PAPER DIALOGUE: BUILDING A STAKEHOLDER BASED RUBRIC TO ENHANCE STUDENT COMMUNICATION SKILLS

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Abstract

The authors describe the process used to create a rubric for measuring student communication skills in engineering. This is unique in that its content is based on input from a particular group of stakeholders, in this case executives whose companies hire many of the students for whom the rubric will be applied. The research method employed semi-structured stakeholder focus groups along with real-time collaborative coding of data by the stakeholders and the researchers to synthesize results. process for using these results to develop the six major categories of the rubric, their sub- dimensions, and descriptors level of the rubric is also described along with a prototype example for one of the six categories. The paper concludes discussion of important factors to consider if applying the rubric to contexts outside of those for which it was originally developed. Scenarios for nursing and developmental math are presented.

Introduction

The standard approach to developing a rubric is to bring together one or more academicians to brainstorm and discuss important dimensions to be measured and then create a scale or scales to apply to each dimension. This approach has significant value in that expert analysis is applied to the creation of the rubric. However, this method, at best, only indirectly accounts for the many complex aspects of student performance that ultimately matter to stakeholders outside the institution. The authors have taken a unique approach for the work described here, where the content of the rubric is developed based on the direct input of stakeholders. In this case the stakeholders are executives employed in companies that will, ultimately, hire many of the students in Georgia Tech's Stewart School of Industrial and Systems Engineering, for which the rubric was developed. Thus, workforce expectations are embedded into the measurement system for student success.

In this paper, the authors describe the process used to plan for and carry out the data collection process. The research method employed semi-structured stakeholder focus groups along with real-time collaborative coding of data by the stakeholders and the researchers to synthesize results. The process for using these synthesized results to develop the six major categories of the rubric, their sub- dimensions, and descriptors at each level of the rubric is also described along with the provision of prototypical example for one dimension under one of the six categories of the rubric for measuring student communication skills in engineering.

The categories and sub-dimensions for communication skills identified by the executives can be adapted and applied to many disciplines and across many contexts. The emphasis on executive input for workforce speaking situations will make the tool universally applicable across disciplines and institutions. As such, the paper concludes with a discussion of important factors to consider if applying the rubric to contexts outside of those for which it was originally developed. Specifically, scenarios for application of

the rubric to nursing and developmental math contexts are developed.

Background

Accreditation standards within engineering programs for the United States have been a major driving force for change in the quality of measurement, assessment, and evaluation. In 2000, the Accreditation Board of Engineering and Technology (ABET) passed guidelines requiring instruction in speaking (ABET, 2000). In response, many engineering schools have added speaking instruction to their undergraduate curriculum. Key ideas represented in the ABET accreditation criteria are also echoed in the influential report "*The Engineering of 2020*" (National Academy of Engineering, 2004). This has resulted in a multitude of different methods to deliver instruction on and evaluate student speaking.

In the Stewart School of Industrial and Systems Engineering's Workforce Communication Program, about 300 students per semester are given communication instruction as part of two courses: Capstone Design and Basic Statistical Methods. The communication instruction is based on information gathered from personal interviews with practicing engineers and managers, and telephone interviews with executives in firms employing engineers. In the Capstone Design course, students work in small groups to apply their industrial engineering knowledge and methodologies to solve problems for real-world clients. They give six presentations over the semester. Their instruction takes place in the Workforce Communication Lab (a dedicated space including five presentation stations) and operates in parallel with their project work. The lab director and three teaching assistants provide six segments of instruction. The instruction includes:

- Storyboarding to check the logical flow of the slides
- Audience analysis
- Review of slide design
- General speaking practice and feedback
- Targeted practice for specific speaking skills needing improvement
- Review of videotapes of speaker.

Assessment of this system based on student self-report questionnaires has shown, for five semesters, a significant improvement in students' self-reported confidence and competence in presenting. However, a system to accurately measure quality based on characteristics of actual student speaking performance has been notably absent. Such a system will be a more valid measure since it will focus on student behavior, which is more objective than student self-report. The system will save time and effort for both students and instructors. Additionally, the use of executive input will ensure that this behavioral measurement tool will be appropriate to the context of much of the communication that engineers and other workplace professionals do.

