PATRICK WINSTON: The Uniform Code of Military Justice specifies court martial for any officer who sends a soldier into battle without a weapon. There ought to be a similar protection for students because students shouldn't go out into life without the ability to communicate, and that's because your success in life will be determined largely by your ability to speak, your ability to write, and the quality of your ideas, in that order. I know that I can be successful in this because the quality of communication, your speaking, your writing, is largely determined by this formula. It's a matter of how much knowledge you have, how much you practice with that knowledge, and your inherent talent, and notice that the T is very small. What really matters is what you know.

This point came to me suddenly a few decades ago when I was skiing at Sun Valley. I had heard that it was Celebrity Weekend, and one of the celebrities was Mary Lou Retton, famous Olympic gymnast, perfect 10s in the vault. And I heard that she was a novice at skiing, so when the opportune moment arrived, I looked over on the novice slope and saw this young woman who, when she became unbalanced, went like that. And I said that's got to be her. That must be the gymnast.

But then, it occurred to me, I'm a much better skier than she is, and she's an Olympic athlete-- not only an ordinary Olympic athlete, an outstanding one. And I was a better skier because I had the K, and I had the P, and all she had was the T. So you can get a lot better than people who may have inherent talents if you have the right amount of knowledge.

So that's what my objective is today, and here's my promise. Today, you will see some examples of what you can put in your armamentarium of speaking techniques, and it will be the case that some one of those examples, some heuristic, some technique, maybe only one, will make-- will be the one that gets you the job. And so this is a very non-linear process. You never know when it's going to happen, but that is my promise. By the end of the next 60 minutes, you'll have been exposed to a lot of ideas, some of which you'll incorporate into your own repertoire, and they will ensure that you get the maximum opportunity to have your ideas valued and accepted by the people you speak with.

Now, in order to do that, we have to have a rule of engagement, and that is no laptops, no cell phones. So if you could close those, I'll start up as soon as you're done. Some people ask why that is a rule of engagement, and the answer is, we humans only have one language processor. And if your language processor is enga-- could you shut the laptop, please?

If your language processor is engaged browsing the web or reading your email, you're distracted. And worse yet, you distract all of the people around you. Studies have shown that.

And worse yet, if I see a open laptop somewhere back there or up here, it drives me nuts, and I do a worse job. And so that ensures that all of your friends who are paying attention don't get the performance that they came to have. So that's it for preamble. Let's get started.

First thing we talk about, of course, is how to start. Some people think the right thing to do is to start a talk with a joke. I don't recommend it, and the reason is that, in the beginning of a talk, people are still putting their laptops away. They're becoming adjusted to your speaking parameters, to your vocal parameters, and they're not ready for a joke. So it doesn't work very well. They usually fall flat.

What you want to do instead is start with empowerment promise. You want to tell people what they're going to know at the end of the hour that they didn't know at the beginning of the hour. It's an empowerment promise. It's the reason for being here.

What would be an example? Oh, I see. At the end of this 60 minutes, you will know things about speaking you don't know now, and something among those things you know will make a difference in your life. Yeah, that's an empowerment promise, so that's the best way to start.

So now that I've talked a little bit about how to start, what I want to do is give you some samples of heuristics that are always on my mind when I give a talk, and first of these heuristics is that it's a good idea to cycle on the subject. Go around it. Go round it again. Go round it again.

Some people say, tell him what you want to tell him. Tell him again, and then tell him a third time, as if people weren't intelligent. But the point is-- the reason is-- well, there are many reasons, one of which is, at any given moment, about 20% of you will be fogged out no matter what the lecture is. So if you want to ensure that the probability that everybody gets it is high, you need to say it three times.

So cycling is one of the things that I always think about when I give a talk. Another thing I think about is, in explaining my idea, I want to build a fence around it so that it's not confused with somebody else's idea. So if you were from Mars, and I was teaching you about what an arch is, I might say to you, well, that's an arch. And that's not to be confused with some other things that other people might think is-- this is not an arch. That's not an arch.

I'm building a fence around my idea so that it can be distinguished from somebody else's idea. So in a more technical sense, I might say, well, my algorithm might similar-- might seem similar to Jones's algorithm, except his is exponential, and mine's linear. That's putting a fence around your idea so that people can not be confused about how it might relate to something else.

The third thing on this list of samples is the idea of verbal punctuation. And the idea here is that, because people will occasionally fog out and need to get back on the bus, you need to provide some landmark places where you're announcing that it's a good time to get back on. So I might, in this talk, say something about this being my outline.

