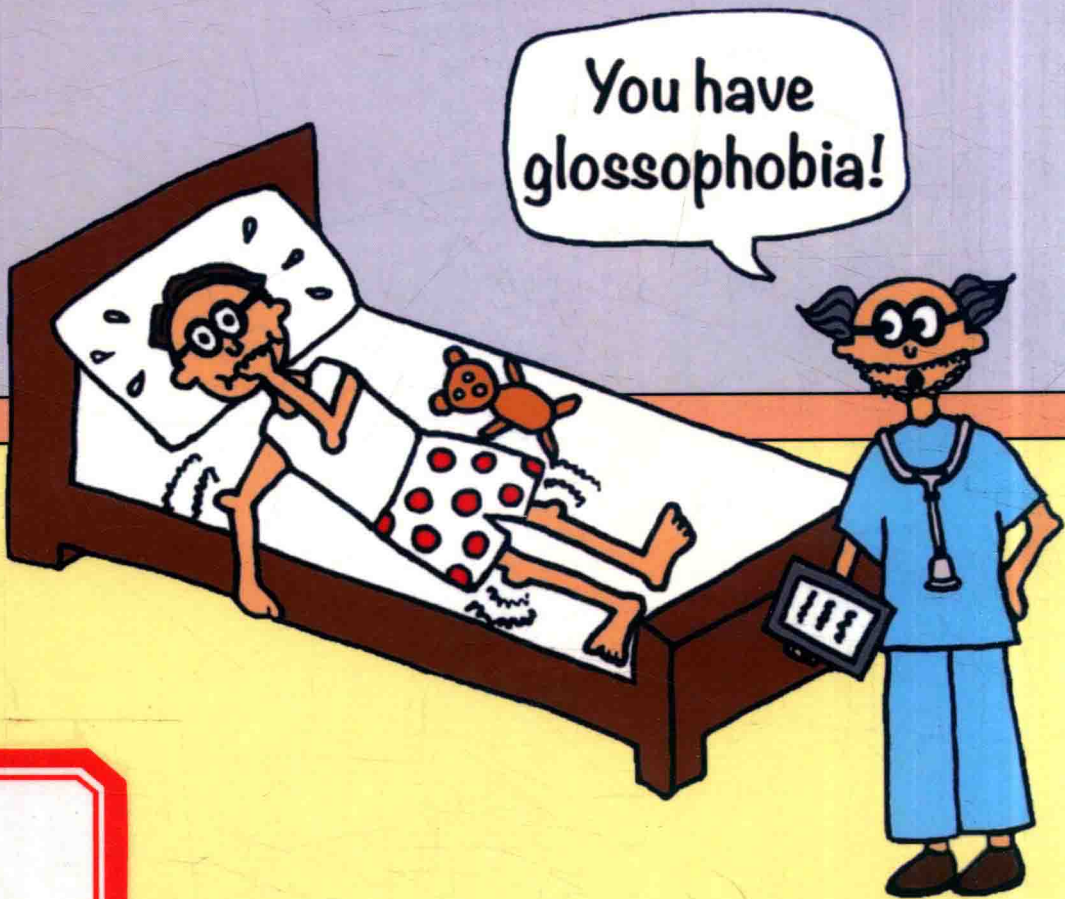


Presenting an Effective and Dynamic Technical Paper

A Guidebook for Novice and Experienced Speakers in a Multicultural World



William B. Krantz



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William B. Krantz

Professor Emeritus and President's Teaching Scholar,
University of Colorado, Boulder, CO, United States

Professor Emeritus and Ohio Eminent Scholar,
University of Cincinnati, Cincinnati, OH, United States



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Presenting an Effective and Dynamic Technical Paper

Dedication

To the two women in my life who helped me with this book: my wife June whose persistent encouragement pushed me to get it finished and who provided many useful comments on its organization and content, and my daughter Brigitte who designed the cover and created all the illustrations that reinforce the content of this book and make it more enjoyable to read.

Glossophobia or speech anxiety is the fear of public speaking or of speaking in general. The word comes from the Greek γλῶσσα *glōssa*, meaning tongue, and φόβος *phobos*, fear or dread.

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Preface

There are always three speeches, for every one you actually gave. The one you practiced, the one you gave ... and the one you wish you gave!

Dale Carnegie, American developer of courses in public speaking,
and interpersonal skills.

