Active Learning: Creating Excitement in the Classroom

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PREFACE

Thirty years ago, McKeachie wrote in the *Handbook of Research on Teaching* (Gage, 1963, P. 1125), "College teaching and lecturing have been so long associated that when one pictures a college professor in a classroom, he almost inevitably pictures him as lecturing." Few would argue with the statement that the vast majority of today's professoriate were primarily lectured to as both undergraduates and as graduate school students. It is not surprising, therefore, that lecturing continues to be our most prevalent mode of instruction.

A host of national reports in the 1980's, however, challenged college and university faculty to develop instructional approaches that transform students from passive listeners to active learners. On first glance, like many of the recommendations provided by "blue ribbon panels," this would seem "easier said than done."

The incorporation of active learning strategies into the daily routine of classroom instruction can, and should, be done. To help in this pursuit, this workshop will engage participants in specific, practical teaching strategies designed to model the use of active learning in the classroom. The handout summarizes the workshop's content and identifies resources for further study.

CONTENTS

WORKSHOP NOTES

Active Learning

I. In the context of the college classroom, what are the major characteristics associated with active learning?

A. Some of the major characteristics associated with active learning strategies include:

1. Students are involved in more than passive listening

2. Students are engaged in activities (e.g., reading, discussing, writing)

3. There is less emphasis placed on information transmission and greater emphasis placed on developing student skills

4. There is greater emphasis placed on the exploration of attitudes and values

5. Student motivation is increased (especially for adult learners)

6. Students can receive immediate feedback from their instructor

7. Students are involved in higher order thinking (analysis, synthesis, evaluation)

B. In summary, *in the context of the college classroom, active learning involves students in doing things and thinking about the things they are doing.*

C. A conceptual framework encompassing active learning might be a continuum that moves from simple tasks on one end to complex tasks on the other. This is, of course, an artificial, oversimplified construct, but it does provide both a visual and conceptual model that is useful for designing courses that maximize students' intellectual engagement. Neither end of the continuum is considered to be "better" or more "desirable" than the other. Simple tasks are defined as short and relatively unstructured, while complex tasks are of longer duration-- perhaps the whole class period or longer-- and are carefully planned and structured.

Figure 1

Simple tasks ---------- Complex tasks

The Active Learning Continuum

II. Why is active learning important?

A. The amount of information retained by students declines substantially after ten minutes (Thomas, 1972).

B. Research comparing lecture versus discussion techniques was summarized in the report *Teaching and Learning in the Classroom: A Review of the Research Literature* prepared by the National Center for Research to Improve Postsecondary Teaching and Learning (McKeachie, et. al., 1987). The review concluded that

> In those experiments involving measures of retention of information after the end of a course, measures of problem solving, thinking, attitude change, or motivation for further learning, the results tend to show differences favoring discussion methods over lecture. (p. 70)

C. Numerous researchers and national reports also discussed the use of active learning strategies in the classroom. Consider the following statements:

> All genuine learning is active, not passive. It is a process of discovery in which the student is the main agent, not the teacher.
>
> (Adler, 1982)

> Students learn what they care about and remember what they understand.
>
> (Ericksen, 1984, p. 51)

> Learning is not a spectator sport. Students do not learn much just by sitting in class listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives. They must make what they learn part of themselves.
>
> (Chickering and Gamson, 1987, p. 3)

> The sort of teaching we propose requires that we encourage active learning and that we become knowledgeable about the ways in which our students hear, understand, interpret, and integrate ideas.
>
> (AAC Task Group on General Education, 1988, p. 25)

> One must learn by doing the thing, for though you think you know it-- you have no certainty until you try.
>
> (Sophocles, 5th c. B.C.)

