

Lisa Johnston and Jon Jeffryes

# Steal this idea

## A library instructors' guide to educating students in data management skills

**A**cademic librarians are increasingly called on to offer training and educational programming on wide-ranging topics to our campus affiliates from information literacy, authors' rights, emerging publishing models, and the latest tools to manage citations and personal information. Recent funding requirements to increase access to the digital data resulting from federally funded research<sup>1</sup> have highlighted an additional area of need for better data management skills and best practices for data sharing.

This shift prompted the Data Information Literacy project,<sup>2</sup> an IMLS-funded project bringing together librarians and researchers from Purdue University, Cornell University, University of Oregon, and University of Minnesota (UM) to better understand and address the data management skills needed by students on our respective campuses.<sup>3</sup>

This article provides a big-picture overview of the work conducted by UM to meet the data literacy needs of our graduate students. We've adapted our instructional approach to data management over the years.

We started with an online, self-paced course<sup>4</sup> in 2012 and then, based on student need and feedback, transformed the training into a comprehensive, multidisciplinary "flipped classroom" five-session workshop series.<sup>5</sup>

After we show you what we've done, we'll tell you how you can take the content we've created and re-use, adapt, and repurpose it for your own students.

### Our approach to teaching a "flipped classroom" data management series

In Fall 2013, the instructors promoted our extracurricular (noncredit) Data Management Workshop Series to UM graduate students an e-mail communication that all graduate students receive on a biweekly basis. This training was advertised as a "Flipped Classroom" series that included seven online videos and five in-person workshop sessions. Participants who signed up for one or more of the five sessions were instructed to watch an online video "lesson" (3 to 9 minutes long) before attending the corresponding hour-long workshop, providing the nonparticipatory instruction at home and facilitating hands-on learning in class (e.g., the flipped classroom approach). Participants that attended all five data management workshops received a certificate of Data Management training for their UM training records. Attendance was completely voluntary and extracurricular.

The following list illustrates the content taught in the Data Management Workshop Series:

- (Online only) Introduction to Data Management
- Session 1: How to Inventory, Store, and Backup Your Data
- Session 2: How to Create Data That You (and Others) Can Understand

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- Session 3: How to Navigate Rights and Ownership of Your Research Data
- Session 4: How to Share Your Data and Ethically Reuse Data Created by Others
- Session 5: How to Digitally Preserve Your Data for the Future
- (Optional homework) Complete Your Data Management Plan

The in-person workshop sessions are highly participatory. Each in-person workshop includes:

1. A concept “check-in” with three-to-four questions (clicker questions embedded in PowerPoint slides) based on the day’s video lesson thus reinforcing the concepts as well as getting everyone on the same page when it came to terminology.

2. Several hands-on exercises and fictitious data scenarios (e.g., “Dr. Trucks studies traffic ...”) allowed students that do not have their own data to fully engage in the activities.

3. Those students who did have data (roughly half of the students in each session) were given the opportunity to directly apply the concepts to their own data in brief worksheet-based exercises.

4. Finally, each session concluded with an assessment in the form of a minute paper that students completed and turned in during class. The minute papers covered both quantitative aspects, such as “Where do you currently store data? (Check all that apply),” and a qualitative question, such as “Briefly describe your backup strategy and any improvements you would like to make in the future.”

At the end of the of the class we also asked students to write down any additional questions they had on the topics covered on the back of the minute paper for follow-up after class. An optional capstone project of this workshop series was to complete and turn in a written data management plan (DMP) addressing the specific and long-term needs of managing their research data, which, if completed, would be reviewed by the instructors.

## Results of the “flipped classroom” approach

After teaching two semesters of an online-only

version of the training,<sup>6</sup> in the Fall 2013 and Winter 2014 sessions we offered the workshop series in our hybrid design. The series was run over six weeks in Fall 2013. Each of the five sessions were offered twice each week, with a cap of 50 enrollees per session to accommodate high interest in enrollment. The workshop sessions were advertised in several ways: an e-mail announcement sent to all graduate students, a post on the library website, and physical in-library posters. As a result, 83 individual students enrolled in at least one of the five sessions. Attendance was a little over 50% on average for the series. A total number of 49 students attended at least one class. Also, 16 students (46% of session 1 attendees) completed all five sessions and received a certificate of data management in their UM training history.

The Winter 2014 session was offered as a workshop each day for one week during Winter break with a cap of 25 student per class. For this session, 31 individual students enrolled in at least one of the five sessions. Attendance averaged 71% for the series with 23 total students attending at least one session and 12 students (60% of session 1 attendees) completed all five sessions and received a certificate of data management in their UM training history. The college affiliation of the two sequences broke out as follows:

- Fall 2013 Data Management Workshop Series Participants by College (n=49)
  - o 29% College of Science & Engineering
  - o 20% College of Liberal Arts
  - o 14% College of Education and Human Development
  - o 12% College of Forestry, Agriculture, and Natural Resources
  - o 25% Other schools/units
- Winter 2014 Data Management Workshop Series Participants by College (n=23)
  - o 30% College of Education and Human Development
  - o 26% College of Liberal Arts
  - o 13% College of Science and Engineering
  - o 9% College of Forestry, Agriculture, and Natural Resources
  - o 22% Other schools/units

The overall feedback on the workshop series was positive. Not only did students continue to attend each of the five sessions, but the students were engaged and actively participated in the hand-on exercises in a meaningful way. Our assessment plan included a four-question evaluative survey sent out to all students that sign-up for library-run workshops. Over all, 24 responses were received out of 72 possible attendees for a 33% response rate. A majority of the respondents (75%, 18) “strongly agreed” that the workshops were delivered in a clear manner. The remaining students either “agreed” (13%, 3) or were neutral (13%, 3).

