Breakout Session: Teaching with Technology

Setup:

- Power Point
- Log into Poll Everywhere
- Have green & red cards ready

Splash Screen: AHC

As people arrive, distribute green & red cards.

INTRO

I am AHC, I teach constitutional law, civil procedure, and professional responsibility at LLS. On the planning committee for this year's conference.

Apology: these breakout sessions are supposed to have lots of dialogue, but this particular session seems to call out for show and tell. I'm going to be doing a fair amount of show and tell, in hopes of demonstrating how various technology can be used.

But please interrupt with questions as they arise!

SLIDE: Today's Topics

In declining order:

- CLICK. Visual aids. This will be our biggest topic
- CLICK. Students' devices.
- CLICK. Polling. The red & green cards are also used for polling.

VISUAL AIDS - THEORY

(a) Theory. (b) Examples from my own classes.

SLIDE: What are Visual Aids

First question: what do I mean by visual aids? Anything you want students to look at other than your smiling face. Students will be looking at *something* during your class.

CLICK. Many different media are possible.

- CLICK. I'm going to be showing you slides, because that's a popular and versatile medium that I'm personally comfortable with. But that is not your only option.
- CLICK. Blackboard / Whiteboard
- CLICK. Document camera. Great for pro/con discussions
- CLICK. Handouts.
- CLICK. And I'm sure there are many others.

The concepts I'm going to present should be translatable to other media besides slide shows.

SLIDE: Goal for Visual Aids

Visuals should complement my words. Like yin and yang, they fit together to create something that is more than the sum of their parts. CLICK. But unduly duplicating the spoken word is not complementary.

Let's see why.

SLIDE: Cognitive Theory of Multimedia Learning (1 of 3)

Richard Mayer at UC Santa Barbara is an educational psychologist. His book *Multi-Media Learning* is a foundational work in the field. If you do a Google search, you'll find tons of information online summarizing and applying Mayer's theories.

CLICK. We begin with a definition of what learning is. It's an active process, where the student selects the inputs to think about, organizes that information into usable models, and then integrates those new ideas with prior knowledge so that it can be incorporated into long-term memory.

This part of the theory is not unique to Mayer, but it's an important building block. So let's spend a little time on what a learner needs to do.

It would be delightful if there was a direct path between your presentation and the student's long-term memory. But of course it's not so simple.

CLICK. First, the student must use her senses – especially sight and hearing – to collect as input all of the teacher's output. So obviously, we need some basics just to ensure our message registers with the student's senses. Speak loudly enough to be heard. Speak slowly enough to be heard. Any visuals need to be clear enough, bright enough, and legible enough.

CLICK. The next step is a lot of processing and thought that occurs in working memory – the active part of your brain that pays attention and thinks about things. You can also think of this as the cognitive capacity to think actively about something, which has to be in your working memory.

Working memory is far more limited than long-term memory. Most people can only hold a few chunks of info in their working memory at a time – five to seven. Compare it to your wardrobe. CLICK. You can only wear a few pieces of clothing at a time, maybe seven or so. CLICK. But you might have a huge closet of options at home.

What's happening in this active space where your brain works with the handful of things held temporarily in working memory?

CLICK. First, there is a process of selection from among all the inputs. You don't NOTICE everything that you SEE; you don't LISTEN to everything you HEAR. You have to focus the attention on certain wavelengths of light or sound, and then perceive what those mean.

CLICK. Then you make mental models of the content, based on what is perceived. This is a process of organizing the info. If it isn't organized into something meaningful in working memory, it is almost impossible to remember it. (It's extremely hard to memorize nonsense! Try memorizing a newspaper written in a foreign language.)

CLICK. Once the mental model is constructed, it needs to be integrated with existing knowledge for long-term storage. The student pulls up prior knowledge from long-term memory (wardrobe) and figures out how to fit the new information with it.

CLICK. After the new info is integrated with the prior knowledge in working memory, then it is possible for it to be stored as long-term memory.

TAKE-HOME MESSAGE: Working memory has a lot of tasks to do – it's not just soaking up info like a sponge. We want to structure our presentations so they set up students' working memory for success.