Of course, the development of this rubric is not limited to the use of executive input only. Scoring rubrics for student speaking are already in use at other organizations, including high schools, state associations, and other universities. One of these key resources upon which the rubric described here builds is the most comprehensive work we know of to date - the work done by Iowa State - which is now used at several other universities (Payne & Blakely, 2004-2008, 2007). Oral presentation rubrics for engineering are also in use, for example, at Carnegie Mellon (2009), Ohio State (2009), Oklahoma State (2009), University of Michigan (2009), University of Arkansas (2009), University of Illinois (2009), and University of Wisconsin (1998). Another extensive project with engineering communication components and measurement tools included as part of the project is the Transferrable Integrated Design for Engineering Education (TIDEE) project (Davis, Beyerlein, Thomson, Olakunle, & Trevisan, 2009). In the

TIDEE project, multiple assessment instruments that can be employed for key activities within capstone design engineering programs have been developed. Many of these tools incorporate aspects of communication (with stakeholders, within a team, etc.).   Each of these tools are considered in the development of the communication rubric described here. Finally, the development of the rubric incorporates oral presentation scoring rubrics developed for other contexts, such as one developed for research presentations given by medical residents (Musial et al., 2005).

Typically, not much documentation is available about how the rubrics described above were developed. However, the authors have attempted to capitalize on their relevant experience in this area (Norback; Norback & Hardin, 2005; Norback, Jernigan, Quinn, & Forehand, 2002; Norback, Leeds, & Kulkarni, under revision; Norback, Llewellyn, & Hardin, 2001; Norback, Sokol, Forehand, & Sutley-Fish, 2004; Utschig, 2001, 2004, 2007). The authors also have professional connections with some of the key personnel involved with the projects at Iowa State and TIDEE. These connections have helped (and will continue to help) guide the process for this work. Finally, the general literature describing the process for building quality rubrics must be considered (Arter & McTighe, 2001; Bargainnier, 2008; Mullinix, 2007; Wiggins, 1988). This literature provides the context for construction of the rubric using the above information.

Methods
Overall Approach
The research method used for this work employed four identical semi-structured stakeholder focus group sessions along with real-time collaborative coding of data by the stakeholders and the researchers to synthesize results.   This work was conducted using a script developed to guide the sessions conducted with the executives (see Appendix A).

These synthesized results were then used to develop six major categories for the rubric by grouping the data by common attributes and consulting with communications experts to formulate names for the categories. Each rubric category then consists of sub-dimensions that are derived directly from the executive input. Next, levels of performance for the rubric were defined and for each sub-dimension a set of descriptors at those levels of performance were produced by selecting key words and example behaviors observed in student performances within the context of engineering.   This aspect of the rubric development process is where the executive input is combined with the existing knowledge from other rubrics and resources that was described in the previous section.

Prototype example items for one dimension under each of the six categories are provided below as examples. These can be adapted for other fields as described below.

Scripting the Executive Focus Groups
Appendix A contains the script used to conduct the executive focus groups. There were three main parts to the executive focus groups. First, snippets of actual student presentations at varying levels of quality were shown. These were provided as cues to trigger the thinking of the executives and also provided them some understanding about the context in which our students deliver their presentations. These snippets were not intended to be comprehensive in representing student presentations, but rather as a way to orient the conversation and ground it in reality.

Second, the executive participants in the focus groups were given a set of very simple written prompts with space to respond individually on a single sheet of paper. This was done to solicit their input about

various attributes of workforce presentations. The prompts were simply requests to list positive and negative aspects of presentations they have seen in the workforce. These prompts were purposely open-ended, non-prescriptive requests so that the participants were not led to feel as if there were any particular expected response.

Third, and finally, the group shared their ideas publicly with the rest of the group. As ideas were offered, they were recorded for all to see on large post-it pages on the wall. Approximately 40 comments were recorded per session. Once all of the participant ideas were recorded, a discussion of the items ensued. The purpose of this discussion was to reduce overlap in ideas, group similar items, and produce a reduced list of performance characteristics for workforce communications which represented all or most of the comments offered. This resulted in between 7 and 15 general performance characteristics per session, each with a set of several corresponding descriptive attributes consisting of the original offered comments. This list was built by writing the names of the synthesized areas on separate post-it pages and numbering each one. Individual comments falling under the synthesized areas were then labeled with the corresponding number until nearly all individual items were used. Any remaining items that were not able to be classified were retained for possible integration into the results by the research team once all four focus sessions were complete.

