The Development of a University Laboratory Safety Training Center: An Adventure In Collaboration

Holly Gates-Mayer
Objectives

• Understand the process that CU Boulder EHS to secure funding for this project
• Identify different sources of funding that may be available
• Recognize the value of collaboration with a variety of different parties with different interests in the project
• Recognize the challenges and opportunities that are inherent in a project like this
• Evaluate the immediate and long term goals for this type of project
Laboratory Safety Training

• The Need
  • When mistakes happen in the lab ......
    • Disruptive
    • Costly
    • Dangerous
    • Potentially Deadly

• Current Training
  • Need to include a hands on component
    • Create an opportunity for class involvement
    • Safe environment to make mistakes
    • Demonstrate appropriate safety practices
    • Encourage problem solving

(Source: Stanford University, Use of open flames in Cabinets/Tissue Culture Hoods, May 29, 2003.)

(http://www.hawaii.edu/news/2016/07/01/independent-investigation-of-lab-accident-complete)
An Idea

• Develop a laboratory safety training facility
  • Hands on training
    • Address issues common to laboratory accidents
    • Address common issues identified during lab inspections
    • Focus on key pieces of lab equipment
      • Chemical fume hoods
      • Biosafety cabinets
      • Chemical safety showers and eyewashes
    • Response to spills in the lab
      • Chemical
      • Biological
  • Safe environment
  • Focused and still fun
    • Instructor
    • Students
How Do We Get This Done?

• What do we need?
  • Funding
    • How do we do this?
    • How much do we need?
  • Space
    • Where?
    • What kind?
    • How big?
  • Equipment
    • What kind?
    • How much?
• Ideas
  • Who to ask?
• Help
  • Who to ask?
  • How much can we ask of any one person or department?
Funding

• Innovation Grants for Short Experiments
  • Fall 2016 (Office of the Senior Vice Chancellor and Chief Financial Officer)
  • Problem statement
  • Proposed solution
  • Involved organizations
  • Required resources

• Selection Criteria
  • Scalable
  • Transformative
  • Furthers the Chancellor’s strategic goals
  • Incorporates cross-organizational and cross-functional collaboration
  • Can be tested during the given fiscal year
Innovation Grants for Short Experiments

• Submitted proposal 9/16/16
• Rejected 9/30/16
• Call for new proposals and revisions of previous proposal
  • Coaching with Vice Chancellor for Strategic Initiatives 12/9/2016
    • Advice
      • Sell why this is important
      • Stress collaborations
      • Include testimonials
      • Specific about needs
    • Encouragement
• Resubmitted 1/13/2017
  • Reviewers needed additional time
• Rejected….again 3/8/2017
Innovation Seed Grant For Faculty and Staff

• One more time??????? 4/21/17
  • Project team members
  • Project goals
  • Project efforts to date
  • Project timeline
  • Partnerships
  • Student involvement
  • Need for project
  • Assessment of project
  • Budget
  • Total budget request
  • Endorsements

• Due 5/5/17...submitted 5/5/17
Innovation Seed Grant For Faculty and Staff

• Awarded!! 6/20/17

• Hard part begins!
How Do We Get This Done?

• What do we need?
  ✓ Funding
    • How do we do this?
    • How much do we need?
  • Space
    • Where?
    • What kind?
    • How big?
  • Equipment
    • What kind?
    • How much?
  • Ideas
    • Who to ask?
  • Help
    • Who to ask?
    • How much can we ask of any one person or department?
Space

- EHS building could not accommodate the lab
- Met with the Assistant Vice Chancellor for Research & Innovation and Director of Research Communications 7/31/17
  - Describe the project
  - Discuss communication strategies
- Met with the Assistant Dean of Infrastructure, College of Arts and Sciences, Chemistry Department Head and Chemistry Professor 8/15/17
  - Chemistry allows for the use of an unused lab for the training center 8/15/17
    - Great location on main campus
- Cleaning and remodeling
  - Removal of excess furniture
  - Removal of unnecessary shelving
  - Floors cleaned, buffed and waxed
How Do We Get This Done?