NOTICE: I was attempting to do that with this slide.

    a) I broke the information into small chunks. This helped you SELECT what to focus on.
    b) Putting things into chunks avoids overloading cognitive capacity. You had time and space to ORGANIZE the information into a mental model without being overloaded.
    c) When the next part of the model is presented, you have PRIOR KNOWLEDGE that you could use to help integrate the next step of the diagram.

SLIDE: Cognitive Theory (2 of 3)

The next observation is the key to Mayer's model.

- CLICK. There are two channels, visual and verbal.
- CLICK. Each has limited capacity. We talked about that previously with the clothing metaphor. Juggling metaphor: giving someone more balls than they can handle, and they all fall the floor.

SLIDE: Mayer's Model

Here is how Mayer presents his model in his book; this is a graphic I found online. NOTICE that I didn't show you this busy slide right away – it would probably overload your capacity, you wouldn't know which parts of the image to select for further processing, and so on. That's why I built up the model in the earlier slide.

So now let's move to the substance of the model.

Without getting into the neurological details, there seem to be TWO CHANNELS by which our brains perceive, model, and integrate new information: **VERBAL** and **VISUAL**. They work in tandem with each other.

- Remember when your parents taught you how to tie your shoelaces. I suspect they demonstrated visually how to do it, and also described it orally.
- Our minds have evolved so that we are good at learning this way: we seem to have the neurological equipment necessary to see someone do something while hearing them talk about it.

The fact that there are two channels is a potential blessing for teachers who are dealing with the limited capacity of working memory. If you keep throwing more words at students, they may hit their limit. But if you also present some well-chosen images to go along with your well-chosen words, you are in effect getting more use out of the existing cognitive capacity, and a richer model can be integrated.

SLIDE: Cognitive Theory (3 of 3)

- CLICK. Presenting to both channels can result in better learning.

Notice that it says IF DONE SKILLFULLY.

I believe that bad visual aids are WORSE than no visual aids at all. Let me give you an example of a bad visual aid.

SLIDE: Here is an example of a bad slide…

Read the text:

An example of a bad visual aid

- Lots of presenters seem to think that projected words should be identical to a set of speaking notes. Or even a verbatim script, like I'm doing now.
- You've probably seen slides like this. They are actually worse than no slide at all!
- You could probably read this entire slide in the time it takes me to read that previous bullet point. So now I bet you are getting restless and bored, waiting for my slow speech to catch up with your fast reading.
- The slide doesn't help you select the most pertinent information. Everything is at the same level of emphasis.
- Paradoxically, the fact that I am reading the words to you aloud makes your understanding worse, not better. The visual channel is not truly engaged, while the verbal channel is overloaded with two copies of everything.

SLIDE: Printed words in the two-channel model

What just happened? The problem relates to the fact that written words are pictures of sounds. CLICK. Mayer thinks that words are naturally handled by the verbal channel, and written words require us to jump across channels to do some translating. This adds to the cognitive load on the verbal channel, while also leaving cognitive capacity on the visual channel essentially untapped.

I don't want to overstate this. People who are blessed with literacy are pretty good at understanding written words, and it can happen automatically and easily. If I flashed the words "FREE BEER" on the screen, it would take you only milliseconds to understand. With that said, we can't expect big blocks of text – by themselves – to do the work of images. The more complex the idea, the less likely it is that mere written words will activate the visual channel.

SLIDE: Goals for visual aids

With any luck, you now understand my basic approach.

NOTICE: I showed your this slide before, and that was on purpose. Repetition is necessary for learning. So if you've got a good slide on an important topic, show it often. There are some slides I show my class several times over, either in the same day or across different days.

So now let's turn to examples.

EXAMPLES

SLIDE: Types of Examples

Here are some categories I will show you.

Illustrations

SLIDE: Illustrations

Our model tells us to make use of untapped cognitive capacity in the visual channel. One way to introduce images into your presentation is to simply add an image: *illustrate* what you're talking about.

Here are some examples from a Civil Procedure class early in the semester, where I am talking about service of process. The basic question: what is a reliable way to notify someone that they have been sued?

SLIDE: Message in a bottle SLIDE: Skywriting SLIDE: McDonald's Readerboard

These slides I just showed are obviously not mandatory. I could tell these jokes orally. But seeing the image with my words adds to power and memorability. Students now have some really solid reference points for inadequate notice.