Analysis of Executive Feedback
Producing the Rubric Format

The executive input at this stage consisted of four sets of 7 to 15 characteristics of performance in workforce presentations, each with a set of attributes composed of the individual comments from the executive participants. Some of the characteristics overlapped, but the overall set was still rather large when thinking of using it for a rubric that would feel accessible and manageable in the classroom.

This problem was addressed with the help of a communications expert who looked at the characteristics represented and further synthesized them into six general areas. These six categories are: 1) customizing the presentation to the audience, 2) interacting with the audience, 3) delivering the presentation, 4) telling the story, 5) sequencing the topics, and 6) designing the slides by focusing on key topics. Each category then has a number of characteristics, each with their own attributes as defined from the executive focus groups. These characteristics were then used to form the dimensions of the rubric.

Next, it was decided that the rubric would use four levels of performance for each characteristic. The four levels chosen were: novice, fair, very good, and best. The use of four levels rather than five was chosen in order to avoid the use of a "neutral" middle level and to force users of the rubric to make firmer decisions about the student performance. The names of the levels were also chosen to avoid the use of negative language so that one could focus on determining what a student presenter *could* do, rather than what they *could not* do.

Finally, descriptors for each characteristic within the six major categories and at each level of performance were produced.   The goal for each descriptor was to make succinct yet visualizable statements with example details. The purpose for this approach is to cue the user to look for specific evidence corresponding to the characteristic of the performance being described without prescribing exactly what that evidence should be. This is important for complex performances such as oral communication where characteristics of the performance can manifest themselves in many ways and not all attributes of that characteristic can be weighted in the same manner for each presentation.

Description of the Rubric Categories

The six prototype categories of the rubric are described below along with specific example details offered by the executives about how those categories come into play during an oral presentation. After they are discussed, an example is given of a prototype rubric for one category's dimensions. For example, under the category *Telling the story*, the dimensions are: expanding slide information, creating coherence between or among points, speaking about data/charts/graphs, and putting information in context.

1. Customizing the presentation to the audience

This category relates to identifying the audience members' characteristics ahead of the presentation and customizing the presentation to audience interests.

The executives stressed that presenters should know their audience's characteristics (for example, their background knowledge) and their interests. For example, the presenter should have identified, before giving their talk, questions the audience will likely want answered. During the presentation, the speaker should stay focused on their audience's needs.

The executives also pointed out that the presentation should be simplified if it is too technical for the audience. Beforehand, the presenter should identify the vocabulary the audience is most comfortable with and usually uses. For example, an audience of industrial engineers will be very familiar with the acronym SKU (a stock-keeping unit or unit used to organize and count stock.) But a layperson audience would need the full phrase used along with a brief explanation.

The executives emphasized engaging the audience by using examples relevant and interesting to them, instead of more general examples. For instance, if a project leader for the smart bridge (which included embedded sensors to accurately detect structural issues) built in Minneapolis after the bridge collapsed had two different audiences—one of civil engineers and one of electrical and computer engineers, the project leader might stress, for example, the structural components for the civil engineers and the process of the sensors collecting and communicating data for the electrical and computer engineers.

When presenters face an audience, they usually know how long their presentation is expected to be. The executives emphasized showing respect for the audience by beginning and ending on time.

2. Interacting with the audience

This category relates to maximizing the potential for audience members to question the presenter, to make comments during and after the presentation, and to feel connected to the presenter through their enthusiasm.

The executives emphasized the importance of having an interactive dialogue with the audience. After each major segment of the presentation, the presenter should ask the audience if they have any questions. The presenters may want to call on people in the audience if they see frowns or surprised looks. They should allow and encourage audience members to ask questions whenever they want, even if the questions interrupt the presentation. And the presenter should leave ample time at the end of the talk for audience questions and discussion.

If the audience gets a copy of the Power Point slides in advance of the presentation, noted the executives, the presenter should take less time to refer to their slides. The presenter should also check the audience's nonverbal cues (such as eye contact) regularly to make sure the presenter is not assuming their audience's preparation is better than it is.

Executives also emphasized that presenters should demonstrate their enthusiasm and excitement

around the presentation's key points. For example, if the presenter has found the answer to a problem, they should explain the difference the solution will make.

3. Delivering the presentation

This category relates to using nonverbal and verbal skills to enhance the delivery of the presenter's message (rather than distracting the audience from the message).

