Lab Safety Training in a Web 2.0 World

Ralph Stuart, CIH
Chemical Hygiene Officer
Cornell University

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Topics to Cover

• The Puzzle of Safety Outreach
• The Emerging Learning Environment in Higher Education (and the wider world)
• Safety Information and Web 2.0
• Connecting our Audiences with our Content
The Safety Outreach Puzzle: Where Do We Start?

Laboratory Chemical Safety Outreach Program

Training

Knowledge
Perception is a function of culture (group) and attitude (individual)

Education

Decisions lead to behaviors which create safety conditions
Lab Safety: Training or Education?

A 2010 review of safety training research says:

• **Training** refers to *planned efforts* to facilitate the learning of specific competencies...needed for success in a *particular environment*. However, the distinction between *training* and *education* is not always clear.

• The review team was unable to make recommendations about the nature of training (e.g. level of engagement, computer versus lecture, number of sessions).

(I think the answer is “Both”)
Why Do We Do Lab Safety Training?

To clarify EHS priorities
1. Health and Safety (both personal and community)
2. Regulatory Compliance
3. Laboratory Productivity
4. Safety Education

To address External Pressures
• Legal expectations
• CSB recommendations
• ACS report on graduate chemistry education
• Concerns of funding agencies
Why Lab Safety Education?

- Student Interest
- To support the Research Mission
  - Interdisciplinary challenges
  - New perspective on the work
- Ongoing Changes
  - Changing science
  - Changing facilities
  - Changing information technologies
So what Learning Culture are we working in?

The “Flipped Classroom”

The flipped classroom is enabled by new technologies and leads to peer learning.
What Information Ecosystem are we in?

- **1990 – 2000: Web 1.0 = e-mail + web**
  - Information is managed for delivery from point A to person or group B

- **1995 – 2005: Web 1.5 = search engines**
  - Search engines find interesting things that weren’t written for you
2005 – present: Web 2.0

• In Web 2.0, there is so much information available that “curators” are needed to help filter and sort it.

• These curators can be professional peers or support staff (EHS or librarians)

• *Usability* and *participation* is a key element in making this information useful (and used).
A Web 2.0 Example:
What Can Lab Vent Do For You?

Interactive Prezi version at
http://tinyurl.com/lab-vent-and-you
A Model:
CDC and APHL Biosafety Competencies

Divides the audience into three groups:
• Entry Level
• Mid-level
• Senior level

Identifies 4 Competency Domains
• Domain I: Potential hazards
• Domain II: Hazard controls
• Domain III: Administrative controls
• Domain IV: Emergency preparedness

Acknowledges the importance of a “Culture of Safety”
The Lab Chemical Safety Audience in Academia

Laboratory Safety Audiences

Based on training requests at Cornell, there are 7 audiences for chemical safety training in the lab:

- Laboratory visitors and class labs
- Entry level lab workers
- Mid level workers
- Core Facility Personnel
- Laboratory supervisors
- Laboratory support staff
- Environmental Health and Safety staff
Defining the Content

The content is based on the RAMP paradigm

All lab workers need to understand their role to:

- Being **aware** of EHS issues
- **Recognize** hazards
- **Assess** risks
- **Manage** lab hazards
- **Prepare** for Emergencies
- **Protect** the Environment

at different levels, depending on their role
Putting the Two Together

This table describes the skills appropriate for the 7 different roles.

The Excel version of this is available at http://tinyurl.com/chem-safe-comp or e-mail me and I’ll be glad to send you a copy.
## A Sample of the Table

<table>
<thead>
<tr>
<th></th>
<th>Visitors and class labs</th>
<th>Entry level (also includes skills to the left)</th>
<th>Midlevel (also includes skills to the left)</th>
<th>Core Facility Personnel (also includes skills to the left)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hazard Assessment</strong></td>
<td>Recognize situations which are not developing as outlined in the standard operating procedure</td>
<td>Understand laboratory-specific safety signage and identify safety concerns in an operating laboratory</td>
<td>With the assistance of EHS professionals, make control banding assignments for general lab safety issues and conduct pre-operational hazard reviews for specific processes of high concern</td>
<td>Track laboratory safety incidents in their laboratory and in similar laboratories at other institutions in order to identify potential emerging risks</td>
</tr>
<tr>
<td><strong>Specific Skills Associated with the Competency</strong></td>
<td>Identification of unusual situations such as chemical spills, odors and other potentially unplanned hazards and bring them to the attention of the laboratory supervisor</td>
<td>Observe laboratory signage and report confusion or discrepancies to laboratory supervisor</td>
<td>Train entry level lab workers in protective practices associated with control band process; develop SOPs for high hazard processes</td>
<td>Identify literature sources which describe best safety practices and laboratory incidents in their field</td>
</tr>
</tbody>
</table>
Two Way Learning

See video Lessons Learned - Maintaining Situational Awareness and Facial Protection

on the CornellEHS YouTube channel
Moving Forward

We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction.

Bill Gates
Cornell Lab Safety twitter feed:
@cornelllabsafe

American Chemical Society Division of Chemical Health and Safety:
@acsdchhas

Laboratory Sustainability News:
@labsustain