Teaching with Technology
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In-Class Polling: Less Teaching, More Learning?

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Did you ever have the sinking feeling that your class features too much of you and not enough of your students? That you may be engaged, but they're not? That you've learned the material, but they haven't? (That you're having fun, but they're not?) Well, I did and so I went in search of ways to improve the classroom experience for my students and ultimately myself. What I found was an online audience-response system that allows students to answer questions during class via text messaging or over the web. It's free to students, quick to display results, engaging and fun. The technology also appears to enhance learning and retention.

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Background

For twenty years, I was a lawyer in the Washington, DC area, working at various times for two law firms and four companies. Although I was grateful for every job along the way and had been successful by some measures, I was not especially happy or fulfilled. One outlet for me was teaching as an adjunct at DC area colleges, which led to the occasional daydream about a second career as a college professor. And so perhaps it did not come as a total surprise to my wife when one evening I came home and asked: "Honey, how would you like to sell everything and move to South Bend, Indiana?" The University of Notre Dame, our *alma mater*, was looking for someone to teach business law to undergraduate students in its college of business. I applied, interviewed and was offered the position. All of sudden, it was someday.

With my wife's assistance, I spent much of the summer preparing for class that fall. In addition to staying home for a few years to raise our son, my wife had herself changed careers, from human resources professional to teacher. After earning a masters degree in education, she became the gifted and talented specialist at a local elementary school. As the summer and my efforts progressed, I would boast about the lectures I was planning and she would gently remind me as only a wife can: "Just remember, it's not about you, it's about the students. They need to be involved; they need to participate."

Mindful of my wife's counsel and recalling the use of the Socratic method in law school, I decided that for each class students would have to brief two cases

in writing as part of their homework. Through in-class questioning, I would draw students out, getting them to teach themselves and ultimately the rest of the class.

Over the course of the fall semester at least two challenges emerged. First, my questioning style proved to be more like that of Ben Stein's Economics teacher in the movie *Ferris Bueller's Day Off* – "Anyone? Anyone?" – than John Houseman's towering Professor Kingsfield in *The Paper Chase* – "Speak louder, Mr. Hart! Fill the room with your intelligence!" For me, the Socratic method is a learned art to be developed over time. Second, even when an individual student's case recitation and my subsequent questioning went well, I was primarily engaging only one student at a time. And so I went in search of a way to involve more students more often. What I found was in-class polling.

Approach

I first learned of polling at the University of Notre Dame when I attended a workshop on using a student-response system, presented by the Kaneb Center for Teaching and Learning. The system enables an instructor to pose a question to the class and have students respond by using a "clicker" – a hand-held device that looks like a TV remote control. The system tabulates students' responses and displays the results. Potential benefits when integrated into traditional lectures include:

- higher levels of engagement (i.e., more students actively engaged more often);
- instant feedback, both to the professor and also to the student; and
- the option of anonymity in responding to sensitive issues. (Martin 2007)

Although there are ways to pose a question and solicit answers from the entire class without introducing technology into the classroom – everything from a showing of hands to paper ballots – none of the traditional methods would seem to offer all three benefits so neatly.

I was intrigued, but not convinced, however, as I also learned that the demonstrated system required students to purchase a clicker for roughly $20 and pay a subscription fee of roughly $15 per semester. I was not eager to add to the cost of my class.

Enter Poll Everywhere, a simple text message voting application for live audiences. The presenter creates a poll on the company's website and the audience

casts votes by sending text messages through a cell phone or clicking a Web page on a smartphone or laptop, indicating the option they wish to select. When the student's response reaches the company's Web servers the vote is counted and tallies are updated in real time. The poll and results can be published to PowerPoint or viewed as a Web page.

