Preparing for Open Science in Qatar: Study of the Attitudes of Academics towards the QSpace Institutional Repository

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Abstract:

Background: Institutional repositories (IR) are most frequently the first technological encounter of academics with some of the key constituents of open science (open access to articles but also to a wide range of other academic outcomes, including in some cases research data; the possibility to share own research outcome and reuse available data).

Objective: To explore how academics in Qatar University perceive the role of their repositories especially in all aspects related to depositing research outcomes, use and reuse of deposited materials and integrating the use of research repositories in their personal research lifecycles.

Methods: A case study examining attitudes of academics in Qatar University towards the use of their research repository, QSpace. Data were gathered through a mixed methodology approach combining a survey and analysis of the repository usage statistics.

Results: Academics are willing to deposit research items, including research data, but have concerns about copyright. Many repository users are seeking Arabic material although most of the items already there are English language items. Top country views for items vary according to item topic.

Conclusions: Academic users need support and training in copyright to encourage deposit of more items, and research data. Qatar University Library staff should supply more scientometric data on item usage to academic staff to encourage deposit.

Keywords: Open Science, QSpace, Research Data, Attitudes of Academics, Copyright

Introduction

The promotion and support for Open Science (OS) differs across various countries and regions. For example, in Europe the League of European Research Universities recently provided an

extensive vision on the opportunities and challenges for universities in this domain (LERU, 2018). A number of national and European policies established milestones which would capture the progress towards open science, for example The Amsterdam Call for Action for Open Science (ACFAOS, 2016) suggests two major goals for all publicly funded research: achieving full open access (OA) for all resulting scientific publications by 2020, complemented by provision of open data. The advancement of OS is not following the same pattern on other continents which could potentially create a new form of digital divide when scholars around the globe follow different research practices resulting in different scale and impact of their work.

One question which does not have a trivial answer is what is the role of libraries in supporting OS. After all, libraries are offering essential infrastructures for OA and research data management, but is their role limited to repositories or there is a bigger potential for them? Ayris and Ignat (2018) illustrated how developments around green and OA, research data management and citizen science contribute to the culture of OS. They also suggested a four-step test to measure the libraries' engagement in OS which definitely is more ambitious than supporting repositories of publications and data:

> *"1. How are libraries offering leadership in their institution?*
>
> *2. What infrastructure is needed – technical, staffing, resources?*
>
> *3. What new skills are needed to deliver Open Science?*
>
> *4. Does [the library's] advocacy lead to innovation?" (ibid., 21).*

This paper focuses on advancement in the OA domain in Qatar, arguing that for the majority of academics their first encounter with open science is through their engagement in open access. The scientific body of knowledge offers multiple studies exploring the barriers in contributing to OA such as Allen (2015) explored the interdisciplinary differences in perceptions of OA; Bamigbola (2014) studies the attitudes towards the use of IR of researchers in the domain of agriculture; Borrego (2017) compared the use of IR vs ResearchGate among Spanish researchers; Davis & Conollay (2007) evaluated the non-use of IR; Foster & Gibbons (2005) provided insights into ways for improving deposit rates among faculty; Kim (2007, 2010, 2011), Kyriaki-Manessi et al. (2013) and Tmava and Miksa (2017) explored the motivation of academic staff in OA. All these studies look at mostly European academic environments and our example from Qatar will expand the understanding of this topic offering an additional perspective.

Any issues encountered by academics in their experience with OA would delay the adoption of OS–and on the contrary, the positive experience with open access would encourage to look into further 'open' areas, such as open data and open methodologies.

Qatar so far has one institutional open access repository hosted by the Qatar University (QU) Library, QSpace.[1] The major national body supporting research, Qatar National Research Fund, adopted its first data management policy earlier this year[2] and it will take some time to see it implemented in real life.

