Using Improvisational Acting Techniques to Improve the Oral Communication Skills of STEM Graduate Students

PI: Shannon Willoughby (shannon.willoughby@montana.edu)
Co-PIs: Brock LaMeres, Bryce Hughes, Chris Organ, Jennifer Green & Leila Sterman | NSF Award #1735124

Members of the STEM workforce are notorious for lacking the ability to describe their work to people outside of their field.

Yet it is crucial for our society to understand the importance of science so that citizens are scientifically engaged and policies are influenced by empirical results rather than mis-information or by mis-trust of the STEM community.

This project aims to improve the communication skills of STEM graduate students using improvisational acting techniques.

It is hypothesized that this type of novel training will reduce the use of jargon when communicating to a non-STEM audience and result in higher scores on a previously validated public speaking rubric.

- A public communications rubric was adopted to evaluate the students’ presentations (Schreiber, Paul & Shibley, 2012).
- Faculty evaluators were calibrated by watching 12 YouTube videos of 3 minute thesis (3MT) presentations.
- After each faculty rated the 3MT videos, the group discussed any different ratings.
- Interrater reliability was evaluated, achieving Cohen’s K = 0.95 in last 5 rounds.
- At least 3 trained evaluators scored students’ public talks.

STEM MS & Ph.D. students are eligible for the program.

Students can receive independent study credits if desired.

The student’s Ph.D. advisor must sign a consent form indicating they are aware of the participation in the program.

Students meet weekly for 1.5 hours through the academic year (2 semesters).

In semester 1, students participate in training by improvisational actors on:
- stage presence & confidence
- story telling
- adapting a story to the audience in real-time.
- playing off of other actors

In semester 2, students get training on creating podcasts and practice giving scientific talks to a non-technical audience.

The program culminates with a presentation at an off-campus public venue & posting of their podcasts.

- An algorithm was used to calculate the scientific jargon of students’ podcasts (Sharon, Baram-Tsubari, 2013).
- To calculate the jargon score, these steps were taken:
  1. Choose a set of texts to create a scientific corpus.
  2. Choose a set of texts to create a contemporary American English corpus.
  3. Create both corpora, with word stops, punctuation, numbers, and hyphens removed.
  4. Prepare transcript text by removing punctuation, numbers, and hyphens.
  5. Determine how many times each word in the corrected transcript file occurs in each corpus.
  6. Calculate jargonnness value for each word.

\[
\hat{j}_i = \log \left( \frac{f_{sci}(i)}{f_{eng}(i)} \right), \quad 0 < f_{sci} < f_{eng}
\]

\[
f_{sci} = 0 \text{ and } f_{sci} > 0
\]

7. Calculate the jargonnness for the whole transcript.

\[
J = \frac{1}{N} \sum_{i=1}^{N} \hat{j}_i \times f_i
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