

Making Lectures More Engaging

In an article for *Faculty Focus*, Davie Davis reviews five points in which recent research into the workings of the brain can help improve pedagogy in the higher education classroom.

1. **“The upper limit of the human brain’s capacity to pay focused attention to a lecture is about 20 minutes.”** To address this wandering attention, vary your methods of content delivery, alternating between lectures, discussion, and activities, allowing students time to assimilate what they’ve learned.
2. **“The most effective learning is based on prior knowledge.”** Build on students’ past experience and coursework to help connect new material to old. Help them relate the material by relating it to something they already know.
3. **“Thought and feeling are inseparable brain processes.** This means that information associated with values and feelings will be more readily learned. So even in science disciplines students should be encouraged to develop passionate stances on issues such as cold fusion or stem cell research so that they will retain information more efficiently.”
4. **“Perceived dangers cause the brain to downshift to its most rudimentary processing mode and bring learning to a halt.”** Negative emotions such as stress or fear impede the brain’s ability to retain or retrieve information. In the classroom, this effect can be seen in overwhelming test anxiety, panic attacks during presentations, or classroom incivility. Instructors can “mitigate some of these effects by using multiple assessments rather than two or three major tests and/or by creating less-threatening learning scenarios, such as small groups or talking partners.”
5. **“The search for meaning is innate.** The human brain constantly seeks meaning and pattern in a rich milieu of emotions, facts, associations, memories, and other inputs.... we can capitalize on the brain’s hunger for meaning by providing information in relevant contexts that yield both intuitive and logical meaning” (Davis, 2008).

Taking these points into account, instructors can redesign their lectures to be more engaging. Make learning more student-centered—involve students in discussion, provide them with relatable and relevant material, and present content in multiple formats. Most importantly, “make students active participants in learning. Students learn by doing, making, writing, designing, creating, solving. Passivity dampens students’ motivation and curiosity. Pose questions. Don’t tell students something when you can ask them. Encourage students to suggest approaches to a problem or to guess the results of an experiment. Use small group work” (Davis, 1999).

This handout will review several techniques to make lectures more active and engaging.

1. Think-Pair-Share
2. Storytelling: Making Course Material Relevant
3. Interactive Lecture Demonstrations and Role-Playing
4. Creative Methods for Encouraging Discussion
5. Twitter

Think-Pair-Share

Think-pair-share was first proposed by Lyman in 1981. It is a quick and easy method of engaging students in a collaborative activity and well suited to instructors without a lot of experience running class discussions or group work (College Level One).

In think-pair-share, the instructor proposes a difficult or open-ended question to the class. The students are asked to think about the question for a minute and then form into pairs to discuss their views. The instructor can ask the pairs to try to reach a consensus or to discuss their thoughts. At the end of a set period of time, the instructor asks the pairs to share what they've discussed with the class.

- Requires only five to ten minutes of class time
- Can be used in classes of any size and seating arrangement
- Low risk for both students and instructor
- Accustoms students to collaborative activities

One possible modification for Think-Pair-Share is Think-Pair-Square-Share. This technique adds an extra step by requiring each pair of students to turn to another pair and discuss what they've shared within the first pair (Schreyer Institute).

After reconvening, instructors can keep the discussion unstructured or they can have students take a vote. Instructors can also have students take a minute to fill out a note card with their thoughts and collect them (College Level One). Instructors can use "student responses as a basis for discussion, to motivate a lecture segment, and to obtain feedback about what students know or are thinking" (Schreyer).

Benefits of Think-Pair-Share:

- Fosters classroom community
- Gives students a chance to work through tough material before the class moves on to the next topic
- Increases student confidence in their answers
- Provides students with an opportunity to work on critical thinking and problem solving skills

For more information on Think-Pair-Share, see:

Doing Collaborative Learning, College Level One, National Institute for Science Education
<http://www.wcer.wisc.edu/archive/cl1/cl/doingcl/thinkps.htm>

Group Work in the Classroom: Types of Small Groups, Centre for Teaching Excellence, University of Waterloo
<https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/developing-assignments/group-work/group-work-classroom-types-small-groups>

Think-Pair-Share, Center for Teaching and Learning, University of Texas at Austin
<http://ctl.utexas.edu/becoming/node/23>

Think-Pair-Share, Schreyer Institute, Penn State University
<http://www.schreyerinstitute.psu.edu/pdf/alex/thinkpairshare.pdf>

Think-Pair-Share, Science Education Resource Center, Carleton College
<http://serc.carleton.edu/introgeo/interactive/tpshare.html>

Making Course Material Relevant (Story Telling)

Making course material relevant to students is important for more than just keeping them entertained. “Relevant, meaningful activities that both engage students emotionally and connect with what they already know are what help build neural connections and long-term memory storage... Effective teaching helps students recognize patterns and put new information in context with the old—a crucial part of passing new working memories into the brain's long-term storage areas” (Bernard, 2010).