• What do we need?
  ✓ Funding
    • How do we do this?
    • How much do we need?
  ✓ Space
    • Where?
    • What kind?
    • How big?
• Equipment
  • What kind?
  • How much?
• Training Curriculum
  • Who is this training center for?
  • What to cover?
  • How much can we ask of any one person or department?
  • Where to get new ideas?
Equipment

- No hazardous chemicals or biologicals will be used in this lab
- One of the unique aspects of this lab is the use of equipment that would otherwise be discarded
  - Fully functional
  - Semi functional
- Lab clean outs and donations
  - Glassware
  - Small equipment
- Larger equipment
  - Biosafety cabinet
  - Nitrogen dewar
  - Compressed gas cylinders
  - Glove box
- Energy saving devices and techniques whenever possible
  - Work closely with Green labs program
    - Cold water recirculation to provide chilled water for different applications
    - Timers for equipment
Lab Safety Training Center

View from west entrance

View from east entrance
Lab Safety Training Center

Glove Box

Gloves for Glove Box
Lab Safety Training Center

Biosafety Cabinet

Chemical Fume Hood
Lab Safety Training Center

Scintillation Counter

Nitrogen Dewars
Lab Safety Training Center

Tie Dye Lab Coats

Compressed Gas Cylinders
How Do We Get This Done?

• What do we need?
  ✓ Funding
    • How do we do this?
    • How much do we need?
  ✓ Space
    • Where?
    • What kind?
    • How big?
  ✓ Equipment
    • What kind?
    • How much?
• Training Curriculum
  • Who is this training center for?
  • What to cover?
  • How much can we ask of any one person or department?
  • Where to get new ideas?
Training Curriculum

• Visited the University of Reno EHS to tour their facility
  • Lab layout
  • Curriculum ideas
  • Challenges
• Our training plan
  • Classroom instruction
  • Hands on training
    • Fume hood
    • Biosafety cabinet
    • Safety Shower (yep, they have to pull the handle)
    • What to do in the event of a spill
    • How to handle chemical and biological waste
• Special lab techniques
  • Demonstrated by subject matter experts
Training Curriculum

• New Teaching Assistants (TAs) would be primary students in this facility
  • Pilot with Chemistry Club members to assess interest and success of format
  • Train the trainer
    • Eventually TAs who are interested will be the primary instructors
    • Earn additional teaching experience and certificate acknowledging their work
  • Modify or adjust curriculum to suit needs of faculty and students as well as to address issues identified by EHS
• Curriculum development and presentation
  • EHS staff
    • Subject matter expertise
    • Willing participants (role play)
  • Collaborators
Training and Activities to Date

• Office of Animal Resources annual refresher Training
  • How chemical fume hoods and biosafety cabinets work
  • What are the differences between them
  • How to work safely in each
  • Limitations of each
  • Ergonomics
  • Spill response
  • Autoclaves

• Chemistry Club students
  • Pizza party (with safety swag bags)
  • Lab coat tie-dye
    • Students had a good time
    • Good ideas for training and equipment
    • Volunteers to be the first students to try it out
Challenges and Opportunities

- Time!
  - EHS staff extremely busy
  - Department collaborators extremely busy
  - Students extremely busy

- Location
  - Lab is not located in our building
  - Have had to have the locks changed

- Keeping the momentum going
  - Competing priorities
  - A brief word about naysayers
Immediate and Long Term Goals

• Finalize initial curriculum, complete the pilot and evaluate
• Name the lab contest
• Identify graduate student teaching assistants who are interested in teaching in the facility
  • Complete train the trainer training
• Utilize 3D camera technology offered by chemistry professor to develop a virtual training module that could be viewed anywhere
• Utilize the facility for emergency response training
• Ideally the concept will catch on and other research departments will be interested in developing their own lab safety training facility.
Questions?