Unlike with clickers, there is no additional cost for most students at Notre Dame. Either they have a cell phone with a generous texting plan or they own a laptop or smartphone. They also know how to send text messages, which mitigates the risks associated with introducing a new technology. I was sold.
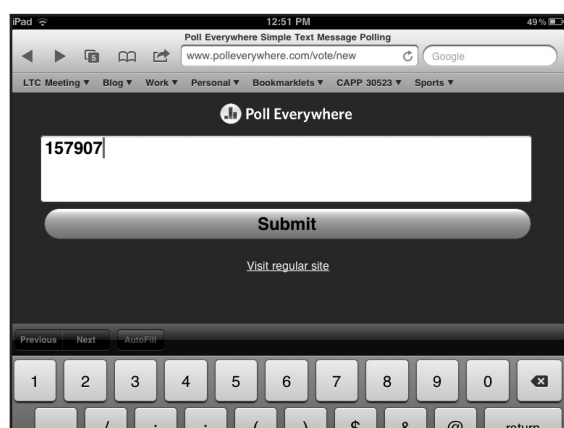

Voting from an iPad

In the fall of my second year, I introduced Poll Everywhere in our sophomore-level business law course, with sections of roughly 35 students each. I envisioned a variety of different uses. Perhaps the most basic was to begin class with a question that reinforced the reading with a key takeaway. (Koegel 2007, Medina 2008) For example, in a class on intellectual property, I began with this question embedded in a PowerPoint slide and asked students to text their answers:

> *Original, Inc., sells its product under the name "Phido." Quik Corporation begins to market a similar product under the name "Fido." This is most likely*
>
> > *a. a theft of trade secrets.*
> >
> > *b. copyright infringement.*
> >
> > *c. patent infringement.*
> >
> > *d. trademark infringement.*

While my students are responding to a question, I often emphasize why I am asking it. In this case, they need to be able to tell the difference between the basic types of intellectual property protection. Once the results are tabulated, I reveal how many

students 'voted' for each answer. I then move to the next slide, which shows the correct answer (d. trademark infringement). Most students get this one right, so I don't usually provide too much additional explanation at that time, saving it for the more detailed lecture to follow.
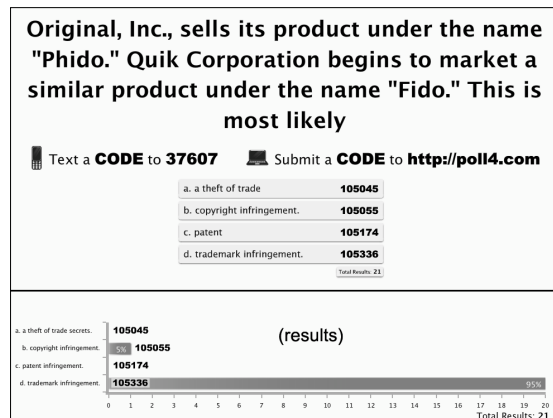

In other classes, I began with a question that I assumed most students would get wrong. These questions break a pattern and consequently they stick with the students. (Heath & Heath 2007) For example, in a class on contracts, I began with this question:

> *Mary offers to pay Mike $50 to run naked from the Main Building at the University of Notre Dame to LeMans Hall at St. Mary's College. Mike can accept the offer only by performance (and not by a promise to perform). If Mike does run naked from the Main Building to LeMans Hall, he and Mary will most likely have formed*
>
> > *a. a bilateral contract.*
> >
> > *b. a unilateral contract.*
> >
> > *c. a quasi contract.*
> >
> > *d. no contract.*

Most students think the correct answer is "b" because (like a unilateral contract) the offer seeks performance as the form of acceptance. But I explain
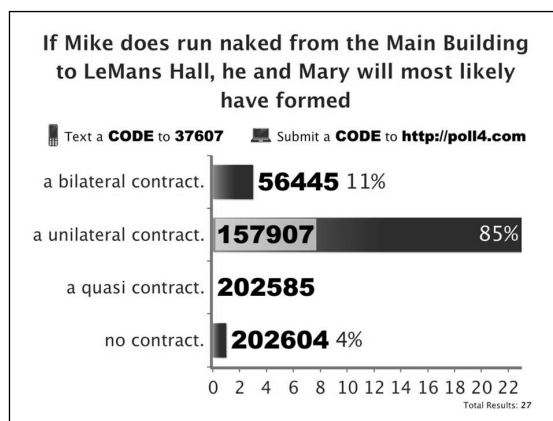
Students realize that, as in life, they are going to have to stop and think critically about all of the facts and all of the potentially applicable rules of law.

