

Visual Aids in Presentations

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I started to get familiar with visual aids in presentations, such as slides (like PowerPoints) and visualizations (like charts and diagrams) in primary school, and for years I kept thinking about how to make presentation slides and visualizations that are helpful to presentations. I was once a strong supporter of the idea that visual aids should be as colorful as possible; then I threw away this idea and shifted to the view that visual aids should be full of content, for the purpose of showing off to my viewers “Yes, this presentation is full of useful knowledge!”. Neither of them is correct in the context of technical presentations. This review of the two books, *Engineering Speaking by Design* and *Storytelling with Data*, reveals what presentation slides and visualizations should be like in technical presentations, and relates those suggestions with my own needs as well as the disciplinary needs of presentations as an Electrical and Computer Engineering (ECE) researcher.

● *Engineering Speaking by Design*

Engineering Speaking by Design covered theories regarding presentation slides — a crucial visual aid to presentations. They discussed slides in the aspect of color and background choices, language use, and insertions of diagrams and charts.

Color Choices

Color choices on presentation slides need to be careful. *Engineering Speaking by Design* rejects randomly putting colors on slides without careful consideration by saying “Don’t run wild with color for its own sake” (86). Color combinations in presentation slides should, instead, serve the purpose of making the slides easy to read. Using light-color texts, like yellow, accompanied by a purely white background is also a bad choice because the texts are hardly visible (86). Whatever color combination is chosen, the basic requirement is that the background has to be kept simple, clean, and uncluttered (80).

English Use

Texts on slides should always be grammatically correct. The book *Engineering Speaking by Design* spends a large paragraph on the correctness of language, including word spelling, punctuation, and quotation (68–70). Apart from correctness, *Engineering Speaking by Design* proposes proper word choice. Words on the slides have to be formal, and as short as possible. The language should be understandable to all audiences, especially when using terms or slangs (75).

Insertions of Diagrams and Graphs

Engineering Speaking by Design holds the view that inserting diagrams and graphs in slides are helpful to the presentation in that they efficiently convey technical information (79). But it also commented that we should not put them to extremes—The number of diagrams or graphs per page has to be limited (82). Efficient as diagrams and graphs are, they cannot

appear solitarily on slides. Textual explanations are necessary. The choice of textual explanations needs to be careful: avoid ones that are too plain and trivial (83).

Discussions

Those suggestions are targeted at technical presentations, but they are also instructive in our in-class presentations. As a student who took several humanity courses in previous semesters, I witnessed many presentations as a viewer. As an example of the “color choices” suggestion, I could recall that a classmate commented on a red-green theme PowerPoint that the slides made him dizzy and disgusting... This reveals the importance of color choices, which should always consider giving the viewer a comfortable experience.

As an audience, I am very picky about the contents on slides, because I usually obtain crucial information from slides, instead of from presenters' fast speeches. The reason rooted behind this phenomenon is the fact that visual senses are far more efficient: I could spend only seconds grasping meanings the presenter wants to convey from the slides but might spend minutes to listen to and to process in my brain what the presenter wants to express. If this visual acquisition of information is of poor quality, the viewer will definitely have a poor impression of the presentation. Once I encounter a chaotic and crowded slide layout or a slide with lots of grammar mistakes, I would quickly label the presentation as “poorly prepared” and lose interest in reading it, and therefore, get distracted. Hence, these examples in my personal experiences show how the suggestions regarding presentation slides are relevant to our presentation needs – namely, in-class presentations.

Further, the suggestions could be useful in the field of Electrical and Computer Engineering (ECE) as well. Recapping the previous three suggestions, an ECE researcher needs to maintain plain, but comfortable color choices in slides, because this fashion of color choices lies in accordance with their workspace style — namely, research institutes. As for the two other suggestions, an illustrative case in *Engineering Speaking by Design* discusses a large circuit schematic in the slides: the complexity of the schematic, lack of focus in language, and a missing context completely overwhelmed the audience (27). This example indicates that proper English use targeting the audience and insertion of simplified diagrams and charts (when they are too complicated) are necessary for ECE research presentations.

● ***Storytelling with Data***

As a further step from insertions of diagrams and graphs in *Engineering Speaking by Design*, *Storytelling with Data* discussed in detail how to arrange those data visualizations. It looks at two aspects: making the visualization effective in expressing information as well as attractive to the audience.

Communicative Effectiveness

Visualizations convey technical information more effectively than texts (43); however, if falsely arranged, the visualization may spoil this feature. To maintain communicative effectiveness, the basic step is that all information in visualizations has to be arranged in an orderly way

instead of cluttering. Detailed steps include using distance proximity, color similarity, and boundary enclosure to categorize elements in the visualization (77); taking advantage of imaginative continuity, line connection, and left alignment to guide viewers towards the expected viewing order (80). Other tips like using color, capitalization, bold font, and large font size difference to highlight key points, enabling viewers to acquire the most crucial information immediately, are also useful in making visualizations communicatively effective (86; 129).

Visual Attractiveness

Color choices are also crucial in visualizations. The baseline rule is that consistency has to be maintained for the same type of information. Using too many colors may puzzle viewers, as a change of color symbolizes a shift of topic (121). Some color combination taboos have to be avoided, like red and green (122).

Another key point is that presenters should try to use stories that fit into visualizations to engage viewers. Creating a narrative flow as an order of presentation is useful in introducing visualizations part by part in an emotionally attractive and logically amusing way (175-177).

Discussions

The suggestions in *Storytelling with Data* are mainly centered around data visualizations in presentations. Smart applications of those suggestions in our presentation needs can make our presentation more effective in technical communications as well as more visually attractive.

In my own presentation needs, I felt the power of visualizations by heart when I was working on scholarship application presentations. Originally, I used a table to indicate my GPA and GPA rank growth semester-by-semester, but it really looked boring on one hand; worse, it failed to exhibit my advancement effectively. Then a bold idea struck me: why not use a line chart to indicate my GPA? Henceforth, I added a line chart right to the table. Meanwhile, I applied some useful techniques that coincide with the suggestions on Communicative Effectiveness, like using different colors to denote different terms and using a bold red font to highlight my highest grade. The progressive trend of my grades was then clearly shown, and I was completely astonished by the effect of this visualization.

As for suggestions regarding visual attractiveness, there is a lot similar to color choices of presentation slides. The diagram should serve the ultimate purpose of informing the reader of large chunks of data in a smooth, concise, and efficient way. If the visualization upsets the viewer, the viewer will leave it behind, and thus, the purpose is not achieved.

I always read presentation handouts from Computer Science conferences, in which visualizations are crucially important. List machine learning as an example, it is totally impossible to include millions of datasets and results of thousands of iterations in a technical presentation; charts and diagrams are the only interfaces between the presenter and the audience. Summarizing the features of an enormous dataset into an inch-wide chart is highly technical. I saw various techniques like secondary y-axis diagrams, combinations of bar and

line charts, sub-charts, etc. Some are effective and easily reachable, while some are puzzling, needing time for viewers to digest. In ECE research presentations, finding the right balance between communicative effectiveness and visual attractiveness is extremely crucial in showing your research achievements.

● Summary

The review investigates the suggestions on visual aids offered by the two books and relates the suggestions to my presentation needs as well as the presentation needs as an ECE research presenter. The discussions reveal the importances of visual aids in presentations. Good visual aids are keys to successful presentations, and thus, worth presenters' efforts and careful considerations.

● References

Knaflic, Nussbaumer Cole. *Story Telling with Data*, Wiley, 2015.

Rothwell, Edward J., and Michael J. Cloud. *Engineering Speaking by Design*, CRC Press, 2016.