The author's interest in public speaking skills was sparked by his English teacher in high school who had the students in his class give short speeches. The teacher was sufficiently impressed with the author's speaking ability that he encouraged him to continue his studies at a college or university. This good advice was a "game changer" for the author since at the time he had no intention of continuing his formal education. As a result in 1957 he enrolled at Saint Joseph's College in Indiana, a small liberal arts college, where he intended to major in journalism. However, he was discouraged from pursuing this major by the chair for the journalism program because the author's English grammar was so poor. This came as a bit of a shock to the author who then decided to major in chemistry, but also to improve his English. Perhaps this instilled some empathy in him for students whose first language is not English and thus who struggle with learning proper English grammar. The author proceeded to read the *Writer's Guide and Index to English*¹ cover-to-cover. Moreover, the author took every opportunity to improve his public-speaking skills. At the time it was a requirement to take a one-semester course in speech. However, the author enjoyed this course so much he elected to take the subsequent course in public speaking. He became very much interested in the power of the spoken word. Oratory competitions at the time were popular. The author entered and won a few awards for his public speaking at these competitions.

The author received a BA degree in chemistry in 1961 and pursued a BS in chemical engineering at the University of Illinois at Urbana-Champaign, which he received in 1962. He did very well in his studies at Illinois such that he was able to pursue postgraduate studies in chemical engineering at the University of California at Berkeley. Both the University of Illinois and the University of California at Berkeley had many gifted scientists and

1. Porter G. Perrin, *Writer's Guide and Index to English*, Scott Foresman and Company, Glenview, Illinois 1959.

engineers including a few Nobel laureates on their faculties. The author observed that many of these faculty were not so gifted in presenting their research work in lectures and seminars. In some cases it seemed that the distinguished scientist or engineer somehow thought that the excellence of their research was sufficient to ensure effective communication to the audience.

Another observation made by the author during his college and university studies was that the curriculum for students studying in the sciences and engineering was so packed with technical courses that it did not provide much opportunity for them to develop their communication skills. In fact, at the time graduate students at major universities such as Illinois and Berkeley did not have the opportunity to present their research work at national and international meetings. In most cases the accepted policy was that the student's work would be presented at technical meetings by their research advisor. Indeed the author never had an opportunity to make either a formal oral presentation or give a poster at any technical meetings during his 5 years of PhD studies at Berkeley. This made the author very committed to providing speaking opportunities for his students when he received his PhD in 1968 and joined the faculty in the Department of Chemical Engineering at the University of Colorado at Boulder.

It was a different day and age when the author began his academic career at Colorado. The author's department chair told him first to become a good teacher and then worry about developing a research program. Accepting such advice today would be suicidal for a young faculty member at a major research university. However, the author did follow the good advice given to him and became a very good teacher. He received many awards for teaching excellence and in particular a lifetime appointment as a President's Teaching Scholar of the University of Colorado. In this capacity he accepted an invitation to coordinate a program to help faculty improve their teaching skills by having one or more of their lectures video-recorded after which the author would provide constructive input for them. Hence, the author became a "teacher of teachers" thereby contributing to an effort to improve the lecturing skills of university educators.

The author also was committed to improving the public-speaking skills of his students. He encouraged his students to enter technical papers competitions and coached them on how to deliver an effective technical presentation. His students were extraordinarily successful in winning awards in regional and national technical papers competitions sponsored by organizations such as the American Association for the Advancement of Science, the American Institute of Chemical Engineers, the American Chemical Society, and the North American Membrane Society. Over a period of 32 years his students won 39 awards including 17 First Place awards at these competitions. It is noteworthy that 15 of these awards in technical papers competitions went to students whose first language was not English! The experience that the author gained in working with his students in preparing for these

competitions laid the foundation for writing this book on "Presenting an Effective and Dynamic Technical Paper — A Guidebook for Novice and Experienced Speakers in a Multicultural World". In particular, he gained experience in coaching students whose first language was not English to not only present papers well, but also to win prestigious awards in technical papers competitions!

The author also was instrumental in creating a forum for students to gain experience in presenting talks on their research work. He was the co-founder and served for 15 years as the Co-Director of the National Science Foundation (NSF) Industry/University Cooperative Research Center (I/U CRC) for Membrane Applied Science and Technology (MAST) sites at both the University of Colorado and the University of Cincinnati. The students who worked on MAST Center research projects were required to make two oral and two poster presentations each year that were critically reviewed by the industry sponsors who provided the funding for their projects. Whereas this provided invaluable experience for the students, it also helped the author hone his skills in preparing students for both formal oral presentations and giving posters on their research work. It was also particularly helpful in gaining experience to help students make technical presentations that would be well-received by the representatives from the industry sponsors of the MAST center.

