Journal of Librarianship and Scholarly Communication

Volume 3 | Issue 1 eP1208

It Takes More than a Mandate: Factors that Contribute to Increased Rates of Article Deposit to an Institutional Repository

Hui Zhang, Michael Boock, Andrea A. Wirth

Zhang, H, Boock, M, Wirth, AA. (2015). It Takes More than a Mandate: Factors that Contribute to Increased Rates of Article Deposit to an Institutional Repository. *Journal of Librarianship and Scholarly Communication* 3(1):eP1208. http://dx.doi.org/10.7710/2162-3309.1208

© 2015 by the author(s). This open access article is distributed under a Creative Commons Attribution License, which allows unrestricted use, distribution, and reproduction in any medium, providing the original author and source are credited.

JLSC is a quarterly journal sponsored and published by Pacific University Library \mid ISSN 2162-3309 \mid http://jlsc-pub.org

It Takes More than a Mandate: Factors that Contribute to Increased Rates of Article Deposit to an Institutional Repository

Hui Zhang

Digital Application Librarian, Oregon State University Libraries and Press

Michael Boock

Head, Center for Digital Scholarship and Services, Oregon State University Libraries and Press

Andrea Wirth

Science Librarian, Oregon State University Libraries and Press

INTRODUCTION Many institutions have open access (OA) policies that require faculty members to deposit their articles in an institutional repository (IR). A clear motivation is that a policy will result in increased self-archiving. The purpose of this longitudinal study is to compare the impact of a campus-wide OA policy and mediated solicitation of author manuscripts, using quantitative analysis to determine the rate of article deposits over time. **METHODS** Metadata for faculty articles published by authors at Oregon State University between 2011 and 2014 was produced by integrating citation metadata from a bibliographic database and the IR. Author names, affiliations, and other metadata were parsed and matched to compare rates of deposit for three separate time periods relating to different OA promotional strategies. **RESULTS** Direct solicitation of author manuscripts is more successful in facilitating OA than an OA policy—by number of articles deposited as well as the number of unique authors participating. Author affiliation and research areas also have an impact on faculty participation in OA. **DISCUSSION** Outreach to colleges and departments has had a positive effect on rate of deposit for those communities of scholars. Additionally, disciplinary practice may have more influence on its members' participation in OA. **CONCLUSION** Until more federal policies require open access to articles funded by grants, or institutional policies are in place that require article deposit for promotion and tenure, policies will only be as effective as the library mediated processes that are put in place to identify and solicit articles from faculty.

Received: 12/15/2014 Accepted: 01/13/2015

Correspondence: Hui Zhang, Oregon State University Libraries and Press, 121 The Valley Library, Oregon State University, Corvallis, OR 97331-4501, Hui.Zhang@oregonstate.edu



© 2015 Zhang et al. This open access article is distributed under a Creative Commons Attribution 4.0 License (https://creativecommons.org/licenses/by/4.0/)



IMPLICATIONS FOR PRACTICE

- 1. Passing an institutional OA policy does not itself result in an increased rate of article deposit to IRs.
- 2. A coordinated article identification, request, and library-mediated deposit process has been determined to be an effective method for ensuring a relatively high rate of article deposit to IRs.

INTRODUCTION

The Faculty Senate at Oregon State University (OSU) passed a green open access (OA) policy in June 2013 that directs faculty to "provide an electronic copy of the author's accepted (post-peer review, pre-typeset) manuscript" (Faculty Senate Library Committee, 2013) of their articles to OSU Libraries and Press (OSULP) for dissemination via the institutional repository (IR). The policy is a *Type 1* policy according to *Good Practices for University Open Access Policies*, and is similar to those policies passed at Harvard, MIT, and the University of California system in that "[it] grants the institution certain non-exclusive rights to future research articles published by faculty" and offers a deposit waiver option to authors on an article-by-article basis (Shieber & Suber, 2014). Previously, in 2012, OSULP initiated a service (hereafter referred to as the Web of Science Project) to identify newly published articles written by OSU affiliated authors and to request those articles from authors for deposit in the IR.

