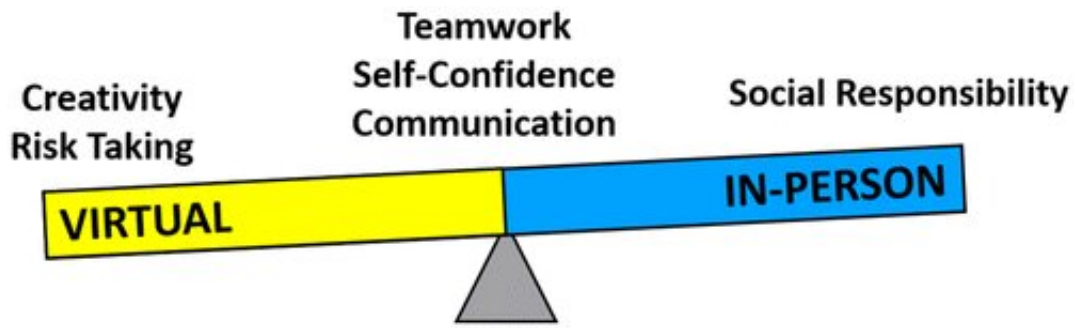
Remote-friendly student project presentations enable creativity and risk-taking

March 29 2021, by Kate McAlpine



Credit: *Journal of Chemical Education* (2021). DOI: 10.1021/acs.jchemed.0c01033

In a two-year study that could help guide educators developing the post-pandemic new normal, student groups at the University of Michigan assigned to make video presentations showed more creativity and risk-taking than groups making conventional in-person presentations.

"Given the importance of project-based learning, our study provides a way to turn virtual limitations into an advantage," said Fei Wen, U-M associate professor of chemical engineering. "We can enhance the student experience and learning outcomes."

Higher education, along with society at large, anticipates a shift in the

balance between in-person and remote activities even after COVID-19 is controlled, say Wen and colleagues. While many might assume hands-on learning is best done entirely in person, the study presents an alternative perspective.

The team began conducting the research in 2017—well before anyone knew COVID-19 was coming—as an effort to examine how different formats improved engaged learning outcomes. They split the students in a mass and heat transfer chemical engineering class into two cohorts: one doing an in-person presentation to high school students, with a poster and a demonstration; and the other making videos posted online. The 248 students who participated self-reported the degree to which their method enabled creativity, risk-taking, teamwork, self-confidence, communication and social responsibility.

"This turned out to be really timely," Wen said. "We did this without realizing the world would be switching to virtual."

At first, the students had some doubts about the video format. But the study revealed its potential. For one, it unlocked a larger range of experiments that the student teams could demonstrate—they were no longer limited to something that would run in a few minutes. Experiments that needed hours or days could be shown with time-lapse approaches.

In an in-person presentation, students have to get the demo right the first time. In contrast, a video can be reshot until the experiment works properly, enabling students to dream up more difficult concepts.

In addition, the video format encouraged a larger range of narrative methods. The "talking head" approach may most closely resemble a conventional presentation, but students also performed skits to explain concepts, added background music to the demonstrations or made the

entire presentation into a song. They also used multiple locations, special effects and animation.

"The change in student perception before and after the project was really surprising to us," said Andrew Zak, a Ph.D. student in chemical engineering and first author of the study in the *Journal of Chemical Education*. "Heading into the project, most students felt the in-person presentation would have a greater impact on four of the six learning outcomes, but after completing the project, only social responsibility was more positively impacted by the in-person format."

Social responsibility means understanding their obligations to act for the common good as engineers. Unlike students assigned to in-person presentations, the video cohort didn't interact with high school students. Their presentations were on the web for anyone to access. Wen believes that this accounts for the lower ratings in social impact.

She has ideas about how to address that, such as arranging a video call with a high school class. However, she recognizes barriers as well, such as the reduced access to technology in low-income schools. It's an area she intends to explore further.

More information: Andrew J. Zak et al. Virtual versus In-Person Presentation as a Project Deliverable Differentially Impacts Student Engaged-Learning Outcomes in a Chemical Engineering Core Course, *Journal of Chemical Education* (2021). DOI: 10.1021/acs.jchemed.0c01033

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