Episode 47: Michael Alley

**KL:** Katie Linder

**MA:** Michael Alley

**KL:** You’re listening to *Research in Action*: episode forty-seven.

[*intro music*]

# Segment 1:

**KL:** Welcome to *Research in Action*, a weekly podcast where you can hear about topics and issues related to research in higher education from experts across a range of disciplines. I’m your host, Dr. Katie Linder, director of research at Oregon State University Ecampus.

On this episode, I am joined by Michael Alley. Holding a master of science in electrical engineering and a master of fine arts in writing, Michael Alley is an associate professor of engineering communication at Penn State. He is the author of *The Craft of Scientific Presentations* (Springer, 2013), which has been translated into Japanese and Chinese. Over the past decade, he has taught presentations to scientists and engineers on four continents, in 16 countries, and at more than 150 institutions. He has presented at Google, MIT, Harvard Medical School, Texas Instruments, Simula Research Laboratory (Norway), Shanghai Jiao Tong University, and the European Space Organization in the high desert of Chile. Alley’s websites on presentations are top Google listings for the topics of "engineering presentations" and "scientific presentations."

Thanks so much for joining me today, Michael.

**MA:** My pleasure. I’m really happy to be here.

**KL:** So, I know that you have done extensive work on best practices for scientific presentations, so I’d love to kind of start there. And many people who are listening to this, we have a lot of researchers, scientists who are listening, but I do think that sometimes when people hear the term “scientific presentation” or “technical presentation,” they think about something that’s going to be a little bit dry, maybe challenging to understand. Does that have to be the case when we’re designing these presentations?

**MA:** Well, let me say, I have the same fear. But one thing that was such a big surprise to me, when I started researching the best presentations in science, in engineering, historically was that it was just amazing how exciting scientific presentations used to be. I’m sure not all of them, but oh my gosh, if you go back in history and you look even, let’s say, 100 years or 150 years, you go back to a presentation by Heinrich Hertz—you might have heard of the word *hertz*; we use it with frequencies and things—but with one of his presentations, there were 300 people in the room, and people were so excited. One person wrote him and said that he couldn’t sleep the entire night, that he was so excited.

**KL:** [*laughs*] Oh, I love that.

**MA:** And when he moved to Karlsruhe Germany, he gave a presentation that more than 1000 people attended, and again, it was just an incredible excitement. And a really cool thing is that Hertz was, when he first began, incredibly nervous as a presenter. But you can look at Albert Einstein, Nikola Tesla, and you hear of these similar types of stories, and I think something became lost for us, certainly during the 80s and 90s. With TED, what has happened is that that excitement’s starting to come back, and what I’m hoping is that those models are going to replace what were the dead, dry models that so many scientists and engineers must have in their minds.

**KL:** Mm-hmm. Well, and I think it’s an interesting point. You know, we sometimes present based on what we’ve seen, and now we have some really excellent models of engaging, exciting presentations. And you also mentioned this idea of people being nervous when they’re presenting, and one of the tips I’ve always heard is to kind of channel that nervousness into excitement and enthusiasm and to think about what is it about your presentation that you’re excited to share. I’m wondering if you have other top best practices for effective scientific presentations, either in terms of how people prepare themselves to give an effective presentation or how did they relay the information in an effective way to their audience.

**MA:** Okay, that’s a really good question, Katie. And I want to go back to this nervousness, because that is the most common question that I receive from young scientists and engineers around the world when I go and talk about scientific presentations. And it’s usually not asked in the big crowd. It’s usually afterwards, where they kind of see me in a hallway, and they’re shy about asking. And whenever I receive that question, I give this answer of, well, arrive early. Get set up. That’s where a lot of the nervousness comes in. Is the equipment working? Become comfortable with the room. Meet people in the room. That’s number one.

Number two is along the same lines that you said, is channel that nervous energy into excitement. Imagine success. Just as a baseball pitcher, a good pitcher, will think about the flight of the ball to the part of the plate where he or she’s trying to pitch it, so will a good presenter think the same thing.

