

On-Demand STEM:



Integrating Knowledge, Extending Reach

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Project Overview

Of special interest:

Adding an online webinar component broadened the outreach

Student responses indicated increases in each of five factors

Face-to-face and online teachers requested additional presentations

Students taking a university speech course worked in teams to develop and deliver STEM presentations in two modes: face-to-face and online. The audience for face-to-face speeches included third, fifth, and seventh grade classes and after-school program. Online audiences

included K-8 teachers and students throughout the state. The innovation for this study was the online webinars. The purpose was to investigate student learning.⁶³ students during fall 2011 and 60 students during

spring 2012 participated. A mixed-methods exploratory design included qualitative data from reflective papers and quantitative data from responses to a student skill survey offered at the beginning and at the end of the term.

Results and Implications

Results were significant for the discipline-defined factors of content, organization, and delivery. Gains were seen in team and personal skills, but the differences were significant only for some of courses offered fall semester

as seen in the table on the next page. Reflective responses provided insight into specific areas of learning. Students wrote about the importance of language choices, audience adaptation in speech preparation and in delivery, about

gaining confidence through presenting, and how they implemented feedback received in rehearsals. Currently we are videotaping and posting student presentations online to reach a broader audience.

| Mean Differences for Five Factors | | | | | |
|-----------------------------------|---------|--------------|----------|--------|----------|
| Fall 2011 | Content | Organization | Delivery | Team | Personal |
| Pre-Test Mean | 3.56 | 3.38 | 3.27 | 3.82 | 4.12 |
| Post-Test Mean | 4.21 | 4.13 | 4.02 | 4.30 | 4.44 |
| Difference | 0.65 * | 0.75 * | 0.76 * | 0.48 * | 0.32 * |
| Spring 2012 | | | | | |
| Pre-Test Mean | 3.89 | 3.60 | 3.70 | 4.04 | 4.31 |
| Post-Test Mean | 4.37 | 4.21 | 4.26 | 4.27 | 4.53 |
| Difference | 0.48 * | 0.62 * | 0.56 * | 0.23 | 0.21 |

* indicates statistically significant difference

Reactions from Students and Teachers

The students responded favorably to this assignment in which they informed younger students about STEM material in both online and face-to-face venues. One student wrote,

"It is definitely going to help me in future speeches. My audience analysis skills are WAY better now because of this project."

Students valued the feedback they received from our community partner, the NASA ERC Director, and they valued delivering presentations to outside audiences.

"The dress rehearsal was very helpful because it allowed us to do the presentation as it would have happened. Stacy's feedback was also very helpful."

Teachers gave very positive responses, such as this one, *"Information presented was something I have not covered with as many pictures and diagrams; it made understanding the information fun and memorable."*

Teachers in both online and F2F audiences gave valuable feedback and requested future presentations.