Successfully Implementing a Positive Safety Culture in an R1 Research Laboratory as a Grad Student Safety Officer

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Safety Resources for Graduate Safety Officers at UC Davis



Post-Settlement Safety Culture in Chemistry at UC Davis

Select changes initiated by settlement agreement:

Addition of FR lab coats and hand protection

Process and control-banded SOPs required for each lab

Special emphasis on chemical storage, segregation, and hazard labeling

Overhaul of training and documentation including Lab Safety Plan, IIPP, EAP

Post-settlement:

We have safety rules and documentation in place, how do we make sure this is being implemented effectively?

Challenge:

Graduate students feel over saturated with added efforts towards compliance

Hypothesis:

Challenges in communication of expectations and methods for implementation affect development of positive safety culture

Goal:

Evaluate how graduate students in the chemistry department feel about safety in their lab and use this data to compare/contrast to the Franz lab. Use this data to improve our safety culture.

Survey of Chemistry Graduate Students to Assess Perceptions of Safety

Polled graduate students in the chemistry department at UC Davis:

- 221 graduate students polled, 66 replied (30% response rate)
- 10 questions regarding perceptions of safety culture in their lab and in the department
- Gathered data on year in graduate school and area of research focus
- Responses kept anonymous

QUESTIONS RESPONSES 66	
Perceptions of Safety Culture at UC Davis	<
Form description	
Do you feel your lab has a good safety culture?	
O Yes	
○ No	
O Don't know	
Do you feel that the safety culture in your lab has improved post-settlement agreement (2012 and on)?	
⊖ Yes	
No No	
O Don't know	
What do you feel is the biggest barrier to improving safety culture in your lab?	
C Lack of clear expectations/safety knowledge	
C Lack of funding	

Survey Respondent Breakdown by Year and Discipline



What type of research does your lab do?



Everyone's Lab Has a Good Safety Culture?

Do you feel your lab has a good safety culture?



Cognitive dissonance: students say their lab has a good safety culture, but some comments indicate they believe otherwise:

"I think overall it's pretty good, certainly better than some other places. Each lab has its own subculture, that's where things start to unravel."

"Safety concerns are brought up and then forgotten."

"Many people still ignore the safety rules."



KC Green

Have the Changes from the Settlement Agreement Improved Safety?

Do you feel the safety culture in your lab has improved post settlement?



3rd year and up: Do you think safety culture has improved post settlement?



Overall, most graduate students who saw/implemented the changes from settlement agreement believe it improved safety culture in their lab.

Lack of Clear Expectations Inhibits Improvement of Safety Culture

What do you feel is the biggest barrier to improving safety culture in your lab?



- Lack of clear expectations/safety knowledge
- Lack of funding
- Safety is not a priority
- Lack of PI support (0%)
- Other

Other:

Lack of accountability Lack of communication between specific lab needs and university expectations Arbitrary rule enforcement Conflicting information from department safety staff

Question: How do safety officers promote lab ownership of safety and increase positive interactions with department and campus safety staff?

Frequent Group Wide Discussions Promote Safety Culture

What do you feel has been the most useful in improving the safety culture in your lab?



- Group specific annual safety training
- Online safety training
- Implementation of SOPs
- Informal group-wide safety discussions
- Other

In the Franz Lab: Safety "Mini tutorials"

Encouraged reduction in hoarding of old chemicals by reviewing guidelines for storage/disposal of hazardous waste

Went through hazard assessment with group

Went through corrective actions to improve day to day

Quote from lab mate: "Improvements to safety culture start with the PI and safety officers. Some of the best training has been efforts to help us see our hazards with fresh eyes instead of complacency, such as doing hazard assessments of everyday procedures."

Many Labs Do Not Discuss Incidents and Near Misses

How often does your lab have safety discussions? (Check all that apply)







In the Franz Group: Incidents and near misses are discussed as part of Safety Mini Tutorials to communicate lessons learned and encourage future incident reporting

Many Groups Do Not Have Frequent Safety Discussions

How often are students having safety discussions?



- Annually only
- Annually + when an incident or near miss occurs
- At least monthly
- Weekly
- Only when an incident or near miss occurs

34% of respondents say they have relatively infrequent safety discussions (annually only, annually + when an incident occurs, only when an incident occurs)

This is surprising considering 58% of respondents said "informal group wide discussions" were the most helpful in improving safety culture!

Perceived Risk Not Correlated to Year in Graduate School



Hazards May be Ignored when Perceived Risk is Low



How hazardous do you feel your research has the potential to be?

Doesn't mean the labs are necessarily underestimating risk associated with their research

However, researchers should be careful to not overlook danger in processes they view as less hazardous

The Burden of Safety Work Tends to Fall on Senior Grad Students

What is your opinion on the time and effort required to implement departmental safety requirements?





In the Franz Group:

Have one student safety officer who is a senior graduate student, and have a younger graduate student act as secondary safety officer to help distribute workload. Also assures there is always an experienced safety officer ready to take over when the previous one graduates

Safety Work is Important, but...

What is your opinion on the time and effort required to implement departmental safety requirements?



Comments from respondents who answered "too much time spent":

"Having the time and money to make improvement is challenging. It's a lot to expect of a graduate student with no extra compensation."

"I think that we need to move to EVERYTHING online... Having a mix of online/paper (I.E. online safety classes and paper SOPs/training documentation) just further complicates having good documentation practices when it comes to safety."

"Sometimes I feel that there is too much time taken away from graduate students to make a laboratory safe and in implementing lab safety procedures, writing SOPs, etc. But I understand that someone has to do it, and its sure as [redacted] not going to be my PI."

Distributing Safety Work Increases Group Ownership of Safety Culture

What do you feel is the most important role of a graduate safety officer? (Check all that apply)



In the Franz Group: Assigning SOP to each member

Each graduate student in the Franz group was tasked with writing the first draft of our new SOPs (based on templates developed by SOP Task Force)

This process meant graduate students were invested in the content of the SOPs as they had contributed to the protocol, decisions for MAQ, etc.

The content in the SOPs was also improved as a result because multiple people's experiences were represented.

Conclusions and Recommendations

Based on survey of graduate students in the Chemistry Department at UC Davis and our personal experiences in the Franz lab:

- Communication between safety personnel and graduate students is KEY
 - Safety officer acts as liaison
- Frequent informal group discussions helps ensure a lab's safety culture is established
 - Discussion of incidents/near misses (both locally and outside)
 - Discussion of corrective actions
 - Discussion of hazard assessments
- Distribution of safety work helps relieve stress from Safety Officer and promotes group ownership of positive safety culture; furthers discussion about reasonable lab guidelines

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The UC Davis SOP Taskforce

Debbie Decker - Chemistry Department Safety Manager **Chris Jakober** - Campus Chemical Hygiene Officer



What we can do better:

We need to keep our lab cleaner!!

Common areas are hard because no one takes ownership

Improving the checkout process:

Go through chemicals that you ordered that may not be good anymore Critically evaluating how you leave the lab Better sample archival

Better emphasis on importance of having a good mental health/state:

Know yourself, your limits and don't be afraid to talk to the group! Too tired Over caffeinated Sick Anxiety or depression

Better follow through with new students:

Do a safety training follow up Making sure they are handling/disposing waste correctly