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Responsible Conduct of Research Role-Plays: Hazardous Substances

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Responsible Conduct of Research

Role-Plays

Hazardous Substances

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Using Role-Plays in Ethics Education
Role-playing can be a powerful learning experience and stimulate lively discussion and debate. However this active learning technique, which most people are unfamiliar with, can also make participants feel awkward and uncomfortable at first. The key to its use is to introduce and frame the technique to any group before starting.

Note to Moderator:
After the workshop participants should receive as a handout the section labeled "Resources." That section also includes a summary of the role-play.

Introduction (2-3 minutes)
We generally start a session by talking about the technique and why we use it. We often label it as "experiential" or "active" learning as we talk about it. This introduction can be done relatively quickly and will improve the participation and comfort level of the group.

Points we make include:

- Role-playing is a type of active learning technique. As such, it promotes deep learning, long-term retention and can be very memorable and powerful
- Participants might feel awkward at first, but they are encouraged to participate as fully as possible. The more authentically they engage in their role the more they will learn
- There are no "right" answers in role-plays
- Participants are not being graded
- The purpose of the exercise is to provide an active learning experience in a safe setting where ethical issues can be explored without being about a real problem
- Because role-plays (or simulations) are participatory, educators believe that the information learned will be retained longer and will be more easily accessible in the future if it is needed
- This training will help participants be prepared to recognize and address ethical problems. By grappling with the sorts of ethical problems that arise regularly in professional life in this safe, non-threatening role-play setting, participants can think through the problem and gain some skills and tools to use should they ever encounter such a problem. We think of this as an "inoculation model." By practicing these conversations you become "vaccinated" and thus better able to resist confusion and anxiety when questions of ethical research arise
- These scenarios are based on real situations that real people encountered (You cannot make this material up)
- After the role-play we will discuss the experience. We also will discuss the outcome of the real-life situation upon which the role-play is based, where possible
- For anyone who is truly too uncomfortable to try it out, we have an observer role. The observers are expected to take notes as they watch others do the role-play and then to provide comments back to the other participants in their group at the end of the process.

Instructions (3-5 minutes)
After introducing the technique, we give the group instructions and an overview of the procedures.

1) Materials should have been copied in advance on different color paper, so the roles are easy to distinguish. For example, the professor role might be on blue paper, the student on yellow paper, and the observer role on green paper. **Participants know only what is in their own roles, and have no information on what is in the other roles; that comes out as the session proceeds. Decide in advance whether you will be distributing the discussion starters with the roles. If you are, the discussion starters for each role (and only that role) should be on the same color paper as the role.**

2) Ask participants to divide into groups of two (professor/administrator and student) or three (professor, student, and observer). Each group must have one each of the two main roles (professor/administrator and student).

3) Announce that everyone will start together and end together. (This keeps the noise level down while directions are being given.)

4) When partners have been selected, hand out the roles and discussion starters. Participants are not obligated to use the discussion starters, but it does make the exercise less daunting for many.

5) Verify that every group has two or three people and that each one has a different color paper.

6) Ask participants to leaf through their materials: each should have role information and a role-play starter. Using the role-play starters is optional, not required. They are provided to help those who need a little guidance to ease into the role-play.

7) Announce the amount of time available. 10-15 minutes is plenty of time for these short scenarios.

8) Provide a bit of time for individual preparation. Suggest that participants make notes of what they want to find out, and what their first sentence will be.

Optional step:
If time and space permit, it can help focus the role-plays and make sure all aspects of the scenario are covered if you verbally review the key points of the scenario and the participants' role. To do this, take one group — all of whom are playing the same role — out into the hallway and keep the other together in the classroom. If there is only one discussion leader, appoint one member of one of the groups to read the role information aloud to the group while the discussion leader works with the first group. When the leader finishes briefing the first group, leave that group to discuss the role among themselves and go brief the second group and answer any questions they might have.

9) Start the role-play. Walk around the room, listening to various groups to get a sense of topics discussed and how the activity is proceeding. Stop the process after it appears that

most have exposed the main dilemma and have spent a little time talking about how to approach it.

10) Make sure at the end of the session that participants receive the "Resources" sheets as a take-away handout.

Discussion (30-45 minutes)
After the role-play the moderator should lead a discussion. Follow the discussion guidelines provided following the role-play. It's also useful to plan for a few concluding remarks at the close of the session to consolidate the discussion.

Tips for Leading Discussions
Opening questions and guidelines for leading a discussion are provided below.

- After the role-play, discussion usually takes off on its own in light of the experience. However, if no one speaks right away, don't worry.

- After you ask the opening question, let at least 10 seconds go by to give people a little time to volunteer. When you are at the front of the class 10 seconds feels like eternity, but that amount of time allows participants to begin to gather their thoughts and work up the nerve to respond.