The question of what motivates faculty to deposit articles in OA repositories has been investigated previously (Kim, 2010; Vincent-Lamarre, Boivin, Gargouri, Lariviere, & Harnad, 2014). However, the findings and discussions primarily focus on author copyright concerns and faculty perceptions of deposit difficulty. There has been little research about the degree to which the passage of university OA policies, outreach activities, mediated deposit services, and other techniques intended to increase the rate of deposit of faculty articles to institutional repositories result in increased deposit rates. This longitudinal study begins to address this gap in the literature through a quantitative analysis of the rate of deposit of OSU faculty articles to the IR, broken down into three time frames: (a) the year prior to initiation of the Web of Science Project; (b) the year after the initiation of the project (prior to campus-wide OA policy); and (c) the year after the campus-wide OA policy passed. It attempts to answer the following questions:

- Research question #1 (Q1): To what extent has the OSULP Web of Science Project resulted in an increased rate of deposit and an increased number of OSU authors depositing articles to the IR?
- Research question #2 (*Q2*): To what extent has the OSU Open Access Policy resulted in an increased rate of deposit and an increased number of OSU authors depositing articles to the IR?

• Research question #3 (Q3): Are faculty from particular colleges at OSU depositing articles at a higher rate than others? Relatedly, are articles published in particular Web of Science subject categories deposited at a higher rate than others?

LITERATURE REVIEW

It has been widely reported in the literature that faculty don't self-archive in IRs without library mediation (Davis & Connolly, 2007; Salo, 2008). Ferreira, Rodrigues, Baptista, and Saraiva (2008) describe efforts at the University of Minho to increase the number of faculty articles deposited to their IR including promotional efforts, value-added services such as download statistics, and the development of a policy. While the University of Minho has a large and relatively successful repository, as judged by Webometrics rankings, it is not clear whether or not this success has been a direct result of these efforts. However, recently Dubinsky (2014) described the growth rate of IRs and ascribed most of the success to work conducted by libraries to request articles rather than any active participation of faculty to self-archive.

A number of authors have investigated the barriers that impede faculty from depositing their articles in OA repositories. Harnad (2006) described three primary reasons that researchers are hesitant to adopt OA: (a) copyright uncertainty; (b) fear of reputational repercussions; and (c) the idea that depositing articles in OA repositories requires too much overhead. Creaser et al. (2010) conducted a study on authors' perceptions of repositories and noted similar issues. Receiving more than 3,000 survey responses and results from four international focus groups, the authors summarized the three most frequently cited concerns towards depositing articles in an OA repository: copyright; ambiguity of embargo period; and the loss of reputation when having scholarly outputs placed with content that has not been peer reviewed. Furthermore, Creaser et al. also noted a difference between researchers from different research fields in their awareness of, and attitudes towards, OA.

The existing literature holds conflicting findings about the effect of OA policies and mandates on increased faculty deposits. Gargouri et al. (2012) found that stronger policies have a positive effect on deposits. The authors collected variables such as total number of deposits and deposit rate for each of 155 institutions that adopted an OA policy and reveal that policy strength has a positive correlation with the number of deposits and the rate of deposits (the number of articles deposited/total number of articles published). Conversely, Xia et al. (2012) suggest that passing a policy does not, on its own, change faculty attitudes regarding OA or deposit practices. Furthermore, the authors emphasize that an OA policy needs to reward faculty who deposit their articles in an OA repository as part of the tenure process.



Vincent-Lamarre et al. (2014) recently explored whether specific characteristics of a policy impact policy effectiveness. The authors crawled 68 IRs at universities with an OA policy to determine the rate of deposit over time. Conditions such as an immediate deposit requirement and deposit required for faculty performance evaluation were determined to have a significant positive influence on deposit rate. Although the study reveals these and other influencing factors for a successful OA policy, it does not discuss the effect of OA outreach activities, author affiliation, or author research discipline on the success of OA policies.