The first thing we're going to do is talk about how to start. Then we're going to deal with these four samples, and among these four samples, I've talked about the first idea-- that's cycling. The second idea, building-- and now, the third idea is verbal punctuation.

So I'm enumerating and providing numbers. I'm giving you a sense that there's a seam in the talk, and you can get back on. So now, we're on a roll, and since we're on a roll, can you guess what fourth idea might be here-- an idea that helps people get back on the bus?

AUDIENCE: Ask a question.

PATRICK WINSTON: Yes?

AUDIENCE: Ask a question. [INAUDIBLE].

PATRICK WINSTON: Ask a question, yes. Thank you. So ask a question.

And so I will ask a question-- how much dead air can there be? How long can I pause? I counted seven seconds.

It seemed like an eternity to me to wait and not say anything for seven seconds, but that's the standard amount of time you can wait for an answer. And of course, the question has to be carefully chosen. It can't be too obvious because then people will be embarrassed to say it, but the answers can't be too hard because then nobody will have anything to say.

So here are some sample heuristics you can put in your armamentarium and build up your repertoire of ideas about presentation. And now, if this persuades you that there is something to know, that there is knowledge, then I've already succeeded because what I want to convince you of, is if you watch the speakers you admire and feel are effective, and ask yourselves why they're successful, then you can build up your own personal repertoire and develop your own personal style. And that's my fundamental objective, and the rest of this talk is about some of the things that are in my armamentarium that I think are effective.

So next thing on our agenda, as we start to discuss these other things, is a discussion of time and place. So what do you think is a good time to have a lecture? 11 AM? Yeah.

And the reason is most people at MIT are awake by then, and hardly anyone has gone back to sleep. It's not right after a meal. People aren't fatigued from this or that. It's a great time to have a lecture.

So that brings me, next, to the question of what about the place? And the most important thing about the place is that it be well lit. This room is well lit.

Problem with other kinds of rooms is that we humans, whenever the lights go down, or whenever the room is dimly lighted, it signals that we should go to sleep. So whenever I go somewhere to give a talk, even today, the first thing I do when I speak to the audio-visual people is say, keep the lights full up. Oh, they might reply, people will see the slides better if we turn the lights off, and then I reply, it's extremely hard to see slides through closed eyelids.

What else can you say about the place? Well, the place should be cased, and I mean that in a colloquial sense, of like if you're robbing a bank, you would go to the bank some occasions before to see what it's like, so there are no surprises when you do your robbery. So whenever I go somewhere to speak, the first thing I ask my host to do is to take me to the place where I'll be speaking so that if there are any weirdnesses, I'll be able to deal with it.

Sometimes, it might require some intervention. Sometimes, it just might require me to understand what the challenges are. So when I came here this morning, I did what I typically do. I imagined that all the seats were filled with disinterested farm animals, and that way, I knew that, no matter how bad it was, it wouldn't be as bad as that.

So finally, it should be reasonably-- it should be reasonably populated. It should be the case that-- if there were 10 people in this hall, everyone would be wondering, what's going on that's so much more interesting that nobody's here. So you want to get a right sized place that's-- doesn't have to be packed, but it has to be more than half full.

So those are some thoughts about a time and place. Next thing I want to talk about is a subject of boards and props and slides. Well, these are the tools of the trade. I believe that this is the right tool for speaking when your purpose is informing.

The slides are good when your purpose is exposing, but this is what I use when I'm informing, teaching, lecturing, and there's several reasons why I use it. For one thing, when you use the board, you have a graphic quality. It's the case that, when you have a board, then you can easily exploit the fact that you can use graphics in your presentation.

So that's the graphic quality that I like, and the next thing I like is the speed property. The speed with which you write on the blackboard is approximately the speed at which people can absorb ideas. If you go flipping through a bunch of slides, nobody can go that fast.

Finally, one great property of a board is that it can be a target. Many people who are novices at speaking find themselves suddenly aware of their hands. It's as if their hands were private parts that shouldn't be exposed in public, so right away, they go into the pockets, and this is considered insulting in some parts of the world. Or alternatively, maybe the hands will go in back like this.

I was once in a convent in Serbia, and my host-- as soon as we entered, a nun came up to us and offered us a refreshment. And I was about to say, no, thank you, and he said, eat that stuff or die. It's a question of local custom and politeness. But then before anything happened there, the nun pulled my hands out like this because it was extraordinarily insulting in that culture to have your hands behind your back.