To make course material relevant:

- **Introduce the subject matter** – Many times, students will be enrolled in the course without having a clear idea of what they will be learning and why it’s important. It’s good to clarify things with an overview of the subject that answer the questions “What is the subject and how is it connected to other kinds of knowledge?” (Fink)
- **Help students understand the significance of the course.** Open the class with a “provocative question or anecdote and relate it to the content” (Berkeley). “Bring in a newspaper or magazine clipping that relates to your course. Whenever you can connect your field to current events, or pop culture, or student interests, you demonstrate relevance, which increases student motivation” (CMU).
- **“Make it real.** In order to foster intrinsic motivation, try to create learning activities that are based on topics that are relevant to your students' lives” (SERC). “Ask students to provide relevant examples from their job or co-op experience or invite practitioners from a relevant field to speak to the class” (CTE).
- **“Introduce the unfamiliar through the familiar**—build on information students have learned previously, either in your course or other courses. Discover students’ strengths, interests, and goals, and relate the topic or learning activity to them” (CTE)
- **“Make it student directed.** Give students a choice of assignments on a particular topic, or ask them to design one of their own. When students are involved in designing the lesson...they better understand the goal of the lesson and become more emotionally invested in and attached to the learning outcomes” (Barnard, 2010).

For more information on making course material relevant, see:

The First Day of Class: What Can/Should We Do? L.D. Fink. Teaching Tips, University of Hawaii

<http://www2.honolulu.hawaii.edu/facdev/guidebk/teachtip/firstday.htm>

Make the Most of the First Day of Class. Carnegie Mellon University.

<http://www.cmu.edu/teaching/design/teach/firstday.html>

Motivating Students: Creating an Inspiring Environment, Centre for Teaching Excellence, University of Waterloo

http://cte.uwaterloo.ca/teaching_resources/tips/motivating_students.html

Motivating Students, Science Education Resource Center, Carleton College

<http://serc.carleton.edu/NAGTWorkshops/affective/motivation.html>

Science Shows Making Lessons Relevant Really Matters, Sara Barnard, Edutopia

<http://www.edutopia.org/neuroscience-brain-based-learning-relevance-improves-engagement>

Ten Ways to Make Your Teaching More Effective. University of California at Berkeley.

<http://teaching.berkeley.edu/tenways.html>

Interactive Lecture Demonstrations

Demonstrations during lectures can be used to break up long chunks of dry information, as well as engage students with the material. “The visual impact of a good in-class demonstration that illustrates a scientific concept can help to make a concept clearer and more 'real' in the mind of a student. Years after taking a class, the 'lecture demos' are often what a student remembers with the greatest clarity” (UBC).

For interactive lecture demonstrations to be most successful, students must be involved throughout the entire process. Students should discuss the purpose of the demonstration, predict what will happen, discuss the theories behind the concepts being demonstrated, and compare their observations to predictions (Morgan, 2007).

Demonstrations can be placed at three stages in a given class – as an introduction to the course topic, at the end to bring the topic to a close, or as an aid used throughout to clarify points or stimulate discussion (Morgan, 2007).

When developing an interactive lecture demonstration:

- Identify a core concept for students to learn
- Choose a demonstration that will illustrate this concept, preferably with an outcome different from student expectations

- Prepare accompanying materials to help students follow along and achieve the desired learning outcomes (SERC)

Learning outcomes are achieved by leading students through three steps:

1. *Prediction.* Have students predict the outcome of the demonstration. This can be done individually or in groups, even potentially as a Think-Pair-Share activity.
2. *Experience.* Run the demonstration for the class, or have students conduct small experiments in groups. Give students time to determine whether their predictions were confirmed.
3. *Reflection.* Have students reflect on the outcome of the demonstration, why they made their initial prediction and the ways in which the demonstration confirmed or contradicted this theory. This can be done in a class discussion, small group work, or in individually prepared written reports (SERC).

Benefits of Interactive Lecture Demonstrations

- Provides concrete examples for abstract principles
- Helps students connect their previous knowledge to what they've learned
- Promotes critical thinking

For more information on Interactive Lecture Demonstrations, see:

“Active Demonstrations for Enhancing Learning,” Frontiers In Education Conference - Global Engineering: Knowledge Without Borders, Opportunities Without Passports, 2007
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4418057>

Interactive Lecture Demonstrations, Science Education Resource Center, Carleton College
<http://serc.carleton.edu/introgeo/demonstrations/index.html>

Using Lecture Demonstrations to Promote Conceptual Learning, Science Centre for Learning and Teaching, University of British Columbia
<http://www.skylight.science.ubc.ca/lecturedemos>

Role-Play

Along with small group discussions and lecture demonstrations, role-playing is a form of active learning that can both engage your students and clarify complex concepts. Role-play is effective because it “provides opportunities for learning in both the affective domain, where emotions and values are involved, as well as in the cognitive domain where experiences are analyzed” (Nickerson).

