

Stakeholders Presentations: A Technical Presentation To A General Audience

In Spring 2019 and 2020 we required the students in our second senior laboratory course at the University of Tulsa to deliver a technical presentation aimed at an audience at an 8th-grade education level. New ABET criteria include *the ability to communicate effectively with a range of audiences*.^[1] Our senior lab series already had communications with peers and supervisors for safety, direct report, and the work group. The general public can be represented by those with an 8th grade education, as they may not remember much chemistry from high school. The students were asked to imagine that their companies were planning to build a new facility in our city, and their task was to convince city council and other interested citizens that the companies were prepared to minimize the chemical hazards to the community.

The individual stakeholders presentation counted as ten percent of the course grade. Ten points were awarded each for visual quality, proper education level, and timing of 15.0 ± 1.0 minutes. The remaining twenty communication points were for presentation skills. All technical skill components were worth ten points. The students were asked to describe the chemical hazards (flammable, toxic, etc.), how the chemical spreads, the potential environmental impacts of a release, and the hazard communications the plant would have with first responders and local hospitals. They were to describe precautions that the plant will take to prevent and mitigate releases.

The faculty developed a list of chemicals that were intentionally hazardous^[2-4] to give the students more to discuss in the presentation. Several weekly lecture sessions were devoted entirely to the stakeholders presentations of about 35 students.

The students were creative with these presentations and supplied information beyond what was requested. In 2019 students presenting on the first day chose on their own to present as safety engineers from real companies that produce their chemicals. The rest of the 2019 class followed their lead. They included information from corporate websites about public safety commitments and safety awards. They chose sites based upon housing density and prevailing wind directions. They showed the routes from the nearest fire department and hospital with travel times. They touted their high-paying jobs, volunteer hours, and interns they would hire from our university.

The students struggled to present at the proper education level. We had to remind them to omit chemical formulae, reactions, and abbreviations such as PPE and *ppm*, and to clearly label and explain any Globally Harmonized System pictograms or National Fire Protection Association diamonds. The students also had difficulty with measures to prevent and mitigate releases and communications with first responders and hospitals. While the students had completed our required Health & Safety course, only about 30% of them had completed an industrial internship. They needed guidance for using alarms to detect releases, safe ventilation of exhaust gases, reduction of ignition sources, and emergency drills with first responders and hospitals.

Some of our alumni who came to presentations were thrilled. They saw a need to train practicing chemical engineers to present to the public. The students were grateful for the communications practice in this course, including these stakeholders presentations.

For 2020 we reduced the required time to 10 minutes, but many students still did not use the whole time. The first-day presenters in 2020 chose not to present as safety engineers from real companies. Most of the rest of the class followed their lead, and the presentations lacked the sense of reality provided by the company association in 2019. In 2021 we will require the students to choose a company and add economic impact as a grading category.

In summary, we added a presentation aimed at the general public to our senior lab series to expand the range of audiences. The students attempt to convince a city council that their companies should be allowed to build plants with dangerous chemicals because the companies know the chemical hazards and will successfully protect the public and their workers. This gives our students another opportunity to practice their presentation skills, with the twist of a non-technical audience.

REFERENCES

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3. Houston Department of Health and Human Services. Toxic Industrial Chemicals. <https://www.houstontx.gov/health/OSP/Chemical%20Emergencies/Toxic%20Industrial%20Chemicals.pdf> accessed July 16, 2020.
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