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Improving Engineering-Student Presentation Abilities with Theatre Exercises

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Improving Engineering-Student Presentation Abilities with Theatre Exercises

Abstract

This paper describes a strategy for improving the presentation confidence and abilities of engineering students by requiring them to participate in exercises from the world of theatre. These exercises are designed to prepare the voice and body for onstage performance, an activity that correlates naturally with delivering professional technical presentations. The paper discusses the philosophy behind this pilot study; full details on the workshop activities; the pre- and post-surveys' contents and student responses to them; and conclusions, study limitations, and future improvements.

Introduction

One of the main impediments to improving presentation abilities is self-consciousness: the presenter's/speaker's fear of looking foolish in front of a crowd of people. Content-centered preparation (i.e., knowing the material and shaping it appropriately for a given audience) can help with this problem in theory, but in practice the physical reality of a critical audience often negates such preparation – in other words, emotion overpowers logic. Thus, presenters (and especially novice presenters) need more practical, more physical strategies for controlling and working with their fear. This paper describes one such strategy wherein engineering students participate in exercises from the world of theatre designed to prepare the voice and body for onstage performance, an activity that correlates naturally with delivering professional technical presentations. For this project, students completed a pre-survey about their to-date presentation experiences and overall public-speaking confidence followed by an interactive workshop on the theatre-based exercises mentioned above. They then completed a post-workshop survey on these same concepts before giving their first presentation of the semester in a technical-communication course. Significantly, the workshop was conducted by a theatre professor (one of the current paper's authors) who began his career with an electrical-engineering degree and several years of experience in industry. The paper discusses the philosophy behind this pilot study; full details on the workshop activities; the pre- and post-surveys' contents and student responses to them; and conclusions, study limitations, and future improvements.

Program Description

The pilot study described here is a product of the Shackouls Technical Communication Program (STCP) in the Bagley College of Engineering at Mississippi State University. This program began in 1999 with an endowment to improve the writing and speaking abilities of engineering students and has grown to include four full-time faculty (all of whom work for the Bagley College and have backgrounds/degrees in English); two part-time writing tutors/coaches; 12 sections of a junior/senior-level technical-communication course required of all undergraduate engineering students; and numerous writing- or speaking-related seminars and workshops throughout the college each semester. The program directly serves over 500 engineering students every calendar year and works closely with all eight of the college's academic engineering departments.

Workshop Genesis and Description

Genesis

While accurate and appropriate technical content is certainly the most important component of any engineering communication, it is also certainly true that the communicators' *delivery* can determine whether said content actually reaches the audience. In a very real sense, this comprises the STCP's mission: helping students manipulate and deliver their technical content for a variety of audiences. One particularly persistent problem over the years is that students generally do not *engage* the audience when they present: even when they know their content and are clearly prepared with respect to subject matter, their deliveries are too often bland and uninteresting – that is, they lack the qualities of effective public speaking shown below:

- **Voice:** sufficient volume, speed, and enunciation; effective dynamics (not monotone); minimal vocalized pauses/nonfluencies (specifically *um/uh*)
- **Body:** upright, unslouched posture; consistent eye contact with the audience (including body faced toward the audience rather than the screen); appropriate facial expressions; appropriate but controlled hand gestures

The cause of this engagement problem is not complicated; public speaking has been a top fear of people in the United States for years, often anecdotally but also in a more documented sense, most recently in Chapman University's "Survey on American Fears," where public speaking placed fifth (9.1%) just behind "Being [a] victim of mass/random shooting" (also 9.1%)¹.

Another persistent problem is lack of experience. As much as any other ability, effective public speaking requires repeated practice at delivering talks before audiences and, more importantly, *reflection* after a talk on what went poorly and the willingness to do it again, better. Assessing the presentation experiences of, e.g., the general public or U.S. college students is beyond the scope of this paper. On a narrower scale, though, our survey participants – all of whom were juniors and seniors – quantified their collegiate presentation experience as follows, in Table 1.

