collected were within the appropriate range, the author decided on the wording selection criteria and saved job advertisements when the following words were present either in the title or the description:

a) "Open Access," "Repository (-ies)," "Research Data Manager," and
b) "Scholarly Communications," "Research Publications," "Research Services," "Research Support" and "Research".

When the job title included the words from (a) the job advertisement, all the related files would be saved. When the wording from (b) would appear in the job advertisement title, the full text of the job was further scanned and investigated. When a job's full text included words from (a), then the job advertisement would be saved. Each job advertisement could have more than one associated file and when this was the case, they were all saved locally in one folder on the author's personal computer. At the end, all the saved files were examined, a spreadsheet containing all the related data per job advert was generated and used for analysis purposes.

4. Results

The author investigated the saved job advertisements and the associated job descriptions and presents conclusions on:

- number of part-time and full-time jobs advertised,
- their duration – permanent or fixed,

- salary offered per job,
- general and specific skills, and
- types of degrees required.

4.1. Full-Time and Part-Time Jobs, Open-Ended and Fixed

UK HEIs advertised both full time and part time jobs, with the majority of them being open-ended (Table 1). With regards to the duration of the fixed term jobs, a wide variety of periods were offered; the most common fixed term duration for 2015 and 2016 was 12 months 64% and 46% respectively while for 2017 it was 24 months, 67%.

4.2. Salaries

The vast majority of the job advertisements would offer a salary range. As it is shown in Figure 1, even though full time jobs have a wider range than part time jobs, the mean average is approximately the same for both categories. As it was expected, the salaries for the "heads" showed a tendency to go higher than the "non-heads," by approximately £15,000.
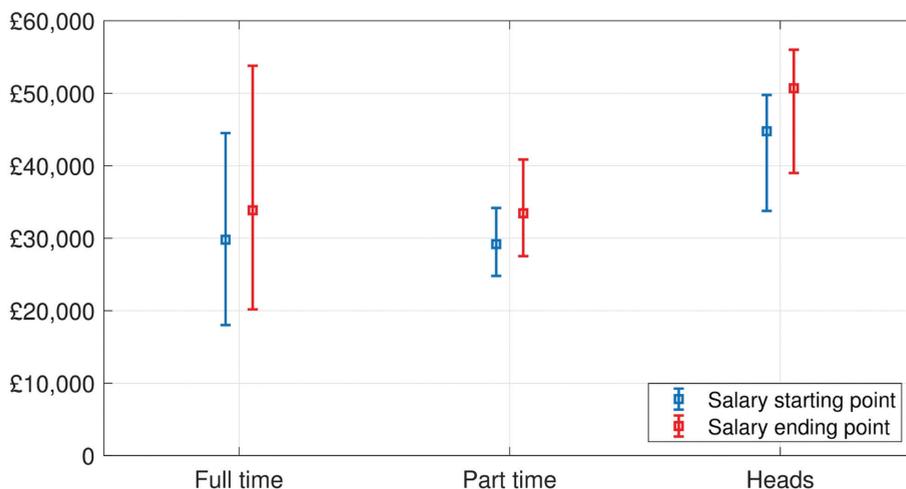
4.3. Required Competences Per Field

The job advertisements presented a set of both general and specific skill sets; the first applied to all open research services positions and the latter defined the subject of expertise. Three subfields in the open research scholarly communications positions were then formulated:

Table 1: Part-time and full-time jobs in relation to permanent and fixed or unspecified.*

Year	F-O	F-F	P-O	P-F	F-U	P-U	Total
2015	7	10	1	1	2	0	21
2016	19	10	3	3	2	0	37
2017	7	3	0	0	1	2	13

*F-O=Full-time – open-ended, F-F=full-time – fixed, P-P=part-time – open-ended.
P-F=Part-time – fixed, F-U=full-time – unspecified, P-U=part-time – unspecified.

Fig. 1: Salary averages per job type.

a. Open Access,
b. Repositories, and
c. Research Data Management.

The general skills contained a broad spectrum of required competences and applied to all three subfields. Conversely, the specific skills had a narrower focus, distinct requirements, extended in detail and were the ones that mainly defined the expertise needed for the job.

