

Strange Bedfellows? Engineering Education & The Performing Arts

5th Annual Engineering Teaching Event

October 31, 2017

[Event Posting](#)

Video Footage (*must be logged into SharePoint Community at <https://sharepoint.uwaterloo.ca/sites/Engineering-Teaching/> to access*)

[Video 1: Presentation by Robert Danisch, Associate Professor and Chair, Department of Drama and Speech Communication](#)

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Presentation

Robert Danisch, Associate Professor and Chair, Department of Drama and Speech Communication

Basic Principles of Communication as a Discipline

or

Things we Tell Students in Communication 101

Video 1 - 3:30

Transmission Model of Communication

Students often recite the transmission model of communication, or the “transmission story” – that the central feature of communication is the ability to transmit some information from my head and put it into your head. We tell students that this is *communications* (with an “s”), and engineers have invented means to transmit signals across distances, but that’s not the human problem of communication.



Communications vs communication

Communications is a technical problem of transmission: how to transmit a message from point to point (ie via telecommunications equipment).

Human communication isn’t about the transmission of data, or whether the message was physically received; it’s much more complicated than that. The reciprocal process of producing effects is the constitutive element of the communication process.

Four axioms of communication

1. Human communication involves the production of effects on others.
2. You’re always producing effects on others. Stop worrying about the process of information transmission and start worrying about the effects you’re producing on others.
3. Communication is multi-modal; language is important, but it’s not the only system of communication that humans use.
4. Building a human relationship is primary to transmission of information. The kind of relationship that’s forged through the communicative process plays a big role in determining whether or not the audience can receive what you’re trying to tell them.

Four related principles of communication for instructors

1. Stop asking “did you get it?” and start asking “what effect have I had?”

2. You can't **not** communicate because you can't **not** produce effects on others; everything you do already has an effect on your students.
3. Our words are not the most important component of our lectures; there are different and multiple ways to produce effects on students. Even the decisions we make with regard to visual design of presentations have an impact on our students.
4. You can't convince an audience of anything until you've forged a connection with them. First you connect, then you convince. The more substantive the affective connection between you and your students, the easier it is to convince them of something.

Video 1 – 11:10

There are more axioms of communication that we won't have time to get to today, but my favourite is number 6. Meaning is never in the denotative content; what's meant is never what's said. Engineers don't tend to like this one much. When an engineer puts something on the board, you think that what's meant is really what's on the board; that's the thing, that's the only thing that's meant. But I always tell my students that meaning is *never* in the denotative content; it's always someplace else. And they hate that, and then they work on it for a while and then they figure out how meaning is not a product of just denotative, descriptive information. But we're not going to talk about that today; we're not going to get that far.

Question: What's the difference between affect and effect?

Affect = verb: active process of stimulus and response

Effect = noun: the result

Video 1 - 13:18

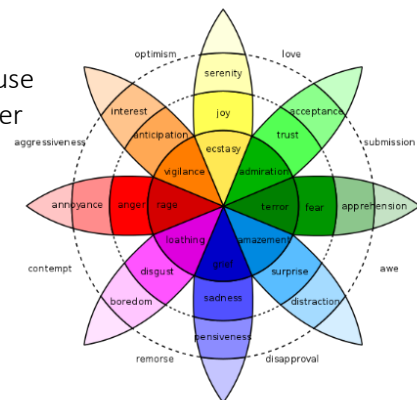
We're going to talk about four things because of their ability to affect audiences: nonverbal communication, questions, stories, and metaphors. They can condition the communication process, but we often don't reflect on them.

Video 1 - 14:00

1. Nonverbal communication

Emotional Contagion

If I'm feeling happy, my happiness is literally contagious. This is because of these things called mirror neurons. A teacher often causes, whether intentionally or not, students to mirror the physiologically affective state (or emotion) that the teacher is in. Whether you like it or not, your students will mirror physiologically what's going on with you. If you're not aware of this process, and you don't act to control it, you've potentially caused your students to react in some way that may not be conducive to the lesson.