Role-playing exercises can take multiple forms. In one form, each student takes on the role of a person affected by an issue, allowing the class to study the impact of that issue. In another form,

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<http://www.ryerson.ca/lt/>

students can take on the role of an abstract concept or phenomena (SERC), playing the parts of “cells, molecules, economic forces, and abstract philosophies, in addition to historical figures, characters in a novel, etc.” (Berkeley).

Role-play can be used to:

- “*To solve a problem* e.g., in a public policy class students play the parts of several stakeholders with distinct goals in a community board meeting.”
- “*To apply skills* e.g., interviewing clients in social work, medicine, sociology, human resources; improvising an interaction in a retail store to practice language learning; taking a patient’s medical history.”
- “*To explore or change values*; to develop empathy; to become aware of one’s assumptions e.g., students enacting a scenario in which new immigrants have to engage with a city bureaucracy; students taking the part of a person or character for whom they have no sympathy; or a situation between people of different cultures or classes” (Nickerson).

Benefits of role-playing in the classroom:

- “The creative aspect of the exercise will make it seem more like play than like work.”
- “The pressure to solve a problem or to resolve a conflict for their character can motivate a student... and is far more typical of the pressure that will be on them in real life.”
- “Particularly useful in courses for non-majors to emphasize the intersection between” the topic and real life.
- Show “the world as a complex place with complicated problems that can only rarely be solved by a simple answer that the student has previously memorized”
- Allow students to combine skills they learned separately, such as quantitative and communications skills (SERC).

For more information on role-playing, see:

“Role-Playing Exercises” by Rebecca Teed, Science Education Resource Center, Carleton College

<http://serc.carleton.edu/introgeo/roleplaying/index.html>

“Role-Play: An Often Misused Active Learning Strategy” by Stephanie Nickerson, *Toward the Best in the Academy*, Volume 19, 2007

<http://teaching.uchicago.edu/ete/07-08/Nickerson.html>

Active Learning Techniques, University of California at Berkeley

<http://gsi.berkeley.edu/teachingguide/sections/active.html#role>

Creative Methods for Encouraging Discussion

There are many different methods for encouraging discussion in the classroom. This can range from activities that encourage student participation (case method, debate) to the seating arrangement of the classroom.

When leading group discussions, it's important to ask the right questions. To help lead students to a deeper understanding of the material, consider these questioning strategies:

- **Shift points of view:** “Now that we’ve seen it from [W’s] standpoint, what’s happening here from [Y’s] standpoint?” “What evidence would support Y’s position?”
- **Shift levels of abstraction:** “When [Y] says “____,” what are her assumptions?” Or seek more concrete explanations: “Why does she hold this point of view?”
- **Ask for benefits/disadvantages of each position**
- **Shift time frame:** “How could this situation have been different?” “What could have been done earlier to head off this conflict and turn it into a productive conversation?”
- **Shift to another context:** “We see how a person who thinks X would see the situation. How would a person who thinks Y see it?” “How might [insert person, organization] address this problem?”
- **Follow-up questions:** “What do you mean by ____?” Or, “Could you clarify what you said about ____?” “How would you square that observation with what [name of person] pointed out?”
- **Point out and acknowledge differences in discussion**—“that’s an interesting difference from what [Y] just said. Let’s look at where the differences lie.” (Indiana University)

Other ways of encouraging student participation:

- **Use a poll.** Prepare students for the day’s topic by polling them before the discussion. This can be done before class using Blackboard, or at the beginning of class using clickers or Twitter. This will help give you a better idea where the class stands, as well as allowing students to see they are not alone in their opinions, thus making them more comfortable with sharing their views (CTE).
- **Assign roles to students.** As two or three students to serve as discussion leaders. Meet with them to review their questions and the format for the discussion. Allow them to take control of your class and facilitate the discussion. If you plan on leading the discussion, “assign one or two students per session to be observers responsible for commenting on the discussion. Other student roles include periodic summarizer (to summarize the main substantive points two or three times during the session), recorder (to serve as the group's memory), timekeeper (to keep the class on schedule), and designated first speaker” (Davis, 1993).
- **Use a token system.** Distribute three tokens (poker chips, pennies, etc.) to each student at the beginning of class. “Each time a student speaks, a chip is turned over to the instructor. Students must spend all their chips by the end of the period... This strategy limits students who dominate the discussion and encourages quiet students to speak up” (Davis, 1993)

For more information on creative methods for encouraging discussion, see:

“Encouraging Student Participation in Discussion” from *Tools for Teaching* by Barbara Gross Davis. Jossey-Bass, San Francisco.