4.4. General Competences

A long list of general selection criteria was created from the collected job descriptions and the ones that would appear more often were singled out (Table 2).

As shown both in the counts and percentages columns, the research support professionals are primarily expected in their roles to liaise with research stakeholders. For the open access and research data management positions four kinds of liaising were mentioned: liaise with researchers within the institution, other library colleagues, research and enterprise departments within

Table 2: Most popular general skills as advertised in job descriptions.

Competencies	#	%
Liaise with all research stakeholders	41	58%
Offer advice and counselling to researchers	34	48%
Compose reports and statistics on open access policies' compliance	27	38%
Continuous professional development	26	37%
Offer training and support to researchers	25	35%
Knowledge on copyright, licensing, Intellectual Property Rights	18	25%
Knowledge on scholarly communications	17	24%
Create, manage and follow workflows	15	21%
Keep up with developments in scholarly communication	14	20%
Draft internal policies	9	13%
Update and maintain webpages	9	13%
Knowledge on bibliometrics	8	11%
Plan and develop internal strategies	7	10%
Knowledge on research metrics	6	8%
Communications	6	8%
Knowledge on academic publishing	4	7%
Plan and organise events	3	4%
Negotiation and influencing skills	2	3%
Be flexible	2	3%

the same institution and other external stakeholders, such as publishers. An additional liaising role was expected for the repository manager position, which was communicating with the repository software provider and others peripheral to the repository technical teams.

The second most popular requirement relates to offering guidance, publishing suggestions, recommendations and in general assisting researchers with funders' open access policies' compliance, deposits in the institutional repository, choosing the best open access publication route or managing research data. Research staff were also expected to produce reports to demonstrate compliance rates, an important component with a highly strategic importance for all academic institutions. By considering how much the open research scholarly communications environment has changed recently, it is no surprise that the continuous professional development appeared in twenty-six job advertisements. In some of the open access job advertisements the candidates would anticipate being members of a learned society, such as the Chartered Institute of Library and Information Professionals or the Association of Research Managers and Administrators.

Prospective staff must have other capabilities as well; they should create training materials, plan, design and deliver training, design strategies, draft

policies and have communication, negotiation and influencing skills to promote the library's strategic goals to research stakeholders. They must be knowledgeable of bibliometrics and be well informed on copyright, licensing and intellectual property rights issues. In addition, they should know how to design and maintain workflows on various research support processes and be computer literate so they can update the university's research support related pages.

4.5. Open Access Specific Competences

Apart from the general skills, these jobs described more specific qualifications; for positions relating to open access services and advocacy, these qualifications include (Table 3):

The most important task of the open access services staff was monitoring compliance with funders' open access policies. An important component of compliance monitoring was the article processing charges (APCs), since in the UK there is a gold (publishing an article immediately open access in a journal with an open license) funder open access policy from the UK Research and Innovation[2] councils and the Wellcome Trust.[3] It was also expected that the open access professionals approach APCs from two directions; with regards to the publishers, i.e. understanding their charges and the licenses, but also in relation to the internal workflows and policies.

In addition, staff should be able to interpret policies, advise researchers on the open access publication routes, and even focus on the promotion of green

Table 3: Most popular skills in open access job adverts.

Open access competences	#	%
Open access policy implementation, compliance and monitoring	19	28%
Manage article processing charges and budget	18	25%
Prepare open access advocacy material for awareness	13	18%
Be a member of a professional body	13	18%
Promote and interpret open access policies	11	15%
Act as an open access expert	10	14%
Offer advice on open access publication routes	5	7%
Offer advice on embargo periods	3	4%

open access (self-archiving the eligible version of the published article into a repository) since there is also a green national funder open access policy by the former Higher Education Funding Council for England.[4] Furthermore, they should be able to educate researchers for compliance purposes, advocate for open access and provide training in the related open access infrastructure and tools. These professionals should also be able to liaise with the research academic staff, colleagues, and the copyright staff.

4.6. Repositories Specific Competences

The job advertisements focusing on repository manager positions depicted a rather different set of skills from the open access list. The focus for these was the repositories and the subfields associated with them, while some technical skills were also expected (Table 4).