In 2005, the author retired from a full-time academic appointment and accepted a part-time faculty position in the Department of Chemical and Biomolecular Engineering at the National University of Singapore (NUS). One of the requirements at NUS was that all the PhD students take a workshop on Oral Communication Skills. This workshop was taught on a voluntary basis by one of the faculty. At the time the author joined the faculty at NUS, the Department Head was desperately looking for a faculty member to volunteer for teaching this workshop. This provided the author with a wonderful opportunity for pulling together the materials on oral communication skills that he had been developing over many years into an organized workshop. It also provided a meaningful experience to sensitize him to the multicultural aspects of public speaking, since nearly all of his students were from Asia, India, and the Middle East. The author then proceeded to offer this workshop at NUS on a regular basis.

In 2008, the author accepted an appointment as a Visiting Professor at Nanyang Technological University (NTU) in Singapore in order to help establish the Singapore Membrane Technology Center (SMTC). He subsequently was invited to offer his workshop on Oral Communications Skills for the PhD students in the SMTC that subsequently was extended to include all the PhD students in the Nanyang Environment and Water Research Institute (NEWRI) at NTU.

The author also has offered his Oral Communications Skills workshop as an invited speaker at several universities around the world. After each

offering of the workshop the participating students submitted an anonymous evaluation of its effectiveness. Several students suggested that the author pull together the workshop materials into some type of a speaker's guidebook that could be used as a convenient reference when the need to prepare a presentation arose. This constructive suggestion from the workshop students led to writing this guidebook.

The Oral Communications Workshop involved two half-days of lectures in which the author discussed the organization and delivery of both a formal oral presentation and giving a poster. At the end of the first lecture the author gave an example of a formal oral presentation in which he would interrupt himself to point out how the presentation incorporated various elements of style and delivery that were discussed in the lecture. At the end of the second lecture the author gave a poster in which he challenged the students to make it difficult for him so that he could indicate how one always remains attentive to the audience. The workshop ended with each student being digitally recorded while giving a 10-minute technical presentation followed by 5 minutes of questions from the audience that consisted of the other workshop students. The workshop students also would anonymously critique the presentations of their peers using a template provided by the author. These critiques would be given to the presenter after their talk. The author then would schedule a 30-minute one-on-one consultation with each student to provide them with constructive comments on how to improve their oral communication skills. Obviously some elements of the Oral Communication Skills Workshop could not be included in this guidebook. However, the online materials available with this guidebook include a digital recording of the author giving a formal oral presentation using slides prepared with PowerPoint during which the author pauses occasionally to point out how he used the various elements of giving an effective talk. It also includes a digital recording of the author giving a poster in which he also points out how he uses the techniques discussed in this guidebook to maintain effective communication with his audience.

Reading through this guidebook will not automatically make the reader a better speaker. However, hopefully it will sensitize the reader to the elements of organizing a technical presentation and to components of an effective delivery style. Perhaps the most important message in this guidebook is that public speaking is an expression of your unique personality. You already have made a conscientious effort to improve your public speaking by obtaining a copy of this guidebook. Your public speaking ability will continue to develop over the years such that it will become an integral part of who you are. This is what makes listening to good speakers so enjoyable—each of us can “bring to the table” a very personalized way of presenting our material!

The author welcomes any feedback on the material in this guidebook and suggestions for improving it. The author can be contacted via email at krantz@colorado.edu.

Acknowledgments

Light travels faster than sound. That's why certain people appear bright until you hear them speak!

—Albert Einstein, 1921 Nobel Laureate in Physics

The author must begin by acknowledging the late Dom Wulstan Mork, his high school English teacher who encouraged him to develop his public-speaking ability and to continue his formal education. The author continued to benefit from good advice under the mentorship of Brother John Marling at Saint Joseph's College in Indiana who helped him in many ways and in particular encouraged him to enter oratory competitions.

The President's Teaching Scholars (PTS) program under the direction of Dr. Mary Ann Shea at the University of Colorado provided a wonderful opportunity for the author to learn from other excellent teachers. The PTS program through its Faculty Teaching Excellence program gave the author an opportunity to work with faculty to improve their lecturing skills.

Professor Raj Rajagopalan, former Head of the Department of Chemical and Biomolecular Engineering at the National University of Singapore, created the opportunity for the author to develop his workshop on Oral Communication Skills that helped him to develop the materials in this guidebook. A special acknowledgment is accorded to Professor Tony Fane, the founding Director of the Singapore Membrane Technology Center (SMTC), and to Professor Wang Rong, the current Director of the SMTC, who encouraged the author to offer the Oral Communications Skills Workshop on a regular basis in the SMTC.

The author would be remiss if he did not acknowledge the many students he mentored in public speaking at the University of Colorado who had the courage to enter and do so well in regional and national technical papers competitions. The author also gratefully acknowledges the many students who took his workshop on Oral Communication Skills and provided useful feedback both to improve the workshop materials and to write this guidebook.