And then, the third thing is actually something that Mark Twain said, and it’s something that I think a lot about, and it has to do, when you look out at the audience, and it’s something he said to a nervous presenter backstage. He said, “Don’t worry. They’re not expecting much.” But a lot of times, I look out at the audience and they just are kind of dragging in, and they’re thinking that this is going to be a waste of an hour, and I don’t know, that pumps me up. But I do think that this question is really a defensive posture. It’s kind of how do you handle this nervousness? And a better question that I tell young scientists and engineers is, really the better question is how do you achieve confidence? And so I would say, trying to do things that help you achieve confidence.

So, best practices number one: really think about your audience. Everybody says that. “Think about your audience.” But I don’t think that people ask the right questions in science and engineering. Certainly you want to ask who they are, and a lot of times you have multiple audiences: people who are really steep in the field and then people, perhaps, who don’t know as much, and then that becomes tough, and it’s important for you to realize you have different people in the room. And another good question is certainly “What do they know?” And then think about what background am I going to have to present? What terms am I going to have to define, or even better yet, avoid? But I’d say the question that people forget to ask about audience, and it may be the most important, is why are they there? Why are they in the room? What is it about your work that they really want to hear? And so probably my best piece of advice is think deeply about that question, and then instead of giving the talk that you want to give, that you maybe like to give, give the talk that they want to hear about your work. And that’s what I’d say is probably my best piece of advice overall.

Second best piece of advice is don’t let slides hurt you, and so many people just kill their presentations because they follow PowerPoint’s defaults. And then third thing, and I’ll talk about this a little bit later on, is how can you project confidence? No matter what you’re feeling inside, what are some things that you can do to project confidence? And the reason that I think that that’s important is that if you succumb to nervousness, a lot of times there gets to be an awkward feedback in the room, where the audience is cringing at you, and then you’re thinking, “Oh, they’re not enjoying this.” And what you want is you want a different kind of feedback. You want them to be nodding their heads, saying, “Oh yeah, this is good, this is good,” which then pumps you up. So, I see presentations sometimes spiral in two different directions. I won’t mind a spiral up.

**KL:** I love these practical suggestions. They’re so helpful, and especially this point you’ve made about the audience. I think that’s such an excellent point.

We’re going to take a brief break. When we come back, we’ll hear a little bit more about Michael’s investigations on confidence in speaking. Back in a moment.

[*music*]

# Segment 2:

**KL:** Michael, one of the really interesting components, for me, about your work is the kind of investigations you’ve done around confidence in speaking, and I know that your investigation has focused on confidence for speakers in general and also on scientists and engineers in specific. I wonder if you can talk a little bit about your investigation and some of your research questions that you’re looking at.

**MA:** Well, as I mentioned earlier, this question about nervousness, which really translates to a question about confidence, is the most common one that I receive in my workshops, and in thinking about it and in asking a number of the most successful speakers in science and engineering about it, what I realized is that there are two types of confidence. There’s the confidence that you feel inside, and that confidence is difficult to achieve. I’ll talk about what people say are the big steps that you need. And then the other one is the confidence that you project.

And so, let’s start, first, with the confidence that you feel inside. What does it take for you to feel confident inside? And know that you may not necessarily achieve it. It’s not like an on-off switch. To me, it’s like a bucket filling up with water. There’s a certain amount of water level that you’re going to achieve, and how much you achieve probably depends upon who’s in the audience, what are the stakes of the talk. But number one is for you to feel confident inside, you have to have good content. I mean, I like to think about a presentation in terms of time. You’ve got 100 people in the room, you’ve got 10 people in the room, it doesn’t matter; you’re using 15 minutes of their time. Is what you are presenting, the content that you are giving them, is that worth their time? And if you don’t have strong content, or you’re shaky about your content, it really doesn’t matter how much practice you’ve done—you’re not going to feel that confidence inside. But it really begins with content.

The second thing is—and this is what a lot of people talk about—but the second thing is preparation. So, I had the chance to meet Jane Goodall. It wasn’t long. It was only a five-minute bus ride that we shared together, and I said, “Look, I’m a huge fan of yours, and I teach presentations to young scientists and engineers around the world. What one piece of advice would you give them?” And she said, “Well. It certainly wouldn’t be the same piece of advice that *I* received when I gave my first presentation, and that was to go up there. ‘You’re the expert.’” She said, “That was *horrible* advice!” And she went on to tell me that she was on this tour of ten cities, and she was giving the same 45-minute presentation at each place, but at each place, she insisted on 45 minutes by herself in which she could think about what she was going to say, to go over it in her mind and imagine speaking to the audience. And I thought, oh my gosh, she’s done with an incredible amount of preparation to begin with, just to put together the talk, but then she wants that extra layer, and I would say that’s a layer that a lot of people don’t have.