Table 1. Respondents' Quantified Presentation Experience

<i>How many total oral presentations have you given in your college career? (If you're not sure, please give an estimate.)</i>	<i>Responses (%)</i>
0 to 3	22
3 to 6	39
6 to 9	20
More than 9	16

The majority of respondents have given three to six presentations during their roughly two to three years in college, an average of perhaps one or two per year. More important than quantity, of course, is the *quality* of the presentation experience: sufficient preparation, multiple iterations of a talk, substantive feedback, and so on. While our survey did not cover the details of students'

specific presentation experiences, students in the Bagley College generally get guided presentation practice in two places: a sophomore-level speech course (CO 1003 Fundamentals of Public Speaking) and the STCP, particularly in GE 3513 Technical Writing, the course in which the present study was conducted. Additionally, about 10 years ago, the departments in the Bagley College were required to reduce degree-program credit-hour requirements in response to state Institutions of Higher Learning instructions, and one of the courses several departments decided to remove was speech, meaning students in those majors lost an important presentation experience. Our general conclusion, then, is that students lack presentation practice sufficient to help them become engaging speakers, which motivated us to implement theatre-based practices and measure their effectiveness.

Why approach this issue theatrically? The main reason is two of the authors' backgrounds: each has 30 years' amateur and professional experience in theatre and musical performance (along with nearly 20 years of teaching, which is, of course, a specific type of presenting). Moreover, one author is actually a theatre professor who began his career with an electrical-engineering degree and several years of industry experience. Thus, using performance-related strategies to help students present more expressively and engagingly was a natural progression.

This concept of using theatrical tactics cross-curricularly has some precedence. Friedland² describes a collaboration between theatre and education faculty to improve student oral-presentation skills at a small college without a communication department. Hardison and Sonchaeng³ discuss "implementing theatre voice training and technology" for teaching oral-presentation skills to ESL/EFL students. Berk and Trieber⁴, meanwhile, argue for the use of theatrical improvisation (improv) *à la* the television show *Whose Line Is It, Anyway?* as small-group learning exercises in the college classroom. Ludovice, et al.⁵ expand this improvisational idea to the realm of engineering specifically for fostering creative innovation in technical environments, while Hammer, et al.⁶ describe a Mayo Clinic-affiliated program using improv to improve medical students' ability to present case histories.

Workshop Description

The workshops involved 226 undergraduate engineering majors divided into six separate time slots and groupings of 40-50 students each, all of whom were currently enrolled in GE 3513. These workshops appeared in the course schedule one week before the start of the students' first presentations in GE 3513. Students were arranged in a circle with the workshop leader (see Figures 1 and 2 below) and began with a warmup phase, which involved loosening up the body and vocal instrument according to specific instructions (see Figure 3 below).



Figure 1. Participants in a Presentation Workshop



Figure 2. Participants in a Presentation Workshop

Group Exercises before speaking:

1. Deep, Central Breathing (vs. shallow, unsupported breathing): say "huh, huh, huh" repeatedly. Is your belly moving in and out? It should be.
2. Relaxation/Phonation: sigh out silently (on air) and feel muscles relax even though you remain standing tall with elongated spine. Now a sigh of release/relief on your voice (make a hah sound) with same relaxation and posture.
3. Resonators
 - throat: say "hah" (head slightly back) and beat your chest like a monkey (throat resonance)
 - mouth: say "huh" (head straight on top of spine) feel the movement from throat to mouth
 - nasal: say "hee" (head forward slightly) feel movement from mouth to nose
 - now go in reverse: hee, huh, hah

Figure 3. Excerpt from the Workshop Warmup Instructions⁷⁻⁸

As the excerpt above suggests, the warmups are somewhat silly, which is a major part of the point; as the workshop instructions assert, “[T]he exercises are often silly because if you are

willing to be silly in public then you go a long way toward fighting the monster of self-consciousness”⁷. Once this ice had been broken, the workshop moved into more of a practice-performance phase requiring each student in the circle to read poetry or news-story selections from a handout, an excerpt of which appears below in Figure 4.

