

## The "Change-Up" in Lectures

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Instructors and students often have the same mental image of how a college class works: The professor talks (lectures); the students usually listen and occasionally write something in their notes. But as teaching consultants visiting a great many classes, we've found the real picture looks somewhat different.

Listen to a colleague reporting on a recent visit:

*I sat in the back of the classroom, observing and taking careful notes as usual. The class had started at one o'clock. The student sitting in front of me took copious notes until 1:20. Then he just nodded off. The student sat motionless, with eyes shut for about a minute and a half, pen still poised. Then he awoke, and continued his rapid note-taking as if he hadn't missed a beat.*

Not infrequently we observe students having lapses of attention. And we've found that it's not enough for us to tell faculty with whom we are working about the problem. They're often aware of it already. What really makes a difference is for us to be able to offer a little theory, which we will do in this article, and then some concrete suggestions of activities they can use in their classes to break up a particular lecture on a particular day.

One explanation for the lapses in students' attention is that the

"information transfer" model of the traditional lecture does not match what current cognitive science research tells us of how humans learn. Research tells us that the brain does not record information like a videocassette recorder.

Instead, it handles information by reducing it into meaningful chunks that we call *categories*. Learning consists of fitting this reduced information into already existing categories or, sometimes, of forming new ones. Categorization determines how a concept is acquired, how it is retrieved from memory, and how it is put to work in abstracting or generating inferences.

Examples are a primary means of making connections between old knowledge and new knowledge. Their concreteness allows students to draw connections between the new abstract idea or principle and what they already know.

Once a new concept has been introduced, students need an opportunity to practice thinking in terms of that concept. Right in a lecture class, you can ask students to generate their own example of the concept, summarize it, write an exam question for it, or explain it to someone else. This approach works with the mind's natural processes, and thus improves learning.

Studies on attention span also shed light on why students have difficulty with the traditional lecture

format. Adult learners can keep tuned in to a lecture for no more than 15 to 20 minutes at a time, and this at the beginning of the class. In 1976, A. H. Johnstone and F. Percival observed students in over 90 lectures, with twelve different lecturers, recording breaks in student attention. They identified a general pattern: After three to five minutes of "settling down" at the start of class, one study found that "the next lapse of attention usually occurred some 10 to 18 minutes later, and as the lecture proceeded the attention span became shorter and often fell to three or four minutes towards the end of a standard lecture." Other studies appear to confirm these findings.

In 1985 Ralph A. Burns asked students to write summaries of presentations and tallied the bits of

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information reported by the "half-minute segment of the presentation" in which they occurred. He reports that students recalled the most information from the first five minutes of the presentation. "Impact declined, but was relatively constant for the next two 5-minute portions, and dropped to the lowest level during the 15- to 20-minute interval." Both of these studies note the severe lapse of attention 15 to 20 minutes into a lecture. As researcher P. J. Fensham observes, "During the falls [in attention] the student has, in effect, phased out of attending to the information flow."

Given that students have an attention span of around 15 to 20 minutes and that university classes are scheduled for around 50 or 75 minutes, instructors must do

something to control their students' attention. We recommend building a "change-up" into your class to restart the attention clock. If your main mode of instruction is lecture, clearly the primary activity for most of your students is listening to one person talk; even in whole class discussion, only the student actually speaking at any given time is doing anything other than listening.

Combining what we know about attention span and how the mind works, we suggest that lectures should be punctuated with periodic activities.

Johnstone and Percival report that lecturers who "adopted a varied approach . . . and deliberately and consistently interspersed their lectures with illustrative models or experiments, . . . short problem solving sessions, or some other form of deliberate break . . . usually commanded a better attention span from the class, and these deliberate variations had the effect of postponing or even eliminating the occurrence of an attention break." Many of our colleagues also report that when they intersperse mini-lectures with active engagement for students for as brief a time as two to five minutes, students seem re-energized for the next 15 to 20 minute mini-lecture.

By planning exactly when to insert an activity, you can make sure that your students pay the most attention to the issues which you feel are most important.

Don't do activities for their own sake; they should be integrally related to giving students practice with the most important concepts in that day's class. So, telling jokes about lawyers halfway through a fifty minute economics class will change students' level of attention, but will add little to their learning of cost/benefit analysis.

Varying your approach to teaching also allows you to get your students actively involved in their own learning. The research on the mind gives us the theoretic base for advocating active learning. A large body of literature tells us that when the goal is to foster higher level cognitive or affective learning, teaching methods which encourage

student activity and involvement are preferable to more passive methods.

Active learning lets you give your students opportunities in class to practice with the concepts you want them to learn. Particularly effective for getting students actively engaged in the classroom are collaborative learning techniques. What better way to get students active than to have them explain their new knowledge to one another? By making the classroom a social learning experience instead of a solitary one, instructors can reduce the student passivity through which some students seem to hide out in large classes.

Research confirms that breaking down the walls of anonymity promotes learning.

One colleague, who teaches journalism, told us that he fell into using small groups by accident, but they generated so much energy and interest in class that he now uses them regularly:

*"I wanted to show some slides and have the entire class talk about [them], but the slides didn't get processed in time. So I got half a dozen magazine spreads, and I divided the [students] up into six groups. I was really, really shocked, but delighted, to see what a tremendous wave of energy this released in the class. All of a sudden these students who had been sitting there listening very passively got very energetic; they began to talk to each other, and they were actually doing exactly what I wanted them to do."*

When you plan your classes, you will want to decide how often to add a change-up and what activity to use. Use the 20 minute attention span as a rule of thumb: In a 50 minute class, use one change-up in the middle; in a 75 minute class, use two change-ups, at roughly one-third and two-thirds of the way through the class period. But don't follow this slavishly; anything that becomes predictable will have less impact. Variety is a powerful force. Having a handful of activities you can use comfortably will keep the students guessing, wondering what you will do next. Be sure to earmark at least one-third of the time you allow for the activity for debriefing afterwards; this is when most of the substantive

lessons of the activity will be confirmed. Without a wrap-up, students see these activities as amorphous and sometimes confusing; a concluding debriefing helps them understand what was important and what was not.