III. What obstacles or barriers prevent faculty from using active learning strategies?

Six commonly mentioned obstacles to using active learning strategies include:

A. You cannot cover as much course content in the time available;

B. Devising active learning strategies takes too much pre-class preparation;

C. Large class sizes prevents implementation of active learning strategies;

D. Most instructors think of themselves as being good lecturers;

E. There is a lack of materials or equipment needed to support active learning approaches;

F. Students resist non-lecture approaches.

IV. How can these barriers be overcome?

A. We believe that there are two primary sets of obstacles that prevent faculty from using active learning strategies in the classroom: (1) the six potential obstacles noted above, and (2) the fact that using active learning strategies involves risk

B. With respect to the six commonly reported obstacles, the following should be noted:

1. Admittedly, the use of active learning strategies reduces the amount of available lecture time that can be devoted to content coverage. Faculty who regularly use active learning strategies typically find other ways to ensure that students learn assigned course content (e.g., using reading and writing assignments, through their classroom examinations, etc.)

2 The amount of pre-class preparation time needed to implement active learning strategies will be greater than that needed to "recycle old lectures;" it will not necessarily take any more time than that needed to create thorough and thoughtful new lectures.

3. Large class size may restrict the use of certain active learning strategies (e.g., it is difficult to involve all students in discussion in groups larger than 40) but certainly not all. For example, large classes can be divided into small groups for discussion activities, writing assignments can be read and critiqued by students instead of the instructor, etc.. See Weimer (1987) for several excellent articles on how this can be done.

4. Most instructors see themselves as good lecturers and therefore see no reason to change. Though lecturing is potentially a useful means of

transmitting information, teaching does not equal learning; this can be seen clearly in the painful disparity between what we think we have effectively taught, and what students indicate they have learned on the examination papers that we grade.

5. The lack of materials or equipment needed to support active learning can be a barrier to the use of some active learning strategies but certainly not all. For example, asking students to summarize in writing the material they have read or to form pairs to evaluate statements or assertions does not require any equipment.

6. Students resist non-lecturing approaches because active learning alternatives provide a sharp contrast to the very familiar passive listening role to which they have become accustomed. With explicit instruction in how to actively participate and learn in less-traditional modes, students soon come to favor the new approaches.

C. A second set of potentially more difficult obstacles to overcome involves increasing one's willingness to face two types of risks.

1. There are risks that students will not:

   a. participate actively

   b. learn sufficient course content

   c. use higher order thinking skills

   d. enjoy the experience

2. There are risks that you as a faculty member will not:

   a. feel in control of the class

   b. feel self-confident

   c. possess the needed skills

   d. be viewed by others as teaching in an established fashion

D. Though the classroom use of active learning strategies will always involve some level of risk, by carefully selecting only those active learning strategies that are at a personally comfortable risk level, you can maximize your likelihood of success. Examine Figure 2 below which contrasts dimensions of active learning strategies with regard to their level of risk.

Figure 2

A Comparison of Low and High Risk Active Learning Strategies

Dimension	Low Risk Strategies	High Risk Strategies
Class Time Required	relatively short	relatively long
Degree of Planning	carefully planned	spontaneous
Degree of structure	more structured	less structured
Subject Matter	relatively concrete	relatively abstract
Potential for Controversy	less controversial	more controversial
Students' Prior Knowledge of the Subject Matter	better informed	less informed
Students' Prior Knowledge of the Teaching Technique	familiar	unfamiliar
Instructor's Prior Experience with the Teaching Technique	considerable	limited
Pattern of Interaction	between faculty & students	among students

E. Instructional approaches can be usefully classified in terms of instructor risk they entail. Figure 3 classifies some teaching techniques in terms of these two criteria:

Figure 3

A Classification of Instructional Strategies By Levels of Instructor Risk

Lower Risk Activities

Pause Procedure

Short Writes

- Summarize last lecture, readings, etc.
- What didn't you understand?
- Analytical lists
- Journal entries

Thumbs up/thumbs down response to statement

Surveys or questionnaires

Formative (ungraded) quizzes

Think-Pair-Share

Brainstorming

Pairs/groups develop an outline of the lecture

Structured group discussions (specific questions provided)

Higher Risk Activities

Group Discussion (no structure)

Guided lecture

Individual/group presentations

Pairs/groups develop applications related to lecture content

Pairs/groups write test questions related to lecture material

Students analyze a problem, poem, photography, etc.