So, we’ve talked about content, preparation. The third thing is focus. Hans Rosling—a lot of your listeners may be familiar with his TED talk—he’s a world health statistician, and after his first TED talk, I ask him, “Boy, you had so much confidence. What were you thinking in the five minutes before you went up there?” And he said, [*false, exaggerated Swedish accent*] “In the last five minutes before I speak, I don’t [*inaudible*] to anybody. I just want to think about what I’m going to say.” And he talked about that in Sweden they do skiing, and he says, “For me it’s like being on a downhill run. You think about going here, and going here, and going here, and going here. And that’s what I think about before a talk.”

And just one last thing that I’ll say, and this one comes from one of the youngest TED speakers whom I interviewed. Her name is Sheila Patek, a biologist, and she told me that “If I had thought about the 800-plus people in the room that day, I never could have done it. What I did was focus on the science, on my research questions, and my passion for those questions, and I let that carry me.” And I think that piece of advice right there, just an honest appraisal of what she was really thinking, is maybe the best piece of advice for achieving that focus that you need for having that confidence inside.

**KL:** These are such great suggestions. I also really like that you brought up this preparation component, because I think, when I talk with people who are speaking, that is the thing that they’re so nervous, like, their lack of confidence keeps them from practicing, and they think they’ll just go up there and it’ll kind of all come together. And that is the piece of advice I give the most often, is to just practice, and even if it feels weird, and you’re kind of talking to yourself in your house or your office or whatever it might be, going through that is a really significant component, I think, of feeling that confidence. So I’m so glad that you raised that.

**MA:** I know, a lot of people probably think I am strange, because I do talk to myself. I try to practice a lot of talks with my dogs on walks, because I can talk to them, and I’ll tell you, they love all my talks, [***KL*** *laughs*] and so that gives me a little confidence.

**KL:** That’s a great idea.

We’re going to take another brief break. When we come back, we’re going to hear a little bit more from Michael about rethinking the way we use PowerPoint. Back in a moment.

[*music*]

# Segment 3:

**KL:** Michael, I know that you’re considered to be kind of a harsh critic of PowerPoint, and I wondered if you could start off just by saying why do you take that stand? What are some of your concerns about PowerPoint?

**MA:** Well I’m probably not the harshest critic. Edward Tufte probably has that mantle. But I am hard on PowerPoint’s defaults. The program itself I think is valuable, but the defaults, oh my gosh. If people would realize that these defaults, they arose in the 1980s, before there was a lot of research on how we learn when we’re listening to someone and then looking at a screen, and if they also knew that the defaults were so heavily influenced by the crude computer architecture of that day, what they would see is that when people use these defaults, essentially what they’re doing is they’re being that king in the Hans Christian Andersen story “The Emperor with No Clothes.” And I mean, he thinks he’s got this big robe on. He thinks he’s got this great way to present, or she’s got this great way to present, but what you’re projecting is something that is the antithesis of helping people learn. Here’s what it comes down to: people project too many words. As the cognitive psychologist John Sweller points out, people can process only so many written words while they’re listening to somebody speak, and the number of written words that most people project when they follow PowerPoint’s defaults, in Sweller’s estimation, is a disaster. We can do better than that. I would say that’s number one.

And then number two is, as Prof. Richard Mayer at University of California, Santa Barbara points out, that people learn much more deeply from words, mainly spoken words, and relevant images than words alone. In other words, we’ve got this second track, our second highway, into the audience’s brain, and that’s with the visual: photographs, drawings, diagrams, graphs, even an equation, certainly a film. These are things that we can use to connect with the audience, and so many people do not. So, that’s what I’d probably say are the two biggest mistakes people makes. They project too many words, and then they don’t present enough visual evidence.

**KL:** So I know that one of things that you advocate is that engineers and scientists use an assertion–evidence approach. I’m wondering if you can talk a little bit about that approach and why you think it makes a difference.