Here are some more illustrations that provide info about a topic that will enhance class discussion..

SLIDE: The Shears from *J. McIntyre*

Source = screenshot from manufacturer's web site.

SLIDE: House from Shelley v. Kraemer

(a) Here's the actual house that the litigation was about. You learn so much about the neighborhood: it's not a wealthy gated community by any means.

(b) I like maps. They emphasize the reality of the case. Also, for me at least, knowing where things took place helps me remember them better.

I grabbed the image off of Google Maps. Notice that "St. Louis" is hard to read. CLICK. Annotate the image, make it easier for people to sense.

SLIDE: Real Estate Advertisement

Here is an advertisement for a new suburban development that was intended to be lily-white. Showing what some real documents look like can be a great illustration.

But once again, beyond the headluine the text is hard to read. CLICK to expand. Sometimes you might be able to blow up the image to a readable size, but here I simply retyped.

SLIDE: McLaurin

This is one of the pictures that is worth a thousand words. U of Oklahoma allowed Mr. McLaurin to enroll in its graduate school of education, but would not let him sit with the white students – he got a chair in the hallway.

Now link this to the legal message from the header. I'm no fan of "separate but equal" racial segregation, but "separate and unequal" is even worse. Here's a powerful visual example of separate but unequal.

NOTICE: I actually put a lot of thought into where to put George McLaurin's name. Keep your words in reasonable proximity to the images they describe.

SLIDE: Richard and Mildred Loving

For high-profile cases, you can often get pictures of the litigants. Showing them makes the case real for the students.

What if you had no other visual aids for *Loving v. Virginia*, but were planning to talk about it for 20 minutes? Leaving this static image up for that length of time can get distracting. Or what if you change topics to something where you have no images? It would be terrible to be talking about some other case while the Lovings are still on the screen.

SLIDE: Black screen

Lesson: Don't be afraid to turn the screen off, or insert a blank slide. Remember that an ill-fitting or distracting visual aid is WORSE than nothing at all.

SLIDE: Mullane on personal service

This slide combines some written words with simple illustrations of them. As you see here, the clip art illustrates what "personal service" is.

CLICK. Mullane also says that personal service is not always required. CLICK. My example is a parking ticket.

Be sure that your illustrations are substantively connected to the point you are trying to make. Otherwise, they just turn into decoration. CLICK. Here are illustrations that don't get at the heart of your message, so they are just distracting – and potentially confusing – decoration.

Don't decorate just for the sake of decoration! Rule 17 from *The Elements of Style* is "Omit needless words." Same should apply to your visual aids: omit needless material. Bad illustrations are worse than no illustrations at all.

Visualizing Text

SLIDE: Visualizing Text

It would not be realistic in a law class to have all the visual aids be purely pictorial with no words – we are in a word-based profession. But with that said, are there ways that we can make our words act more like pictures? This is something I've done a *lot* of experimenting with.

CLICK. Recommended reading: Butterick's *Typography for Lawyers*.

SLIDE: McCulloch procedural posture

Let me show you the procedural posture of *McCulloch v. Maryland*, an important Con Law case from 1819. CLICK to reveal.

This is all text, but the placement of the words on the page conveys meaning. Left/Right corresponds to State/McCulloch. And up/down is a time sequence. Like a picture, the *location* of the visual stimulus conveys part of the meaning.

SLIDE: Necessary & Proper Clause

Problem: we have important legal text to talk about in class. But it's just a big block of text. If nothing else, the reader has a bad SELECTION problem. Which words are the ones to focus on?

Some classrooms will have a way for you to mark up the text on the fly (underlining, circling, annotating). That's a big help, but can we improve on a bare block of text?

SLIDE: N&P Clause (Reformatted)

The same words in the same order, but I've added (a) line breaks; (b) bullet points for items that are parallel; (c) emphasized some text with bold face and color; (d) added cross-reference in brackets.

Here is a tool you can work with. You can effectively point to the lines you want, helping with SELECTION. But you are also helping with modeling, by highlighting the parallel constructions. With this on the screen, you can have a much better conversation with your students about the clause.