Nonverbal Priming

Through all the channels other than words, we prepare someone physiologically for the message we're about to deliver. If we haven't chosen the correct mechanism for priming, or preparing, the audience to receive the message, then they won't ever receive the message. They'll shut down or they'll alter the message in some way.

Tone

95% of conversations end in the same way they start in terms of tone. If you enter into a conversation with a tone of hostility, then hostility will persist throughout the conversation. Tone physiologically resonates with the person. Your tone will condition their reception of the message; this is unavoidable. Some research says that physiological responses, facial responses and primary emotions seem not to be culturally based.

Exercise: volunteer leaves, pauses, re-enters and stands at the front of the room. Audience identifies the first emotion they feel in response to that walk. All students in public speaking do this exercise; the presentational components will condition the effect of the message you're about to deliver. There are different modes of carrying your body that will communicate different affective emotional responses on the part of the audience.

Audience Response to Volunteer One

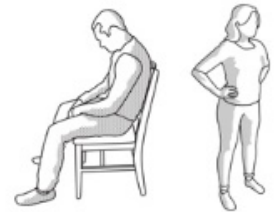
- Eeh (noncommittal sound)
- Confident and serious
- "Why am I doing this?"
- Authoritative; looking at everyone
- Looking for a chair; I'm waiting for him to get out of the way

Body Posture

Body Position

Pro-gravity posture: your body works with gravity (shrinking)

Anti-gravity posture: your body works against gravity (rising) ← signals confidence



Spine Angle

Angled toward = engagement or interest

Angled away = disinterest

Audience Response to Volunteer Two

- Odd pose; this isn't a runway
- Anxious or in a rush; stressful feeling

This is often what teachers communicate to their students. Unintentionally. You always already have an internal physiological affective state at every moment of the day. If you're harried and stressed and rushing constantly, that will manifest itself nonverbally whether you like it or not; it's almost impossible to control. That anxiousness will also be manifested subsequently in your students. On the flipside, if you're bored or uninterested in your own lecture material, that will also manifest itself in your students.

If you're bored by your materials, your students will be, too.

A professor who used the same slides for 20 years was lamenting the fact that his students seemed bored in class. When asked why that might be, he said that he wasn't sure because his lectures were good. When asked how he knew that his lectures were good, he replied that he'd been using the same ones for 21 years. When asked if he found the material boring, he said yes, it's terribly boring. When it was suggested that he change his slides, he replied that no - the math is right. He didn't realize that by reusing the same slides, he was boring himself and that by boring himself, he was physiologically boring his students, whether he liked it or not.

Nonverbal Congruence

You have an experience of the world, you have your own awareness of this experience, and you communicate it verbally or nonverbally. Students (like all humans) are very perceptive judges of congruence or inauthenticity. Inauthenticity is a misalignment between awareness of experience and communication of experience. When an instructor reveals incongruence, students know and will not respond. They'll perceive you as inauthentic, and will not be responsive to you or your lesson. It's important to authentically represent your physiological state. Teach to your personality. If you're funny, or not funny, or nerdy - it's all fine as long as you show them something authentic.

Audience Questions about Nonverbal Communication

Q Are there differences in terms of how this relates to male and female instructors?

A Yes, gender matters in those performative dynamics, but that's a big topic that we won't get to today.

Q In general, you want to design your slides so that they're interesting to you...

A Yes, ways of manifesting your own experience and awareness of what matters to you will physiologically and nonverbally communicate that something matters to your students.

Q If you're off having a bad day, or your own state isn't what it should be, do you just fake it?

A No! Talk to students about the fact that it's a bad day for you. If you arrive to class frustrated, owning up to it helps students see you as authentic. It helps them be aware of the nonverbal dynamics in the room.

Q If humans are good judges of authenticity, how does it work for actors?

A It's not an easy thing. Actors have the capacity to authentically represent the character's internal sense of experience in verbal and nonverbal ways. Acting is the form of creating the affect in the audience that the writer wants the audience to feel. If you're not an actor, just ignore the pretending part and embrace your internal state as it already is because it should be easy for you to represent authentically.