**MA:** Okay, so this particular approach—I coined this term with a colleague of mine from University of Virginia, Kay Neeley, and this particular term is one that we’ve assigned to a different kind of an approach from what you have when you follow PowerPoint’s defaults. So, those people who have PowerPoint’s defaults, they’ll have a phrase headline. In science and engineering, you’ll see things like “Introduction,” “Methods,” “Results,” “Discussion,” “Background,” and then they’ll have a bulleted list, maybe bulleted list and an image. What we advocate is that you build your talk on messages, not phrase topics. And so this may seem counterintuitive to what I just suggested, but think of your talk as built on a sentence, so when I build a slide in a scientific talk, I will, at the top of the slide, write a succinct sentence, one or two lines, that states the main takeaway of that scene.

So that’s the first thing, and that in itself requires more work, because you’ve really got to think about what is that main takeaway. But you build the talk that way, and then rather than supporting that main takeaway with a bulleted list, you support it with this visual evidence. It could be a photograph, it could be a drawing, it could be a diagram, it could be a graph, it could be a film, but what you’re doing is you’re essentially taking a slide that’ll have 40, 45, 50 words on it, and you’re creating a slide that might have 15, 16 words on it but then has this visual evidence. And you’re also folding a lot of the sentences into your speech, because rather than looking up and having these bulleted lists, which by the way the audience doesn’t have time to read, rather than doing that, you are explaining that visual evidence. And if you know that visual evidence, then it becomes so much more of a natural kind of way to present.

Now, you might say, “Hey, I know that sentence headline and I don’t need it,” and actually that could be great in a TED talk that’s given to generally a non-technical audience. Even though they will have that message, they will build the scene on that message, a lot of times they’ll take the message off. But one thing that I’ve noticed is that the more technical the message is, the more they will leave it on, and the reason is that message becomes a safety rope for that audience that maybe just thinks about “Oh, what am I going to get at the grocery store?” or thinks about their own work from something that you said, and then they can all of the sudden snap back in. “What’s the main takeaway here? Oh, it’s that sentence at the top.” And they can stay with the journey.

So, we’ve talked about the two big principles. The third principle is, as I mentioned, fashion sentences on the spot, but after planning and practice. Don’t try to memorize your entire talk, and you don’t need that bulleted list. It’s like when you were a kid and you were learning to swim: let go the side of the pool. Give it a try. Start with a really short talk, and then learn that oh yeah, if I practice and I add the visual evidence there, I’m just explaining that visual evidence. I’m going through the graph: “This is the y-axis. This is the x-axis. Here’s what this curve is telling us.” And you’ll find that you are fashioning sentences in a very natural way. Students have told me that changing to this approach is transformative to them, that before, they felt as if they were like that caged lion, that they had to go here, and then here, and then here, and then here on the slide. They had to talk about it in a certain order, and now they had much more of a freedom, that okay, I mean, I’m going here and here, as Rosling said, in a big picture, but at that actual gate, oh, I’m turning this way, oh, maybe I’m turning it this way. A little bit different. And there’s a wonderful freedom and a wonderful spontaneity that occurs when you present in that fashion.

**KL:** I love that idea, and also, I think this questioning of the PowerPoint defaults is something that—especially novices. I mean, they’re going to come in and really rely on PowerPoint to really structure. And I think, also, academics may not feel confident about putting together a slide deck that is engaging and really visually oriented, so I’ll go ahead and link to a few resources in the show notes. *Presentation Zen* and *Slideology* are both books that talk about more of these visual components from a design perspective, and there’s also a couple of online tools that offer templates that are a little bit different than PowerPoint. One of them is SlideCarnival, which is specifically for Google Slides, and then another potential resource for academics is Canva, which is another way to create some visual elements for slides that comes with templates but are really echoing some of the things that you’re saying here, Michael, about emphasizing different kinds of things and really combining the visual with the text in a more multimedia way. So, I’ll make sure to link to those things in the show notes. Michael, we know that PowerPoint’s defaults are deeply entrenched. People have been depending on this for a long time.What is your plan for having lots of people adopt this new kind of approach, this assertion–evidence approach that you’re proposing here?