<http://teaching.berkeley.edu/bgd/participation.html>

Promoting Effective Classroom Participation, Centre for Teaching Excellence, University of Waterloo.

http://cte.uwaterloo.ca/teaching_resources/tips/promoting_effective_classroom_participation.html

Teaching With Case Method, Indiana University Teaching Handbook, Indiana University at Bloomington

http://www.teaching.iub.edu/wrapper_big.php?section_id=case

Twitter

Twitter is a social media tool that has been increasingly adopted for use in the classroom. Twitter was founded in 2006 as an internet-based social network with a similar interface to text messaging, where 140 character updates, or “tweets,” could be viewed by a circle of friends, or “followers.” The site exploded in popularity, and soon the interface was being used for many other purposes, from spreading news to playing games.

In a recent study of the use of Twitter as a discussion method in a higher education classroom, the “results showed that the experimental group had a significantly greater increase in engagement than the control group, as well as higher semester grade point averages. Analyses of Twitter communications showed that students and faculty were both highly engaged in the learning process in ways that transcended traditional classroom activities. This study provides experimental evidence that Twitter can be used as an educational tool to help engage students and to mobilize faculty into a more active and participatory role” ([Junco 2010](#)).

Ways of integrating Twitter into the classroom are limited only by your imagination. Some methods include:

- **Classroom discussion**

Twitter can be used as a way to stimulate class discussion, both during the class or outside of class. A hashtag (a unique tag that allows users to identify and follow all Tweets on a specific topic) can be created to represent a course or section (ex. #RYEHIST101). Students can use it to talk with each other, their TAs, or their instructors. An example of Tweeting used within a university classroom can be viewed here:

<http://www.youtube.com/watch?v=6WPVWDkF7U8>

- **Exploring trending topics and current events**

Twitter provides students with real time, first person reactions to events all around the world. Twitter feeds, for instance, can be used to create live-updating maps of crises around the world, like this one, built by UCLA to cover tweets from Cairo during the 2011 revolution:

<http://egypt.hypercities.com/>

- **Tracking conference discussions**

Conferences are assigned their own hashtag (ex. #mlanet11 was the hashtag for the 2011 MLA Convention), and can be an excellent way for students to follow new directions in scholarly thought, as well as network with people in the field.

- **Following a professional or a company**

Most major companies and news organizations have one or more Twitter feed, useful for marketing, business, or journalism programs. Many academics, scholars, writers, and scientists also use Twitter. Following them can make course material seem relevant, or give students insight into potential applications for the knowledge they are acquiring.

- **Tweeting as characters or historical personages**

The @SamuelPepys account (<https://twitter.com/#!/samuelpepys>) Tweets excerpts from Samuel Pepys's actual diary, engaging students with primary resources.

The Twitter in Hell project was run by an English teacher who asked their students to compose Tweets in the voice of Dante in a class on *The Inferno*.

<http://www.uni.illinois.edu/og/news/2009/04/anonymous-fame-steve-rayburns-twitter>

- **Recreating historical events**

@ RealTimeWWII (<https://twitter.com/#!/RealTimeWWII>) has been Tweeting live “this day in history” updates from the Second World War, starting in 1939. As of January 2012, the account had over 200,000 followers. This type of technique requires students have the ability to do in-depth research, write succinct summaries, and integrate of historical sources, as in this sample Tweet from February 2, 2012, which was presented with a historical photo:

“Soviet bombers are attacking Finnish town of Sortavala, near Mannerheim Line – centre ablaze, at least 20 civilians dead.” Photo:

<https://twitter.com/#!/RealTimeWWII/status/165041093073846272/photo/1>

More information on other uses for this technique:

<http://thenextweb.com/twitter/2011/09/25/how-an-ex-history-student-is-using-twitter-to-bring-world-war-2-to-life/>

For more information on using Twitter in the classroom, see:

“Twitter in the Classroom” by Sally Wilson, Ryerson University Librarian
<http://web20.blog.ryerson.ca/files/2012/01/twitter2012.pptx> (ppt slides)

“Twitter for Academia”
<http://academhack.outsidethetext.com/home/2008/twitter-for-academia/>

“A Framework to Teach with Twitter”
<http://chronicle.com/blogs/profhacker/a-framework-for-teaching-with-twitter/26223>

“Practical Advice for Teaching with Twitter”
<http://chronicle.com/blogs/profhacker/practical-advice-for-teaching-with-twitter/26416>

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<http://www.facultyfocus.com/articles/instructional-design/a-brain-friendly-environment-for-learning/>

Junco, R., Heiberger, G. and Loken, E. (2011), The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, 27: 119–132.
doi: 10.1111/j.1365-2729.2010.00387.x