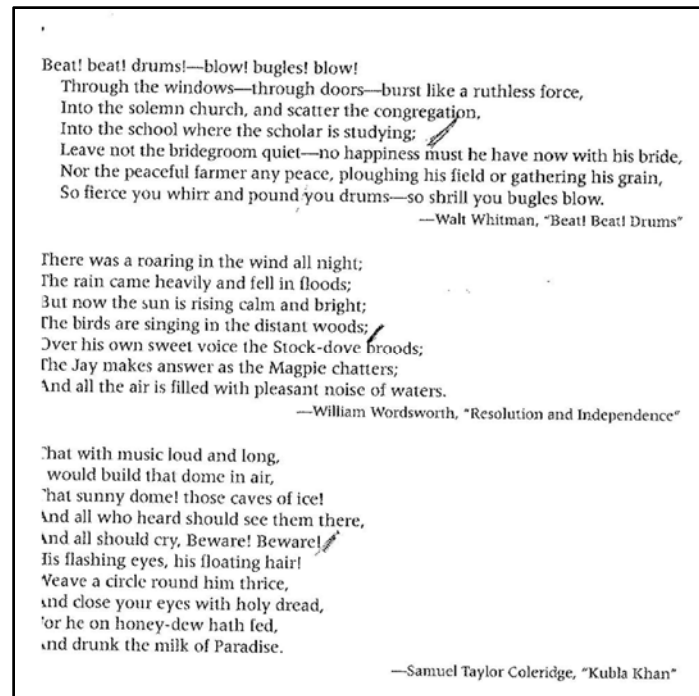


Figure 4. Excerpt of Workshop Readings⁹

Students were critiqued as they read according to the elements of delivery discussed during warmups (enunciation, projection, posture), a method with three objectives:

1. Students are put on the spot in front of their peers, which reinforces the purposeful silliness of the warmups (“fighting the monster of self-consciousness”) and provides a realistic presentation scenario (talking in front of people).
2. Students get real-time constructive feedback on their performance, often with the chance to repeat all or part of their reading if necessary.
3. As readings progress around the circle, students toward the end of the process see/hear their peers’ performances and learn from them (*emphasize this word, avoid vocalized pauses*, and so on), often improving their own readings before they even deliver them.

After the entire circle read, the workshop leader went around the circle and asked students to speak the first line of their upcoming presentations employing the strategies on which they had by then been working for the past 45 minutes or so. The three objectives listed above also applied here: students are put on the spot, they get real-time feedback, and later speakers benefit from watching 30 to 40 students speak before them.

Survey Description and Results

Students completed pre- and post-workshop surveys designed to gauge their general confidence in giving presentations as well as their confidence in both vocal and body preparation. The

specific questions asked appear below in Tables 5-9. First, participant demographics appear in Tables 2-4.

Table 2. Survey Participants' Academic Major

<i>What is your academic major?</i>	<i>Responses (%)</i>
Aerospace	3
Biological/biomedical	7
Chemical	17
Civil & environmental	12
Computer science	10
Electrical & computer	12
Industrial	8
Mechanical	25
Software	4
Other	1
Did not answer	2

Table 3. Survey Participants' Genders

<i>What is your gender?</i>	<i>Responses (%)</i>
Female	20
Male	77
Other	1
Did not answer	2

Table 4. Survey Participants' Ethnicities

<i>What is your race/ethnicity?</i>	<i>Responses (%)</i>
African-American	7
Asian/Pacific islander	4
Caucasian/White	81
Hispanic	2
Other	4
Did not answer	2

Table 5 below shows that respondents who reported being confident in their presentation ability rose from 28% pre-workshop to 52% post-workshop.

Table 5. Overall Level of Confidence Results

<i>How do you rate your overall level of confidence in delivering oral presentations?</i>	<i>Pre-Workshop (%)</i>	<i>Post-Workshop (%)</i>
Very confident	5	6
Confident	28	52
Somewhat confident	42	31
Somewhat under-confident	15	4
Under-confident	7	3
Very under-confident	1	1

Table 6 below shows that respondents who reported being confident in their voice/vocal preparation rose from 24% pre-workshop to 63% post-workshop.