Video 1 - 36:20

2. Questions

Why do people continue to like Donald Trump? People are drawn to Donald Trump and believe that he is telling them good or important or true things. It's actually simple – it's due to the structural pattern of his communication practices. It's organized around three simple questions:



Why?
How?
What?

Often in communication patterns, the What? comes first, the How? comes second, and the Why? comes last; that structural pattern engages the wrong part of the brain at the wrong time. In the first part of this talk, I explained that we prime, or condition, audiences to what we have to say because we are physiologically affecting them; we're causing them to have an emotional state. We're also doing that when we structurally organize our content or material in a particular way. If you target the limbic system

first (with a Why? question), the audience will be more responsive, or more likely to believe or follow what you have to say, when you target the neocortex second.

Apple computers; they organize everything about Why? first and How? & What? second. Their answer to the Why? question is “To challenge the status quo.” The Apple logo has a bite out of it because it represents Eve biting the apple; it was forbidden. So why you buy an Apple product is because you want to resist the status quo. How they do it and what you buy at the end of the day are secondary consideration. Proponents of Apple will buy whatever the device is because they want to be seen as resisting the status quo. By starting with the Why?, Apple has primed us to want to buy their products.

Why does Donald Trump want to build a wall with Mexico? Because he says Mexicans are rapists. So he goes out and he represents a whole group of people as dangerous. And then he says we’re going to build a wall – how? Nobody knows. There’s no budget; no one has any idea how this would ever happen. And no one that votes for Trump actually cares – it doesn’t matter how it happens or what happens; what matters for them is why. He’s told them right away why he wants to do it.

By foregrounding the Why?, you engage the limbic system – you directly engage with the emotional affective response of your students. They now want to know or follow your line of reasoning. This is why every one of my classes starts with a Why? question; we never ever start with a What? or How? question – these get worked out through the course of the class.

Last week we started out with, “Why does Vladimir Putin like Facebook so much?” I want them to think about why the Russians would use Facebook toward the ends they wanted to use it in the 2016 election. If I foreground that question, I get a different limbic physiological affective response from my students.

This is similar to what’s done in an academic paper, but in an academic paper, you would lay it out not as a question, but as a statement, such as, “This is significant because...” That’s not necessarily what you want to do in the classroom. Asking or phrasing it as a question matters.

Video 1 – 43:20

What did you teach recently? What was the main theory that you taught?

Participant 1: Angle of twist.

RD: So you have to teach something about the angle of twist. I’m sure I could ask you, “What is the angle of twist?” and, “Can you give me an example of how the angle of twist works?” You could answer both of those questions. But what if I ask you Why? Why do the students learn it?

Participant 1: In order to design an element to resist torsion.

RD: What? I’m confused about the Why?. And if there’s ambiguity or unclarity about the Why?, there’s going to be confusion about the How? and the What?. If there’s perfect perspicuity about the Why?, it’s easier to achieve clarity about the How? And the What?.

Participant 2: So they can make good wrenches.

Okay, that’s a clearer Why? – that makes perfect sense to me. So I might ask my students at the start of class, “Do you want to make a good wrench?” and then I would use that as a call back later in the class. I

would ask if they know the How? and What? they need to know in order to make a good wrench, but I could go further and ask, "Why would one want a good wrench?" And that might be necessary, depending on the audience, to engage the limbic brain.

Exercise: write down the last substantive What? that you taught and then formulate a question about why it mattered.

Video 1 - 46:10

Question: Can we have some more examples?

Why? Why does the image of the apple with a bite out of it represent the company?

What? Nonverbal cues can manifest physiological affective responses in consumers.

How? Create a connection between corporate identity and identity of consumers (resist status quo).

Why? Why do we need good wrenches?

What? Angle of twist.

How? Use the angle of twist to calculate maximum torque capability of your wrench.

Why? Why do all businesses fail?

What? Establish a resilient business.

How? Ensure cashflow is sufficient.