BACKGROUND

As a land grant institution, OSU has long supported the distribution of the scholarship of its faculty and students to citizens of the state and the world in a variety of ways, and the OSU OA policy is a significant milestone in the university's longstanding efforts to make faculty scholarship more broadly available. In 2005, the OSU Faculty Senate passed an OA resolution. The resolution asked "the scholars of...[OSU] to play a part in... open-access and affordable-access endeavors in their various capacities as authors, readers, editors, referees, and members of scientific boards and learned associations" (Faculty Senate Scholarly Communications Task Force, 2005).

Previously, in 2004, OSULP established an IR, one of whose primary purposes was to provide OA to OSU authors' accepted manuscripts of research articles. Over time, the library experimented with a variety of methods and outreach efforts to increase article deposits. In addition to outreach efforts to promote the repository and the benefits of depositing articles, OSULP reviewed faculty vitae to determine which articles could be deposited to the IR and deposited those articles on behalf of faculty members. OSULP also worked closely, one might say opportunistically, with those colleges who demonstrated an interest in OA and the potential of the IR to make their scholarship more widely available.

After the OSU Library Faculty passed the world's first library faculty OA policy in 2009, OSULP worked with individual departments and colleges to pass their own OA policies. College of Oceanic and Atmospheric Sciences (2010), College of Forestry (2011), and Department of Geosciences (2011) policies followed. The rate of deposit increased in these colleges largely because proponents of OA, especially college publications staff, worked with OSULP to solicit articles from faculty in those colleges. College and library staff proactively identified articles that could be deposited and deposited articles on the authors' behalf. This method had the best early result of getting articles into the repository.

It wasn't until the library began using the Web of Science citation database to track new articles published by the OSU community that another significant increase in the number of faculty articles available in the IR occurred. OSULP staff use the Web of Science address

search field and RSS feed features to identify, request, process, and make faculty articles available in the IR.

Beginning with articles published after January 2012, OSULP began inviting OSU authors identified via Web of Science to send their articles to staff at OSULP for deposit to the IR. The procedure continues to evolve, but includes the review of article citations from Web of Science to ensure that the articles are authored by persons with an OSU affiliation. Each article is then categorized according to the version that can be deposited and any publisher-imposed embargo conditions associated with it. Staff send email requests for manuscripts to faculty and deposit the articles in the IR after they are received from the authors.

When an author was from a college that had passed a college-level policy, and the version of record could be deposited, staff deposited the article without getting the author's approval. Final manuscripts were requested from authors when the publisher policies allowed such deposit. After the campus-wide OA policy passed, OSULP staff continued to deposit versions of record when permitted. At this time, OSULP also began requesting final manuscripts for all remaining faculty articles indexed by Web of Science unless a publisher or OSU author explicitly asked that their articles not be placed in the IR under the OA policy. From 2012 through June 13, 2013 (when the OA policy passed), approximately 1,700 articles were eligible for deposit based on publisher policies. Because OSULP no longer checked publisher policies after the OA policy passed, had the OA policy been in effect from 2012 through June 13, 2013, an additional 400 articles (over 2,100 total), would have been eligible out of the 2,600 articles indexed by Web of Science during that time.

METHODS

Citation databases such as Web of Science are regularly used in bibliometrics studies because they provide useful search features and metadata about the works indexed such as author affiliations and citation tracking. In 2014, Web of Science added the option to refine search results by gold OA publications. However, Web of Science does not help identify articles deposited through self-archiving to repositories (green OA). Therefore, the primary methodology developed for this study was to combine OSU publication activity from Web of Science with article metadata exported from the IR in order to determine article rate of deposit.

Data Creation

Web of Science Citations

The body of OSU publications used for this study was determined by using the Web of Science address search field across the three broad subject indexes to which OSU subscribes



(Science Citation Index Expanded, Social Sciences Citation Index, and Arts & Humanities Citation Index) and setting the timespan to January 2011 through October 4, 2014 (the date of the search). Web of Science records were exported into Microsoft Excel and cleaned up (duplicates were removed and non-article records excluded) leaving a total of 6,592 records (#pub_in_WoS) for the study. The distribution of articles by publication year is listed in the table below.