Table 6. Voice/Vocal Preparation Confidence Results

<i>How do you rate your level of confidence in your voice/vocal preparation in delivering oral presentations?</i>	<i>Pre-Workshop (%)</i>	<i>Post-Workshop (%)</i>
Very confident	6	6
Confident	24	63
Somewhat confident	42	29
Somewhat under-confident	20	1
Under-confident	6	2
Very under-confident	1	0

Table 7 below shows that respondents who reported being confident in their body preparation/body language rose from 28% pre-workshop to 53% post-workshop, while the amount of “Very confident” responses rose from 2% to 10%.

Table 7. Body/Body Language Confidence Results

<i>How do you rate your level of confidence in your body preparation/body language in delivering oral presentations?</i>	<i>Pre-Workshop (%)</i>	<i>Post-Workshop (%)</i>
Very confident	2	10
Confident	28	53
Somewhat confident	42	26

Somewhat under-confident	18	6
Under-confident	4	2
Very under-confident	2	1

Table 8 below shows responses to questions concerning students' opinions on levels of comfort and preparation for oral presentations. The yellow-highlighted sections show significant increases in respondents' comfort with delivering presentations as well as recognition of the importance of voice and body preparation.

Table 8. Results on Opinions Regarding Presentation Preparation

<i>Which of the following statements apply to your experiences giving oral presentations? (Choose all that apply.)</i>	<i>Pre-Workshop (%)</i>	<i>Which of the following statements apply to your experiences giving oral presentations? (Choose all that apply.)</i>	<i>Post-Workshop (%)</i>
I am comfortable delivering oral presentations.	32	This workshop helped me be more comfortable with the idea of delivering oral presentations.	54
I know how to prepare for delivering oral presentations.	38	This workshop will help me better prepare for delivering oral presentations.	54
Preparing the voice for oral presentations is important.	30	Preparing the voice for oral presentations is important.	54
Preparing the body for oral presentations is important.	27	Preparing the body for oral presentations is important.	50
Preparing the voice and body for oral presentations is as important as knowing the content for oral presentations.	47	Preparing the voice and body for oral presentations is as important as knowing the content for oral presentations.	57
In general, I need more practice at preparing for oral presentations.	45	N/A	N/A
I need more practice at preparing my voice for oral presentations.	27	N/A	N/A
I need more practice at preparing my body for oral presentations.	24	N/A	N/A

The final part of the post-workshop survey involved the prompt “Please provide any additional comments you have about the workshop.” Forty-nine students responded, and these responses appear below grouped by the themes “positive” (Table 9 – 32 comments), “negative” (Table 10 – nine comments), and “other” (Table 11 – eight comments). The responses appear exactly as students typed them with errors intact, so all errors present are [sic]. Note that even five of the nine negative comments acknowledge **some** positive element of the experience. Note to that “Mr. Carlisle” refers to co-author and workshop leader Greg Carlisle.