Video 1 - 48:40

Characteristics of an Effective Question for the Purposes of Engagement

- 1) It ought to be somewhat open-ended, and students shouldn't be easily able to predict or identify the answer. Their engagement will be spurred by their desire to find the answer. You want to prevent a situation where the students can fill in the blank by reading ahead in the textbook, for example.
- 2) Really good questions – the professor doesn't know the answer. Like in your research – you're not sure, that's why you're doing the research. Students will read that you don't know the answer, and feel more engaged.
- 3) The question locates its significance outside of the class or subject, outside the confines of the disciplinary knowledge.

These are the primary characteristics of engaging questions. They manifest a response from the limbic system that How? and What? questions don't manifest.

Video 1 - 51:55

3. Stories

A story is something with a challenge or choice; a moment of uncertainty that has to be reconciled over the course of a plot. Without a challenge or a choice, you don't have a story.

When I used to work in engineering, we did everything around student challenges or choices: technical challenges or choices – whatever the challenge or choice was, everything was organized around it. So in class, I would narrate the challenge or choice. For example, the challenge or choice in the Challenger explosion was what the engineer could do and what they might say to other people to get them to listen, and how the conflict between management and engineers worked out at NASA in that moment. We would narrate it out in class.

Humans are beings that tell stories. The challenges and choices that we face engage us with one another and make us want to think through what we would do with those same challenges or choices.

Organize or structure courses or particular class meetings around a challenge or choice. Articulate or describe that challenge or choice, whatever it is. The more detail, the more engaged the students will be. Stating things metaphorically is also beneficial. The more you can organize the class meeting around the challenge or choice, the more you've implicated your audience in reconciling or figuring out the end.

If you describe your challenge or choice in 3 sentences, and the audience wants to know how it's reconciled, you have an engaged audience.

Video 1 - 56:10

Question: Could you give a couple more examples of the differences between challenges vs choices?

Examples

Choice A kid finds a gun outside the school. He knows who it belongs to, so he has to decide what to do. He could turn it in to the school, or he could return it to the owner. He has to make a choice, and I had to tell the story in a way that made the audience want to know what he chose.

Challenge In Lord of the Rings, Frodo is *supposed to* take the ring to Mount Doom to destroy it, but he gets there and he's still challenged by the draw of it.

A choice is between one or more possible options that may appear equally feasible; a challenge exists when an opposing force is trying to push you toward one choice, and you're trying to push against it. How I would describe it in terms of what we've talked about so far is that you start with the Why? question, describe the challenge or choice through the How? and then you'd get to the What?, the theory part later.

In an engineering classroom, an engineering problem could have, potentially, multiple avenues for solutions, such as different products for building construction. I would ask them to lay out a series of choices for me and the tensions between the choices for that particular construction project. If they were thinking about that first, then the What? and How? – what instrument or calculation they would use for the evaluation of one choice over the other – would come later.

Question

In the engineering design process, this could be easily applied. But what about teaching linear algebra?

The best way to get your students engaged is to NOT to put the equation (the What?) on the board first, but to somehow unpack why the equation came about, and what challenges it might be able to solve. For example, “Why would this person have done that? Most of the math we use is from physicists who were trying to solve problems...” To engage students, you have to foreground the Why? for students to follow that with the What? and the How? This is true in public speaking; the Why? has to be foregrounded for the audience to follow the What? and the How?. And if it’s structured around a challenge or choice, it’s more powerful and effective. And if the person doing the presenting has authentically represented their passion and interest, that is contagious.

4. Metaphors

We ended up not having time for this subject, but the use of metaphors draws people in. When used effectively, especially within a story, engagement will be increased.

-----End of Video 1-----

Teaching Takeaways from Presentation

What you’re communicating nonverbally can block student receptivity to what you’re saying (and prevent or hinder learning). Pay attention to what you’re communicating nonverbally by being aware of and considering these communication concepts:

1. Emotional Contagion
2. Nonverbal Priming
3. Tone
4. Body Posture
5. Nonverbal Congruence

Don’t begin a lesson by spelling out the main theory or concept. Use the established public speaking practice of asking Why? before getting into How? and What? in order to draw students in and maximize student engagement with the concept.

Humans are hardwired for stories. Use this to engage your students by structuring lessons around a detailed story. This will make students want to know the ending (ie the main point, theory, or concept for the lesson). And remember – a story must include a challenge or choice or else it’s not a story!

