

How to Improve Technical Presentations

By George D. Byrne

How can we applied mathematicians get more of our results, methods, and software used by those in other disciplines? In his article "Communication Skills Affect Image of Mathematician" in the July 1986 issue of *SIAM News*, Lloyd W. Black suggested that we need to improve our communications skills.

Perhaps he is right. We all know that our technical presentations can stand some improvement. Black felt that our presentations are "at times poorly delivered, ill-structured, repetitious, overly long, unpracticed, and badly integrated with accompanying graphics." If you have been to a technical meeting, you probably will agree that at least some of us need help even when addressing our colleagues in our own fields.

Technical presentations can be fun to give. Here are some practical tips. They are based on my experience in industry and academia, as a consultant, and as a professional speaker. They are the same tips I shared with many of you at the conference on ordinary differential equations in Albuquerque in July 1986.

Prepare Your Presentation for Your Audience

When we know the background and interests of the audience, we can communicate with them far more effectively. In the old days in computing, we used to use a core dump—a printout of the entire contents of computer memory—to debug our software. Today the memories of most personal computers hold too much information to be useful—the trouble is there are no clues to what is relevant. Now think about some of the recent presentations you heard. Were any of them core dumps?

Keep the Fog Density Low

Next we need to put together an understandable presentation. James Gleick

("But Aren't Truth and Beauty Supposed to Be Enough?")—*Science Times* section, *New York Times*, Tuesday, August 12, 1986) had the following observation about speakers at the recent International Conference of Mathematicians. The technical presentations were in three parts. In the first part of the presentations, everyone could follow the speaker. In the second part, a handful of experts could follow the speaker. In the third part, only the speaker understood what was being said. To save time, many speakers jumped directly to the third part.

We have all seen that happen. That kind of communication does not foster financial, popular, or moral support for our field. Aren't we more likely to develop support by having our work understood?

Developing an outline, writing an abstract, and then fleshing out the body of the presentation helps make the presentation clearer. Giving the objectives and conclusions at the beginning of the presentation orients the audience and helps them follow the presentation. We are not writing mystery novels!

Low-Density, Legible Visual Aids Are Essential

For most subjects, the speaker will do best by basing his or her presentation on visual aids—typically a set of 35 mm slides or view graphs. This article, for example, was created from the view graphs I developed for the Albuquerque meeting.

Visual aids should provide a detailed outline of your talk, but not so detailed that your audience will be overwhelmed. After all, why display a sea of equations that no one can hope to follow?

It is all too easy to put too much information on a visual aid. Some rules of thumb used by the 3M company and others are: *20 characters per line maximum, eight lines per page maximum, and "the visual must be visible."*

For best results, stay well below the max-

imum character and line counts. At a recent international conference, the average view graph displayed about 16 lines of text. It was clear the audiences could not cope with both the visual and verbal messages of the speakers.

To make sure your visual aids are legible, do not use yellow writing on clear transparencies, typewritten view graphs, or view graphs made from pencil-written text. A simple rule of thumb is to find out how large the audience might be, prepare some visual aids, and try them out in a room large enough to hold the audience.

Do pictures, figures, and graphs help? They certainly can if they can be easily read and add to the story being told.

By following these rules, our audiences will have the greatest understanding of our presentations.

Involve the Audience

One way to keep the audience listening is to involve it in the presentation. For example, we can ask a question (if we do, we need to wait for a response and then acknowledge it). We can also address remarks or questions to members of the audience by name (as long as we are sensitive to the possibility of embarrassing someone). Sometimes an audience can be made to feel involved by having the members recall earlier speakers and their remarks. For example: "Earlier today, John Doe said that human time was more important than computer time. I agree."

Have you ever wondered why speakers do not face an audience? In the *New York Times* article cited earlier, there is a photo of a distinguished mathematician turned toward a projection screen and away from his audience. In daily conversation, we normally face one another because this improves communication. The next time you give a presentation, imagine there is a sign on your back that reads, "Face the Audience."

Be Enthusiastic

A well-known professional speaker, Alan Cimberg, makes the point that non-sense information delivered enthusiastically is better received than good information delivered lifelessly. He points out that we need to be enthusiastic about our own presentations and enjoy delivering them. This does not mean we need to leap about and be funny, but it does mean we need to inject a little life and joy into our presentations. If we don't enjoy our own presentations, how will our audience, or our students?

Avoid Reading the Presentations

One way to keep our presentations lively is to confine them to the principal points and deliver them in a conversational style. Reading the presentation reduces eye contact, leads to a monotone delivery, and makes a presentation dull. If we cannot remember everything, there is the distinct possibility that there are too many points to be made. Reading a view graph or flip chart also is not a good idea. Normally, everyone in the audience is reading ahead of the speaker, and one might ask: "Why is this speaker here?"

Dress Appropriately

When we speak, we are selling our ideas, our services, and our profession. We are also representing ourselves and our organization. Isn't it reasonable that we should dress well for the event?

Make the Presentation Fit the Time Slot

Sometimes, a speaker who suddenly realizes that time is running out will race through the last part of his or her presentation. The problem here is usually one of timing. We can get the timing down by practicing with audiotape, videotape, or even live in front of an audience. These can

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all be valuable ways of honing and polishing a presentation. By the way, rehearsals are great confidence builders. We can usually find a kind but firm critic who can give us a hand in developing our presentations.

Check the Physical Facilities

It is a good idea to arrive early enough to check the sound equipment, projection equipment, temperature of the room, lighting, and seating. It is too late to correct any deficiencies or learn how to use the equipment when we are walking to the podium.

This, too, is a big confidence builder. If something is not the way we like it, we should be prepared to make appropriate changes ourselves. We can communicate with our audiences much better when everyone is comfortable and the equipment is not an obstacle. Bert Decker, an expert in business presentations, says that if an audience has more than 40 people, a

good sound system and microphone are needed.

It also pays to arrive early for a presentation to make sure that everything is working. Otherwise, O'Toole's Law can easily come into play. O'Toole's Law says: "Murphy is an optimist."

Making the Final Hurdle

The first step in giving a technical presentation is difficult for many of us. Simply put: *We do not need to fear giving our presentations.* The very best speakers use the adrenaline generated before a performance to help them. They know that no one else has their expertise and no one else can give their presentation. It is the speaker's show. Realizing that helps tremendously in giving a good presentation.

Improving Your Presentation Skills

We can always improve our presenta-

tions, and we should try. Consider the possibility of taking courses at a college, a university, or the workplace. There also are organizations such as Toastmasters International, a 60-year-old organization concerned with the development of communications and leadership skills in a low-cost, pleasant way. If you would like information about a Toastmasters club convenient to you, send me a stamped, self-addressed envelope, along with the name and address of your employer or your home address.

Using these tips should help us improve the understanding and acceptance of our ideas, our methods, and our software. It should also help us to receive appropriate recognition. Please let me know how these ideas work out for you.

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