Are Medical Students Comfortable Managing Research Data?

Rebecca Reznik-Zellen

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NEGEA Annual Retreat 2014
Context

- Data are becoming a more visible part of the scholarly record.
  - Funder requirements are emerging. ([OSTP](https://www.ostp.gov))
  - Publication requirements are evolving. ([PLoS ONE](https://journals.plos.org))
  - Cultural expectations are growing. ([DataBib](https://www.databib.org))
  - Citation standards are being established. ([DataCite](https://www.datacite.org))
  - Impact measures are developing. ([Impactstory](https://impactstory.org))
Data literacy is not a formal component in most undergraduate and graduate student curricula.


A medical student’s work life is demanding.

Libraries have been filling in the gaps for education and training on research data management.

- Data Information Literacy program (Purdue)
- New England Collaborative Data Management Curriculum (UMMS)
- MANTRA (Edinburgh)
UMMS

- Founded 1962
  - School of Medicine
  - Graduate School of Biomedical Sciences
  - Graduate School of Nursing
- 1100 students
- $240 million in federal and private research grants (FY13)
  - Top quartile for NIH funding
Objectives

- Determine baseline for comfort and familiarity with data management concepts
- Identify needed resources and training opportunities on campus
Method

- Developed 20+ question online survey covering enrollment, experiences, and attitudes
- Opened survey between February 2 and March 14, 2014 to 1108 GSBS, GSN, and SOM students
- Received 141 complete responses (12.6%)
Research is a significant component of student life at UMMS. However, few students receive or have prior training in managing research data and few students are aware of funding agency requirements for data sharing.
Overall, 74% of respondents are either actively involved in research or are considering joining or undertaking a research project.
Respondents with prior training by school (n=135)

<table>
<thead>
<tr>
<th>School</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSBS</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>GSN</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>SOM</td>
<td>67</td>
<td>10</td>
</tr>
</tbody>
</table>

81% overall have no data management training

Respondents aware of funding agency requirements by school (n=138)

<table>
<thead>
<tr>
<th>School</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSBS</td>
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<td>12</td>
</tr>
<tr>
<td>GSN</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>SOM</td>
<td>68</td>
<td>9</td>
</tr>
</tbody>
</table>

79% overall are unaware of agency requirements
Findings

2. In general, GSBS respondents score themselves higher than GSN or SOM respondents on their comfort with and awareness of data management activities and best practices.

Most respondents do not find data management to be a barrier to research productivity.
Familiarity with data management activities by school
(n=113)

Average Familiarity

<table>
<thead>
<tr>
<th>School</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>57.15</td>
</tr>
<tr>
<td>GSBS</td>
<td>75.33</td>
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<tr>
<td>GSN</td>
<td>57.94</td>
</tr>
<tr>
<td>SOM</td>
<td>50.00</td>
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</tbody>
</table>
Awareness of data management best practices by school (n=109)

Self-scoring scale 1–100

Average Awareness

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Overall</td>
<td>41.09</td>
</tr>
<tr>
<td>GSBS</td>
<td>51.76</td>
</tr>
<tr>
<td>GSN</td>
<td>52.05</td>
</tr>
<tr>
<td>SOM</td>
<td>33.78</td>
</tr>
</tbody>
</table>
Productivity

71% of respondents overall do not perceive data management to be a bottleneck for productivity in their projects or labs.
Findings

3. There is a need for both formal and informal data management training programs across the schools that address best practices for data management in general as well as common challenges that students face with data management.
Respondents that would want data management training by school (n=138)

<table>
<thead>
<tr>
<th>School</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSBS</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>GSN</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>SOM</td>
<td>32</td>
<td>45</td>
</tr>
</tbody>
</table>

66% overall would like to receive training, documentation, or guidance on data management practices
Respondents that would take a formal curriculum component on data management by school (n=137)

<table>
<thead>
<tr>
<th>School</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSBS</td>
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<tr>
<td>GSN</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>SOM</td>
<td>44</td>
<td>32</td>
</tr>
</tbody>
</table>

Formal curriculum component

50% would take an elective or other formal curriculum component on data management.
The Library makes the following recommendations based on the results of this survey.

- Develop/launch a combination of formal and informal multi-modal courses tailored by school, year, and topic.
- Partner with Information Technology and the Office of Research funding for course content and delivery.
- Conduct a similar survey among faculty to draw parallels and compare responses among cohorts.
Library Data Services Advisory Group

- October 2013
- Established cross-institutional group to assist with needs assessment and provide strategic direction for library-based data support services. This group includes members of IT, Quantitative Health Sciences, and the Office of Research and provides important external perspective.

Image credit: Dorothy Byatt, http:// datapool.soton.ac.uk/tag/research-data/  

Assessment of Doctoral Biomedical Student Research Data Management Needs

- November 2013
- Conducted a survey among GSBS PhD students to explore the specific institutional repository (IR) data management needs of the University’s biomedical sciences doctoral students. See poster for details.

Figure and project credit: Kate Thornhill /Lisa Palmer

Identification of Existing Services and Policies

- November/December 2013
- Identified and collected existing university policies and services relevant to the management of research data. This activity demonstrated the existing options for support as well as gaps in oversight of research data.

Photo credit: Greg Schupe Photography

Student Data Management Survey

- February/March 2014
- Conducted a survey among GSBS, GSN DNP and PhD, and SOM undergraduate students to gauge their comfort with and awareness of data management activities and best practices. The study was designed to identify needed resources and instruction opportunities on campus.

Faculty and Administrator Interviews

- February/March 2014
- Participated in third and final DuraSpace/ARL/CLIR eScience Institute. The program facilitates collaboration among different institutional entities with the goal of developing a strategic agenda for research data support services.

Photo credit: http://www.duraspace.org/e-science-institute
Thank You

- Rebecca.Reznik-Zellen@umassmed.edu
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Shout out
- Len Levin
- Sally Gore
- Lisa Palmer
- Donna Kafel
- Andrew Creamer