that the correct answer is "d. no contract" because the subject matter of the offer – running naked – is illegal and thus cannot serve as the basis for a contract. This question does at least three things: (1) it gets students' attention because most get it wrong; (2) it makes students realize that, as in life, they are going to have to stop and think critically about all of the facts and all of the potentially applicable rules of law; and (3) it seems to have earned me a reputation as a "tricky @#$%&*+," which I guess comes with the territory. This question also has the virtue of being concrete; college students 'get' streaking. (Heath & Heath 2007)   I typically planted two more questions throughout the fifty minute class, with the goals of re-engaging the students, emphasizing a key point, seeing if they understand a concept I've just explained, and working on critical thinking.

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Because students' responses are anonymous, they receive no class credit for answering a question correctly. They do, however, get to answer questions free of stigma and see how their peers answered. Because it is anonymous, this strategy is especially useful for sensitive questions. In addition to selecting answers to a multiple-choice question, students may submit prose responses. For example, after telling students that I assume none of them would shoplift a music CD from our bookstore, I ask them:

> *Have you ever downloaded copyright-protected music from the Internet without paying for it?*
>
> - *Yes*
> - *No*

The vast majority of students, sometimes over ninety percent (90%) of the class, answer yes! I then ask: "Why? Why is it not ok to shoplift a CD, but ok to download music without paying for it?" Using the system's text messaging capability, students have responded in a variety of ways:

- I'm stickin' it to the man
- It's only one song
- Everyone does it; we grew up in culture where it is considered ok
- It's already been paid for
- It's not tangible (there is no incremental cost or loss)
- I wouldn't buy it; I only copy it because it's free and so there is no lost sale to the artist, the record company
- I won't get caught

Results for Why is it not ok to take a CD from the bookstore without paying for it but ok to download music from the Internet without paying for it?

Response ⇕
it's available and easy to download
because I'm helping them out by playing their songs real loud
im a man. im 40
I think people consider anything they find on the internet- pictures, songs, information- fair game.
Because one is a blatant act of stealing whereas technology has made it so that downloading pirated music is no longer perceived as a crime
became God and the bookstore are clearly connected where the internet is just magic
because you aren't really taking it from anyone in particular. Its just there.

At some point the responses start to degenerate – "O'Doyle Rules!" from the movie *Billy Madison* is a favorite – and I then I know it's time to cut off the text messaging. Sometimes the text messaging fosters additional classroom discussion by those who are willing, even eager, to speak candidly; sometimes it does not. Different classes seem to have different personalities. The exercise typically ends with me explaining how at least some of the responses involve rationalizing and that there is no ethically meaningful difference between shoplifting and illegally downloading music. End of sermon.

Finally, I used online polling simply to break up the class. (Medina 2007) I recognize that not every student shares my enthusiasm for business law. There is a lot to absorb, even when the class is merely reinforcing assigned readings. During a class that covered the statute of frauds, I showed a clip from the movie *Jerry Maguire* and went on to draw from other Tom Cruise movies and tabloid stories. Late in the class, when eyelids were growing heavy and attention short, I put up this question: "What is your favorite Tom Cruise movie?" I recognize that a visitor to the classroom at that moment might have wondered if this was the highest and best use of time, but my sense is that we need the educational equivalent of an intermission in some class sessions.