Publication year	2011	2012	2013	Jan-Oct, 2014
Articles	1,615	1 <i>,77</i> 9	1,916	1,282

Table 1. OSU Faculty Publications by Year

Article Metadata from Institutional Repository

The second dataset used in the study was created by exporting metadata for all faculty published articles that have been deposited into OSU's IR following instructions below:

- Metadata-export, a tool provided by the DSpace community, was used to generate this data set by extracting faculty publication records in the IR to a comma separated values file (i.e., csv) format by collections that loosely represent academic units such as colleges and departments of OSU.
- Each metadata record in this dataset was normalized to include the following three columns: title—parsed from the field of *dc.title*; publication date—parsed from the field of *dc.date.issued*; and DOI—parsed from the field of *dc.identifier.doi*.

The results include metadata of research articles from 70 collections with a total number of 6,471 articles published from 1980 to 2014, and 2,302 articles out of this corpus were published between January 2011 and October 2014.

Data Integration

The purpose of the data integration was to identify which articles from the Web of Science citations had been deposited into the IR. The method of integrating the two datasets was supported by Text CSV software, a piece of open source software to facilitate the processing of comma-separated data:

• The integration script searches for articles with an exact match of DOI or title between the two datasets.

- If a match is found, a new column will be appended to the matching article in Web of Science citation.
- Finally, the resulting dataset is capable of indicating whether a faculty article has been deposited into the IR and producing the total number of faculty articles that are deposited in IR and also indexed by Web of Science (#pub_in_IR).

To demonstrate how the data integration works, pseudo code is provided below:

```
open WoS citation as f1, metadata-export from IR as f2
for each line l in f1
search l.DI against all dc.identifier.doi in f2
if match found: append new column 'OA in IR' to l with value 'Y'
else if match not found
search l.TI against all dc.title in f2
if match found: append new column 'OA in IR' to l with value 'Y'
if match not found: append new column 'OA in IR' to l with value 'N'
end if
end
end
```

Data Analysis

The first task of the data analysis was to deal with problematic citations from Web of Science. For instance, some articles from the Web of Science dataset are either missing the entire publication date or have publication date as a range of time (e.g., May-July or FALL). All of the missing data in this study can be classified as missing at random because the probability of having a missing data object (e.g., missing publication date) is unrelated to its value or other variables in the collection (Howell, 2012). The solution adopted by this study to address the missing data (162 out of 6,592 articles) was to simply remove the samples with missing data and conduct the analysis on the remaining 6,430 articles.

The next data analysis task was to parse essential information required for the research such as author affiliation, number of authors, and research areas from the Web of Science citation:

- Author affiliation, the colleges and programs where an author reports, is parsed from the C1 field in the Web of Science citation.
- Number of authors is parsed from the AU (Author) field.
- Research areas of an article are parsed from the Web of Science Category field.

The parsing algorithm extracts desired content by looking up patterns of different fields. For instance, in the C1 field, top-level institutions (e.g., universities) are separated by semi-



colons and second-level academic units (e.g., colleges and departments) are separated by commas shown in the example below:

[Long, A. R.] Texas A&M Univ, Dept Nucl Engn, College Stn, TX 77843 USA; [Gentile, N. A.] Lawrence Livermore Natl Lab, Livermore, CA 94550 USA; [Palmer, T. S.] Oregon State Univ, Corvallis, OR 97333 USA

In the case of parsing research areas, since many journal articles are associated with multiple Web of Science categories, they are counted more than once in the category analysis. For instance, if an article is affiliated with three categories of *Biotechnology & Applied Microbiology, Food Science & Technology*, and *Microbiology*, then each of the three categories will count that same article as a member.

Finally, the degree of OA participation was measured by the article rate of deposit, which is defined as the percentage calculated from the following equation:

#pub_in_IR is the number of articles that are deposited in institutional repository and also indexed by Web of Science, and #pub_in_WoS is the number of total articles indexed by Web of Science citation within the same period of time, determined by article publication date. The time span is set up in one year increments in this study. For example, rate of deposit before the Web of Science Project is calculated as the number of articles from Web of Science citations that have been deposited into the IR divided by the number of articles in Web of Science citations between January 1, 2011 to December 31, 2011, or one year before the project started.