So why is that? Well, it's usually supposed that that's that it has to do with whether you're concealing a weapon. So if your hands are in your pockets or behind your back, then it looks like you might have a weapon, and that's what I mean by the virtue-- one of these virtues of the board. Now, you have something to do with your hands. You can point out the stuff.

I was once watching Seymour Papert give a lecture, and I thought it was terrific. So I went a second time-- first time to absorb the content, second time to note style. And what I discovered is that Papert was constantly pointing at the board. And then I thought about it a little while, and I noted that none of the stuff he was pointing to had anything to do with what he was saying. Nevertheless, it was an effective technique.

So that's just a little bit about the virtue of blackboards. Now, I want to talk about props. The custodians of knowledge about props are the playwrights.

Many decades ago, I saw a play by Henrik Ibsen. It was*Hedda Gabler.* I remember vaguely that it was about a woman in an unhappy marriage, and her husband was in competition for an academic job with somebody else. And he was going to lose partly because he was boring, and partly because the competitor had just written a magnificent book. By the way, this is back in the days before there were copying machines and computers.

Anyhow, as the play opens, there's a potbellied stove, and in the beginning of the play, the potbelly stove, with its open door, just has some slightly glowing embers. But the potbellied stove is always there, and as tension mounts in the play, and you see this manuscript, this prop that Ibsen so artfully used, you just know that something's going to happen, because as the play goes on, the fire gets bigger and hotter and finally all consuming, and you just know that that manuscript is going to go into that fire. This memorable thing is what I remember about the play.

So playwrights have got this all figured out, but on the other hand, they're not the only people who can use props. Here's an example of the use of a prop, also due to Seymour Papert. He was talking about how it's important to look at the problem in the right way, and here's an example that not only teaches that, but makes it possible for you to embarrass your friends in mechanical engineering.

So here's what you do. Take a bicycle wheel, and you start it spinning. And then you put some torque on the axle, or equivalently, you blow on the edge. And the issue is, does it go that way, or does it go that way?

Now, the mechanical engineers will immediately say, oh, yes, I see-- right hand screw wheel. And they'll put their fingers in this position, but forget exactly how to align their fingers with the various aspects of the problem. And so it's usually the case that they get it right with about a 50% probability. So their very fancy education gets them up to the point where they're equivalent to flipping a coin.

But it doesn't have to be that way because you can think about the problem a little differently. So here's what you do. You take some duct tape, and you put it around the part of the wheel like that. And now, you start to think about, not the whole wheel, but just a little piece that's underneath the duct tape.

So here, that piece comes rolling over the top, and at this point, you blow on it with a puff of air. Forgetting about the rest of the wheel, what happens to that little piece that's under the duct tape? It must want to go that way because you banged on it like that. It's already going down like that.

And what about the next piece? Same thing. Next piece? Same thing.

So the only thing that can happen is that the wheel goes over like that. And so now, you'll never wonder again because you're thinking about the problem in the right way, and it's demonstrated by the use of a prop. You can try this after we're done.

Another example I like to remember is one from when I was taking 8.01. Alan Lazarus was the instructor at the time, and he was talking about the conservation of energy, kinetic and potential. And there was a long wire in a ceiling in 26-100 attached to a much bigger steel ball, but one-- not one like this.

And Lazarus took the ball up against the wall like this. He put his head flat against the wall to steady himself, and then he let go, and the pendulum takes many seconds to go over and back, and then gently kisses Lazarus's nose. And so you have many seconds to think, this guy really believes in the conservation of energy.

Do not try this at home. The problem is that, the first time you do this, you may not just let go. There's a natural human tendency to push. So that's a little bit on a subject of props.

It's interesting. Whenever surveys are taken, students always say more chalk, less PowerPoint. And why would that be? Props are also very effective. Why would that be?

I'll give you my lunatic fringe view on this. It has to do with what I would call empathetic mirroring. When you're sitting up there watching me write on the board, all those little mirror neurons in your head, I believe, become actuated, and you can feel yourself writing on the blackboard. And even more so, when I talk about this steel ball going that way and this way, you can feel the ball as if you were me, and you can't do that with a slide. You can't do it with a picture. You need to see it in the physical world. That's why I think that-- oh, yes, of course, it's-- there are speed questions involved, too, that have to be separated out. But I think the empathetic mirroring is why props and the use of a blackboard are so effective.

Well, let's see-- oh, yes, there is one more thing by way of the tools, and that has to do with the use of slides. I repeat, I think they're for exposing ideas, not for teaching ideas, but that's what we do in a job talk or conference talk-- expose ideas. We don't teach them. So let me tell you a little bit about my views on that.

