SOME LECTURING HEURISTICS

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From Patrick Winston's talk on *How to Speak*.

A handful of heuristics makes it possible to improve lectures, make better presentations, and survive oral exams. This is a list of my favorites.

PRELIMINARY PLANNING

Get a feel for what is coming. Find out how many people there will be and how much they know. Find out who has talked before if you are part of a series.

Look at the hall. Arrange for a room that will be comfortably crowded. Near-empty rooms suggest unexpectedly and embarrassingly low attendance. Those who are there will think that those who are not are having more fun.

Realize that the nature of an audience changes with its size. With fewer than 20 people, discussion is possible. With more than 50, a performance is expected, and an audience can turn vicious if it does not get one. Start your career teaching to small classes.

Realize further that your mood may be determined by only a few people. A smiling nodder will make you feel good, and you will do better. People reading newspapers will make you feel bad, and you will do worse. Do not permit people to do things that make you feel bad.

Schedule the talk for 11 a.m. Most people are awake by then and few have gone back to sleep. Just after lunch is the worst time to talk -- a few people are bound to go to sleep no matter what, thus depressing you. Late afternoon is also bad since some people will be running out of gas and others will be itchy to get off to some squash game or something. Never speak after dinner unless your talk is strictly joke and astonishment oriented.

Realize that a lecture has these parts:

- The menu
- The hors d'oeuvre
- The entree
- The dessert

THE MENU

It is hard to get a lecture started and stopped smoothly. In starting, the problem is to attract attention and get people quiet. If you just start talking, your first words will be lost, annoyingly. Start by writing a few words of outline on the board. This both gets things started and provides an outline to refer to during the rest of the talk.
Never start with a joke. People are looking for their pencils and getting accustomed to your voice. Jokes always seem to do poorly in the first few minutes.

**THE HORS D'OEUVRE**

Present a carrot immediately and be excited by it. Tell the audience what great things they will understand or know how to do as a result of your talk.

Focus. It is best to have a central, exciting concept. Relate the central, exciting concept of the day to some cosmic truth.

**THE ENTREE**

Cycle over the difficult ideas. Give a one-paragraph overview. State the theory. Show an example. Work a problem. Give a one-paragraph review. Realize that 20% or more of the audience at any given time are thinking about something else.

Use examples, analogies, and exceptions to delineate the concept. "This is an arch; this is not an arch; this is almost an arch...."

Use verbal punctuation to help people follow your argument. "This is a bad representation for three reasons: first, it makes nothing explicit ...; second, it is a bad representation because ...; and third ...." Kennedy used verbal punctuation effectively in the 1960 debates with Nixon even though he numbered his points "One ..., two ..., two ...."

Ask real and rhetorical questions to keep people's brains actively engaged.

Suggest a simple experiment with a curious, unexpected result. Make it fun for people to talk about your stuff. "Look at the full moon. Note that it seems flat."

Have an eccentricity. Make it fun for people to talk about you. Chew tobacco or wear a rope belt. Erase with both hands. Tousle your hair. Pull out your shirttail. But note that extreme eccentricity is bad form for younger people. Something cute and endearing in a full professor may be pretentious in an assistant professor.

Cultivate gestures. Point at the board a lot. This may be good even if the things you point at are unrelated to what you are saying.

Look people in the eye. Find the person that likes the stuff and look at him often. This establishes that you are not a videotape.

Be with the people. Walk toward and away from the audience as well as left and right to help break down the implied barrier. Avoid rooms with a platform.

Deflect obstructionists. Tell them you will deal with their question after class because it is a detail, tangential, has a long answer, has already been explained, or you have to think about it. In any event, do not annoy the others by getting sidetracked into something.

**Props**

Use props. If you are talking about vision, show pictures. If you are talking about force sensors bring one.
Take along a few blocks if your talk is about the blocks world. Unroll a giant check-plot of an IC if you have been working on design aids.

Drink coffee. You need something to do occasionally when you want to stop and think. Pipes are out these days.

**The Board**

Practice board work. Neat drawings, particularly in color, create the impression that the lecturer cares. Use color. Care.

Make lists. Have the audience help.

**The Viewgraph Projector**

Decide what you want to say on a transparency and say less. Avoid small print that no one can read. You are speaking, so there should be little or nothing to read anyway.

Hand them out. If you rely on transparencies to carry the lecture along, hand out copies in the beginning. They go by too fast to take notes.

Never read a transparency. Reading a transparency will drive about 20% of your audience nuts. Paraphrase instead.

Never cover up part of a transparency. The cover up technique will drive about 10% of your audience nuts. Use overlays instead.

Stand near the projected image. Do not force the viewer to divide his attention.

Do not let anyone darken the room. The darker it gets, the less alert people will be.

Prepare drawings carefully. Neat drawings, particularly in color, create the impression that the lecturer cares. Use color. Care.

Repeat important points.

**Movies and Slides**

Avoid movies and slides until the end. For these you must darken the room and this will put some people to sleep, never to waken until it is time to march out.

**THE DESSERT**

Do not talk more than an hour. This is the attention span most people have been trained for. If you must speak a little longer, say so in the beginning so people can pace themselves. Take a break in the middle if you must speak more than a little longer than an hour.

Stop when you are done. Do not babble on if you have nothing to say.

Top things out. Observe that the promised understanding or procedure has been delivered.
Show a movie. Mention early that it is coming so that people will have something to look forward to.

Tell a joke.

Hand out the gifts. This is the time to distribute papers, so that people cannot fidget with them while you are talking. There are obvious exceptions.

In general, it is hard to end a lecture. Previewing the next lecture always seems to lose --- people start dashing for the door like the lemmings rushing for the sea.

THE ORAL EXAMINATION

Presenting your Work

Practice. Have your friends give you mock examinations. Demand that they be tough so that the actual examination will be a snap by comparison.

Cycle in on what you have done. Start with a one sentence explanation, then give a one paragraph explanation, and finally proceed with the detailed explanation. Otherwise you run the risk that the examiners will sidetrack you with questions before you have a chance to show your hand.

Memorize a few key sentences. You want to get the beauty out beautifully.

Sit down. If you are nervous, and there is a chair with a table handy, use them.

Try to convey a sense of quiet confidence.

Answering Questions

Talk. Usually someone will warn you if you are wandering off the track if they know you are.

Confess. If you are absolutely stuck, say so. Usually someone will give you a hint or get you off the hook through a new line of questioning.

Demonstrate a knowledge of standard problem solving heuristics, mentioning the ones you are trying. Simplify the problem. Try working out a special case first. Draw a diagram. Specify an analogy. List the assumptions. List the ideas and tools that seem relevant.