RESULTS

Effect of the Web of Science Project

Most of the articles deposited in the IR can also be found in the Web of Science index. For instance, Web of Science indexed 99% of the 2,302 articles published between 2011 and 2014 that were deposited in the IR. As a result, OSULP initiated the Web of Science Project to identify newly published articles and request copies of these articles for deposit in the IR since January 2012. Table 2 (following page) illustrates that the rates of article deposit jumped to 45% one year after the project started, compared to 12% the year before the project began.

Table 3 (following page) demonstrates the number of unique OSU authors who had articles deposited into the IR before and after the Web of Science Project. The results also

Pre-WoS Project Jan-Dec, 2011	First Year of WoS Jan-Dec, 2012
197	799
1,615	1,779
12.20%	44.91%
	Jan-Dec, 2011 197 1,615

Article in IR: number of open access articles deposited in the IR, WoS: Web of Science Article total: total number of articles published by faculty and indexed in WoS

Table 2. Web of Science Project Impact on Number of Articles Deposited in IR

	Pre-WoS Project	First Year of WoS		
	Jan-Dec, 2011	Jan-Dec, 2012		
OA authors	315	1,176		
Total authors	2,209	2,399		
Percentage	14.26%	49.02%		

OA authors: number of OSU authors who have articles in the IR, WoS: Web of Science Total authors: number of OSU authors in all articles

Table 3. Web of Science Project Impact on Number of Unique Authors in IR

demonstrate the success of the Web of Science Project as the percentage of authors with articles available in the IR increased almost 250% one year after the project.

Effect of Open Access Policy

A university-wide OA policy was approved by OSU faculty senate and took effect on June 13, 2013. The expectation was that the approval of the policy would increase faculty motivation to deposit articles and expand OSULP's ability to request manuscripts. The results, which show a slight decline in the rate of deposit for the one year after the policy was in effect (see Table 4, following page), do not demonstrate increased motivation. Instead, the results suggest that passing an OA policy alone is not a guarantee of increased faculty engagement in OA initiatives. The results may also suggest that faculty may have become disengaged with the Web of Science Project over time, resulting in fewer responses to requests for articles. Additionally, the project's ability to use article versions of record may change over time, affecting the overall deposit rate from year to year.



	Jun 15, 2012 – Jun 15, 2013	Jun 16, 2013 – Jun 15, 2014
Article in IR	747	742
Article total	1,682	1,731
Rate of deposit	44.41%	42.87%

Article in IR: number of open access articles deposited in the IR

Article total: total number of articles published by faculty and indexed in WoS

Table 4. OA Policy Impact on Number of Articles Deposited in IR

The study also shows a slight decrease in the number of OSU authors who deposited their articles in the IR in the year after the OA policy was passed. However, the difference between the two years is too small to conclude that the policy had an impact on this outcome (see Table 5).

	Jun 15, 2012 – Jun 15, 2013	Jun 16, 2013 – Jun 15, 2014
OA authors	1,136	1,087
Total authors	2,322	2,336
Percentage	48.92%	46.53%

OA authors: number of OSU authors who have articles in the IR Total authors: number of OSU authors in all articles

Table 5. OA Policy Impact on Number of Unique Authors in IR

Institutional Repository Deposit Rate by College and Subject

In order to examine whether author affiliation influences the rate of deposit, library staff compiled the rate of article deposit by author-identified unit. A total of 19 author affiliations (e.g., colleges and departments) at OSU were found to have more than 100 articles indexed by Web of Science between January 2011 and October 2014, and the top ten are listed in Table 6 (following page).

For the purpose of equal and easy comparison, the author affiliations are manually aggregated into colleges at OSU and ranked by the number of published articles. As illustrated in Table 7, five out of the ten colleges have a rate of deposit of more than 30%. This suggests that attitudes and practices of particular colleges towards OA have an impact on faculty rate of deposit. This topic is covered in more detail in the discussion section.