I remember, once, I was in Terminal A at Logan Airport. I'd just come back from a really miserable conference, and the flight was really horrible. It was one of those that feels like an unbalanced washing machine. And for the only time in my life, I decided to stop on my way to my car and have a cup of coffee and relax a little bit. And as I was there for a few minutes, someone came up to me and said, are you Professor Winston?

I think so, I said. I don't know. I guess I was trying to be funny.

In any event, he said, I'm on my way to Europe to give a job talk. Would you mine critiquing my slides? Not at all, I said. You have too many, and they have too many words.

How did you know, he said, thinking perhaps I had seen a talk of his before. I hadn't. My reply was, because it's always true. There are always too many slides, always too many words. So let me show you some extreme examples of how not to use slides.

Well, for this demonstration, I need to be way over here and when I get over here, then I can start to say things like, one of the things you shouldn't do is read your transparencies. People in your audience know how to read, and reading will just annoy them. Also, you should be sure that you have only a few words on each transparency, and that the words are easy to read.

And I hope I'm driving you crazy because I'm committing all kinds of crimes, the first of which is that there are too many words on the slide. Second of which is, I'm way over there, and the slide's way over there. So you get into this tennis match feeling of shifting back and forth between the slide and the speaker.

You want the slides to be condiments to what you're saying, not the main event or the opposite way around. So how can we fix this? Step number one is to get rid of the background junk. That's always distraction.

Step number two is to get rid of the words. When I reduced the words to these, then everything I read a previous time, I'm not licensed to say, because it's not on the slide. I'm not reading my slides anymore, but I'm saying what was written on the slides in a previous example.

So what else can we do to simplify this? Well, we can get rid of the logos. We don't need them. Simplification.

What else can we do? Get rid of the title. Now, I want to talk to you about some rules for slide preparation. I'm telling you the title. It doesn't have to be up there.

By reducing the number of words on the slide, I'm allowing you to pay more attention to me and less to what's written on the slide. I mentioned it before-- we-- have only one language processor, and we can either use it to read stuff or to listen to the speaker. And so if we have too many words on the slide, it forces people in the audience to read this stuff and not listen.

A student of mine did an experiment a few years ago. He taught some students some web-based programming ideas. Half the information was on slides, he said the other half, and then for a control group, he reversed it. And the question was, what did the subjects-- that is to say, freshmen at his fraternity-- what did the subjects remember best, what he said, or what they read on the slide? And the answer is, what they read on the slide.

When their slides have a lot of material on it, they don't pay attention to the speaker. In fact, in the after action report, one of the subjects said, I wish you hadn't talked so much. It was distracting.

Well, the last item is eliminate clutter. Here's some clutter. No reason even for those bullets.

So the too many words problem is a consequence of a crime Microsoft has committed by allowing you to use fonts that are too small. So you should all have a sample slide like this that you can use to determine what the minimum font size is that's easily legible. [INAUDIBLE], what do you think of those?

AUDIENCE: Which size is right?

PATRICK WINSTON: What's that?

AUDIENCE: Did you ask me what size is right?

PATRICK WINSTON: Yeah, minimum, maybe.

AUDIENCE: 40 or 50.

PATRICK WINSTON: Yeah, he says 40 or 50. I think that's about right. 35 is beginning to get too small, not necessarily because you can't read it, but because you're probably using it to get too many words on the slide.

What other crimes do we have? Well, we have the laser pointer crime. And for that-- in the old days, when we didn't have laser pointers, we used wooden ones, and people would go waving these things around. And pretty soon it became almost like a baton twirling contest, so here's what I recommended in the old days for dealing with this kind of pointer.

This is an example of use of a prop. Jim Glass up there saw this talk about 20 years ago, and said, oh, yeah, I remember that talk. That's the one where you broke the pointer. It's amazing how props tend to be the things that are remembered.

Well, now, we don't have physical pointers anymore. We've got laser pointers. It's a wonder more people aren't driven into epileptic fits over this sort of stuff.

Well, here's what tends to happen. Look at that. It's a lovely recursive picture, and I can become part of it by putting that laser beam right on the back of my head up there.

Then what do you see? You see the back of my head. I have no eye contact, no engagement, nothing.

I was sitting with a student watching a talk one day, and she said, you know what, we could all leave, and he wouldn't know. So what happens when you use a laser pointer? You can't use a laser pointer without turning your head and pointing it at something, and when you do that, you lose contact with the audience. You don't want to do it.

So what do you do if you need to identify something in your image, and you don't want to point at it with a laser? This is what you do. Put a little arrow on there and say, now, look at that guy at the end of arrow number one. You don't need to have laser pointer to do that.

