Research Ethics throughout the Curriculum: Promoting Scholarly Integrity at the University of Arizona

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Acknowledgements:
Elizabeth Boyd, Ph.D.
Tina Tarin
Goals of the Project

• To build an integrated RCR training program that:
  
  • maximizes opportunities for exposure to concepts and best practices;
  
  • provides multiple levels of engagement for students, trainees, and faculty;
  
  • and engages individuals through multiple modes of interaction.
CGS PSI Project Activities @ UA

- **Full-day Conference**

- **Half-day workshops**

- **Small grants program**

- **Resource Center**
The Institutional Activities Assessment

- What did we learn from assessment of institutional and program activities that support research ethics education?
  - RCR/ethics education in the Graduate College and the University is dispersed, variable, and inconsistent
  - Low response may rate reflect communication obstacles, survey fatigue, and relevance issues
  - Terminology may bias some disciplines
  - General campus climate regarding central administration
Dept holds RCR forums/speakers/classes?

<table>
<thead>
<tr>
<th>Response</th>
<th>Yes</th>
<th>No</th>
<th>In planning phase</th>
<th>Don't know</th>
<th>Not applicable to this department/program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Percent</td>
<td>42.2%</td>
<td>46.7%</td>
<td>4.4%</td>
<td>2.2%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Response Count</td>
<td>19</td>
<td>21</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Answered question:** 45  
**Skipped question:** 8  

### Department Breakdown:

- **Science/Ag:** %Yes: 50%, %No: 50%
- **Social/Educ:** %Yes: 80%, %No: 20%
- **Engineering:** %Yes: 70%, %No: 30%
- **HealthSci:** %Yes: 60%, %No: 40%
- **GIDP:** %Yes: 60%, %No: 40%
- **Hum/Arts/Arch:** %Yes: 40%, %No: 60%
Dept requires RCR training for...?
Faculty to trainee/grad RCR role in P&T?
How do **grad students** learn about RCR topics?

<table>
<thead>
<tr>
<th>Topic</th>
<th>Advisor or Mentor</th>
<th>Courses (classroom)</th>
<th>Workshops (e.g., RCR)</th>
<th>Printed materials</th>
<th>Web-based materials (e.g., online modules)</th>
<th>No Resource</th>
<th>N/A</th>
<th>N/A</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data acquisition, management, sharing, and ownership</td>
<td>85.0% (34)</td>
<td>47.5% (19)</td>
<td>12.5% (5)</td>
<td>15.0% (6)</td>
<td>17.5% (7)</td>
<td>0.0% (0)</td>
<td>5.0%</td>
<td>2.0%</td>
<td>40</td>
</tr>
<tr>
<td>Conflicts of interest and commitment</td>
<td>80.0% (32)</td>
<td>37.5% (15)</td>
<td>12.5% (5)</td>
<td>17.5% (7)</td>
<td>22.5% (9)</td>
<td>7.5% (3)</td>
<td>5.0%</td>
<td>2.0%</td>
<td>40</td>
</tr>
<tr>
<td>Use of human participants in research</td>
<td>72.5% (29)</td>
<td>45.0% (18)</td>
<td>15.0% (6)</td>
<td>27.5% (11)</td>
<td>42.5% (17)</td>
<td>0.0% (0)</td>
<td>17.5%</td>
<td>7.0%</td>
<td>40</td>
</tr>
<tr>
<td>Use of animals in research</td>
<td>37.5% (15)</td>
<td>12.5% (5)</td>
<td>5.0% (2)</td>
<td>17.5% (7)</td>
<td>17.5% (7)</td>
<td>2.5% (1)</td>
<td>57.5%</td>
<td>23.0%</td>
<td>40</td>
</tr>
<tr>
<td>Use of hazardous substances</td>
<td>47.5% (19)</td>
<td>20.0% (8)</td>
<td>22.5% (9)</td>
<td>25.0% (10)</td>
<td>20.0% (8)</td>
<td>2.5% (1)</td>
<td>42.5%</td>
<td>17.5%</td>
<td>40</td>
</tr>
<tr>
<td>Research misconduct</td>
<td>84.6% (33)</td>
<td>31.3% (20)</td>
<td>15.4% (6)</td>
<td>20.5% (8)</td>
<td>23.1% (9)</td>
<td>5.1% (2)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>39</td>
</tr>
<tr>
<td>Publication practices and responsible authorship (including plagiarism)</td>
<td>87.2% (34)</td>
<td>33.8% (21)</td>
<td>17.9% (7)</td>
<td>25.6% (10)</td>
<td>20.5% (8)</td>
<td>5.1% (2)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>39</td>
</tr>
<tr>
<td>Mentor and trainee responsibilities</td>
<td>82.5% (33)</td>
<td>37.5% (15)</td>
<td>7.5% (3)</td>
<td>7.5% (3)</td>
<td>2.5% (1)</td>
<td>5.0% (2)</td>
<td>10.0%</td>
<td>4.0%</td>
<td>40</td>
</tr>
<tr>
<td>Peer review (manuscript, grant, research and publication processes)</td>
<td>87.5% (35)</td>
<td>32.5% (21)</td>
<td>7.5% (3)</td>
<td>15.0% (6)</td>
<td>10.0% (4)</td>
<td>5.0% (2)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>40</td>
</tr>
<tr>
<td>Collaborative research</td>
<td>87.2% (34)</td>
<td>41.0% (16)</td>
<td>2.6% (1)</td>
<td>10.3% (4)</td>
<td>7.7% (3)</td>
<td>2.6% (1)</td>
<td>2.6%</td>
<td>1.0%</td>
<td>39</td>
</tr>
<tr>
<td>Personnel Management</td>
<td>54.1% (20)</td>
<td>18.9% (7)</td>
<td>2.7% (1)</td>
<td>5.4% (2)</td>
<td>2.7% (1)</td>
<td>10.8% (4)</td>
<td>29.7%</td>
<td>11.0%</td>
<td>37</td>
</tr>
<tr>
<td>Financial Stewardship/Grant Management</td>
<td>57.3% (22)</td>
<td>15.8% (6)</td>
<td>2.6% (1)</td>
<td>7.9% (3)</td>
<td>7.9% (3)</td>
<td>10.5% (4)</td>
<td>23.7%</td>
<td>9.0%</td>
<td>38</td>
</tr>
</tbody>
</table>