Students work a problem then evaluate each others' work

Role plays illustrating a concept from lecture

Responsive lecture

F. Because lecture classes have been the prevailing instructional approach seen most often by faculty when they were undergraduate and graduate students, many faculty have had limited personal experience with, and few role models for, active learning alternatives. To help identify your personal levels of risk and the active learning strategies you might be willing to try in future classes, complete the self-assessment that follows as Figure 4:

Figure 4

A SURVEY OF CLASSROOM TEACHING METHODS

DIRECTIONS: There are many different ways faculty make use of class time. We would like you to describe the teaching strategies you have used *in the class you teach most often*.

Step 1: Carefully read the list of teaching strategies (i.e., the left-hand column) and indicate with a check mark (3) if you used this teaching method the **last time** you taught this class.

Step 2: Then indicate with a check mark (%) whether you would be willing to try this teaching method the **next time** you teach this class.

Teaching Strategy	Last Time	Next Time
I lectured during the entire class period.	( )	( )
I showed a film or video for the entire class period.	( )	( )
During lecture, I gave a short, ungraded quiz to check student comprehension of material	( )	( )
I assigned a short writing activity without having class discussion afterward (e.g., writing end-of-class summaries, providing questions over material)	( )	( )
I had students complete a survey instrument	( )	( )
I had students complete a self-assessment activity (e.g., complete a questionnaire about their beliefs, values, behaviors)	( )	( )
I took the class on a field trip	( )	( )
I assigned a laboratory exercise that was done by students	( )	( )

I lectured with at least 15 minutes of time devoted to recitation or asking questions designed to check student understanding of material (interaction between teacher-student/student-teacher)	( )	( )
I led a class discussion focused on a visual/audio stimulus (e.g., a picture, cartoon, graph, song)	( )	( )
I had students engage in a brainstorming activity (i.e., a group activity designed to generate as many ideas as possible)	( )	( )
I lectured with at least 15 minutes of time devoted to class discussion (interaction between student-student, with occasional questions/remarks by teacher)	( )	( )
I assigned a short writing activity that was followed by at least 15 minutes of class discussion	( )	( )
I assigned an in-class reading activity that was followed by a significant class discussion lasting 15 minutes or more	( )	( )
I assigned a small group discussion or project (e.g., case study work)	( )	( )
I had students complete a problem solving game or simulation in groups	( )	( )
I assigned individual student presentations (e.g., speeches, reports)	( )	( )
I assigned small group presentations (e.g., debates, panel discussions, plays)	( )	( )
I assigned a student-centered class discussion (e.g., students developed the questions and lead the discussion that followed)	( )	( )
I led a role playing activity	( )	( )

G. An *enhanced lecture* is defined as a series of short, mini-lectures punctuated by specific active learning events designed to meet class objectives. Using this model, the enhanced lecture could fall anywhere on the active learning continuum, depending on the complexity and frequency of the strategies used. A simple enhanced lecture could involve two to three pauses during the lecture to allow students to compare notes or ask questions. Those instructors who are familiar and comfortable with more complex strategies might choose to incorporate into the class period lengthy group activities focused on skill development, punctuated with brief mini-lectures that summarize a previous activity or create a transition for the next activity. Again, the extent to which these active learning strategies are incorporated into the lecture depends on the course objectives and the instructor's teaching style. For example, one construct for developing course objectives and associated active learning strategies (for more examples, see Appendix One) would be to ask the questions, as a result of this course:

What should students know (knowledge)?
What should students be able to do (skills)
What should students feel (attitudes)?

H. Risk Activity

From the activities you would be willing to try next time you teach a class, which do you consider to have the greatest personal risk for you? Once you have made that decision, please answer the following questions:

1. What appeals to you about taking the risk?

2. If you took the risk, what could go wrong?

3. If the things you feared most were to happen, what could you do to correct the situation?

I. According to Gorham (1988) the following behaviors promote student learning:
   1. Appropriate use of humor
   2. Praising student performance
   3. Engaging students outside of the classroom
   4. Appropriate level of self-disclosure
   5. Encouraging students to talk
   6. Asking questions about student viewpoints or feelings
   7. Following up on topics raised by students even if not directly related to class material.
   8. Referring to "our" class and what "we" are doing.