The executives agreed on a number of skills needed for the effective delivery of a presentation. They suggested the presenter should set themselves up for success by projecting confidence through serious clothing and meticulous grooming. They stressed the presenter should know their material well without memorizing it. The audience can tell when a presentation is memorized, and often memorization can lead to missteps. The executives also emphasized the importance of good posture and bearing, and the use of energy and good inflection during presentations. They mentioned presenters should avoid ending sentences on an up note or rising tone so it is clear they are making a statement and not asking questions.

The executives pointed out the presentation should be precise and succinct, and the pace should be smooth and not too rapid. The presenters should use pauses where appropriate and leave the slides up long enough for the audience to listen to explanations and digest any graphs or charts. The executives reported that eye contact (looking at individual members of the audience) is key. And, finally, presenters should use their hands for emphasis but avoid too much body motion and nervous hand gestures.

4. Telling the story

This category relates to using flow and interconnectedness to combine coherent sequences and create a unified message.

The executives pointed out aspects of presenting that help the presenter "tell the story." The presenter should expand upon the displayed information by telling the audience about what they can't see. For example, presenters should use stories or anecdotes to support their main points. Concrete examples help put information in context of explain it in "real life."

The executives agreed that the presenter should use appropriate slide headers and transitions between slides to create a coherent set of points. And when presenting data or charts and graphs, executives stressed the presenter supporting the data with a concise verbal description. The main point of the data should be explained and demonstrated with specific examples.

5. Sequencing the topics

This category relates to using the order of the main topics to establish credibility and engage the audience.

The executives stressed the presenter start by describing the presentation's purpose and the reason the presentation is important to the audience. The presenter should describe the big picture and clarify what the audience will be able to take away from the presentation. The opening sentence is key to engaging the audience right up front.

The executives emphasized the presenter should also quickly establish their credibility so the audience will trust their information. As the presenter continues, they will need to keep referring back to the big picture and "what's in it [the presentation] for the audience." As the presenter moves from slide to slide they should help the audience transition, reviewing the main points they've already covered and describing briefly how the points lead to the topic about to come up. It may help to have the final point on the slide lead in to the next slide.

At the end of the presentation, the executives emphasized, the presenter should summarize key points. If the presentation is persuasive, the presenter should end with a call to action and a "rallying cry" to tell the audience exactly what they're expected to do.

6. Slide design and focusing on key points

This category relates to being concise and including the appropriate information to back up the key points.

The executives stressed putting on the slide only what is necessary to support the main points of the presentation. They pointed out that presenters should make one or two main points on each slide and mentioned the general guideline of eight words per bullet and eight bullets per page. They also suggested presenters use charts and graphs to support the key points. Finally, presenters should distribute only a few takeaways.

Example of the Rubric's Dimensions

Below in Table 1 is an example of the rubric for the category of *Telling the story*. The dimension described is *Speaking about data/charts/graphs*. The four levels are novice, fair, very good, and best. As the speaker's quality of presentation improves, they provide a more and more concise description for the data/charts/graphs. They also demonstrate with details.

Table 1 – Example of Rubric for Category of *Telling the Story*

Dimension	Novice	Fair	Very Good	Best
Speaking about Data/charts/graphs	Show the data and let the audience draw their own conclusions OR do not explain data and display data/charts/graphs briefly assuming the audience can understand	Point out the different parts of the data directly from the visual; that is, note details and assume the audience can understand the details and connect to the main point	Support some data with limited verbal description OR discuss main points and a few details	Support the data with concise and specific verbal description, for example, describe why the audience is looking at all the numbers; explain the main point of the data and demonstrate with a couple of details

This level of description is being developed for all dimensions within every category and an emphasis is being placed on keeping the descriptions concise and easy to understand.

Considerations in Applying the Rubric
Industrial Engineering – Capstone Design Presentations

The scoring system described in this paper was developed in an engineering context and will be applied to student presentations in Capstone Design. However, the scoring system can be translated and applied to other settings, such as nursing and developmental math needs in community colleges. Examples based on the six rubric categories are described below for these two applications.

Nursing – nurse/doctor communication

For nurses, most communication is either one-on-one or one person interacting with a small group.

The audience often includes doctor(s), patients and their family members, other nurses, and nurse assistants. When interacting with a doctor, a nurse *customizes their "presentation"* by knowing and using the relevant technical terms and by keeping the interaction brief. To be effective, the nurse will optimize *interaction* in several ways. First, they will build into their interaction questions or cues the doctor can respond to. Second, they will close with a question asking if the doctor has everything they need, leaving an opportunity for the doctor to request follow-up information.