Affiliation	OA Articles	Non-OA Articles	Total	OA Rate
Earth, Ocean, & Atmospheric Sciences (College)	340	273	613	55.46%
Botany & Plant Pathology (Department)	129	160	289	44.64%
Forest Ecosystems & Society (Department)	125	156	281	44.48%
Fisheries & Wildlife (Department)	100	142	242	41.32%
Zoology (Department)	93	154	247	37.65%
Mechanical, Industrial, & Manufacturing Engineering (School)	44	103	147	29.93%
Civil & Construction Engineering (School)	40	106	146	27.40%
Electrical Engineering & Computer Science (School)	44	122	166	26.51%
Veterinary Medicine (College)	35	130	165	21.21%
Chemistry (Department)	51	208	259	19.69%

Table 6. Top 10 Author Affiliations by Number of Articles Deposited in IR

College	OA Articles	Non-OA Articles	Total	OA Rate
College of Earth Ocean and Atmosphere Science	297	176	473	62.79%
College of Forestry	199	167	366	54.37%
College of Science	186	174	360	51.67%
College of Agricultural Sciences	369	376	745	49.53%
College of Engineering	207	426	633	32.70%

Table 7. Top Five Colleges by Number of Articles Deposited in IR



Deposit rates by Web of Science subject category are in proximity with the rate of deposit by author affiliation in similar research areas. For instance, the subject category of *Oceanography* has a deposit rate of 57%, which is almost identical to the deposit rate of the *College of Earth, Ocean, and Atmospheric Sciences* at 55%. Because the dataset only includes OSU publications, the overall deposit rate for a subject category will be closely linked to the deposit rates of academic units that cover similar research areas. Table 8 gives the article deposit rate for the top ten subject categories.

Subject Category	OA Articles	Non-OA Articles	Total	OA Rate
Oceanography	176	131	307	57.33%
Geochemistry & Geophysics	74	81	155	47.74%
Marine & Freshwater Biology	91	115	206	44.17%
Geosciences, Multidisciplinary	74	105	179	41.34%
Environmental Sciences	200	317	<i>517</i>	38.68%
Plant Sciences	83	133	216	38.43%
Ecology	227	372	599	37.90%
Agronomy	58	101	159	36.48%
Forestry	96	177	273	35.16%
Biochemistry & Molecular Biology	47	162	209	22.49%

Table 8. Top 10 Web of Science Subject Categories by Number of Articles Deposited in IR

DISCUSSION

Building OA-Friendly Communities with Library-Initiated Outreach

The rate of deposit of OSU scholarly articles increased significantly when OSULP initiated the Web of Science Project to identify and request articles from authors in January 2012. In the calendar year prior to the initiation of that procedure, 197 out of 1,615 articles published in that year were deposited to the IR, a rate of deposit of 11%. Over the course of the following 12 months, after the Web of Science Project began, 45% of articles were deposited by library staff, on behalf of faculty authors. Between June 13, 2013 (the date when OSU OA policy passed) and June 15, 2014, the rate of deposit for articles published

in that time period was 43%, lower than the rate of deposit in the preceding time period (post-Web of Science Project, pre-OSU OA policy).

Despite the passage of the OA policy by the Faculty Senate, faculty authors have not yet increased their deposits to the IR. Although the specific reason for the lack of increased uptake at OSU is not known, local anecdotal evidence as well as the experiences of other institutions (Chen, 2014; Kim, 2010; Vincent-Lamarre et al., 2014) point to lack of awareness of the policy, understanding of the policy, and time constraints as possible reasons.

While it is not possible from this study to determine causation between outreach activities and rate of deposit—overall, by academic unit, and by Web of Science subject—the data does suggest that outreach to particular colleges and departments has had a positive effect on rate of deposit for those communities of scholars. Librarian outreach about the value of OA and the IR has historically been strongest to those communities with the highest rates of deposit—College of Earth, Ocean and Atmospheric Sciences (55%), Department of Botany and Plant Pathology (45%), and College of Forestry (44%).