The useful aspects of the workshops, as reported by the students, included learning about campus services available to them, hands-on exercise, and the group discussions. One student commented, “The one hour sessions went by quickly. The information was relevant and succinctly presented, with references provided for those that wanted to learn more.” Students felt that we might improve the workshop series by including “a more diverse set of examples of research” and by holding longer sessions that would allow for more in-depth coverage of the topics.

Overall, the instructors felt that the benefit of the workshop series was the multidisciplinary setting. Having the students break into groups that included those outside of their home disciplines allowed time for a transfer of skills and best practices to students. Also, the training appeared to offer a good mix of theoretical and practical concepts that kept engagement high. Disadvantages were the acknowledged lack of depth for each session topic. Indeed, the learning objectives were geared to present a broad overview of the major issues of data information literacy to a relatively novice audience. However, in the future, more expert skills should be explored in an advanced version of the workshops, which may or may not work well in a multidisciplinary setting.

### Here's where you come in

We want to share not only what we've learned,

but also the material so that you can use it. We know that building an entire curriculum for a workshop is a huge undertaking (believe us, we know) and with all the other tasks out there it can be difficult to carve out the time needed. To help provide a leg-up, we have made our entire workshop series content (slides, handouts, videos, etc.) openly available for educational use and repurposing.<sup>7</sup>

This instructor version of our site is intended for librarians and other educators of data management in an academic content. On the site you'll find:

- an outline of each workshop session with instructor notes on pacing and group exercises;
- all the materials (slides, worksheets, handouts, scenarios, assessments) that we created to use in the class;
- the online video lessons that students view before the in-person sessions; and
- the content of the series' supporting website.<sup>8</sup>

We invite you use our materials however you see fit: use them as a series, divide them up, rearrange them, add to them, change them radically. The sky's the limit.

### References

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## Notes

1. J. P. Holdren, "Memorandum for the Heads of Executive Departments and Agencies—Increasing Access to the Results of Federally Funded Scientific Research," (2013), accessed February 18, 2014, [www.whitehouse.gov/sites/default/files/microsites/ostp/ostp\\_public\\_access\\_memo\\_2013.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf).

2. See our project site at <http://datainfolit.org>.

3. Jake Carlson, Lisa Johnston, Brian Westra, and Mason Nichols, "Developing an Approach for Data Management Education: A Report from the Data Information Literacy Project,"

*International Journal of Digital Curation* 8, no. 1 (2013): 204-217, accessed February 18, 2014, [www.ijdc.net/index.php/ijdc/article/view/8.1.204](http://www.ijdc.net/index.php/ijdc/article/view/8.1.204).

4. Jon Jeffryes and Lisa Johnston (2013), "An E-Learning Approach to Data Information Literacy Education," 2013 ASEE Annual Conference (Atlanta) accessed May 5, 2014, [www.asee.org/public/conferences/20/papers/6956/view](http://www.asee.org/public/conferences/20/papers/6956/view).

5. The series content is freely available at <http://z.umn.edu/datamgmt14>.

6. Jon Jeffryes and Lisa Johnston, "A Scalable Approach to Data Management Education of Graduate Students" (poster presented at the Data Information Literacy Symposium, West Lafayette, Indiana, September 22-24, 2013), accessed February 18, 2014, <http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1004&context=dilsymposium>.

7. See the entire workshop series content at <http://z.umn.edu/teachdatamgmt>.

8. If you want to see the site as intended for students, visit <http://z.umn.edu/datamgmt14>. *ZZ*

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*("The social media...", cont. from page 430)*

course of content on the Facebook homepage. We will continue using Promoted Posts for this important reason: Promoted Posts appear as regular posts in the News Feed. This strong advantage allows us to locate important content within that space where users primarily see and interact with content.

With a limited investment in ads and with strategically targeted investment in Promoted Posts, advertising on Facebook can result in increased engagement and growth. We are skeptical of the long-term value and cost-effectiveness of ads, and therefore cannot recommend that libraries invest deeply in ads. Promoted Posts, on the other hand, offer a more consistent and cost-effective method for increasing user awareness of library services and resources.

In short, our initial experience shows that paid growth strategies should be approached with restraint and should be built on a foundation of organic growth. Social networking

through Facebook offers libraries new ways to connect with users, and advertising on Facebook offers a tantalizing but unpredictable route for reaching those users.

## Notes

1. Hemant C. Sashittal, Rajendran Srirama-chandramurthy, and Monica Hodis, "Targeting college students on Facebook? How to stop wasting your money," *Business Horizons* 55, no. 5 (2012): 495-507: 499.

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3. Christopher Chan, "Using Online Advertising to Increase the Impact of a Library Facebook Page," *Library Management* 32 (4/5): 361-370; Christopher Chan, "Marketing the Academic Library with Online Social Network Advertising," *Library Management* 33 (8): 479-489.

4. Zeljka Hadija, Susan B. Barnes, and Neil Hair, "Why We Ignore Social Networking Advertising," *Qualitative Market Research: An International Journal* 15 (1): 19-32. *ZZ*