The author also gratefully acknowledges his daughter, Brigitte Elise Krantz, who created the illustrations for this guidebook. Perhaps her artwork will convince some readers that a bit of humor can make communicating both the written and spoken word more effective! He also thanks his wife,

June Clair Krantz, who encouraged him to write this book and continually prodded him to finish writing it! She also proofread all the material and contributed many helpful suggestions for making this guidebook more useful.

Finally, the author would like to acknowledge the staff of his publisher, Elsevier. The directives provided by the Elsevier staff made preparing this book much easier. In particular, the author acknowledges Joslyn T. Chaiprasert-Paguio, Editorial Project Manager, and Mary Preap, Senior Acquisitions Editor, with whom he worked closely in preparing this manuscript for publication.

Testimonials From Student Award Winners

The author has mentored students from many different countries both through his workshops on oral communication skills and working with them individually. More than 50 of these students have won major awards in formal oral and poster technical papers competitions. In particular, the author has helped many students whose first language was not English win awards in technical papers competitions. The following student testimonials attest to the effectiveness of the public-speaking techniques advanced in this guidebook.

Dr. Sim Siang Tze Victor from Singapore won First Place Awards at two international technical papers competitions during his PhD studies at Nanyang Technological University:

My sincere appreciation goes out to my mentor, Professor Dr. William B. Krantz for his inspirational advice and critiques. Without his valuable inputs, a number of my awards would not have been possible. In particular, I have him to thank for the Young Leaders Award at the International Desalination Association (IDA) World Congress 2011 and the Patron Prize at the 8th International Membrane Science and Technology Conference (IMSTEC) 2013 for the best oral presentations I have been awarded. It has been my utmost pleasure to be under your tutelage.



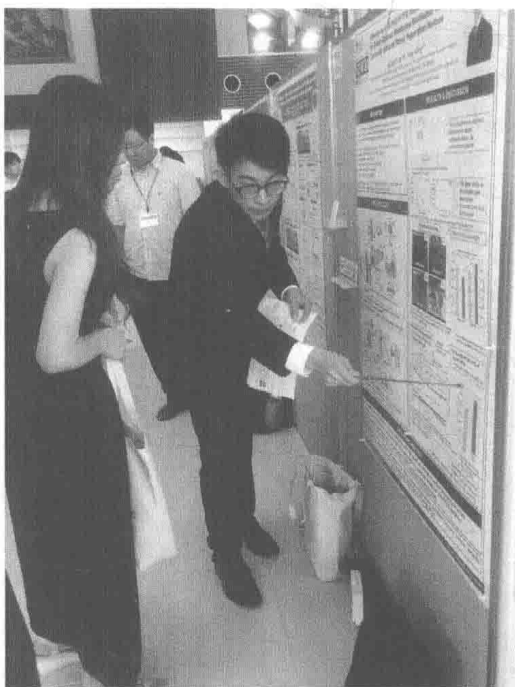
Dr. Sim Siang Tze Victor (left) from Singapore receiving one of several awards he won.

Jian-Yuan Lee from Malaysia won the Best Paper Award at the 2015 European Membrane Society Meeting in Aachen Germany and a Best Poster Award at the 2016 Singapore International Water Week (SIWW) Conference during his PhD studies at Nanyang Technological University:

My poster has been selected as one of the Best Student Posters of SIWW 2016! Thank you very much for your help and support during the preparation of this poster and I really appreciate it!

Zhao Jie from China won the Best Student Poster Award at the 10th Aseanian (Association of Southeast Asian Nations) Membrane Society Conference in 2016 in Nara Japan during his PhD studies at Nanyang Technological University:

I would like to express my sincere thanks to you for your very useful instructions on oral communication. I tried to follow all your tips such as mechanical pointer, name cards box and small free-take posters. Thank you very much again.



Zhao Jie from China giving his poster at the 10th Aseanian Membrane Society Conference.

Dr. Siew-Leng Loo from Malaysia won First Place in the Student Poster Competition at the Conference on “Engineering With Membranes 2013: Towards a Sustainable Future” in 2013 in Saint-Pierre d’Oléron France during her PhD studies at Nanyang Technological University:

Thank you for delivering such an informative workshop on oral communication. The workshop has given me a comprehensive picture of what to expect when presenting. This information has been a useful guide to me on the preparations that need to be made in advance. In addition, your tips on how to effectively channel nervousness into enthusiasm have been particularly helpful to me. Thanks again for helping me to overcome my fear of public speaking!

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