Years of work with the College of Forestry and College of Earth, Ocean and Atmospheric Sciences to establish their college-level policies and general participation in the IR has resulted in OA advocates throughout those colleges. It is not surprising, then, that these colleges have higher rates of deposit than most others at the university. The fact that these two colleges implemented college-level OA policies prior to the passage of the institution-wide policy, also suggests that passing those college-level policies raised awareness of OA and article deposit at some level and has resulted in a higher rate of deposit among faculty within those colleges. It would be worthwhile to continue to track faculty deposits longitudinally by college in order to determine whether deposits from those colleges continue to show a higher rate of deposit or if they will level off as other colleges become increasingly aware of the university-wide policy.

Limitations

The primary data set for this study is produced from the Web of Science citation database, which covers most scientific fields but is less comprehensive in some disciplines than others (Falagas, Pitsouni, Malietzis, & Pappas, 2008). In consequence, some OSU faculty publications are missing from this data set because they are not included in the Web of Science database. However, based on observations from OSULP staff, faculty self-deposit of articles directly to the institutional repository has always been negligible; and, whether they are indexed in Web of Science or not, this form of article deposit has not increased significantly since the policy was passed.

SC Volume 3, Issue 1

JLSC

This study does not track the rate of faculty publishing in OA journals, because the purpose of the study is to evaluate rate of deposit to the IR. Further research could expand this study to look at other factors on rate of deposit such as whether a co-author is employed by a federal agency or when the results of research are required to be made freely available by federal agencies. When a co-author is employed by a federal agency, OSULP automatically deposits the articles because the articles are deemed to be in the public domain.

Journal archiving policies are another factor not considered here. Articles are automatically deposited by OSULP in cases where the publisher allows such deposit or when there is a co-author employed by a federal agency. As these cases increase or decrease, there will be a corresponding effect on rate of deposit. Finally it is also important to note that one year's worth of post-OA policy data is not enough to draw definitive conclusions about whether there are positive effects of passing an OA policy, and it is impossible to isolate the effect of OSU's policy outreach and implementation services. A related area for future research would be to compare OSU's results with those of other OA policy institutions that rely entirely on faculty self-deposit of articles. The outcome of this comparison could provide further insight on the effectiveness of an OA policy in increasing rate of deposit versus article solicitation and deposit services such as OSULP's Web of Science Project.

CONCLUSION

Adoption of OA at OSU, as measured by the percentage of faculty articles deposited into the IR, has not come solely as a result of the campus-wide OA policy, but is the result of outreach activities and mediated deposit services. The rate of deposit for colleges that have participated in depositing articles and other research to the IR over a substantial period of time, and that had previously passed college-level OA policies, is generally higher than the rate of deposit for other OSU colleges. Librarian outreach about the value of OA and the IR has also historically been strongest to those colleges with the highest rates of deposit.

After an article request and deposit process was initiated to identify, request, and deposit articles from faculty, the rate of deposit at OSU climbed from 11% to 45% and has held steady since, with the passage of an institution-wide OA policy not yet showing a positive effect. With a goal of making as much OSU faculty scholarship OA as possible, the question then becomes: What can be done to further increase the rate of deposit of OSU faculty articles? Perhaps nothing at all can be done internally, and 45% of faculty articles cannot be improved upon.

OSU's OA policy, like the other institutional OA policies in the United States, is not a true mandate. Policy waivers at most, if not all, OA institutions in the United States are

automatically granted upon request. Also, there is no policy enforcement in place at these institutions, so even faculty who are aware of the policies are free to ignore them. Adoption of a University of Liège type policy that requires deposit of articles to the institutional repository in order for them to be considered for promotion and tenure appears to be a long way off in the United States, at least at the institution level.

Until more federal agency policies are implemented that require open access to articles funded by grants, or institutional policies are in place that require article deposit for promotion and tenure review, institutional OA policies will only be as effective as the library mediated processes that are put in place to identify and solicit articles from faculty. Given this, OSULP plans to continue to request newly published articles from faculty and deposit them to the IR on their behalf. The OSU OA policy will continue to be promoted via this mechanism. OSULP will also continue to provide value-added support to help faculty meet less easily ignored (if they want to continue to receive funding) emerging federal agency OA policy requirements.

ACKNOWLEDGEMENTS

Thanks to all the volunteer reviewers whose comments helped to improve this paper.