Metaphors will further engage your students.

-----Start of Video 2-----

Question & Answer Panel Session

Panelist Introductions

Maud Gorbet

An associate professor in Systems Design Engineering, Maud started at the University of Waterloo in May, 2007. She teaches undergraduate courses in engineering science, including physiology, biology, biomaterials, materials and design from 1st year to 4th year. Maud enjoys learning about teaching pedagogy and exploring new teaching methods, and most recently flipped the second year materials science course.

Video 2 - 3:30

What do you do to make the classroom an engaging place?

- walk around during class with clicker in hand to advance slides
 - it's a great way to make sure students are listening
 - being stuck at the board is boring
- use props and materials to teach different concepts
 - talk about the properties of common items found within the classroom
- tell them a story where there are challenges and choices
 - discuss the impact of each choice based on information available
 - stories get students interested, helps them engage with the more fundamental topics

Mark Pritzker

Mark has been a professor in Chemical Engineering since 1989 and teaches electrochemical engineering, physical chemistry, wastewater treatment, and applied math. He is also the Teaching Champion for Chemical Engineering.

Video 2 - 5:45

What do you do to make the classroom an engaging place?

- has been lucky in that topics of courses taught have been closely related to research area
 - has thought a lot about it, so it's easy to think of it in many different ways and come up with analogies
 - deep interest in topic, so it's easy to convey enthusiasm
- arrive prepared
 - preparation conveys calmness

Dan Davison

An associate professor in Electrical and Computer Engineering, Dan has been teaching courses in the area of control systems for the past 17 years and has recently begun teaching in the ECE capstone design project. He's passionate about teaching and has received several teaching awards; he describes his teaching approach as traditional and relatively low-tech, relying on a high degree of organization and enthusiasm with a focus on the human relationship between the instructor and student.

Video 2 - 7:45

What do you do to make the classroom an engaging place?

- limit the use of technology
 - people like people more than they like technology; take advantage of the fact that humans like each other and focus on building a relationship with your students

- o only use technology if it will help tremendously (ie very large classes)
- put in the hours before the course begins so you're fully prepared
 - o you're giving students a message if you come in on day 1 with the whole course planned out and prepared
 - o they see that you value them and the course
- demonstrate enthusiasm
 - o your attitude reflects on the students - mirroring is real!
 - o move around to convey enthusiasm
 - o never teach something you're not enthusiastic about; if it's a dry topic, find something interesting about it
- use stories/parables
 - o people love stories, even a story that's not related to the course will grab student attention, but if you can get the story to connect with the material, even better
 - o try to make the entire course a story that bridges everything together through a theme; students will better remember concepts that are connected
 - o try to build suspense so that students want to know the answer

Video 2 - 13:25

Questions

Participant 1

It's difficult to get my 4th year students to engage in my 4B technical elective course because students are focusing heavily on their 4th year design project (FYDP); any tips?

Panelists

Can you relate it to the FYDP? Can you make it a piece of the FYDP?

Participant 1

Yes, the course project can relate the course project to their FYDP, but they don't want to show up for class.

MG

Can you present them with higher-level challenges? It becomes more dangerous and the impacts could be much higher, and that might be a way to engage them. We actually had a discussion about this with some of our (SyDE) classes - there are some who just want project-based courses and others want to learn about all the different things, but when we intersect what they were saying it was really about learning the limitations and what you can do, so really looking at the implications and some of that. Maybe that's a way?

RD

Do you believe that the course is as/more important than their FYDP? It's a loaded question... if you don't, they'll get that. Once I told a class at the beginning, "This class is more important than all of your other classes," and I told them if they stayed to the end, I would tell them why. I knew that if I communicated to them implicitly... so you need a clear reason why it's important, and then that has to be articulated to the students.

MP

If they come, are they interested in the materials? You could force them to attend with deliverables and then once they come you can show them how it's useful...

Participant 1

I like Rob's point of, "What do I believe is actually more important?" And I might actually believe the FYDP is more important.

MP

More and more we're told the FYDP is the most important thing, and I think that does a disservice to everything else... it's important but everything is important.