As we have already seen monitoring compliance with funders' open access policies was the most popular competency in the open access subfield and similarly in this section a set of skills is required to ensure this; some examples were, good knowledge of metadata, bibliographic and technical standards, the ability to edit repository records for metadata updating and apply record corrections. Again, this role does not work in silo, but communication channels are expected, with which the repository manager would be able to promote the repository, assist with the outputs' deposits, and place the

Table 4: Most popular skills in the repository manager job adverts.

Institutional repositories competences	#	%
Ensure records' accuracy and quality	23	32%
Manage and maintain the repository	18	25%
Monitor deposits	14	20%
Promote repository to researchers	11	15%
Assist with the repository deposits	9	13%
Review repository submission workflows	9	13%
Ensure compliance with metadata schemas and standards	8	11%
Make the repository a pivotal source for the Research Excellence Framework	7	10%
Follow international standards for data harvesting and discoverability	6	8%
Ensure compliance with open access policies	5	7%
Discover open access publications	2	3%
Maintain the repository main page	2	3%

Table 5: Most popular skills in the RDM job adverts.

Research Data Management competences	Count	Percentage
Act as the research data management expert	8	11%
Ensure compliance on research data funders' policies	5	7%
Offer practical advice on research data management	3	4%
Ensure digital curation	2	3%
Apply digital preservation standards	2	3%
Interpret user requirements on research data management	2	3%
Advocate for research data management	2	3%

repository in the centre of the open research services. Another priority is the use of international metadata schemas and standards that ensure the open access discoverability of the content from global harvesters, such as CORE,[5] and its reuse in text analytics.

4.7. Research Data Management Specific Competences

Compared to the two aforementioned subfields, the research data manager role is the most recent. The collected job advertisements illustrate the necessary expertise in this field (Table 5).

From a quick look it seems that the counts in this subfield are relatively low, especially when compared to the counts of the open access and repository manager positions. Three different explanations are provided; first, this field is relatively new. Second, there was a low number of job advertisements in this subfield and third it was common for this role to be advertised in connection with one of the other two roles, i.e. open access or repository manager. Overall, the research data manager role lists as primary tasks to "act as the RDM expert" and "ensure compliance with funders' data policies". Since a good understanding of the landscape of RDM is key in this role, these professionals should be knowledgeable in data curation, digital preservation standards and ensure the digital curation of the content.

4.8. Degrees Required

Apart from the general and specific competencies required for each job role, the author analysed the education and experience requirements as these were

Table 6: Level and types of degrees required in open research support services.

Education versus experience	Essential	Desirable
LIS Undergraduate degree	6	0
LIS Master's degree	10	7
LIS Undergraduate or Master's Degree	7	4
Any Undergraduate Degree	17	0
Any Master's Degree	10	1
Equivalent experience	30	2
Experience in Research or Research Degree	3	0

advertised per job. As it is shown in Table 6, there is a wide variety of essential qualifications for the professionals in these fields, while there is a smaller reference to desirable qualifications.

Most of the applications required an equivalent previous working experience, while the type of degree and whether this is in Library and Information Science (LIS) field does not seem to have an impact. An equal number of job postings, ten, demanded a master's degree either in any field and in LIS, while a smaller number of postings, six, sought an undergraduate degree in LIS and a much larger quantity of postings, seventeen, required any undergraduate degree. It is important to mention that there were three job advertisements that called for either a research degree or previous experience with research and all these three jobs were advertising a job with a strong focus on research data management. That could be attributed to the fact that those working in research data should not only have a good familiarity with the research process, but possibly to have conducted research themselves.

5. Discussion

The analysis and results of these seventy-one UK job descriptions of open research services positions has shown not only a large number of general and specific subfield skills, but also a wide variety of different competencies. Due to the rapidly progressing and currently shifting open research environment the research services environment is becoming more complex, a finding that is in agreement with the discoveries of Cassella and Morando (2012). Even though library staff have always been part of the lively library communities

with a focus on supporting their users, it is currently expected from them to extend their capabilities even further and master their communication and liaison skills, so they can not only "sell" the funders' open access policies, but to influence them with their convincing arguments.