With regard to *telling the story* and *sequencing the topics*, the nurse should start by letting the doctor know the level of criticality of the communication. This will help the doctor turn their attention to the issue. The nurse will give the context of the interaction (for example, whether this deals with a particular patient or other nursing needs.) Then they will *emphasize key points* and continue to *customize to their audience* by avoiding irrelevant details and providing specific examples or specifics for each symptom, supporting their points with the relevant documentation. In closing, the nurse should describe a plan of next steps for both the doctor and the nurse. And, as mentioned earlier, the doctor will be given the opportunity to ask for more information.

In *delivering their "presentation,"* the nurse will maintain eye contact to make sure the doctor is still paying attention. They may use their hands for emphasis, for example, holding their shoulder if they are discussing a shoulder injury. The nurse will build in brief pauses for the doctor to ask questions or acknowledge what they have said, and the nurse will make sure the relevant documentation is complete and at hand.

Developmental Math – problem solving in student pairs

In developmental math courses in a community college setting, the application of the scoring rubric would differ from its use in a nursing setting. We describe an example application where students in these developmental math classes are reporting results of work they have done in pairs (for example, graphing an exponential function). They will have a mixed audience consisting of their professor and their peers. Therefore, they will *customize their presentation* to both by showing the professor they understand the concepts and describing to their fellow students how they solved a particular problem. The pair of students presenting will need to demonstrate they know the relevant math vocabulary and how to use the concepts to solve the problem.

To make sure they *interact with the audience*, the two presenters should build in questions for the other students during their presentation. For example, one of the presenters might ask, "How many groups used this step?"

The presenters will also *sequence their topics* as they *tell their story, focusing on key points*. To start, the presenters will repeat the problem to be solved and present an outline of the process they used. They will describe key steps, providing clear transitions between each step. The presenters will describe the necessary detail for each step, including any incorrect paths taken in prior trials which can be emphasized as key points to avoid pitfalls. At the end of the presentation, the two presenters will summarize their key points, describing the solution and generalizing if possible about the concepts learned so that they may be applied by the students to future math problems.

When *delivering the presentation*, the two speakers will be coordinated so they know when their partner will end and when they will start presenting. The boardwork and delivery will be coordinated to allow for regular eye contact to check their audience's nonverbal cues. And they will pace the presentation so it's smooth and not too rapid to follow.

Conclusions

The process for developing a rubric based on executive input has been described. This process has four key elements. First, the data was collected from the executives with a free-response brainstorming activity after viewing brief snippets of student presentations in typical context for senior undergraduate engineering. Second, the data was synthesized using group discussion for each of the four focus groups. Third, the data was further synthesized by authors into six categories in consultation with additional resources and experts in communication. Fourth, the category sub-dimensions (or characteristics) were placed into four levels of performance in a matrix system. The matrix was populated with details of the characteristics at each level of performance based on the specific feedback provided by the executives.

Additionally, the original context for use of the rubric was described in some detail and examples of specific suggestions provided by the executives were given. Finally, a discussion of how the basic categories for the rubric can be adapted to scenarios in nursing and developmental mathematics was then presented.

References

ABET. (2000). Criteria for Accrediting Engineering Programs. from www.abet.org

Arter, J. A., & McTighe, J. (2001). *Scoring Rubrics in the Classroom: Using Performance Criteria for Assessing and Improving Student Performance.* Thousand Oaks, CA: Corwin Press, Inc.

Bargainnier, S. (2008). Fundamentals of Rubrics. In D. K. Apple, S. W. Beyerlein & C. Holmes (Eds.), *Faculty Guidebook - A Comprehensive Tool for Improving Faculty Performance* (4th ed.). Lisle, IL: Pacific Crest.

Beyerlein, S. W., Apple, D. K., Holmes, C., & (Eds). (2007). *Faculty Guidebook: A Comprehensive Tool for Improving Faculty Performance* (4th ed.). Lisle, IL: Pacific Crest.

Carnegie Mellon Enhancing Education Program. 2009, from www.cmu.ed/teaching/designteach/teach/rubrics.html

Davis, D. C., Beyerlein, S. W., Thomson, P., Olakunle, H., & Trevisan, M. (2009). Assessments for Capstone Engineering Design. from http://www.tidee.org/static/Information_Packet_TIDEE_Capstone_Assessments.pdf

Mullinix, B. (2007). *A Rubric for Rubrics: Reconstructing and Exploring Theoretical Frameworks.* Paper presented at the Professional and Organizational Development (POD) Network Conference, Pittsburgh, PA.