J. You can successfully overcome each of the major obstacles or barriers to the use of active learning strategies, and reduce the possibility of failure, by gradually incorporating teaching strategies that increase student activity level and instructor risk into your regular teaching style. *Choose what is appropriate for you within the context of your discipline!*

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Appendix One

ACTIVE LEARNING STRATEGIES FOR ENHANCING THE LECTURE

Activities to include in the first ten minutes of a lecture.

In an individual writing activity have students summarize the main ideas from the previous class session and speculate (or pose questions) about the upcoming class session.

Ask students to identify one question from the assigned readings that they would like to have answered in class (could be done prior to class). (Open book). Students then share their question with 3 peers and pick one question from the group to pose to the instructor. Finally, each group asks the instructor a question.

Have students gather in groups of 3 or 4 and discuss a) the issues they expect will be relevant to the day's scheduled lecture topic and/or b) what they expect to get from the lecture and how they think it can be used (applied) in their work or outside life.

Give students the plot to the lecture and then begin class by having them write their reflections on a question based on the upcoming lecture. Students can then turn to the person next to them and discuss their responses for five minutes.

Put students into groups of three and have them develop a set of "consensus answers" to a series of eight to ten questions about the topic for the day. After providing correct answers followed by a discussion, reward the group with the most correct answers.

The students could work in small groups to brainstorm and possibly organize past experiences that may relate to the class objective for the day.

Present a concept or a group of concepts to students at the beginning of class. On plain paper, 1) they are instructed to brainstorm ideas related to the concept(s), and 2) draw the relationships among the concept(s) and their ideas. (At the end of class, they will be asked to do this again). This activity may be done in pairs.

During the first 10 minutes provide the students with a problem covered in their previous night's reading. Ask them to hypothesize how the problem might be resolved. Then have them compare their hypothesis with the actual resolution. Have them discuss those factors which were responsible for the differences between the hypothesis and the actual solution.

Activities for the middle 30-45 minutes of class.

Students are randomly assigned to groups (4-6 students) the first class meeting of the quarter. In the first group meeting they get to know each other, name their group, select a spokesperson, select a topic from a list for a group presentation at the end of the quarter, and develop questions that the group wants to ask the instructor ("no holds barred"). This is used in an organized behavior class. Variations, i.e. omitting topic selection, can be used in any class at any time. The group is used in subsequent classes for experiential exercises related to topics.

Use "thumbs up, thumbs down or thumbs sideways". Make a statement about the content and tell students to put their thumbs up if they agree with the statement - thumbs down if they disagree or thumbs sideways if they don't know. Discussion on why the choices were made follows.

Break the students up in small groups (four to five) and assign a role-playing task to highlight different methods/circumstances illustrated by the text or lecture. The students must plan and then act out a short scenario which illustrates the method assigned to their group.

Round table exercise: write a response to a question, then pass it to the person on your left until all in the group have had the opportunity to respond. Responses can also be passed between groups.

Cooperative paraphrase exercise as part of a discussion between pairs ("What I understand you to have said is.....").

Stop and have students engage in a short write ("What do you think and/or feel about what has been said?")

After reading a short essay describing and discussing a concept that is relevant to the task at hand each student reflects on the application of this concept to her life. She then shares with another student her ideas. Feedback (questions of clarification, paraphrasing, etc.) is required before the second student can share his thoughts. Then both students draw conclusions and share those conclusions.

Have students work in small groups to complete a cognitive map (a diagram showing relationships between elements) of concepts addressed in class. Large group discussion follows.

Have students work in small groups to complete an ungraded mini-test over concepts addressed in class. Discussion of the answers follows.