The too-heavy crime-- when people ask me to review a presentation, I ask them to print it out and lay it out on a table. When they do that, it's easy to see whether the talk is too heavy, too much text, not enough air, not enough white space, not enough imagery. This is a good example of such a talk-- way too heavy. The presenter has taken advantage of a small font sizes to get as much on the slide as he wanted. Lots of other crimes here, but the too-heavy-- the fact that it's too heavy is what I wanted to illustrate.

So here, by contrast, another talk-- one I gave a few years ago. It's not-- it wasn't a deeply technical talk, but I show it to you because there's air in it. It's mostly pictures of things.

There are three or four slides that have text on them, but when I come to those, I give the audience time to read them. And they're there because they might have some historical significance. The first slide with a lot of text on it is an extraction from the 1957-- from the proposal for the 1957 AI conference at Dartmouth. Extraordinarily interesting event, and that historical extraction from the proposal helps drive that point home.

What else have we got here? Oh, yeah, your vocabulary word for the day. This is an hapax legomenon. What that means is, this is the kind of slide you can get away with exactly once in your presentation.

This is a slide that got some currency some years ago because it shows the complexity of governing in Afghanistan by showing how impossibly complex it is. It's something you in the audience can't understand, and that's the point, but you can't have many of these. You can have one per work, one per presentation, one per paper, one per book. That's what hapax legomenon is, and this is an example of it.

Well, I've shown you some crimes. So you might be asking, do these crimes actually occur? So they do.

[LAUGHTER]

There's the hands in the pockets crime. There's a crime and time and place selection here. This is how you get to the Bartos Theater. First thing you do is you get on these steps over at the Media Lab, then you cross this large open space, then you turn right down this corridor.

[LAUGHTER]

At this point, whenever I go in there, I wonder if there are torture implements around the corner.

[LAUGHTER]

And then when you get in there, you get into this dark, gloomy place. So it's well named when they call it the Bartos Theater because it's a place where you can watch a movie, but it's not a place where you can give a talk.

Now, on a subject of does it happen, here's a talk I attended a while back in Stata. Notice that the speaker is far away from the slides. Speaker's using a laser pointer. And you say to me, well, what's happening here? It's, by the way, the 80th - 80th! slide of the presentation. Notice that it extends with the words, this is the first of 10 conclusions slides.

[LAUGHTER]

So what's the audience reaction? That's the sponsor of the meeting.

[LAUGHTER]

He's reading his email. This is the co-sponsor of the meeting. He's examining the lunch menu.

[LAUGHTER]

What about this person? This person looks like he's paying attention, but just because it's a still picture. If you were to see a video, what you would see is something like this [YAWNS].

[LAUGHTER]

So yeah, it does happen. Well, now, that's a quick review of tools. Now, I want to talk about some special cases. We could talk a little bit about the informing or to say another way, doing what I'm doing now. But I'll just say a few words about that.

In that kind of presentation, you want to start with a promise like I did for this hour that we're going through now. And then it comes to the question of how do you inspire people? I've given this talk for a long time, and a few years ago, our department chairman said, would you please give this talk to a new faculty, and be sure to emphasize what it takes to inspire students.

And strangely, I hadn't thought about that question before. So I started a survey. I'd talked to some of my incoming freshmen advisees, and I talked to senior faculty and everything in between about how they've been inspired.

What I found from the incoming freshmen is that they were inspired by some high school teacher who told them they could do it. What I found in the senior faculty, they were inspired by someone who helped them see a problem in a new way. And what I saw from everyone is that they were inspired when someone exhibited passion about what they were doing, exhibited passion about what they were doing.

So that's one way to be inspiring. It's easy for me because I do artificial intelligence. And how can you not be interested in artificial intelligence?

[LAUGHTER]

I mean, if you're not interested in artificial intelligence, you're probably not interested in interesting things. So when I'm lecturing in my AI class, it's natural for me to talk about what I think is cool and how exciting some new idea is. So that's the kind of expression of passion that makes a difference while informing with respect to this question of inspiring.

Oh, yeah and of course, during this promise phase, you can also express how cool stuff is. Let me give you an example of a lecture that starts this way. I'm talking about resource allocation. It's the same sort of stuff you would think of when your-- it's the same sort of ideas you would need if you're allocating aircraft to a flight schedule or trying to schedule a factory or something like that.

But the example is putting colors on the states in the United States without any bordering states having the same color. So here it goes. This is what I show at the beginning of the class. This is a way of doing that coloring.