Musial, J. L., Alton O. Parker, Craig A. Reickert, Sarah A. Adams, Sishir Rao, & Shepard, A. D. (2005). Developing a Scoring Rubric for Resident Research Presentations: A Pilot Study. *Journal of Surgical Research, 142*(2), 304-307.

National Academy of Engineering. (2004). *The Engineer of 2020: Visions of Engineering in the New Century.* Washington D.C.: National Academies Press.

Norback, J. Shaul. Norback Criteria for Communication Excellence. from www.isye.gatech.edu/workforcecom

Norback, J. Shaul, & Hardin, J. R. (2005). Integrating Workforce Communication into Senior Design. *IEEE Transactions on Professional Communication, 48*(4), 413-426.

Norback, J. Shaul, Jernigan, S. A., Quinn, A. B., & Forehand, G. A. (2002). *Teaching Workplace Communication in Senior Design.* Paper presented at the American Society for Engineering Education 2002 Conference Proceedings.

Norback, J. Shaul, Leeds, & Kulkarni. (under revision). Integrating an Executive Panel on Communication

into Senior Design Tutorial. *IEEE Transactions on Professional Communication.*

Norback, J. Shaul., Llewellyn, D. C., & Hardin, J. R. (2001). Integrating Workplace Communication into Undergraduate Engineering Curricula. *OR/MS Today, 28*(4).

Norback, J. Shaul, Sokol, J., Forehand, G. A., & Sutley-Fish, B. (2004). *Using a Communication Lab to Integrate Workplace Communication into Senior Design.* Paper presented at the American Society for Engineering Education 2004 Conference Proceedings.

Oklahoma State University---School of Electrical and Computer Engineering. 2009, from http://www.ece.okstate.edu/abet_capstone_design_portfolios.php

Pacific Crest. (2007). Pacific Crest Home Page.   Retrieved October 5, 2006, 2008, from http://www.pcrest.com

Payne, D., & Blakely, B. (Eds.). (2004-2008). *Multimodal Communication: Rethinking the Curriculum.* Iowa City, IA: ISUComm at Iowa State University.

Payne, D., & Blakely, B. (Eds.). (2007). *ISUComm Foundation Courses: Student Guide for English 150 and 250.* Iowa City, IA: ISUComm at Iowa State University.

University of Arkansas Mechanical Engineering. 2009, from http://comp.uark.edu/~jjrencis/REU/2007/Oral%20Presentation%20Form.doc

University of Illinois and University of Wisconsin. (1998). Checklists for presentations *Writing Guidelines for Assignments in Laboratory and Design Courses,* 2009, from http://courses.ece.uiuc.edu/ece445/documents/Writing_Guidelines.pdf

Utschig, T. T. (2001). *The Communication Revolution and its Effects on 21st Century Engineering Education.* Paper presented at the Frontiers in Education Annual Conference, Reno, NV.

Utschig, T. T. (2004, October 20-23, 2004). *Work In Progress - Utilizing Assessment as a Means to Increased Learning Awareness.* Paper presented at the 34th Annual ASEE/IEEE Frontiers in Education Conference, Savannah, GA.

Utschig, T. T. (2007). Writing Performance Criteria for Individuals and Teams. In D. K. Apple, S. W. Beyerlein & C. Holmes (Eds.), *Faculty Guidebook: A Comprehensive Tool for Improving Faculty Performance* (3rd ed.). Lisle, IL: Pacific Crest.

Wiggins, G. (1988). *Educative Assessment: Designing Assessments to Inform and Improve Student Performance.* San Francisco: Jossey-Bass.

Biographies

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Dr. Judith Shaul Norback is a Senior Academic Professional and General Faculty in the Stewart School of Industrial and Systems Engineering at Georgia Institute of Technology. Her degrees are in social psychology from Cornell and Princeton. As the Director of Workplace and Academic Communication, she has developed the Workforce Communication Program by conducting interviews with engineers, managers, and executives of firms employing engineers and using the information along with faculty input to develop and teach Workforce Presentation Instruction in Capstone Design and Basic Statistical Methods. Formerly, she worked for eight years at Educational Testing Service identifying the basic requirements of jobs and then founded and directed for eight years the Center for Skills Enhancement, Inc. Her clients included the U.S. Department of Labor, the National Skill Standards Board, the entire American steel industry, and many colleges and universities. At Georgia Tech, Norback has directed the