- If the discussion is really lagging at any point, a useful technique can be to ask participants to discuss whatever the proposition is with their neighbors. This "buzz groups" approach can build up enough confidence that people will start talking.

Role-Play Discussion Guidelines: Moderator

General questions to ask:

After the role-play is over and the groups come back together, ask the participants what was going on in this interaction.

Work to elicit the whole story, by alternately asking those who played each role what their concerns were:

- For those playing the student, what were their concerns and how they understood the situation?
- Ask those playing the faculty member, what were their concerns and how did they understand the situation?

Then summarize for the group the essential facts of the two main roles. It can be helpful to make a two-part list on an overhead or chalkboard while you are eliciting information, noting the concerns of the faculty member and the concerns of the student.

If there were recurring themes in the groups you picked up while the role-play was under way, work those into your discussion. Ask the group how closely the two versions that emerged in discussions match. If they do align, what was the most helpful in eliciting information and establishing trust, leading to a useful and constructive discussion? If they do not match (you may have some groups in each category), what kept the two versions from aligning? Was information missing? What kept it from coming out?

Other general questions to ask:

- What were the most helpful things that were said?
- What do people on each side wish the person on the other side had asked or said?
- Who should take the next step here? Why?
- Should the student proceed with a complaint or just let this drop?
- What is likely in either scenario?
- Is there a good outcome to this situation?
- What elements might make it more or less likely to come out well?
- What could the student or the adviser have done earlier to change or prevent the current outcome?

If you had any observers, ask them what they saw going on; see if anyone picked up signals the participants missed. What were they? What difference might it have made if the missed signal had been caught? Ask the group to identify the issues that are presented in this role-play.

Give a brief overview of your department/university's hazardous substances regulations. This can also be a good time to highlight the serious consequences in both safety and regulatory penalties for violations, citing a recent example or two to emphasize the seriousness of the situation. It is important to emphasize that in this scenario ethical decision-making goes beyond complying with regulations. It addresses issues of responsibility and collegiality.

Specific questions to ask:

- How might the student frame this concern without being perceived as a troublemaker?

- To what extent should a graduate student be responsible for the safety of everyone in the lab?

- What other steps might the student take if these first efforts are rebuffed?

- Is this an issue that can be ignored? What might happen if it is?

- What happens if the grad student simply makes an anonymous call to the hazardous waste office on campus? Is this a good choice? What are the likely outcomes if the student does this?

- What issues are presented in this role-play? *(These include compliance with regulations, communication between role-players, trust of participants, consequences for failure to abide by regulations and constructive ways to have a difficult professional conversation.)*

Try to lead the participants to trying out various approaches for raising concerns with the adviser: the more that the student avoids accusations or blame and focuses instead on a desire to be helpful to the adviser, the better this conversation is going to go. Have participants try out various approaches, or the moderator can say, "What if I were to say to the adviser "[insert suggestions from the group here]" How does that sound?

Principles that apply in hazardous material:

Environmental Safety

- Hazardous material must be properly handled, stored and disposed of according to campus and departmental guidelines
- Laboratory environment must also be properly ventilated with hoods wherever needed

Obligations of student

- Need to report concerns in order to keep everyone safe
- To not jeopardize their career

Obligations of mentor

- Must not jeopardize students, or minimize risk to students and others
- Must comply with regulations, post safety information and follow it
- Must model compliance and teach students
- Must understand and communicate local and state emergency response plans and know how to obtain additional help if needed.

Alternative Formats

A. After the discussion, ask for two volunteers, and do the role-play again, in a "fishbowl" format where the audience will observe one pair proceed through the scenario. Stop the action every now and then and ask for suggestions from the audience on what might be done

differently to improve the outcome. Ask the role-players to back up a bit in the interaction and try to incorporate that advice as they move forward again. See if there are differences in how the interaction goes. What lessons can be learned?

B. Pass out the roles and have each person prepare individually.

Ask for two volunteers to come forward to do the role-play in a "fishbowl" format, and then follow with the discussion portion.

Close by talking about the amalgamation of real-life situations on which this role-play is based. This information can be found in the "Bibliography/resources for participants" section. We often hand this out to participants at the end, so participants leave with a summary of the topic and a list of resources should they wish to explore the topic more.

RESOURCES

Role-Play Summary

This role-play focuses on the dilemmas in balancing regulatory requirements, personal relationships and a natural reluctance to "cause trouble." These dilemmas arise in many settings, and can be particularly acute in laboratories that handle hazardous substances because of the serious safety implications of violations. In addition, violations can carry fines and penalties for laboratories and universities where they occur. The worries of the graduate student in the role-play about potential laboratory shut-downs and corresponding research delays are all too real. Specifics of regulations vary according to the materials being handled. The underlying principles regarding human and environmental safety stay the same.

