

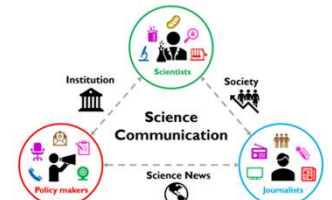


# Science Communication to the Public: Pedagogical Endeavors at Xavier University of Louisiana (SCP-XULA)

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**Introduction:** Recent events including the pandemic, extreme weather and oil crisis have once again opened up the call for scientists to engage with society in a more meaningful manner. Scientific communication to the public (SCP) is a complex problem with multiple facets to it including the diversity of decision makers, the background knowledge of the science at hand, ideology, sociology and trust. The lack of trust is amplified in the minority communities due to historical issues. We at Xavier University of Louisiana, a historically black college and university hope to address this issue using pedagogical methods of deliberation on science.

**Models of Science Communication:** Two major models have emerged to address this complex problem. **Model 1:** One-way communication where in the science knowledge is disseminated by experts to the public in various forms such as formal education or educating the mass public through mass media. While this form of science communication has been somewhat effective, misinformation, the social and psychological make-up of diverse audience can lead to biased interpretation of the information. **Model 2:** Two-way communication in the form of deliberative democracy has emerged as a favored practice in several quarters of the scientific world where the scientists are translating the knowledge into useful form with the help of the opinion of diverse populations when given their due consideration for decision making.

**Pedagogical Solution:** The goal is to implement a science communication program at Xavier. The objectives are (1) to conduct professional development of faculty through yearly workshops, (2) award mini-grants for curriculum enhancement, (3) train undergraduate students as facilitators of deliberative pedagogy and (4) practice science communication through community outreach activities. We present the results of our work on objectives 1, 2 and 3.

## Professional development of faculty through yearly workshops

Two day workshop was conducted for STEM and non-STEM faculty and staff who wish to develop their public engagement and science communication skills, enabling them to establish meaningful dialogue with diverse audiences on Science Communication to the Public. The workshops supported participants in addressing specific audiences, scientific topics, engagement methods, development of course modules, implementation and assessment.

### Four sessions to the workshop over two days:

**Session 1:** Introduced the faculty to best science communication practices for engaging the public. Engaging with different types of audience such as general public, journalists, in-person engagements or communicating science online was explored. Participants considered the range of audience, and the role of intermediaries.

**Session 2:** Outlined the importance of deliberation process for engaging Socio-Scientific Issues (SSI), e.g. climate change, environmental contaminants, food security. Methods for implementation of SSIs as course modules were examined with examples highlighting the roles of instructor, facilitators and students.

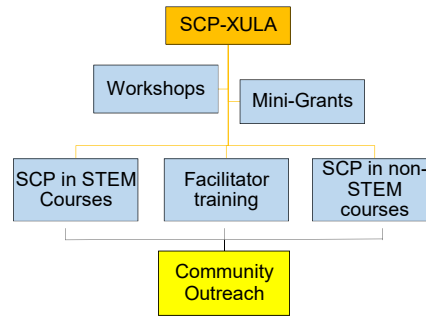
**Session 3:** Participants presented their chosen SSI or their research topic for communication to varied audiences. Through guided discussion, participants reviewed the social context and identities that influence perspectives within the SSI. Participants collaborate with peers to adapt their chosen SSI for a course-based experience.

**Session 4:** Development of deliberation pedagogy in classrooms on the chosen SSI. Participants participated in a deliberative discussion, considered implementation strategies, and assessment.

Six faculty attended the workshops which took place on October 23<sup>rd</sup> and November 6<sup>th</sup> from 9 am to 4 pm. The post-workshop survey of the faculty revealed that all workshop attendees strongly agreed that the content was presented in an interactive and engaging manner, the knowledge and/or skills that they learned in these sessions will be applied in their interactions within STEM communities and would recommend the workshop to their colleagues.

- In a reflection on sessions 1 and 2 of the workshop, the participants also felt that the workshop content and discussion was useful, provided the opportunity to present an SSI, helped in understanding the findings from research done on the communication of science to public.
- In a reflection on sessions 3 and 4 of the workshop, the participants liked the interactivity, examples and discussion during the sessions which enables them to practice key aspect of the workshop and receive instant feedback. Assessment guides and examples were appreciated.
- All participants felt that a session involving student/non-faculty deliberation on an SSI would have given them a hands-on experience.

## The SCP program workflow at XULA



### Facilitator Training

All deliberation on SSIs were facilitated by trained facilitators. Our consultant Sara Drury created videos and guide sheets for training XULA students as facilitators. 25 Students in the core course 'Science and Public Policy' were trained as facilitators. Additionally, research technicians working in various research groups across campus took part in a facilitator training session on campus.

Student deliberations on the SSIs 'Water Metal Contaminants' and 'Energy Choices and Survivability' were facilitated by the trained students and technicians.

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## Curriculum Enhancement- Incorporation of Modules on Science Communication to the public (SCP)

Workshop attendees were invited to apply for a mini-grant with a proposal to develop a course module on a SSI that conforms to the overall course objectives. Deliberation of potential policy choices is one of the class activities on the new module. An oral or written assignment would be required for assessment. Four faculty were awarded the mini-grant.

### Water Metal Contaminants Module:

**Course:** General Chemistry Laboratory – Freshmen level course

**Expected Impact:** ~500 students every year

Quantitative analysis of metals in given samples is an experiment in the general chemistry laboratory. In coordination with this experiment students was given news articles on metals contaminants in the United States. The module was developed and implemented in Spring 2022. Handouts on policy choices developed by our consultants at Wabash were provided to the students. One hour of class time was utilized for deliberation on the issue and the policy choices. Oral video presentation was made by the students upon completion of the deliberation activity.

### Energy Choices and Survivability:

**Course:** Ecology – Junior level course

**Expected Impact:** ~25 students every year

The Social Science Issue (SSI) taken up in this course is of how we balance energy consumption with our own survival and sustainability. An introductory summary was provided to the students on the patterns of energy consumption in U.S. and world for the past ~ 100 years with statistics from literature published by reliable sources. The deliberation activity was on policy choices, developed by the National Issues Forums, that listed out three options based on views and concerns of people from across the country regarding America's energy future. A written report was submitted by students for assessment.

### Mental Illness in America and Opioid Epidemic:

**Course:** Disorders of the Brain – Neuroscience Senior level course

**Expected Impact:** ~25 students per year

The SSI 'Mental Illness in America, How to We Address a Growing Problem?' will be introduced in the course module on 'biological changes associated with mood disorders' and the SSI 'What should we do about the Opioid Epidemic' will be covered in the module that focuses on the 'neurobiology of substance abuse'. The implementation of the SSIs will take place in Fall 2022.

### Food and Water Security:

**Course:** Core course taken by students from all majors in the junior and senior level

**Expected Impact:** ~30-60 students per year

Global food and water security will be SSI for this course. The development of the course modules are ongoing. Implementation is expected in Fall 2022.