And you might say, well, why don't we wait till it finishes? Would you like to do that? No? Well, we're not going to wait till it finishes because the sun will have exploded and consumed the earth before this program finishes.

[LAUGHTER]

But with a slight adjustment to how the program works, which I tell my students you will understand in the next 50 minutes, this is what you get. Isn't that cool? You got to be amazed by stuff that takes a computation from longer than the lifetime of the solar system into a few seconds. So that's what I mean by providing a promise upfront and expressing some passion about what you're talking about.

Well, the last item in this little block here is it has to do with what people think that they do it at MIT. You ask faculty what the most important purpose is, and they'll say, well, the most important thing I do is teach people how to think. And then you say oh, that's great. How do you teach people how to think? Blank stare.

No one can quite respond to that part, that natural next question. So how do you teach people how to think? Well, I believe that we are storytelling animals. And that we start developing our story, understanding and manipulating skills with fairy tales in childhood and continue on through professional schools like law, business, medicine, everything. And we continue doing that throughout life.

So if that is what thinking is all about. And we want to teach people how to think, you provide them with the stories they need to know, the questions they need to ask about those stories, mechanisms for analyzing those stories, ways of putting stories together, ways of evaluating how reliable a story is. And that's what I think you need to do when you teach people how to think.

But that's all about education. And many of you here are not necessarily for that, but rather for this part, for persuading, which breaks down into several categories, oral exams, not shown, shop talks, getting famous. I won't say much about oral exams other than the fact that they used to be a lot scarier than they are today.

In the old days, reading the literature in a foreign language was a part of that. And there was a high failure rate. And when you look back on those failures, the most usual reason for people failing an oral exam is failure to situate and a failure to practice. By situate, I mean, it's important to talk about your research in context. This is a problem that's being pursued all over the world. There hasn't been any progress before me in the past 30 years.

Everyone is looking for a solution because it will have impact on so many other things, such situating and time and place and feel. And then as far as practice is concerned, yes, practice is important. But that doesn't mean showing your slides to the people you share an with.

The problem with that is that if people know what you're doing, they will hallucinate that there's material in your presentation that isn't there if it isn't there. A variation on the scene, by the way, is your faculty supervisor is not a very good person to help you debug a talk because they, in fact, know what you're doing. And they will, in fact, hallucinate there's material in your presentation that isn't there.

So you need to get together with some friends who don't know what you're doing and have them-- well, you start the practice session by saying, if you can't make me cry, I won't value as a friend anymore.

[LAUGHTER]

And then when you get to the faculty on a oral exam, it will be easy. You see, difficulty-- the amount of flak you'll get from somebody is proportional to age. The older somebody is, the more they understand where they are in the world. But the young people are trying to show the old people how smart they are, so it's subtly vicious.

So whenever you have an opportunity to have an examining committee that's full of people with gray hair, that's what you want. Well, that's just a word or two about something I haven't listed here. Let's get into the subject of job talks.

So I was sitting in a bar many years ago in San Diego. I was a member of the Navy Science Board, and I was sitting with a couple of my colleagues on the board Delores Etter from the University of Colorado. She made me so jealous I could spit because she'd written 21 books, and I'd only written 17.

And then the other one was Bill Weldon from the University of Texas. He was an electromagnetism guy, and he knew how to use rail guns to drive steel rods through tank armor. These were interesting people.

So I said, what do you look for in a faculty candidate? And within one microsecond, Delores said, they have to show us they've got some kind of vision, quickly followed by Bill who said, they have to show us that they've done something. Oh, that sounds good, I said.

And then I said to them, how long does a candidate have to establish these two things? What do you think? Well, compare your answer to theirs. Five minutes.

So if you haven't expressed your vision, if you haven't told people that you've done something in five minutes, you've already lost. So you have to be able to do that. And let me just mention a couple of things in that connection.

Here, the vision is in part, a problem that somebody cares about and something new in your approach. So the problem is understanding the nature of human intelligence. And the approach is asking questions about what makes us different from chimpanzees and Neanderthals.

Is it merely a matter of quantity, or we're just a little bit smarter in some continuous way? Or do we have something that's fundamentally different that chimpanzees don't have and Neanderthals either?

And the answer is yes, we do have something different. We are symbolic creatures. And because we're symbolic creatures, we can build symbolic descriptions of relations and events. We can string them together and make stories.

And because we can make stories, that's what makes us different. So that's my stump speech. That's how I start most of my talks on my own personal research.