Distribute clearly worded questions, relevant to the topic introduced in the first ten minutes of class, to small groups. Each group discusses their topic, using notes and text, and presents a brief answer to the class. The remaining time is used to summarize and integrate the responses.

Have students find/report statistical information and then prepare generalizations based on those results. For instance, in a geography class, use the current edition of Goodes' World Atlas and have students in groups list the top four Lemo alloy metal producers (countries) from the atlas. Instructor will write these on the board (e.g. Chromicism, countries 1-4, etc.). At this point, the board will be covered with statistics of various metals ("boring" according to students). Then have students work in small groups to make four generalizations about these countries.

When there is a topic which lends itself to the discussion, differences of opinion, etc., and a total class discussion would be "chaotic" or perhaps only a few students might participate, the class is divided into smaller groups (of their choosing or mine). The topic is then addressed in small groups with a "reporter" in each group. After a 10-15 minute time frame, the reporters are asked

to exchange places within the groups, i.e., each reporter ends up in a different group, and continues the exercise sharing input from his/her previous group.

After lecturing for 10-12 minutes with material and information brought by the instructor from sources beyond the class assigned readings, pause for 3-5 minutes. Students, working in ad hoc pairs with someone seated next to them, share what they have understood from the lecture and prepare a two-three statement summary, which a few groups can share subsequently with the entire class (on a voluntary basis).

Require groups of students to determine how to "act out" a concept under discussion: i.e. independent assortment of alleles or electron transport. This would follow the introductory information in the lecture.

During a discussion of a specific technique (i.e., software development), review the basics of the technique. Assign short group tasks to solve a specific problem in phases. Stop the group and discuss the results. Then assign a more complex task until you get the students to solve the entire problem. Use the last few minutes to review the task and assign individual homework using the same technique.

Have a structured group discussion following a film, focusing on controversial issues, ethics, etc.. Provide specific questions to be answered by small groups, each having a facilitator and recorder/reporter.

Have question/answer period where students are assigned to bring one question raised in the course of reading their assignments, on a 3x5 card. Don't use too often - the questions become pretty dull!

Have the students form small groups (four to five people) and provide each group with a real-life example related to the course content. The students critique the example using what they have learned. For instance, in a research course they could be given a real survey that they can redesign and improve.

Activities to include in the last ten minutes of a lecture.

Hand out 4X6 cards to the students (one per student) and ask them to write down on the cards (one side) the major points covered in the class or the purpose of that specific class. Then, I have them discuss what they have written with a partner for about two minutes. Then, I ask them to write a revised version of the points or purpose on the reverse side of the card, which they hand in as they are leaving class.

Have students working in pairs or groups develop an outline of the day's presentation.

Have students develop an alternative way to present the lecture material

Have students form groups of three or four. Introduce a problem related to today's content. Ask groups to solve the problem, proposing three alternative strategies towards its resolution.

Divide the class into groups of three to five, depending on size of class. Ask each group to propose three goals which they would like the class to accomplish at the next meeting.

Have students form groups and write one or two good multiple choice questions and present these questions (via overhead) to the class. Discuss the questions.

Have students review each other's notes to enhance learning.

Have students answer the discussion questions at the end of the assigned chapter. They then explain their answers to the class.

Have students summarize the main topics of discussion in one or two paragraphs and then relate them to yesterday's discussion.

Have students evaluate each other’s work-- in this time frame, something very small (notecards for research papers, for example), making sure they have grading instructions. To ensure low risk: create short, structured specific roles. Make sure student's know each other’s names.

Have students keep a journal, taking a few minutes to write down their feelings and thoughts regarding various topics.

Select Active Learning Articles (1995-1999)

Charles C. Bonwell, May, 2000

This is a bibliography in the making. Its purpose is not to provide an exhaustive bibliography: rather it hopes to present examples of good practice. If you are aware of other articles that would be useful for teachers engaging in active learning, email me at bonwell@ix.netcom.com and I will include them in the next revision.

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Possible Applications:

As you reflect upon the session to this point, how might you apply what you have heard to your courses or classroom?