In the role-play scenario, a graduate student is seeking advice from a fellow graduate student about how to balance concerns about personal safety — their own and that of others in the lab — regulatory consequences and the potential damage to relationships by asking questions about potential violations. What is the student's responsibility to discover whether there are violations? What are the consequences for avoiding knowledge? How should those competing concerns be balanced?

The two students seem to be moving toward the conclusion that the safety issues are serious enough that some action must be taken. At this point, the issue becomes how to raise the issue professionally and in a way that minimizes hard feelings or anger with the student who raises the concerns. To avoid a "shoot the messenger" situation, the discussion should focus on constructive and effective ways to have a conversation with the disorganized adviser about the potential safety problems in the lab.

Real Story

This role-play is an amalgam of real-life situations. The most common problems that arise with hazardous substances in laboratory research are:

- Pile-up: Over the years, chemicals accumulate that may deteriorate and create a dangerous situation. For example, very old ether containers with even a small amount of ether that oxidizes can be exceedingly dangerous. This and other situations can become serious enough that the university itself might not have sufficient facilities to handle safely and thus may need to incur expenses with outside contractors. These expenses can be (and often are) charged back to the originating laboratory/PI. These situations are often discovered when faculty leave, retire or simply move from one lab to another.
- Lab modification: Similar to the situation in the role-play, labs short on space and long on creativity often convert an area not really intended to be laboratory space. Ventilation is a major concern, although other safety concerns also arise.
- Mailing: Without any bad motives, simply focusing on getting the work done, researchers mail each other chemicals and samples. Without proper training and precautions, this can become a very dangerous situation—and lead to heavy penalties.

- Improper disposal: Particularly at campuses that have charge-back fees to investigators to help cover the disposal costs, "dump and run" can become tempting to researchers and lab staff. Universities have seen this happen with chemicals, radiation and biowaste, and it can again be quite hazardous and carry large penalties.

- Ignorance at the interdisciplinary interface: when researchers in one area venture into interdisciplinary research and either are unfamiliar with the regulations governing the work or have lab personnel (like a post-doc) from the area working with them, and not have sufficient expertise to provide adequate supervision.

The graduate student is right to be concerned both about safety and about the potential consequences of raising the issue. The conversation with the adviser could be very difficult and the student needs to have thought through in advance how to "frame" the conversation in the most constructive possible manner.

An approach that many often start with is to ask questions: "Gosh, in my safety training…." If the innocent question yields results, the problem could be solved. However, one possible problem with this approach that should be considered in advance is what the student's next step will be if the "innocent-sounding" question is dismissed or shut down, or worse, if the student is explicitly directed to ignore it. If the student is convinced that action needs to be taken because of safety, this could complicate the next step, and should be anticipated in formulating the first approach.

Oversight agencies in the hazardous substances area at the national level are the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA). There are generally state agencies with oversight as well.

Resources on Responsibilities with Hazardous Substances

Responsible Conduct of Research Resources

Columbia University
http://ccnmtl.columbia.edu/projects/rcr/

Committee on Science, Engineering, and Public Policy, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, *On Being a Scientist: Responsible Conduct in Research*, National Academy Press, Washington, D.C., 2nd ed., 1995.
http://www.nap.edu/readingroom/books/obas/

ORI Introduction to the Responsible Conduct of Research,
http://ori.dhhs.gov/publications/ori_intro_text.shtml

Online Ethics Center, National Academy of Engineering
http://onlineethics.org

Research Ethics Modules, North Carolina State University,
http://www.fis.ncsu.edu/Grad/ethics/modules/index.htm

Macrina, F. L. (2005). *Scientific Integrity: An Introductory Text with Cases* (3rd ed.). Washington, D.C.: American Society for Microbiology Press.

North Carolina State University Open Seminar
http://openseminar.org/ethics/screen.do

Shamoo, A. E., & Resnik, D. B. (2003). *Responsible Conduct of Research*. New York: Oxford University Press.

role one with starter

Advising Graduate Student Role

What follows is an outline of your role. You will need to improvise to some extent – be creative but try to stay within the bounds of what seems realistic.

You have been a graduate student in your current lab for a few years. One of your fellow graduate students in another lab is pretty sure that their lab violates regulations about hazardous substances in a couple of different ways: first, there's an old closet that was converted (quietly, over a weekend) into more bench space. Second, the student's adviser told a post-doc to clean out a hood that was overflowing with old bottles and other junk. The student saw the post-doc take all the bottles out of the hood, put them in a box and carry them out. Given what you know about how to dispose of hazardous substances safely, none of the proper disposal steps were being followed. In addition, although many of the materials used by lab can be quite dangerous, no information is posted anywhere in the lab on emergency procedures. Your fellow student is concerned about what to do.