SLIDE: N&P side by side

The reformatted one looks more like a picture. It is visually conveying some relationships between the ideas that are found in the words.

A friend of mine is a poet, who said that one definition of poetry is writing that is organized around a principle other than the width of the page. Your visual aids can do that. Turn your legal texts into visual poetry!

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I started doing this kind of reformatting in my Civ Pro class with court rules and statutes, but last year I realized it can also be used for passages from court opinions.

SLIDE: McCulloch (original)

Highlighting the key words is a good start: it's important to show that this is a statement about the relationship between means and ends. But we can make it more visual.

SLIDE: McCulloch (reformatted)

Now that the pieces are separated, you can have a much better discussion.

SLIDE: McCulloch (tomayto, tomahto)

This slide attempts to show something interesting about how this famous quote has been interpreted. For most of the quote's history, it has been viewed as a statement about judges being deferential to Congress. CLICK. But in the recent Obamacare case, Chief Justice Roberts went out of his way to emphasize language that in his view empowered the court to rein in Congress.

Visualizing Concepts

I just talked about turning words into pictures. Even better is if you can turn ideas into pictures.

SLIDE: Map from Rodriguez

A map is an obvious way to represent a concept. For Con Law, this map shows the location of different school districts. I annotated it with data from the opinion.

SLIDE: Time Line

Here is a simple time line of a class action suit from Civ Pro. Power Point has a built-in function that creates time line graphics for you.

Here, the dotted lines represent the parts of the process that are different between a class action and a regular law suit. CLICK to reveal additional info.

SLIDE: Org Chart

Another built-in shape in Power Point is the org chart. Here is a slide from Professional Responsibility, showing how Bar Discipline works in California. CLICK to show progress from Hearing Department of Bar Court, appeal to the Review Department, then appeal to the state supreme court. CLICK to reveal possibility of SCOTUS review of federal issues. CLICK to reveal the courts that aren't involved.

SLIDE: 28 USC 1367

Here's a slide created by a Civ Pro student, to help him visualize a subject matter jurisdiction statute that can be hard to grasp.

CLICK to reveal.

SLIDE: 2x2 chart

I love tables, especially 2x2 charts. Here's a simple one from Con Law showing the interaction of two doctrines within Equal Protection. As discussed above, we are using words, but their spatial positioning conveys meaning, just as in a picture.

SLIDE: New Deal Consensus

A great thing to do with tables is to put cases in the appropriate boxes. Here is one from Con Law. CLICK to reveal.

SLIDE: New Deal Consensus #2

Then, on subsequent class days, if I want to remind of this general legal principle, I have this version.

SLIDE: Shield and Sword

One technique to help you with visualizations is to develop some recurring visual iconography.

Here's an example from Civ Pro, students often wrestle with the difference between claims and defenses. I had verbally been using the familiar analogy of sword and shield. But then I put it into a slide, and the students loved it. CLICK to reveal what the symbols mean.

> SLIDE: Claim Preclusion

Once you establish the visual vocabulary, use it throughout the course.

Here's an example where I define claim preclusion. Imagine Case #1, where plaintiff is wielding a sword (claim) at the defendant. CLICK. Then after that lawsuit is over, plaintiff sues defendant again! CLICK. This is where the shield (defense) of claim preclusion arises.

Visualizing Cases

> SLIDE: Visualizing Cases

For a lot of cases, especially with multiple parties or claims, it will really help class conversation if you do something to make the issues visual. Keep this visible while discussing the case. It really helps keep people on the same page, and may clarify important facts for students who didn't glen them from the reading.

> SLIDE: GSI Commerce

The case is about conflicts of interest. We start with our standard visual vocabulary for plaintiff and defendant.

- CLICK. Here are the parties' lawyers. This is standard visual vocabulary in my PR class.
- CLICK. Motion to disqualify. But why?
- CLICK. Add BC Acquisition Group
- CLICK. Add J&J
- CLICK. Add a/c relationship.

Would you have to build it up symbol by symbol, or can you present it all at once? Either is possible and much better than not having the diagram. But I like to do the step-by-step reveal. If you show it in one image, at the very least, you need to talk through it: combine the visual with your spoken words.