## A Change-Up Sampler

The list below presents over a dozen "change-up" options. You should be able to find a few here that work for you. On that dark night of the teaching soul, when you have run out of ideas for a change-up, pick something new from this list.

### Student Generated Questions:

#### Write a Question

The simplest of these techniques: instead of saying "Are there any questions?" ask each student to write down one to three they have about the material just covered. Then ask several (volunteers at first) what their questions are and answer them (or get other students to answer them). Having students write their questions down gives them all a chance to acknowledge what they really do not know. Seeing the questions in writing helps them feel authorized to ask them.

#### Exam Questions

Alone, or in pairs, or groups of three, students write an exam question about material just covered in class. (They should follow the format of your actual exams—essay, multiple-choice, etc.) After a brief time for discussion, you select at least four groups to report their questions to the whole class. Write these on the board and ask other students to critique them (give specific criteria). You can collect all of the questions in writing; use the best ones on the exam!

### Problem Solving:

#### Paired Discussions

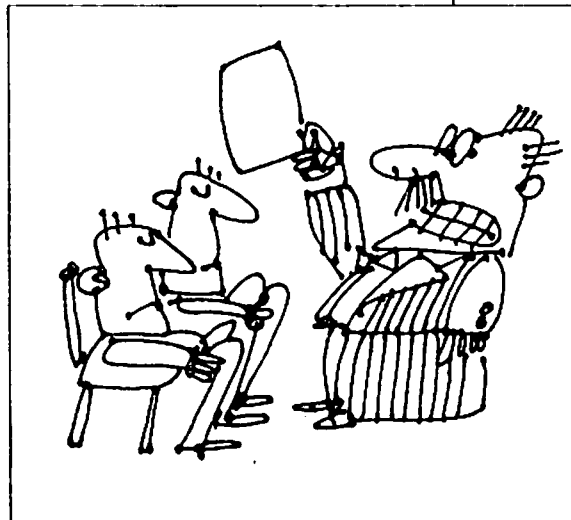
In three or four minutes, have students discuss something with the person next to them: summarize class so far; react to theory, concepts,

or information being presented; relate today's material to past learning, etc.

Make your questions as specific as you can.

#### Think (or Write) - Pair - Share

Pose a question which requires analysis, evaluation, or synthesis. Each student thinks or writes on this question for one minute, then turns to the person seated nearby to compare ideas. Then the pairs share their ideas with some larger group (pairs of pairs, section of the class, or whole group).



### Concrete Images

To help students make specific references to the text, go around the room and ask each one to state a concrete image/scene/event/moment that stands out. List these on the board. Follow up by having them find themes or patterns, missing points, etc. Then discussion can move to analysis with a common collection of facts.

### Generating Ideas:

#### Buzz Groups

Give one or two prepared questions to groups of three to five students. Each group records its discussion and reports to the whole class. Then help the class synthesize the groups' answers.

#### Truth Statements

Ask several small groups to decide on three things they know to be true about some particular issue. This is

useful when introducing a new topic which students think they know well, but where their assumptions need to be examined.

### Kisses and Crackers

To overcome the flagging of attention, when you notice energy and attention diminishing, pass out crackers and Hershey's kisses. The professor who taught us this technique tells us that research in "accelerated learning" shows that eating about once per hour actually promotes learning. Not only does the food wake students up, the mere

act of passing the bags around changes the activity and refocuses attention. He says that this also helps students feel good about his class and him and overcome science anxiety.

### Controversial Topics:

#### Reaction Sheet

After presenting a controversial topic, pass around several sheets to collect written reactions to these three questions: "What ideas do you question?" "What ideas are new to you?" and "What ideas really hit

home?" Follow up with discussion. Variations are to ask each student to write a sheet or to have small groups do so.

### Value Lines

Students line up according to how strongly they agree or disagree with a proposition or how strongly they value something. This gives a visual reading of the continuum of feelings in the group. Next, sort students into heterogeneous groups for discussion by grouping one from either end with two from the middle. Ask students to listen to differing viewpoints in their groups and to paraphrase opposing positions fairly.

### Forced Debate

Ask all students who agree with a proposition to sit on one side of the room and all opposed on the other side. Hanging signs describing the propositions helps. It is important that they physically take a position

and that the opposing sides face each other. After they have sorted themselves out, switch the signs and force them to argue for the position with which they disagree. This activity—which pushes “Value Lines” one step further—is one of very few activities that plunge people into temporary ownership of viewpoints in opposition to their own strongly held opinions.

### **Student Self-Evaluation**

Have the students write a brief evaluation of their learning.

After an essay (or project) have them answer the following: Now that you have finished your essay [or project], please answer the following questions. There are no right or wrong answers; I am interested in your analysis of your experience writing this essay [or doing this project].

1. What problems did you face during the writing of this essay?
2. What solutions did you find for those problems?
3. What do you think are the strengths of this essay [project]?
4. What alternative plans for this essay [project] did you consider? Why did you reject them?
5. Imagine you had more time to write this essay [work on this project]. What would you do if you were to continue working on it?

And finally, **varying media** often provides a useful change-up. Slides, overheads, pictures, video clips, music or sound can refocus attention and provide a shared experience which students can then critically “unpack” in discussion. Remember to give context for the new material, to show or play only what you need, and to direct student attention to the aspects of the material you regard as especially important. ■■■