You've been thinking about your friend's dilemma with the hazardous substances problem. You agree that there's likely a set of violations here, and you think the ventilation and improper disposal issues could be really serious. You know your friend doesn't want to get anyone in trouble, and also doesn't want anyone to get hurt—or their work delayed because of fines or clean-up suspensions of work. Prepare some advice to give your friend.

Advising Graduate Student Role-Play Notes:

Write down any other notes and make a plan for your meeting:

Starting the Hazardous Substances Role-Play

Advising Student: *Hey…*

Grad Student: *Hi…*

Advising Student: *Well, I've been thinking about what you've been telling me about this hazardous waste problem…*

Grad Student: *Yes… I know this can be serious from what I've heard… If the regulations and safety office were to find out we're not complying with the rules, it can lead to a very dangerous situation and serious consequences for the lab…*

Advising Student: *I agree… I think we should do something… Do you think your adviser cares about the issue?*

Grad Student: *Yes, I do think so… but for some reason, despite all of the training that we've had dealing with hazardous waste issues, it is not even given a second thought in our lab… I feel like the environment in the lab right now is not safe for someone to work in…*

Advising Student: *Maybe you should approach your adviser… Make sure you're not confrontational…but tell your adviser that you have a personal concern that needs to be discussed…*

Grad Student: *Right… I don't want to be in the lab and have something dangerous happen… it would be too late for me to say anything…I'd rather approach my adviser before something happened…*

Advising Student: *So, do you think your adviser is careless about this sort of issue?*

Graduate Student Role

What follows is an outline of your role. You will need to improvise to some extent – be creative but try to stay within the bounds of what seems realistic.

You have been a graduate student in your current lab for three years, and you really like it a lot. The lab techs, other students and post-docs are a good group to work with, the atmosphere is positive and supportive and you have a great relationship with your adviser. Your own project is going really well and you're very happy, even if you are working very long hours all the time. The only thing that worries you is how much of a mess parts of the lab are (not your bench or area). To put it nicely, your adviser is disorganized about everything but the ideas for the projects he's working on. His office looks like a tornado hit it and he misplaces everything he touches. The reason you're getting worried is that last year, in the required ethics training, one topic touched upon was regulations about hazardous substances.

You are pretty sure that your lab violates those rules in a couple of different ways: first, there's an old closet that was converted (quietly, over a weekend) into more bench space. You're guessing that the ventilation isn't very good, since it was originally a closet, and the training really hit on the importance for health reasons of ventilation issues. Second, your adviser told the post-doc to clean out a hood that was overflowing with old bottles and other junk. You saw the post-doc take all the bottles out of the hood, put them in a box and carry them out. Given what you were told in your training about how to dispose of hazardous substances safely, none of the proper disposal steps were being followed. In addition, although many of the materials in use in the lab can be quite dangerous, there is no information posted anywhere in the lab on emergency procedures.

You don't want to cause trouble. You also don't want to contribute to a situation where someone (including you) can get hurt, or the lab could get shut down or fined for violations. The consequences were really stressed in the training. You don't want your projects (or any of those in the lab) to be suspended or delayed. You're trying to figure out what you should do. Where can you get information? What might happen if you do nothing? What options do you have and what do you think you should do? You have been worrying about this and talking with your friend, a grad student in your department, but in another group. You are going to talk with your friend one more time to make a plan for what, if anything, to do.

Graduate Student Role-Play Notes:

Write down any other notes and make a plan for your meeting:

Starting the Hazardous Substances Role-Play

Advising Student: *Hey…*

Grad Student: *Hi…*

Advising Student: *Well, I've been thinking about what you've been telling me about this hazardous waste problem…*

Grad Student: *Yes… I know this can be serious from what I've heard… If the regulations and safety office were to find out we're not complying with the rules, it can lead to very dangerous and serious consequences for the lab…*

Advising Student: *I agree… I think we should do something… Do you think your adviser cares about the issue?*

Grad Student: *Yes, I do think so… but for some reason, all of the training that we've had dealing with hazardous waste issues is not even given a second thought in our lab… I feel like the environment in the lab right now is not safe for someone to work in…*

Advising Student: *Maybe you should approach your adviser… Make sure you're not confrontational…but tell your adviser that you have a personal concern that needs to be discussed…*

Grad Student: *Right… I don't want to be in the lab and have something dangerous happen… it would be too late for me to say anything…I'd rather approach my adviser before something happened…*

Advising Student: *So, do you think your adviser is careless about this sort of issue?*

observer role

Observer Role

- *Read both roles on the following pages.*
- *Watch the interview and take notes.*
- *If the conversation appears to be stopping early, encourage discussion on topics that still haven't been addressed.*

Did the two students work together well?

Is their approach constructive? Do you think it will work?

Are the students anticipating possible future developments from the approach they are considering?

What questions do you think could/should have been considered that were not?