Other methods (please fill in box): 6

Answered question: 40

Skipped question: 13
Outcomes of Activities Assessment

• **Areas for Intervention**
  - Responses for Humanities and Arts (did they ignore this because they saw it as not relevant to their field?)
  - RCR interpretation/explanation in Health Sciences
  - RCR activities/classes in Engineering and Sciences
  - Add RCR statement/info on all dept websites
  - Increase “difficult discussions” in Science and Engineering
  - Programs for postdocs and techs (orientation & in service)
  - Ways to engage faculty in RCR programs (beyond online IRB)

• **Some challenges and some (simple) solutions:**
  - Who to target?
  - What to present?
  - When to reach your audience?
  - How to deliver content?
Who to target?

- **Challenge**: Identifying audiences and providing instruction

- **A Solution**: Central role for graduate students in driving RCR training
  - Grad-to-grad
  - Grad w/ faculty
  - Grad-to-undergrad
What to present?

• **Challenge**: RCR represents a broad range of issues and topics, only some of which will be relevant for most audiences.

• Broad-based RCR training helps orient trainees to underlying issues, but is challenging to deliver in an engaging way.

• **A Solution**: Thematic or topic-driven approach
When to reach your audience?

- **Challenge**: Trainees at different stages of their careers may have different needs and different understandings of critical issues.
- **A Solution**: Target particular career-stages
How to deliver RCR content? #1

- **Challenge**: Traditional teaching methods may make RCR seem abstract, compliance-oriented rather than values-based.
- **A Solution**: Locate RCR within the issues at the heart of our disciplines.
How to deliver RCR content? #2

• **Challenge**: Traditional teaching methods may make RCR seem abstract, compliance-oriented rather than values-based.

• **A Solution**: Locate RCR within the issues at the heart of our disciplines.
Climate Integrity Survey (>%4.5)

- Thrush/Martinson survey instrument
- Aimed at all researchers
- ~1700 individual responses (~15%)
How beneficial would it be for people in your department/program to receive additional instruction in responsible research practices?
How able are people in your department/program to define research misconduct?

**Life Sciences (%>4.5)**

- Undergraduate Student
- Graduate Student in a Course-based Masters Program
- Graduate Student in a Research Masters Program
- Graduate Student in a Doctoral Program
- Support Staff / Technician
- Postdoctoral Trainee / Research Associate
- Fixed-term Faculty; Not Tenure-track
- Tenure-track Faculty; Not Tenured
- Tenure-Tack Faculty; Tenured
- Clinical Faculty
- Research Scientist
After working with “Carrots”, a “Stick” was introduced: NIH & NSF Regulations

- Resource & how-to web pages
- More workshops
  - Developed set of workshop presenters from faculty etc.
  - Offer multiple topics in interactive sessions
    - Role plays, talks, difficult discussions, web resources, etc.
- Got people’s attention and enabled us to assist in meeting compliance requirements
Final Thoughts ...

- New regulations helped motivate students/faculty to seek out RCR training opportunities, but also tended to shape their expectations toward more traditional ways of learning.
- Designing and delivering high-quality RCR training is labor-intensive and time-consuming – how do we sustain the initial energy, especially in difficult economic times?
- Motivating faculty to do more or to change what they have been doing is the most difficult challenge of all. Our efforts were hampered by packed schedules and curricula, poor communication systems, and ‘old’ ways of thinking.
- Graduate students are creative, motivated, and keenly aware of many of the core RCR issues. They are the future of RCR...