Research staff are also expected to interpret complex policies, either internal or external, something that has been also mentioned by Chan et al. (2005). This implies that staff should be experts in the field, understand policies well, be proactive thinkers of the impact and consequences that the complexities of a policy could have to researchers. They should also be in a position to provide solutions to those researchers who, for example, have received funding from more than one funder with non-harmonised open access policies. They should also be keen to communicate and engage with colleagues in other institutions to adopt best practices and workflows and be able to discern the right research stakeholder per specific case.

The skills for the three subfields were mixed; for example, a job advertisement would request expertise on open access and research data management, or, advocacy on open access policies and management of the institutional repository. A possible explanation is that the open research landscape does not have clear lines per subfield and staff knowledgeable in one field could also serve in another field as well; for example, when compliance with funders' open access policies is concerned or with creating advocacy strategies. Another explanation is that academic institutions do not operate with unlimited funding and are not in position to support as many job vacancies as they would wish, but due to the pressure from funders' open access policies they are bound to offer research support. In general, the largest amount of "clean" job descriptions (17), i.e. jobs advertised for only one specific subfield, came from the Russell Group institutions; maybe because they serve a large number of researchers with various cases, their research services teams are large in numbers and they can afford it.

It has already been mentioned in the results section that the reason behind the low count of the RDM jobs in the competencies table was due to the fact that these jobs were often combined with another subfield. Based on the very low number of job advertisements with the title "research data management" – only one job advertisement used the title "research data management" and that was in combination with "open access" – allows us to question whether UK academic institutions have already covered these positions or if there is

a gap? According to Cox and Pinfield's (2013) findings, one third of the academic institutions surveyed reported that they had already a research data management policy in place, leaving two thirds without one. Another study (Cox, Kennan, Lyon, & Pinfield, 2017) indicates that even though libraries are in the favourable position to be more active in RDM, there are limitations prohibiting this effort. For example, lack of leadership, difficulty in establishing effective policies and locating funding and resources. To overcome these barriers requires further investigation. Based on the findings from the aforementioned studies and the fact that this research discovered such a low reference to this subfield we can assume that there is indeed a gap. This could be because either institutions are not aware themselves of the requirements relating to this post and neglect addressing it, do not consider it to be a priority, or do not feel the pressure from funders' policies for compliance monitoring.

Finally, of interest are the findings relating to the degree level and the subject fields that are expected from those who apply for the open research services jobs. It is clear that the degree itself is not sufficient alone to prove knowledge and expertise is validated from the candidate's previous working experience. Academic institutions do not consider a LIS degree, both at the undergraduate or graduate level, to be an advantage. On the contrary, an undergraduate degree in any subject field is expected to work equally well, while for some job advertisements a master's degree in LIS was listed as 'desirable'. These results may imply that the complexity of the field can be successfully addressed by other backgrounds as well. It may also reflect a delay from LIS degrees to embed in their course programme this open research expertise, which explains why a degree in the field is not valued as being important.

6. Conclusion

This research attempted via an analysis of the UK job advertisements to discover all the essential requirements that academic institutions expect from their prospective repository manager employees. The need emerged from the constant developments in the open research and scholarly communications landscape and the willingness to explore how these affect the academic institutions' open research services. This article attempts to close the current literature gap regarding the general and specific skills that prospective job candidates should acquire. It also expects to place future professionals in

the favourable position of being aware of the educational and professional choices and possible career path they need to make in order to succeed in one of these positions.

As these job descriptions could influence LIS future trends and skills, this paper can also serve as useful reading to those who participate in the design of the LIS degree programmes. The committees planning for the future capabilities of the LIS students could introduce to their curriculums the necessary courses that can strengthen the LIS students to become the future open research services professionals.

Further research could involve not only a larger sample of job advertisements originating from a longitudinal study, but also a larger variety of job descriptions advertised in more than one geographical area. These studies could explore both the general and specific skills but also the national funders' open access policies and investigate whether there is a correlation between the required skill sets and the types of green or gold funders' open access policies.

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Notes

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[1] http://roarmap.eprints.org/cgi/search/advanced.

[2] https://www.ukri.org/news/ukri-open-access-update/.

[3] https://wellcome.ac.uk/funding/guidance/charity-open-access-fund.

[4] https://webarchive.nationalarchives.gov.uk/*/http:/www.hefce.ac.uk/.

[5] https://core.ac.uk/.