Workforce Communication Lab and taught students communication skills. She has continued her research into the communication skills required for success in the workforce and assessment of those skills through support from the National Science Foundation, the Alfred P. Sloan Foundation, and the Engineering Information Foundation. Norback has presented at many national conferences and since joining Georgia Tech in 2000 has published articles in *INFORMS Transactions on Education*, the *American Society for Engineering Education Annual Conference Proceedings*, and *IEEE Transactions on Professional Communication.* Currently she is focusing on assessing the Capstone Design communication instruction, developing performance assessment for communication, and writing a book for John Wiley & Sons on <u>Oral Communication Excellence for Engineers.</u>

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Appendix A
Script for Executive Meetings: Input on Scoring Student Presentations

I. Introduction
1) As they come in
   a. fill out demographic info
   b. check with each executive individually to see if OK to videotape meeting
2) Goal
   a. building scoring system for student presentations, based on your experience
   b. We are interested in what <u>you</u> think is important.
   c. Want graduates to be able to give stellar presentations to executives.
3) Plan= Georgia Tech students (teaching assistants) will do the grading. They are smart, but they don't have the experience of knowing what to look for. In order to get the best from them, need to tell them what to look for.
4) So, need it to be observable and recognizable
   a. Enough that can describe behavior so someone else can recognize it
   b. *****think about entire presentation***: characteristics of auditory behavior, physical behavior, visual aids**
5) as a result of exec's input, will have written description of things to look for—comments will be **anonymous**

II. Overview of meeting
1) will show you some examples of student presentations
   a. these are not whole examples, just snippets
   b. <u>we are not asking you to evaluate these presentations</u>---
   c. we are showing you the examples so you know what the raters will see and to stimulate your thoughts
2) <u>we will ask you to write down some things we should look for---both positive and negative</u>
3) we will have open discussion
4) we will ask you to rate the importance of the characteristics
5) closing

III. Viewing Examples

1) execs see six "snippets" of students presenting at end of Capstone Design, on screen—to set the stage
2) during "snippets", execs have <u>will not have</u> relevant slides as handouts in front of them (this is what professors see in class)---because if execs have slides, "they can compensate for content issues. Also they can control the speed of the paper slides but not the digital slides, which allows them to make up for deficiencies in the presentation (e.g., going too fast, too much text, too little explanation, too much complexity for one slide, etc.)" (W)
3) have 2 examples each of "A", "B", "C" presentations
4) randomize order, but start with "B" and end with "B"
5) length of "snippets"…don't bore them, but don't skimp…get true flavor of presentation. E.g.,

no eye contact for many minutes, not just at beginning. E.g., repetitive behavior. Stop snippet when you're seeing nothing new…

6) Criteria in selecting snippets:
   a. None from companies executives represent
   b. Good quality audio and video
   c. Spread out within each grade level
   d. Represent wide range of things…graphs, charts, text, pictures…

IV. Note most important things to look for.

1) have worksheet in front of execs:

```
┌─────────────────────────────────────────────────┐
│              Executive Meetings Form 1           │
│                                                  │
│  Name _____                                  │
│  Date _____                                 │
│                                                  │
│                                                  │
│  Things we should look for:                      │
│                                                  │
│                                                  │
│  Positive                                        │
│                                                  │
│                                                  │
│                                                  │
│  Negative                                        │
│                                                  │
│                                                  │
│                                                  │
│  Comments                                        │
│                                                  │
│                                                  │
└─────────────────────────────────────────────────┘
```

V. Open Discussion (turn on video camera if OK'd)
   1) beginning of second hour start discussion
   2) let's discuss for about 20 minutes
   3) begin by writing down all positives and negatives from each exec on flip chart sheets (large post-it sheets) and put them on wall
   4) then refinements on new sheet…clustering, clarifying, examples
   5) try to get "general comments" notes into this list

TA assisting—list things to look for on form 2; print out as soon as finished

VI. Rate Importance
   5) Ask executives to fill out form 2:

Executive Meetings Form 2

Name _____

Date _____

Things we should look for:

No.	Characteristic	Importance Rating			
		Low	Moderately Low	Moderately High	High
	(from earlier discussion)				
	(from earlier discussion)				

VII. Summary and Close

    1) ask—email them write-up of points and ask them to rank order and comment—OK?

    2) Other…

VIII. After meetings, aggregate across meetings