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[1] https://qspace.qu.edu.qa/
[2] https://www.qnrf.org/en-us/Funding/Policies-Rules-and-Regulations/Data-Management-Plan-Policy

To provide a further idea on the engagement in Qatar with open access, we explored how many events were organized within the International Open Access week which begun back in 2007 across the Middle Eastern and North African (MENA) countries (see Fig.1). The fact that over half of the countries in the region are not involved with the advocacy of OA is indicative; within this region Qatar is among the three forerunners.
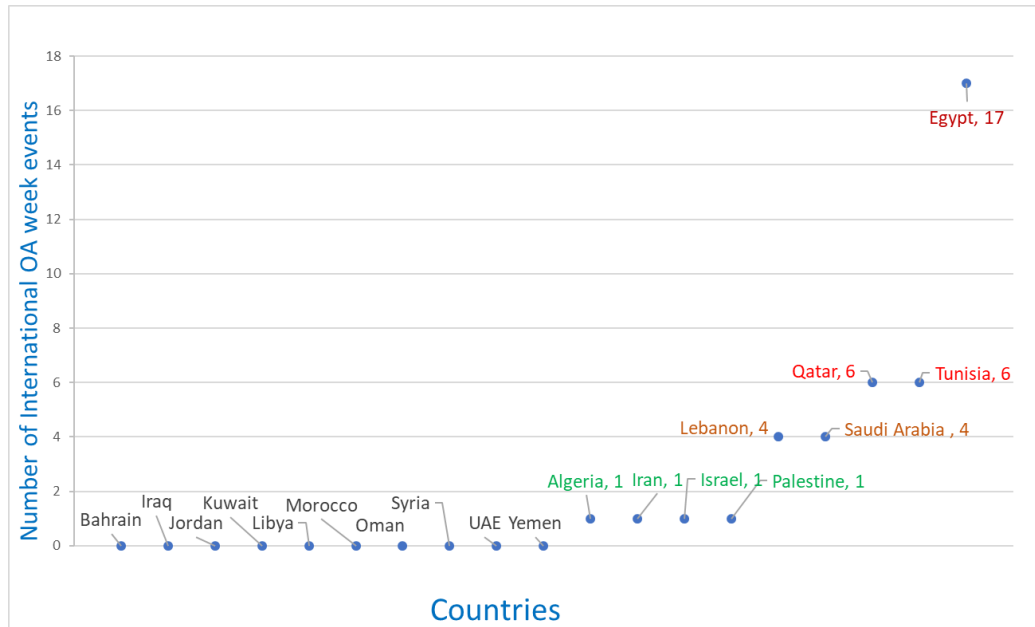

Figure 1: International OA week event in MENA

Considering that there is still relatively little knowledge on the specifics of OA adoption in MENA, we will be taking as an example the development of QSpace and exploring how two types of users – academics contributing to it and end users accessing its content are engaging with it.

The paper explores the following aspects:
1. How institutional repositories contribute to embracing some key concepts from the open science domain?
2. What are the current patterns of engagement of QU academics with the institutional repository and what are the hindering blocks in spreading further its use?
3. What is the engagement with the IR content of users around the globe?
4. What lessons we have learned on the role of library staff in fostering open science research?

Methodology

In our study we are using a mixed methods approach which combines a consultation with academics from QU on the role and use of QSpace via a survey, and observations on the analytics data on the IR use.
The survey was distributed through email targeting all academics and researchers affiliated with QU. The survey excluded non-teaching university staff members. The overall population at the time of distributing the survey (April 2018) was 1423 academics. The number of respondents is 479, equivalent to a response rate of 34%. All respondents are from a single institution, QU.

The survey is a combination of open- and closed-ended questions. To reduce any strain on respondents, all questions were optional. In total 28% of the academics answered all survey questions and further 6% answered the survey partially (this is how the overall survey rate of 34% is composed). In processing the results all responses were considered, including the partial responses due to the underlying principle of flexibility integrated in the survey design.

The survey addressed different aspects of the experience of academics with QSpace, combining their IR awareness, attitudes towards OA and patterns of QSpace use. In addition, we have explored the item level usage statistics available in QSpace to understand what are the patterns of use in the top viewed items in the repository for repository material in English and in Arabic. The top viewed items of the repository helped getting insights about the users' population worldwide and what content of QSpace is attracting most engagement. Observing the engagement patterns, especially for materials in different languages, is an area which is not well addressed in the current literature on OA and we hope that this initial evidence from Qatar will inspire more colleagues to look into the implications of language in OA and respectively in OS.