Table 9. Additional Respondent Comments – Positive

I really enjoyed the workshop. I wish we had more time for him to work with everyone more independently, but I know with the large number of students this isn't very feasible.	Mr. Carlisle was very hands-on and helpful in showing my group how to speak and stand while giving a presentation.	I found the workshop very interesting, and I feel so much more comfortable speaking in front of crowds.
This was a fun and interesting workshop and more informative and lasting than an in-class lecture.	Enjoyed his workshop, would like to see him come back and teach more.	I enjoyed his workshop and I feel that I will be a much more effective presenter now.
Although I didn't like standing for such a long period of time, I enjoyed how interesting and entertaining he kept the workshop. The ideas he presented made sense to me, and I'm glad I'll be able to put them to use in the future.	I enjoyed this workshop. Mr. Carlisle was not only enthusiastic but he was also knowledgeable about the material. This workshop helped to prepare me for my presentation by giving me good ideas.	Mr. Carlisle was very intergetic. He did very well in keeping us interested in what he was talking about. Also showed us techniques on how to present ourselves to capture the audiences attention. Showed us ways to hit highs and lows with our voices depending on the context of the words we are saying.
It's like alot of things in life, you get out of it what you put into it. That said it was very helpful, especially the vocal representations of the poems and whatnot	The workshop helped me loosen up in front of other people. It made us get out of our comfort zone and practice speaking in front of others. I enjoyed the workshop.	A very good speech teacher, I really liked the way he showed us how we can use our voice to express ourselves, and who we are. Definitely helpful.
It was very informative	Enjoyable	Great workshop
It was fun and informative, but it would have been more exciting if the entire group was interested in participating to their fullest. Obviously, getting a large group of engineering students out of their shells may be a bit challenging, but overall I think [name] did a good job at that.	I personally enjoyed the workshop. I personally think it helped calm me down before my presentation, and allowed me to relax during my presentation, and to focus on the task at hand. I highly recommend that this workshop be kept for future classes.	The Greg Carlisle workshop was definitely interesting! He gave me another view on presentations. Going into presentation 1 I was nervous, but he made it seem less intimidating. Body language is still a tough thing to accomplish, but with practice, I know I can get better.
He had great energy, kept the audience involved and interested.	He was very interesting and easy to listen to.	I enjoyed participating in the workshop.
I found the workshop not only enjoyable but extremely helpful. I would recommend you continue to do this for technical writing students.	I felt like the group of engineering students may not have been as receptive as his typical crowd, but I know we all benefited from hearing his tips and advice. Mr. Carlisle	It was helpful in many areas of my speech delivery skills and showed me a number of things to correct with my public speaking.

	should definately speak to future groups of students.	
This workshop gave me more confidence in presenting and achiving my goal of being an excellent speaker.	I think it would be a good idea to bring him back next year for [name of course] students.	I felt like the session was a leaning experience. I also think i will be more comfortable in front of an audience.
It was helpful and motivating.	The workshop was useful and [name] was constantly engaging.	I enjoyed the workshop.
Very interactive	Great fun!	

Table 10. Additional Respondent Comments – Negative

I would say what makes a good speaker is confidence. In my opinion, getting people to act goofy or silly in a group setting is not an effective way to boost confidence for every person. For me, confidence is gained from learning good speaking techniques and knowing the material. The last part of the workshop where we learned how to better enunciate, change our voice's pitch, and project was very helpful to me.	I felt that some of the vocal lessons from the workshop would be more applicable to speeches and theatrical performances than technical presentations. I did think that if these techniques were moderated or toned down, they could keep an audience engaged in a technical presentation.	While I understand why we were required to go to the workshop, I feel like overall it was a waste of time. The things that were covered could have be accomplished in a 5 minute PowerPoint or a handout given to the class.
Mr. Carlisle was a very great presenter, but I do not think his presentation had an impact on me.	I thought he was a good speaker but I didn't feel like I got very much out of it.	Things were a bit rushed and felt like more of a personal attack than constructive criticism.
I don't personally believe I have to prepare my body and/or voice besides the minimum of deep breathing and reciting my part verbally to loosen up the muscles.	It would have been nice to take this workshop earlier than the day of our presentations, because being critiqued right before having to give a presentation made me pretty self-conscious.	Although the workshop was fun and interesting, the methods seemed to silly to take serious and to actually practice before a presentation.

Table 11. Additional Respondent Comments – Other

It taught me how to stand in the crowd	I learned how to not lose my voice at football games.	He was cool. I just really wasn't into acting like a monkey.
For question #4, I didn't check answer (e.) only because I believe that if someone is knowlegeable and passionate enough about a given subject, it is possible to overcome any obstacles dealing with speaking, nervousness, and body language when an giving an oral presentation about that subject. Not to say that preparing voice and body aren't important.	It was a very interesting experience and helped in ways I did not foresee. I have never really been one to act silly in public simply because I do not find that it helps me loosen up. I have no problems speaking in public either but it was definitely a different kind of seminar.	It was a somewhat akward workshop, but overall it helped. He saw everyones nervous gestures and pointed them out. This allowed everyone to be aware of this going forward.

It was an all-around unique experience.		
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Last is a comparison between presentation scores and averages from the spring 2008-summer 2014 semesters, which included no workshops, with those from the fall 2014 semester, which included the surveys and workshops described here. As Table 12 below shows, aggregate scores either remained the same or rose slightly.