> SLIDE: Calder v. Jones

Here's a personal jurisdiction case, which lends itself to a map. The defendants wrote and published an allegedly defamatory article in Florida, circulated it nationwide, and plaintiff wants to sue in California.

SLIDE: In re Murray

You can use the words-as-pictures idea to help students visualize cases. Here is a bar discipline matter with three counts. CLICK to reveal. Notice how the spatial organization of the words on the screen helps convey meaning (i.e., that counts 2 and 3 rely on the same statute).

Orientation Tools / Roadmaps

SLIDE: Orientation Tools (Roadmaps)

One of the most important jobs for the teacher is to keep the students well oriented, so they know where new material fits into a larger schema. This is crucial for the process of integrating new information with prior knowledge.

Visual aids can help connect the new material to the prior knowledge.

SLIDE: Civ Pro

I developed this slide that shows every single topic that we cover in Civil Procedure. Note how the groupings are in threes and fours. Three phases, and within each we have a manageable number of sub-headings (and sub-sub-headings). Basically, this gives students the structure of their entire course outline.

(In your first few years of teaching a course, you won't know the entire structure of the course, so of course you won't be able to give students an overarching outline yet. Think of this as a goal you build toward.)

Every single day in Civ Pro, this is my opening slide. Repetition!

CLICK. Reveal more detail for each unit.

SLIDE: Professional Responsibility

The author of this casebook actually had a set of mnemonic devices in the forward to the casebook: the Four C's, the Three C's, and FAIR.

As we finished each unit, I changed the box to a check mark.

SLIDE: Con Law

For my Con Law class, I developed an orientation tool that is almost entirely visual. Every concept in the book fits somewhere on this visual schema. I need to explain the diagram to students several times over the course of the semester; but once they get it, they really like it. (Of course, not every class lends itself to a purely visual "big picture" like this one.)

Discussion Organizers

SLIDE: Discussion Organizers

A visual aid can help you frame a class discussion.

SLIDE: Service and Notice

Have class come up with examples for each quadrant of the 2x2 chart.   CLICK. If desired, add identifying labels for each box.

SLIDE: Cleburne

Two rows per column.

SLIDE: Collective Note-taking

As an example of from Griswold. CLICK to expand.

QUESTIONS ABOUT VISUAL AIDS???

STUDENT DEVICES

SLIDE: Today's Topics

What about students' use of devices in the classroom?

SLIDE: Laptaps for Notetaking

There are vigorous arguments about this, and no national consensus (and there won't even be a consensus on your faculty).

Fact of the matter is: students are accustomed to laptop note-taking; and they are also adults. But the practice causes lots of potential problems for classroom involvement – and also for student learning.

SLIDE: Recommended Reading: Student Laptop Use

The most valuable thing I can do for you is give you these citations to studies indicating worse learning when students take notes via laptop as opposed to taking notes by hand.

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My main advice on this topic: talk to your colleagues and see what sells with your students and your faculty.

POLLING

SLIDE: Today's Topics

Topic: polling.

The problem with socratic method: you call on one person and have a fabulous exchange. Maybe everyone else is keyed in, imagining their own answers to your questions. But maybe they are tuning out. Is there a way to have everyone participate – at least to the extent that they have to think about a question and formulate an answer?

We could do a show of hands. But you always get a large number of abstainers. A way to eliminate abstention is to use the card method.

GREEN/RED POLL: Should we have term limits for US Supreme Court justices? Hold up the green card if you favor term limits, the red card if you oppose them.

It's fast, participatory. You'll always have to carry some extra cards, and it takes a bit of time for students to pull out their cards from backpacks, etc.

A possible downside – it is binary. Here's where polling software can come in. My school has an account with Poll Everywhere, so I'll show you a few options of things you can do. I'm just scratching the surface.

POLL: Superpowers (Multiple Choice) POLL: Superpowers (Word Cloud) POLL: Multiple choice Civ Pro question (facts on board). POLL: Multiple choice (facts in book or handout)

Another feature I really like is the "clickable image"

POLL: Which state's law?

This uses a built-in map. You can also design your own image where people can click on things.

POLL: What kind of preemption?

This is, in effect, a form of visual multiple-choice question.

<p align="center">***</p>

SLIDE: Farewell