Evidence from Qatar

Survey Results

The overall survey and its results are discussed in detail in Al Abdulla (2018); for the purposes of this paper we will only present the outcomes related to engagement patterns of academics with the QSpace IR. The survey respondents were offered a set of different attitude statements in order to identify what are the main motivations supporting the use of QSpace. As shown in Table 1, there is no significant variation in the aspects of QSpace which are perceived to be useful. For each statement, the respondents could provide a value from a Likert scale ranging from 1 to 5 where the values of 1 are 2 show low importance of the particular aspect, 3 is "moderate", and 4 and 5 indicate high importance. If rounded to the nearest whole number, the obtained mean for all statements would be equal to 4 but the actual mean values show slight preferences towards some of the suggested areas of importance of the IR with the *ease of locating own's research work* and *providing long-term preservation* being the most popular statements. Overall, most academics demonstrate a positive attitude towards QSpace.

Items	Mean
Make it easy for other people to search for and locate my work.	4.23
Provide long-term preservation of my digital research materials.	4.12
Allow me to search the IR for the most current research findings of my colleagues.	4.05
Preserve the research of the University in a central place.	4.04
Make my research available with very little effort on my part and without my having to maintain a website of my own.	3.96
Make preprint versions of my research available to a worldwide audience.	3.74

Table 1: Academic attitudes and priorities for QSpace

In order to understand further the academics' attitude towards QSpace, a direct question "Would you deposit your publications in QSpace?" had been included in the survey. The response was positive (see Fig. 2) However, when academics were asked if they would share the publication's final version in QSpace, the percentage of the positive responses dropped significantly (Fig. 3). This illustrates one of the concerns of the academics towards the use of QSpace, the insecurity about the rights to share the last revision of their research publications, consistent with results obtained in previous studies.
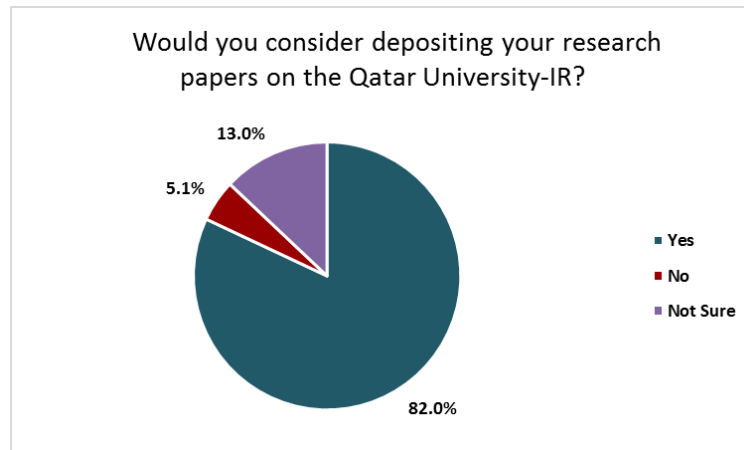

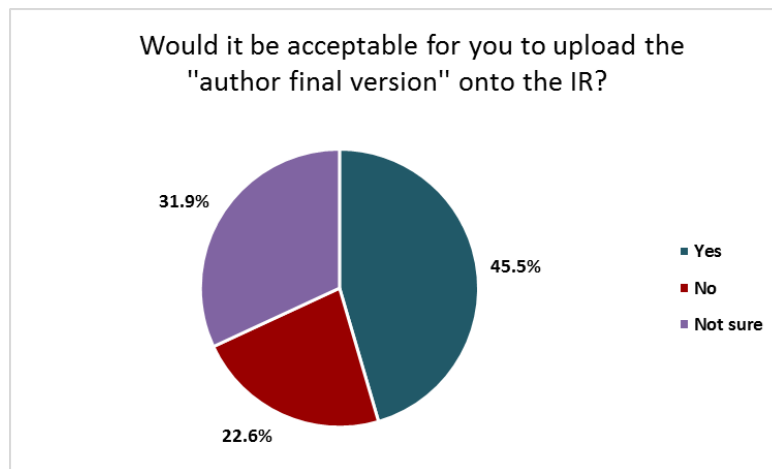Figure 2: Readiness to deposit works in QSpace