Table 12. Comparison of Average Team Scores for GE 3513 Presentation Assignments

	Average Scores Spring 2008- Summer 2014	Average Scores Fall 2014
Presentation 1	89.3	89.3
Presentation 2	89.6	90.6
Presentation Average	89.5	89.6

Because presentations in GE 3513 are collaborative, however, individual student scores are the average of a team rating and an individual rating, and because the individual rating is based on voice and body performance, this latter metric is the one that actually relates to the study in question. Table 13 below shows the individual-rating portion of a typical GE 3513 grading form, while Table 14 compares the post-workshop individual ratings from fall 2014 with those from previous semesters. This comparison shows a larger grade increase for both of the course's presentations.

Table 13. Example of a GE 3513 Grading Form – Individual-Speaker Rating Portion

<i>Voice</i>							
	1 st speaker		2 nd speaker		3 rd speaker		4 th speaker
4	Sufficient volume	5	Sufficient volume	5	Sufficient volume	5	Sufficient volume
4	Appropriate enunciation & speed	4	Appropriate enunciation & speed	3	Appropriate enunciation & speed	4	Appropriate enunciation & speed
3	Noticeable enthusiasm	5	Noticeable enthusiasm	3	Noticeable enthusiasm	5	Noticeable enthusiasm
4	Minimal nonfluencies	4	Minimal nonfluencies	4	Minimal nonfluencies	4	Minimal nonfluencies
5	Coherent flow of ideas	5	Coherent flow of ideas	5	Coherent flow of ideas	5	Coherent flow of ideas
COMMENTS: 1 st speaker: Good delivery overall, though a bit monotone at times -- work on your vocal variety/energy; transition to speaker 2 was too quiet. 2 nd speaker: Superb, poised delivery overall; very well done. 3 rd speaker: Suitable delivery overall; work on slowing down your speech a bit (too fast) and varying your vocal variety (not so monotone). 4 th speaker: Superb, poised delivery overall; well done.							
<i>Body</i>							
	1 st speaker		2 nd speaker		3 rd speaker		4 th speaker
5	Consistent eye contact	4	Consistent eye contact	3	Consistent eye contact	4	Consistent eye contact
4	Natural movements & gestures	4	Natural movements & gestures	4	Natural movements & gestures	4	Natural movements & gestures

5	Minimal distracting tendencies/tics	5	Minimal distracting tendencies/tics	5	Minimal distracting tendencies/tics	5	Minimal distracting tendencies/tics
COMMENTS: 1 st speaker: Excellent physical delivery overall; good, consistent eye contact. 2 nd speaker: Good physical delivery; no problems to note. 3 rd speaker: You looked at the screen too much -- make sure you look out at the whole room consistently. 4 th speaker: Very good physical delivery; no problems to note.							
TOTAL RATING FOR EACH MEMBER (avg. of above scores)							
4.3	1 st speaker	4.5	2 nd speaker	4.0	3 rd speaker	4.5	4 th speaker

Table 14. Comparison of Average Individual Scores for GE 3513 Presentation Assignments

	Average Individual Scores Pre-Workshop	Average Individual Scores Post-Workshop
Presentation 1	83.9	86.4
Presentation 2	84.4	86.4

Conclusions, Limitations, and Future Improvements

The results of this initial study show that workshops involving theatre-based exercises could help improve student confidence in the voice and body aspects of oral presentations, while the impact on student presentation grades (with an admittedly small sample) looks promising.

An obvious limitation of this work is that it involves only one group of students in one semester. Firmer evidence of the strategies' usefulness requires multiple iterations. A related limitation is the lack of comparative pre- and post-surveys from previous semesters: that is, what would student confidence levels look like derived from surveys without the prospect of a presentation-related workshop?

Along with addressing these limitations, future administrations of these surveys and workshops will also address various logistical issues about the experience, some of which appear in Tables 9-11 above (fewer students per workshop group, longer time slots/a less rushed setting, and so on).

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