Participant Comment

Rob brought another thing, and that's suspense. Ill tell you in 12 weeks... I'll tell you in the next lecture... if you can come up with something compelling.

MH

There's also expectancy theory and one of the pieces; people need to value the outcome. For whatever reason, perhaps because they've designed it themselves, they value the outcome of the FYDP. But if you said "at the end of this course, you'll know how to make a million dollars," they might show up. One of the things is to have an outcome they value but then you need to prove to them that they'll be able to achieve the outcome.

Participant Comment

Are they learning? I mean, they could not show up and learn it, or they could not show up and NOT learn it.

Participant Comment

Ultimately as long as they learn it, I'm happy. Some students don't show and are able to engage with ne material and do okay. Others really disengage, and then their graduation is in jeopardy. My understanding is that there are a number of other 4th year instructors that are unhappy with this situation.

MH

Does anyone teaching a 4th year course that doesn't have this problem?

Participant Comment

If you use discussion marks, they have to show up. At the beginning you tell them, "Some of the previous year students said it really helped their FYDP." For example, some of the concepts can help them pitch their ideas to investors.

GDS

One of the things we've been talking about is some of the kinds of activities we can do to get the students engaged, but I think there are other things at play in this example. For example, you mentioned a course project and I immediately wondered, if they've already got a project this term, maybe don't have a project? Why not make your learning activities fit in better with their other courses? They've got the FYDP as part of their life - what can you do in the other parts of their life that will fit in nicely? I'm not sure we think about that very well.

Participant Comment

If you know that they value the FYDP, make your course part of it. What you'll learn here will help you come up with a better FYDP. I'll help you solve your FYDP problems. Lots of students come to tech staff and they want to know how to do something that we know they would learn in your class; if you frame it into a, sort of an FYDP boot camp, I'm sure they would see the fit.

Participant Comment

I also teach a 4th year elective, and I try to relate to what they've done in their 4 years and what they want to do with their career. The students have a wide range of knowledge, so I try to take advantage of that so that the students who haven't done as much can benefit from the students who've done a lot in their work terms.

Video 2 - 22:17

Participant 2

Teaching a 1B course, and I try to ask a lot of Why? questions, but the students don't want me to make them think; they want me to solve - just give the answer.

MH summary

So you're teaching a 1B course, and you do a lot of the asking of the Why? questions, but the students just want to know the How? and the What?, or at least that's what you're hearing from them. They want you to spend more time just writing on the board and less time engaging; they only want you to tell them what they need to know for the tests and exams.

DD

If you really want the Why? questions to matter, put them on the midterm. If they know the midterm will be all How? and What?, that's what they'll focus on. If the reasons for things are important, build that in. But it can be overdone; people can only be so engaged, and you can't compete with everything. If every single thing comes back to Why?, at some point, students will be frustrated and say, "Enough!"

MP

It could also be the fact that they're 1Bs; they're so preoccupied with surviving.

Participant Comment

For students who don't like the Why? in class, if you put Why? in the exam, you'll get pushback. Doing too much Why? is a challenge.

MP

Don't make it worth too much.

RD

To many, it's usually about clarity. If you can't clearly answer a Why? question it can be because too many reasons are being offered. Also, especially at the 100 level maybe it's less the case, but the significance has to be located outside of the discipline-specific contents of the course. But that's not unusual, even with Arts students, they want to know what's on the exam. They want you to tell them what's on the exam so that they can pass the exam. For me, I just talk to them about why that's what they want because it's totally bizarre to me. It seems even more bizarre for an engineering student who's going to have a career, in a profession, I mean... what does it matter if they get an 85 or an 88? Marks don't matter.

MP

Usually by the time they get to 3rd and 4th year, students get it implicitly. I find 4th year students are easier to teach because a) they're taking the course because they want to, and b) they realize whether they get a 65 or an 80, they're going to get pretty much the same job that they're going to get.