REFERENCES

Chen, X. (2014). Open access in 2013: Reaching the 50% milestone. *Serials Review*, 40(1), 21-27. http://dx.doi.org/10.1080/00987913.2014.895556

Creaser, C., Fry, J., Greenwood, H., Oppenheim, C., Probets, S., Spezi, V., & White, S. (2010). Authors' awareness and attitudes toward open access repositories. *New Review of Academic Librarianship*, 16(S1), 145-161. http://dx.doi.org/10.1080/13614533.2010.518851

Davis, P. M., & Connolly, M. J. L. (2007). Institutional repositories: Evaluating the reasons for non-use of Cornell University's installation of DSpace. *D-lib Magazine*, *13*(3), 2. Retrieved from http://www.dlib.org/dlib/march07/davis/03davis.html

Dubinsky, E. (2014). A current snapshot of institutional repositories: Growth rate, disciplinary content and faculty contributions. *Journal of Librarianship and Scholarly Communication*, 2(3): eP1167. http://dx.doi.org/10.7710/2162-3309.1167

Faculty Senate Library Committee. (2013). OSU Open Access Policy. Retrieved December 4, 2014 from http://university.edu/sites/default/files/openacesspolicy_final_single_page.pdf

Volume 3, Issue 1

Faculty Senate Scholarly Communications Task Force. (2005). Resolution proposed by the Scholarly Communications Task Force. Retrieved November 26, 2014 from http://university.edu/senate/agen/reports/2005/06d.html

Falagas, M. E., Pitsouni, E. I., Malietzis, G. A., & Pappas, G. (2008). Comparison of PubMed, Scopus, wWeb of Science, and Google Scholar: strengths and weaknesses. *The FASEB Journal*, 22(2), 338-342. http://dx.doi.org/10.1096/fj.07-9492LSF

Ferreira, M., Rodrigues, E., Baptista, A. A., & Saraiva, R. (2008). Carrots and sticks: Some ideas on how to create a successful institutional repository. *D-lib Magazine*, *14*(1), 3. http://dx.doi.org/10.1045/january2008-ferreira

Gargouri, Y., Lariviere, V., Gingras, Y., Brody, T., Carr, L., & Harnad, S. (2012). Testing the Finch hypothesis on green OA mandate ineffectiveness. arXiv preprint arXiv:1210.8174. Retrieved from http://arxiv.org/abs/1210.8174

Harnad, S. (2006). Opening access by overcoming Zeno's paralysis. In N. Jacob (Ed.), *Open Access: Key Strategic, Technical and Economic Aspects*. Oxford: Chandos Publishing. http://dx.doi.org/10.1016/B978-1-84334-203-8.50008-X

Howell, D. (2012). Treatment of missing data. Retrieved September 23, 2014 from http://www.uvm.edu/~dhowell/StatPages/More_Stuff/Missing_Data/Missing.html

Kim, J. (2010). Faculty self-archiving: Motivations and barriers. *Journal of the American Society for Information Science and Technology*, 61(9), 1909-1922. http://dx.doi.org/10.1002/asi.21336

Salo, D. (2008). Innkeeper at the roach motel. *Library Trends*, *57*(2), 98-123. http://dx.doi.org/10.1353/lib.0.0031

Shieber, S., & Suber, P. (2014). Good practices for university open-access policies. Retrieved November 6, 2014 from http://cyber.law.harvard.edu/hoap/Good_practices_for_university_open-access_policies

Vincent-Lamarre, P., Boivin, J., Gargouri, Y., Lariviere, V., & Harnad, S. (2014). Estimating open access mandate effectiveness: I. The MELIBEA Score. arXiv preprint arXiv:1410.2926. Retrieved from http://arxiv.org/abs/1410.2926

Xia, J., Gilchrist, S. B., Smith, N. X. P., Kingery, J. A., Radecki, J. R., Wilhelm, M. L., . . . Mahn, A. J. (2012). A review of open access self-archiving mandate policies. *portal: Libraries and the Academy*, *12*(1), 85-102. http://dx.doi.org/10.1353/pla.2012.0000