How do you express the notion that you've done something? By listing the steps that need to be taken in order to achieve the solution to that problem. You don't have to have done all of those steps. But you can say here's what needs to be done.

An example, here's what needs to be done. We need to specify some behavior. We need to enumerate the constraints that make it possible to deal with that behavior. We have to implement a system because we're engineers, and we don't think that we've understood something unless we can build it.

And we've built such a system, and we're about to demonstrate it to you today. That would be an example of enumerating a series of steps needed to realize the vision. So then blah, blah, blah, blah, blah, blah, blah, blah. And then you conclude by-- you conclude by enumerating your contributions.

It's kind of mirror of these steps. And it helps to establish that you've done something. So that's a kind of general purpose framework for doing a technical talk. Now, only a few more things left to do today.

Getting famous is the next item on our agenda because once you've got the job, you need to think a little bit about how you're going to be recognized for what you do. So oh, first of all, why should you care about getting famous? I thought about this in connection with a fundraising event I attended once, a fundraising event for raising money to save Venice from going under water and having all of its art destroyed.

Anyway, I was sitting here, and JC was sitting here. That was Julia, the late Julia Child. And as the evening wore on, more and more people would come up and ask Julia to autograph something or express a feeling that she had changed their life. And it just happened over and over again.

So eventually, I turned to Julia, and I said, Ms. Child, is it fun to be famous? And she thought about it for a second. And she said, you get used to it.

[LAUGHTER]

But you know what occured to me? You never get used to being ignored. So it's-- here's a way to think about it. Your ideas are like your children. And you don't want them to go into the world in rags. So what you want to do is to be sure that you have these techniques, these mechanisms, these thoughts about how to present ideas that you have so that they're recognized for the value that is in them.

So that's why it's a legitimate thing to concern yourself with packaging. Now, how do you get remembered? Well, there's something I like to call Winston's star.

And every one of the items I'm about to articulate starts with an S. So if you want your presentation ideas to be remembered, one of the things you need to do is to make sure that you have some kind of symbol associated with your work. So this arch example is actually from my PhD thesis many, many years ago.

And in the course of my work at that time, this work on arch learning became mildly famous, and I didn't know why. It was only many years later that I realized that that work accidentally had all of the elements on this star. So the first element is that there was a kind of symbol. It's the arch itself.

Next thing you need is some kind of slogan, a kind of phrase that provides a handle on the work. And in this case, the phrase was one shot learning. And it was one shot because the program I wrote learned something definite from every example that was presented to us. So in going from a model based on this configuration to something that isn't an arch base on that configuration, the program learned that it has to be on top, one shot learning.

So that's a symbol, slogan. And now we need a surprise. Yeah, the surprise is you don't need a million examples of something to learn. You can do it with one example if you're smart enough to make use of that example appropriately. So that was the surprise. You can learn something definite from each example.

Next item was a salient idea. Now, when I say salient idea, I don't mean important. What I mean is an idea that sticks out. Some theses, funnily enough, have too many good ideas, and you don't know what it's all about because which one is it? So you need an idea that sticks out.

And the idea that stuck out here was the notion of a near miss. You see, this is not an arch, but it doesn't miss by much. So it's a near miss.

And finally, you need to tell the story of how you did it, how it works, why it's important. So that's a bit on how to not so much get famous, but how to ensure that your work is recognized. Well, we're almost finished because now we're down to this last item, which is how to stop.

And when we come to that, there's a question of all right, well, what is the final slide? And what are the final words? So for the final slide, let me give you some examples of possibilities.

How about this one? Well, you might see that slide and think to yourself, there are 1,000 faculty at MIT. Nice piece of work, but not so much, but it's only a tiny piece of work if you divide by 1,000. So when you show a whole gigantic list of collaborators at the end of a talk, it's a kind of let down because it suggests that nobody knows. Well, did you do anything significant?

Now, you've got to recognize your collaborators, right? So where do you do that? Not on the last slide, on the first slide. All this was on the first slide. These are the collaborators, so you don't want to put them at the end. You don't want a slide like this.

How about this one? This is the worst possible way to end a talk.

[LAUGHTER]

Because this slide can be up there for 20 minutes. I've seen it happen. It squanders real estate. It squanders an opportunity to tell people who you are. It's just--

What about this one? I often see it. I never see anybody write it down. Also, it wastes opportunity.

Oh my God, even worse. All of these lines do nothing for you. They waste an opportunity for you to tell people-- to leave people with what you-- with who you are.

Well, what about this? Is this a good one? It might seem so at first, but here's the problem. If you say these are my conclusions, these are perfectly legitimate conclusions that nobody cares about.

