Rethinking Oral Presentations for Engineers in a Global Society

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Abstract
Effective oral presentation skills are becoming increasingly important for engineers and scientists, but in Japan, traditionally messages are often conveyed implicitly and listeners are expected to be responsible to understand the content. When presenting to audiences with various cultural and linguistic backgrounds, speakers should be responsible for conveying messages to help the audiences to understand the content effectively. Therefore, making conscious efforts to change the listener-responsible style to speaker-responsible style is very important for Japanese students to be successful presenters in a global society. A new approach to presentation, called the Assertion-Evidence approach, can be a powerful tool to help speakers convey message effectively while helping audience comprehend and retain the content. In this paper, we explain what the AE approach is and how the use of this approach help Japanese students deliver effective presentations. This approach is characterized by three main features: building talks on messages not topics, supporting those messages with visual evidence, and delivering the talk by forming sentences on the spot (but after practice).

Keywords: English presentations for engineers, Assertion-Evidence approach, speaker-responsible style

1. Introduction
Effective oral presentation skills are becoming increasingly important for Japanese students in pursuing their goals in academic and professional situations. Shinya Yamanaka, a Japanese Nobel Laureate, also emphasizes the importance of acquiring effective presentation skills for scientists stating that presenting research findings explicitly is as important as the research itself [1]. Now, not only are videos of various presentations easily available on the Internet but also there are an increasing number of books and classes that teach effective presentations. However, it is still common to observe speakers who deliver presentations without paying much attention at helping the audience to understand and retain the content of presentation. This shortcoming originates not only from lack of skills and experience, but also cultural norms held by speakers consciously or subconsciously. As Erin Meyer [2] points out, in Japan, traditionally “messages are often conveyed implicitly, requiring the listener to read between the lines” and listeners are primarily expected to be responsible to understand the message. Meyer also suggests that this traditional communicating style is related to Japanese language, homogeneous demographics and long shared history. By contrast, in countries such as the United States, which have a large number of immigrants with different cultures, different languages, and different histories, speakers are accountable for conveying the message accurately by communicating explicitly.

When presenting to audiences with various cultural and linguistic backgrounds, conveying messages implicitly does not help the audiences to understand the content effectively. Therefore, making conscious efforts to change the listener-responsible style to speaker-responsible style is very important for Japanese students to be successful presenters in a global society. A new approach to presentation, called the Assertion-Evidence approach (AE approach), can be a powerful tool to help speakers make this shift and improve their presentation skills. In this paper, we explain what the AE approach is and how the use of this approach help Japanese speakers deliver effective presentations.

2. The Assertion-Evidence approach
The AE approach is a unique way of delivering talks and is characterized by three main features: building talks on messages not topics, supporting those messages with visual evidence, and delivering the talk by forming sentences on the spot (but after practice). This new approach has been adopted by engineers at various organizations such as Penn State, MIT, Cornell, Rose-Hulman, Simula Research Laboratory, Shanghai Jiao Tong University, Texas Instruments, and the University of Wisconsin-Madison [3].

2.1 Building talks on messages
A typical style of presentations is that speakers give talks standing next to a screen showing slides that follow PowerPoint’s default settings. In this default, typically a topic phrase is placed on top of a slide with bulleted lists given below, as shown in Figure 1. This commonly practiced style can be described as building talks on topics. According to research of Garner et al. [4], approximately 65% of the slide sets of technical presentations in engineering and science that they analyzed use PowerPoint’s default structure. However, Garner and Alley argue that following this topic-sub topic structure is not effective from the perspective of multimedia learning theory, stating that this structure does not
give the audience “cues about the hierarchical structure” of the content [5]. For instance, a topic phrase at the top of Figure 1 slide, “When RF Waves Are Applied”, gives the general topic, but does not emphasize what the speaker wants to convey.

The Assertion-Evidence approach guides speakers to build talks on messages by having the speaker place a sentence headline that summarizes a message that he or she wants to convey in each slide. As shown in Figure 2, the sentence should be limited to one or two lines and placed on top of the slide [6]. This guideline was “refined through critique sessions of more than 400 technical presentations given over four years at Virginia Tech” [7]. Although these changes in slide structure might appear insignificant, they in fact affect the understanding of the whole presentation. Creating a sentence headline that summarizes the main message for each slide helps the speaker to stay focused on the message. Furthermore, if the audience cannot comprehend what a speaker says, the audience can always look up and read the sentence headline to obtain the main message.

2.2 Supporting those messages with visual evidence

The AE approach guides speakers to place visuals instead of a bulleted list for supporting the sentence headline. Garner and Alley [5] argue that the use of graphics is effective from the perspective of multimedia learning principle, which states that people “learn more effectively from graphics accompanied by spoken or written verbal information than verbal information alone”. In addition, Garner and Alley [5] explain that the absence of a bulleted list helps reduce “cognitive overload,” when the audience is faced with trying to read too many written words while listening to a speaker [9]. For instance, the AE slide shown in Figure 2 has about half of the written words of the bullet-list slide of Figure 1. Having fewer words to read allows the audience to focus more on what the speaker says. As Garner and Alley found in a controlled study [5], this approach actually leads to higher audience comprehension.