Figure 3: Readiness towards uploading 'Author's final version'
to QSpace

This observation is echoed by the responses to the survey questions which explored the reasons preventing authors from depositing their publications in QSpace, and showed that 66.7% of the respondents indicated that the reason for refusing to post their works is copyright issues with publishers. They indicated that the lack of clear explanation about copyright issues and publishers' policies are a big challenge; this influences the mission and role of QSpace to offer the OA environment and services for the academics of QU. In order to ensure proper upload of publication in OA environment where copyrights are preserved, the publisher and the authors should grant their permission.

The rest of responses are divided equally among three answers with a rate of 9.5% respondents for each answer, namely: 'I want to see how policies will be applied', 'I do not compile research papers', and 'I do not have to deposit as long it is not compulsory for all research papers.'

In addition, the importance of QSpace as an environment to deposit research data for academics and researchers is another element which had been explored. More than half of respondents (52.5%) suggest that it is important to have an option for depositing research data, a second pillar of the OS environment which is still not available in QSpace. The high rate of interest to share research data is an important finding which will guide the future development of QSpace.

Engagement of international audiences with QSpace

While the survey data presented above allow to explore what are the attitudes of the potential depositors to QSpace, the academics and research staff, the analysis of the usage statistics of QSpace is indicative on the impact of this unique Qatari OA repository within the global community.

For the purposes of the initial exploration on the international usage of the repository we analysed the statistical data on an item level. This analysis allows to start exploring users' attitude by identifying who are the potential users; this could help future marketing campaigns (both to convince QU academics of the benefits of depositing in the IR, and to increase the engagement with the material in the IR among relevant user communities in Qatar and abroad).

QSpace has two types of statistics which are Repository Level Usage Statistics (RLUS) and Item Level Usage Statistics (ILUS). RLUS allows exploring the most viewed titles or subjects within the repository; it is designed to help understand better the usage of QSpace. In addition, ILUS filters the views of a specific item by country showing the number of people who are accessing a specific item and where they are coming from. This kind of detailed statistics will assist us to explore and to get more information about the users' attitude towards the use of QSpace. The top ten items viewed worldwide in the whole QSpace as presented on Fig. 4.

According to the most popular titles, most end-users visit QSpace to view Arabic content while QSpace caters mostly English language articles. Currently, the English items in the repository outnumber substantially the Arabic ones. According to QSpace browse by language, the number of English materials is around 4000 items whereas the number of Arabic materials is about 2500 items. The preference for Arabic materials probably could support the interpretation that in English language-dominated OA environment the offering in a less prominent language (in terms of content offering) would attract more users to explore such resources, coming from countries where this language is a native one.

For example, if we look at the distribution of full text articles in DOAJ at the time of writing, indicative of the situation with gold OA, the English language articles are dominating the OA resources constituting 85.5% from all resources in the directory (3,537,365 articles out of 4,137,455 in total). There are articles in 77 different languages, some represented by only one submission in the directory. There are 19,668 articles in Arabic language, or only 0.5% from all full text articles. This is disproportionate to the number of native speakers of those languages where English had about 379 million speakers worldwide, and Arabic has 319 million[3]; of course this is not indicative of the ratio of the number of researchers whose native language is

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[3] According to the statistical data on https://www.ethnologue.com/statistics/size.

English or respectively Arabic, but in times of growing citizen science (Dobreva, 2016) and within the OS agenda the accessibility of publications and data in a variety of languages remains one of the areas which need attention.