**MA:** Well, I will add one more link here, and it’s primarily for scientists and engineers, but a lot of people in business and other disciplines are linking to it, and it’s called assertionevidence.com [*sic*]. And essentially what has happened is I’ve been reaching a lot of undergraduates and graduate students and young scientists and engineers in the world, and if I work with them, we have so many times we see this transformation of their presentations, and they are really excited to present in this new way, and then they go work for an established company, or they go maybe do research with an older professor, and they get shut down. They said, “Oh, no, that’s not the way we present.” We’ve got a revolution, in a sense. I mean, you may think that I’m exaggerating, but I have to say there’s an incredible amount of passion that goes into these battles between the younger or the newer versus the older and the established.

And you’re absolutely right. PowerPoint’s defaults are entrenched, and it’s so hard for the young people to effect change here, but there are things that they can do. One thing, and this resonates with scientists and engineers, is I will tell the older, established managers, “Be an experimentalist. Give this approach one shot, maybe in a low-stakes talk, maybe just kind of a talk that is to your group, but think about it. How much does the audience understand, how much do they remember, how much do they believe? That’s the measure of a scientific talk. And when I get organizations that kind of look at it like that, then all of the sudden you hear a different stance. “Okay, I like this aspect, I like this aspect, I’m not sure that my people will be able to deliver.” And that’s okay. A lot of times they’ll say, “Well, but you see, our slides stand as a set of notes,” and that’s probably the most common counterargument that I get back, but then I counter with “But look. You know, I’ve been a real critic of PowerPoint, but let me say that Robert Gaskins and Dennis Austin, when they created this program, they created this incredible feature called the notes page. You can make a better set of notes than what you’re doing now if you’ll put an assertion–evidence slide at the top, and then in the notes page, put in paragraphs that give the background information. Put in full reference citations to those images that are on there. You can have a set of notes that will trump the slide decks that people will pass out with bulleted lists, because you can, with paragraphs in those notes, you can make connections, something that bullet lists are not at all good at doing.

**KL:** Michael, you’ve certainly given me many things to think about for my own presentations. I want to thank you so much for coming on this show, sharing your expertise and some of what you’re learning from your investigations. Thank you so much.

**MA:** Well thank you, Katie. It’s a pleasure to speak to your audience.

**KL:** And thanks also to our listeners for joining us for this week’s episode of *Research in Action*. I’m Katie Linder, and we’ll be back next week with a new episode.

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# Bonus Clip #1:

[*intro music*]

**KL:** In this bonus clip for Episode 47 of the *Research in Action* podcast, Michael Alley discusses his Tips for Presenting to Non-Scientists—take a listen.

I’m wondering if you can talk a little bit about scientists who might be presenting to non-scientific audiences, and they’re talking with people who maybe aren’t very familiar with some of the fundamental components of whatever it is they may be presenting on. What are some ideas you have for engaging those audiences during a scientific presentation?

**MA:** That’s a great question, and that’s such an important question, and scientists and engineers, overall, we are not doing a good job of communicating our work to the general person on the street. I mean, when you turn on television in the morning, how many scientists and engineers do you see on the morning shows? Not many, usually none. And I think it’s not because we don’t have exciting things to say—we’ve got incredible information to share—but so many of us just make it so painful for that audience, or the audience can’t quite understand, and then the television stations, they feel awkward, and so a lot of times I don’t think they invite us.

But here’s my best piece of advice for that situation where you’ve got to speak to the general public. I want you to think of someone in your family, okay? I mean, this could go like grandparents, uncles, I mean, make it your extended family, someone who is not a scientist or an engineer, but someone who commands a presence in the room, that when that person, at a holiday, speaks, everyone gets quiet. Give your talk to them, and here’s the reason: because when you’re giving your talk to them, if they don’t understand something or they don’t see the importance of something, they’ll just cut you off and say, “I don’t get it.” They won’t be polite (it’s usually they just don’t have the time for it), and they will be honest with you, and if in this sense you have that person in your mind, I think you’ll do better than—a lot of people try to have everybody in their mind and in a sense don’t really present to anyone.

**KL:** I love that suggestion.

[*music*]

You’ve just heard a bonus clip from episode 47 of the *Research in Action* podcast with Michael Alley discussing his Tips for Presenting to Non-Scientists—thanks for listening!