Results

The results have been positive. Working with the Office of Information Technologies at the close of both Fall and Spring semesters, we surveyed students and learned the following: the great majority of students liked using online polling, thought it enhanced their learning, and found that it made class more engaging. Ninety five percent (95%) of the 173 responding students either strongly (138) or somewhat (27) agreed with the following statement: "I like using texting in this class to answer questions." Ninety three percent (93%) either strongly (88) or somewhat (73) agreed with the following

statement: "Using texting in this class helps me learn." Ninety eight percent (98%) either strongly (147) or somewhat (23) agreed with the following statement: "Using texting makes the class more engaging." Comments include:

- It makes everyone participate so that class is more engaging and everyone is responsive.
- It is easy and simple, and it really gauges how well I've mastered the material.
- Gives an idea of what test questions will be like. Highlights important key concepts.
- Able to see where I stand in the class.
- I did not have to buy a . . . clicker from the Bookstore - or remember to bring it. My phone is free and I always remember it.
- You don't have to be embarrassed to answer a question wrong.
- Mixes it up. Keeps the class moving.
- It's fun.
- AWESOME.

Of course, while attitudinal survey data is suggestive of efficacy, I recognize that it is not necessarily dispositive. I will leave a more detailed study of in-class polling and improved exam performance to the experts. And as long as we're being honest, I should note that not all the feedback from students has been positive. Some of the complaints from our end-of-semester surveys were technical in nature – some students experienced weak cell phone service and delays in transmission/tabulation. Others cited the cost to those who don't have generous texting plans. (Again, it's not clear to me that this is actually a problem.) Still others found some of the questions too easy and/or not representative of the questions on the exams, and so questioning remains a work in progress. In particular, I am in search of longer questions that require issue spotting and application of the law to a set of facts. Finally, my sense is that at some point enthusiasm for using the system wanes among students, leading response rates to tail off as the semester winds down.

Recommendations

In the ensuing two semesters I occasionally added the "Think-Pair-Share" strategy to my in-class polling in order to improve the level of engagement, learning and retention. After asking a question, I would tell students to:

- think about the problem and try to answer it in their head;
- pair up with a partner and discuss their proposed answer, and
- respond individually using Poll Everywhere. (Ludlow 2001)

The opportunity to think, pair and share typically yielded discussion between students, and, happily for me, that discussion was often about the problem I posed. I now have a new variation planned:

- present a question that should yield a significant percentage of both right and wrong answers:
- let students respond via online poll;
- ask students to discuss how they answered with someone who answered differently;
- let students respond again via Poll Everywhere, and see if the results improve, i.e., see if students are able to teach each other the right answer. (Mazur Group 2010)

With or without these variations, posing a limited number of questions to a class using an online polling system is engaging, effective and fun. It's a good way to supplement what is primarily an introductory, lecture-based class. And it's so easy, a lawyer can do it!

Late in the class, when eyelids were growing heavy and attention short, I put up this question: "What is your favorite Tom Cruise movie?"

References and Resources

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John Medina, *Brain Rules: 12 Principles for Surviving and Thriving at Work, Home and School* 88-93, 95-147 (2008)

Web Resources

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"7 Things You Should Know About Clickers", Educause Learning Initiative, (2005), http://net.educause.edu/ir/library/pdf/ELI7002.pdf

"Classroom Response Systems", Derek Bruff, http://derekbruff.com/site/classroom-response-systems/

"Using Think-Pair-Share in the College Classroom", Susan Ledlow (2001) http://clte.asu.edu/active/usingtps.pdf

The Learning Technology Consortium

The LTC began in 1998 as a partnership of institutions with similar instructional goals, strong technology and faculty support programs, and an interest in collaboration around teaching and learning with technology. The members are:

- University of Delaware
- University of Florida
- University of Georgia
- University of Maryland
- University of North Carolina at Chapel Hill
- University of Notre Dame
- University of Pittsburgh
- Virginia Tech
- Wake Forest University

Representatives meet semiannually at one of the institutions, where members tour specialized facilities and discuss the selection and use of learning technologies, benchmarking, and collaboration.

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