Statistics

Total Visits

	Views
أمثلة على اختلاف القراءات المتواترة و أثر توجيه القراءة فيها: خمسة نماذج مختارة من سورة)الكهف)الجزء الخامس عشر(	7357
علاقة السياسة اللغوية بالتخطيط اللغوي (دراسة حالات من الوطن العربي)	6631
Deanonymizing tor hidden service users through bitcoin transactions analysis	5720
من أسباب ظهور الفلسفة الأوربية الحديثة : تجليات القصور الفلسفي و العلمي و الروحي لنظرية الإكيلورس في أوريا العصور الوسطى : قراءة تاريخية تحليلية مختصرة	3818
نظرية السعادة عند الفارابي	3754
اللسانيات الإدراكية و تاريخ اللسانيات	3269
السكان في دولة قطر "دراسة ديموجغرافية"	2960
المعاني التواني عند عبد القاهر الجرجاني من خلال : الكناية والاستعارة والتمثيل	2893
Sexist Language in Arabic: The Case of Qatar University Academic and Administrative Staff	2856
العوامل المؤثرة في إكتساب اللغة الثانية وكيفية تحسين تعليمها	2802

Figure 4: The top ten items viewed worldwide in QSpace

Similarly, the data on green OA resources captured by OpenDOAR, show that English and Spanish are the most popular languages within the institutional repositories around the globe for those IRs which are represented in the directory.[4]

Hence the analysis of the users of QSpace provides some interesting food for thought regarding the language of the openly accessible items from the repository. Based on this analysis, the benefit of looking at the language trends is to identify the language preferred by users subsequently focus libraries' campaigns for attracting more OA content to offer stronger collections in the areas of interest. Therefore, the OS movements in Qatar should consider the Arabic intellectual resources and especially the management of Arabic data.

Furthermore, ILUS was used to analyze the top titles viewed by users from all over the world collected from the RLUS. These statistics offer valuable and comparable data such as total visits, total visits per month, full text visits, top country views and top cities views. A useful feature is the top country views, which is the number of views associated with each country. Using these data we can identify how many users are accessing this item for each country. The ILUS also gives an indication about the subjects that the users are interested in.

In this study, we highlight the top country views and the subject interests for users which in turn help understand the use patterns of QSpace users. The most viewed item from the

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[4] According to http://v2.sherpa.ac.uk/view/repository_visualisations/1.html

repository is an Arabic publication from 2006 about the successive Quranic readings entitled "أمثلة على اختلاف القراءات المتواترة وأثر توجيه القراءة فيها: خمسة نماذج مختارة من سورة الكهف من الجزء الخامس عشر". This item had been viewed 7357 times. According to Fig. 5, the ILUS confirmed that it is mostly viewed by users from USA followed by Algeria, Morocco and other countries from the MENA region.

Top country views

	Views
United States	908
Algeria	770
Morocco	540
Yemen	476
Egypt	419
Saudi Arabia	401
Iraq	287
Jordan	262
United Arab Emirates	235
United Kingdom	204

Figure 5: The country views of the most viewed title in QSpace

To check if other articles on the same topic are attracting a similar audience, we selected another title which discusses the same subject and checked the top country views. The publication "اوجه اختلاف القراءات وآثار توجيهها: نماذج مختارة من سورة الإسراء من الجزء الخامس عشر" from 2005 has 904 views only. However, it had been accessed by users from the same countries in different order as illustrated on Fig. 6. We can safely say that those countries appear in the list of the top country views for most of the titles that contain the Quranic Readings subject although their order of appearance may differ. For example, the article entitled, " عناية الإمام ابن القيم بالقراءات" was published in 2008 and has 244 views in total. The USA, Morocco and Algeria are again in the list of the top country views (see Fig. 7).

Top country views

	Views
Morocco	123
Algeria	92
United States	80
Iraq	50
Egypt	45
Malaysia	38
Saudi Arabia	28
United Kingdom	27
Jordan	27
Qatar	27

Figure 6: The country views of an item with Quranic Readings in the title

Top country views

	Views
United States	18
Germany	14
France	9
Poland	8
Qatar	8
Algeria	6
Egypt	6
Saudi Arabia	6
United Kingdom	5
Morocco	4

Figure 7: The country views of another title contains Quranic Readings as subject

According to the RLUS list of the top viewed items in the repository, the second viewed item is also an Arabic language and is entitled "علاقة السياسة اللغوية بالتخطيط اللغوي (دراسة حالات من الوطن العربي)". The item is a student thesis about the language policy and language planning and it had been uploaded to the repository in 2014. As illustrated in Fig. 8, this item accessed by 6633 people, but mostly by users from Algeria which reached 2731 out the total.