What they care about is what you have done. And that's why your final slide should have this label, contributions. It's a mirror of what I said over there about how job talks ought to be like a sandwich. And the final slide, the one that's up there while people are asking questions and filing out, it ought to be the one that has your contributions on it.

Here's an example from my own stump speech. Yeah, this is what I talk about a lot. Yes, here are the things that I typically demonstrate. And I wait for people to read it. And the final element there is this is what we get out of it, so that's an example of a contribution slide.

All right, now, what about the other part? You got your final slide up there. It's a contribution slide. Somehow you have to tell people you're finished. So let's see it, check out a few possibilities.

One thing you could do in the final words is you could tell a joke. It's OK. By the time you're done, people have adjusted themselves to your voice parameters. They're ready for a joke.

I was sitting in another bar, this time in Austin, Texas with a colleague of mine named Doug Lenat. And Doug's a fantastic speaker. And so I said to Doug, Doug, you're a fantastic speaker, what's your secret? And he said, oh, I always finish with a joke, and that way, people think they've had fun the whole time.

[LAUGHTER]

So yeah, a joke will work down there. How about this one? Thank you. I don't recommend it. It's a weak move. You will not go to hell if you conclude your talk by saying thank you, but it's a weak move, and here's why.

When you say thank you, even worse, thank you for listening, it suggests that everybody has stayed that long out of politeness and that they had a profound desire to be somewhere else. But they're so polite, they stuck it out. And that's what you're thanking them for.

So once wild applause has started, you can mouth a thank you, and there's nothing wrong with that. But the last thing you do should not be saying thank you.

Now, you say to me, well, doesn't everybody say thank you? Well, what everybody does is not necessarily the right thing. And I like to illustrate how some talks can end without saying thank you.

I like to draw from political speeches, but the ones that I've heard recently aren't so good, so--

[LAUGHTER]

So I'm going to have to go go back a little bit. So here is Governor Christie. He gave the Republican keynote address one year. This is the end of his talk. Let's see what he does.

[APPLAUSE]

CHRIS CHRISTIE: And together, everybody, together. We will stand up once again for American greatness for our children and grandchildren. God bless you, and God bless America.

[APPLAUSE]

PATRICK WINSTON: So that's a classic benediction ending. God bless you, God bless America. Now, I don't want to be partisan about this. So I think I'd better switch to the keynote address in the Democratic Convention. It was delivered that year by Bill Clinton, who knows something about how to speak.

[APPLAUSE]

BILL CLINTON: If that is what you want, if that is what you believe, you must vote, and you must re-elect President Barack Obama. God bless you, and God bless America.

[APPLAUSE]

[LAUGHTER]

PATRICK WINSTON: Now, watch this. Let's go back a little bit and redo it. What I want you to see is that at one point, he seems to be almost pressing his lips together, forcing himself not to say thank you. Then there's another place where he does a little salute. So watch for those this time around.

[APPLAUSE]

BILL CLINTON: If that is what you want, if that is what you believe, you must vote, and you must re-elect President Barack Obama. God bless you., and God bless America.

[APPLAUSE]

PATRICK WINSTON: That's where he's pursing his lips.

[LAUGHTER]

There's the salute.

[LAUGHTER]

Yeah, I think that's pretty good. Now, what are we gonna take away from this? Well, I suppose I could conclude this talk by saying God bless you, and God bless the Massachusetts Institute of Technology, but it might not work so well.

But what you can get out of this is you don't have to say thank you. There are other things you can do. And it's interesting that over time, people figure this out, and there's some stock ways of ending things.

So in the Catholic church, and the good old Latin mass, it ended with ite missa est, which translates approximately to OK, the mass is over, you can go home now.

[LAUGHTER]

And of course, at musical concerts, you know that it's time to clap not at the end of the song, but rather when the conductor goes over and shakes hands with the concert master. Those are conventions that tell you that the event is over. So those are all possibilities for here.

But one more possibility, and that is that you can salute the audience. And by that, I mean, you can say something about how much you value your time at a place. So I could say, well, it's been great fun being here. It's been fascinating to see what you folks are doing here at MIT. I've been much stimulated and provoked by the kinds of questions you've been asking, it's been really great. And I look forward to coming back on many occasions in the future. So that salutes the audience. You can do that.

Well, there it is. You know what? I'm glad you're here. And the reason is by being here, I think you have demonstrated an understanding that how you present and how you package your ideas is an important thing. And I salute you for that.

[LAUGHTER] And I suggest that you come back again and bring your friends.

[APPLAUSE]