2.3 Forming sentences on the spot (after practice)

How to deliver the words of a presentation is a challenge for scientists and engineers. As shown in Table 1, there are advantages and disadvantages for different styles such as extemporaneous, impromptu, memorizing and reading [6]. In the AE approach, speakers are encouraged to speak extemporaneously. However, this delivery style does not mean that speakers deliver their words on the spot without any practice. Alley [6] advocates that the best way for most scientific presentations is an extemporaneous talk after practice because of four reasons. First, the audience is likely to give credibility to speakers who deliver without reading or looking at notes. Second, natural variation of the speaker’s pace in extemporaneous talk can help audience comprehend the talk better. A speaker’s pace tends to correlate with the difficulty of the content. When speakers talk about difficult and complex matters, they naturally slow down their pace, while they speed up the pace when they go through less difficult matters. The changes in a speaker’s pace make it easier for audience to follow the talk and comprehend the content. Third, an extemporaneous talk allows speakers to take enough opportunity to have eye contact with audience. Lastly, in an extemporaneous talk, speakers can more easily adjust the presentation to respond to cues given by the audience.

3. How the Assertion-Evidence approach help audience and speakers

The three main features of the AE approach (building talks on messages (not topics) supporting those messages with visual evidence, and forming the words on the spot after practice) have a very positive effect on both audience and speakers. Alley et al. examined audience retention of information in a large geoscience course at Virginia Tech. Two groups of students learned the same information presented on slides by the same instructor and answered the same questions. The only major difference was the design of the teaching slides. One group had traditionally designed slides
(topic phrase headline and bulleted lists) while the other group had the AE approach slides. Alley et al. found that the group with the AE approach slides recalled the information more correctly than that with traditional slides [10].

Table 1 Advantages and disadvantages of different sources for speech [6]

<table>
<thead>
<tr>
<th>Sources</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extemporaneous</td>
<td>Credibility earned</td>
<td>Wording not exact</td>
</tr>
<tr>
<td></td>
<td>Easy to adjust speech</td>
<td>Much preparation</td>
</tr>
<tr>
<td></td>
<td>Eye contact</td>
<td>Natural pace</td>
</tr>
<tr>
<td>Impromptu</td>
<td>No preparation time</td>
<td>Potential for disaster</td>
</tr>
<tr>
<td></td>
<td>Eye contact</td>
<td>Difficulty in organizing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of visual aids</td>
</tr>
<tr>
<td>Memorizing</td>
<td>Precision</td>
<td>Potential for disaster</td>
</tr>
<tr>
<td></td>
<td>Smooth delivery</td>
<td>Unnatural pace</td>
</tr>
<tr>
<td></td>
<td>Credibility earned</td>
<td>Inability to adjust speech</td>
</tr>
<tr>
<td></td>
<td>Eye contact</td>
<td>Most preparation</td>
</tr>
<tr>
<td>Reading</td>
<td>Precision</td>
<td>Lack of eye contact</td>
</tr>
<tr>
<td></td>
<td>Smooth delivery</td>
<td>Inability to adjust speech</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Significant preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of credibility</td>
</tr>
</tbody>
</table>

Furthermore, Garner and Alley investigated the AE approach’s effect on audience comprehension by comparing learning outcomes of two groups of students who viewed the AE approach presentation and the common-practice presentation. The group that viewed the AE approach presentation showed superior comprehension and fewer misconceptions [5]. These studies show the advantage of using the AE approach for audience comprehension and retention of the content.

Garner and Alley [11] also examined the effect of the AE approach on speaker’s understanding of the content. They had engineering students create slides using either the AE approach or the common-practiced structure to teach other students about MRI scans. Results revealed the AE approach increased speakers’ understanding of the content significantly. As mentioned above, there are many advantages for using the AE approach. A major downside of this approach is that it demands more from speakers. Identifying the most important message for each slide and placing a sentence headline takes much more time than just writing a topic-phrase headline and supporting that headline with a bulleted list. In addition, it is challenging to find effective and explanatory images to support some messages. Moreover, speaking extemporaneously and naturally without notes is challenging for many people, and doing so in a foreign language is even more challenging. Surprisingly, though, this downside eventually leads to building confidence in speakers. While spending much time in identifying the main messages with visuals, speakers gradually and steadily deepen their understanding of the topic. The explanatory visuals help speakers remember the content and keep focused on the main message. Talking extemporaneously naturally demands plenty of practice. However, all the work demanded by the AE approach makes speakers feel that they own the content and their takeaway messages.

4. Implication for Japanese students in engineering

As shown in the previous sections, the AE approach provides support for speakers to convey message effectively while helping audience comprehend and retain the content. In other words, it can be said that the Assertion-Evidence approach leads speakers to take responsibility for conveying the message effectively. Therefore, we argue that using AE approach should help Japanese speakers change their listener-responsible style to speaker-responsible style in communication. In addition, since the AE approach places strong emphasis on effective use of graphs and images to support the sentence headline, students in science and engineering fields, who often use graphs and images for their presentation, can benefit to a great degree.

All the necessary information about the AE approach is available at a website (http://www.assertion-evidence.com/) with many model presentations. One of the most useful resources are templates for this alternative slide structure. The site also has a step-by-step tutorial. Creating a sentence headline for each slide and developing supporting visual evidence may be quite difficult and time consuming for people who use the AE approach for the first time. However, those who have used this approach often embrace it and claim its powerful effect on building confidence in presenters.
References

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Biography

Tomoko Hori is a professor of Liberal Arts Department at National Institute of Technology, Tokyo College. Her general area of interest is researching effective instructional techniques for L2 pronunciation by analyzing English prosody. She spent five months at The Pennsylvania State University as a visiting scholar and learned the Assertion-Evidence approach.

Michael Alley is an associate professor of engineering communication at The Pennsylvania State University. He is the author of The craft of scientific presentations, The craft of editing, and The craft of scientific writing. He teaches workshops on technical presentations to companies, laboratories, and universities in the United States, Europe, the Middle East, and China.