Top country views

	Views
Algeria	2731
Morocco	762
United States	491
Saudi Arabia	261
Qatar	231
Iraq	205
Egypt	171
United Kingdom	112
Sudan	86
China	48

Figure 8: The country views of the second most viewed title in QSpace

The third item of the top viewed list is an English language item. It is a student thesis entitled "Deanonymizing Tor hidden service users through bitcoin transactions analysis" completed in 2017. According to ILUS, the item is viewed 5751 times specially in May 2019 with 2259 times out the total as analyzed in Fig. 9. For this item, most users are from Russia (2963 readers). The results showed that the second highest number of viewers was from the USA (572 readers) followed by Ukraine (502 people). The country distribution for this item on a modern economic topic in English follows a very different pattern.

Total Visits Per Month

	January 2019	February 2019	March 2019	April 2019	May 2019	June 2019	July 2019
Deanonymizing tor hidden service users through bitcoin transactions analysis	71	40	52	867	2259	975	67

Top country views

	Views
Russia	2963
United States	572
Ukraine	502
Kazakhstan	246
Germany	160
Belarus	131
United Kingdom	102
Qatar	99
France	85
Armenia	74

Figure 9: The monthly views of the third most viewed item in the QSpace

Another item among those with highest number of views is about Al Farabi, a renowned philosopher and scientist who is well known in the Islamic world. The title was in Arabic language about Al Farabi's concept of happiness and the item had been viewed by 3754 people. This article has been accessed mostly by users from Morocco, Egypt, Algeria and the USA (see Fig. 10). In QSpace there are four Arabic language articles in total about Al Farabi's Philosophy or theories. For all of them Morocco, Egypt, Algeria and the USA are regularly appearing among the countries of the item's top country views list.

Top country views

	Views
Morocco	597
Egypt	419
Algeria	341
United States	310
Syria	194
Iraq	166
Qatar	111
Tunisia	110
United Arab Emirates	70
Lebanon	56

Figure 10: The country views of the fifth most viewed title in QSpace

This type of statistics offers an overview about the popular areas and subjects that engage researchers coming from different countries. This type of analysis offers a useful information towards the QSpace end users' attitude. The library role is to make the best use of these statistics, possibly combined with scientometric analysis on the top titles and providing evidence to QU academics on the impact of their OA presence.

Discussion and Conclusion

While OS is high on the European agenda, countries from other regions are still working on expanding OA, the very first necessary condition for transforming the traditional research practices in OS, benefitting from open data, open methodologies and citizen science.

This paper explores the attitudes of academics towards the use of the first OA IR in Qatar. While OS is still not popular in the academic practice in Qatar, the IR is an important instrument to attract more academics to share and reuse research as an initial step in the OS direction. Our observations show several worth-noting trends related to QSpace:
- The end-users of QSpace prefer the use of Arabic materials although the IR caters mostly English language articles.
- Certain subjects (Quranic studies; philosophy) show repeated patterns of users coming from the same group of countries.
- The data on end-users, potentially combined with scientometric data, can be used to demonstrate the impact of OA to QU academics and increase the submission rate to QSpace.
- Among the QU academics, there is a strong interest in depositing research data, a feature not currently available. However, the management of the repository is planning to work on research data deposit.

- Consistently with other countries, there is a tendency for a very enthusiastic general acceptance of the repository, but when the actual deposit of final versions of own publications is discussed the positive answers drop significantly. One important aspect to address in future training is handling copyright issues, or negotiating agreements with publishers.

Finally, the reflection on the four steps for libraries to engage stronger with OS (Ayris and Ignat, 2018) confirms that QU Library is a potential champion of OS in Qatar. First, it offers leadership not only within its institution but also within the library sector in Qatar. Second, the survey presented above highlighted one necessary future development, research data deposit which would expand the OS opportunities of researchers. Third, over the last years, the library actively supported training of Qatari library professionals in the OA domain. And last but not least, the focus on QSpace users is helping to strengthen the advocacy of the library. This is consistent with the library strategy in building an innovation lab which will hopefully soon support the first OS experiments of QU academics.

Acknowledgments

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