# Bonus Clip #2:

[*intro music*]

**KL:** In this second bonus clip for Episode 47 of the *Research in Action* podcast, Michael Alley shares The Four Aces for Projecting Confidence—take a listen.

**MA:** Yeah. We’ve talked about the confidence inside. I guess we need to talk about the confidence that you project, and so, here, I think about something, again, that Twain said. And he was making a joke about religion, but there’s a kernel in here that I really like. He talked about the calm confidence of a Christian with four aces. So, let’s put the religion to the side for a second. I want to focus on four “aces” that your listeners can have when they present, and these aces essentially are cards they can play to project confidence.

Ace of spades: start strong. And by no means do I think that this ace is easy to play, but the beginning is such an important time. The audience is sizing you up. You have got to practice that part of your talk. Sheila Patek, that biologist whom I mentioned, she said she practices the beginning at least fifteen times. She may go through the whole talk maybe three times, but the beginning she practices fifteen. Another thing I would say is if you have slides, know that first slide backwards and forwards. I am stunned how many people will turn back and look at the slide when they say what their title is, or even worse, say what their name is. [*laughs*] I mean, you have got to be making eye contact when you say those kinds of things, and make sure that that first thing that you say, that first sound, is actually a word. So many times I hear people begin with “uh” or “umm.”

Another thing that I think is a good piece of advice is scrunch your toes. So, at the beginning you probably have the most nervousness, and a lot of times it’ll come in a dance—a lot of people do kind of a samba. But what I would suggest is scrunch your toes and let the energy come out that way, but stand tall as you can. If you can, try to move closer to the audience at that beginning, because you really want to connect with them and look at people in the eye. There may be some people who are scary to look at; okay, don’t look at them. But look at every part of the room. You can always find somebody who really is smiling at you. Ace of hearts, and we’ll talk about this a little bit later, but it is reduce the text on your slides. You project zero confidence when you’re reading a bulleted list. Those are your notes, and essentially what you’re telling the audience is, “Oh, I really didn’t know this talk, so I’ve got to look at my notes on the screen.” Know your slides. I’ll talk, maybe, a little bit later here about this assertion–evidence approach that I advocate, as opposed to following PowerPoint’s defaults. But build your talk on messages, support those messages with visual evidence, not bulleted lists, and then when you present, fashion sentences on the spot, but after planning and practice. Don’t try to memorize a talk. You just can’t do it. It’s too much work, and you’ll get really tongue-tied trying to say this word or that word. Instead, know the sequence of ideas, as Rosling mentioned.

Ace of diamonds is know what comes next. In other words, if you know that sequence of ideas, you can actually make a really sweet transition to the next slide or scene that you show, and it really works in the subconscious, but you anticipate what the audience may be thinking. And I got to tell you, that is so powerful, and that is what the best speakers do.

And then my ace of clubs is finish strong. A lot of scientists and engineers, they fumble the ending. They kind of rush to the question period, they ask for questions, and the audience doesn’t know what to do. But what you want to do is really, at the ending, you want to slow it down. You want to state your main takeaway, maybe your main arguments that got you to that point. You want to have some kind of closure that is thoughtful. And then you want to pause. You hope the audience will break out in applause. They won’t, because people have clapped too early in a classical music concert and they’re scared. But all you have to do is say “thank you,” “Xièxiè” in Chinese, “danke schön” in German, and the audience will applaud, and that applause is important. It gives you confidence. It also kind of lets people know in the room who maybe weren’t sure about your talk, who maybe were on the edges of understanding it, “Oh, this was a good talk.” It just is a nice way to then lead into the questions, and when the applause is dying down, then that’s when you want to ask for questions. And one small thing: when you get a question that you can’t answer fully, don’t say what you know and then apologize. Apologize first. Say, “I can’t answer everything about your question, but here’s what I can say.” And so when you finish that question, again, you play that ace of clubs, you finish strong.

**KL:** Again, more excellent suggestions. I know, for our listeners who may be rapidly taking notes, I’ll just remind them that we are linking to Michael’s book in the show notes if you’re interested in more of these practical suggestions.

You’ve just heard a bonus clip from episode 47 of the *Research in Action* podcast with Michael Alley sharing The Four Aces for Projecting Confidence—thanks for listening!