Video 2 - 27:45

MH

One of the things I do is I ask Why? and I take the students answers and I write them on the board and I'll often organize them as I write, into pre-determined categories, and then I'll organize it and put structure behind the Whys and relate it to what I'm going to cover, and maybe what I won't cover, so that it's clear I'm actually listening to what they're saying and adding another level to it.

Participant Comment

You have to look at what is in the learning objectives for your course; is the Why? that important? I think for a 1b course, the Why? shouldn't be that important. You need to add some Why? to engage students, but the What? and How? are the important pieces, so you need to look at how much time you spend in each lecture and how it's aligned with that.

Participant 3

My question is about the Why? – I don't know if it's the personality distribution of the students I teach in ECE as opposed to Arts students, or whether this is common. I want to ask Why?, I want to engage the students. I can get them listening to me very well, but as soon as I ask them Why?, I don't get a board full of answers – I get a bunch of people waiting. Is this common to other people?

RD

You've got to wait them out.

Participant 3

But I've been told I can't do that because it'll trigger social anxiety.

MH

When you ask Why?, you get a deafening silence and maybe one or two quiet comments.

RD

I wait them out. If I have to wait half an hour, I wait half an hour.

MG

I've had a similar issue, and I think part of it is that engineers don't communicate very well and there is anxiety. So I started giving them cue cards or post its, and I ask the question and they can chat and they write it, and then I go around and pick some up and read them as I go and build on that. And that also allows, for example if you have a class of 120 it takes forever to write it all on the board, but you can pick a couple cue cards and get some questions that way and build on that, and that helps overcome anxiety, and eventually that warms them up, and by the end of the term it might be a little bit easier.

Participant Comment

That's a problem that's been solved by active learning. Active learning step one: tell them to talk to the person beside them for 30 seconds, make a list, answer your question, and then randomly call on a few people.

Participant 3

They don't want to do that either.

Participant Comment

You have to do it randomly so that they know their number could come up.

RD

Do it the first day, too. There's a lot of research that says the first day matters a lot. If you model the first day that they're not talking, they'll get the message from day one that they're not supposed to talk. And it's much harder for you in week five to get them to talk.

Video 2 - 31:50

Participant Comment

The expectation can also be set by every other class they've been in. Most of the profs don't expect anyone to say any answer but a number. Ever. It takes time and a bit of modelling to get over that hump.

Participant Comment

Drink tea; the pause seems longer to you than it does to the students, so you need something to do while you wait, and that's why I drink tea. Also setting expectations; having something that's really challenging that they cannot resist challenging you on, like if you say something is a hard-and-fast rule in one lecture and then you break it the next lecture, somebody's going to jump in and complain. So something that gets them in that mindset of wanting to challenge and ask, and then they're used to having that kind of discussion.

DD

First lecture sets the tone for everything. I always talk about my teaching philosophy in the first class. If interaction and why questions and discussion are important for your course, explain, or ask them, why you think it's important. This is the course; why is it important? They have to believe it's important. It's important for them to answer; it's in their best interest to answer, not just the latest fad... there has to be a reason you're doing it, so make it explicit to the class... if nobody answers, talk about why nobody's answering. Set the framework; this course will include these ingredients and why. Talk about Bloom's and the levels of learning; students agree they should get at least to the Applied level – I've never had pushback on that. But if you do it after the midterm, that's too late. So talk about your teaching

philosophy and that might help set the stage for these questions. You could even say, “I’m going to sit here until questions are answered, so how will we get these answered?” If it’s important, that is – otherwise drop it.

Video 2 - 35:20

Participant Comment

I usually inherit the tone an instructor has set. My two tricks for getting students to start engaging, and it’s still a struggle in an active learning environment:

- 1) Ask students to put up their hand if they did something - no-commitment, no big deal.
- 2) Ask another no-big-deal question, but this time call on someone to talk about their experience.

Recognize that it can be a personal risk for them to share an answer; it can be scary to say the wrong thing. When I feel like that might be the situation, I try to expose myself to some risk in some way so that they know I’m in this with them.

Participant Comment

I would suggest you try active learning, so everyone can be part of it, and you can walk around, and they see you as someone who listens to what they’re doing.

Wrap-up and Thanks

-----End of Video 2-----