Interactive Teaching in Large Lectures

Objection A: "I can't learn that many names."

Anonymity is a major concern in large lecture hall classes. Although large lectures come with the daunting task of learning 100+ student names and faces, there are several solutions that can help an instructor learn at least a large portion of them.

Solutions

1. Require students to upload a picture to their Canvas profile or utilize the Photo Roster in Canvas so that you can learn names.

2. Use a seating chart – the Attendance tab in Canvas has an easy to use seating chart function that includes student pictures.

3. Ask students to create a (paper) folded nameplate to display on their desks.

4. Schedule mandatory office appointments the first few weeks of class so that you can introduce yourself, answer any student questions, and put a face with a name. During these meetings, you could record information or take notes for future reference.

5. Call on students, even if you don't know their names. Ask students to give their names when you call on them and then use their names in your responses.

6. Use simple games to encourage students to speak up and introduce themselves. The reward can be the game itself or participation points.

7. As students turn in their first assignment or exam, take a few extra seconds to try to match a name to a face.

8. Arrive early and stay late after class and use the time to talk with individuals or small groups of students.

9. Schedule an extra weekly meeting or Coffee Chat that meets on the same day and time each week. The location can shift to different areas on campus or stay at the same coffee shop/location depending on your comfort level. Tell students that the point in the meeting is an opportunity for you to learn more about them and for them to have additional opportunities to learn and provide feedback. There is no extra credit involved; it is simply a meeting for interested parties.

Objection B: "Fixed seats make it hard to form groups."

Problems associated with large lectures extend beyond the number of students enrolled to issues with the environment. Large lecture classes usually take place in large lecture halls that have stadium seating with fold down desktops or tables bolted to the floor. This creates an environment that makes group formation seem impossible, but there are ways to incorporate groups in large lectures.

Solutions

10. Instead of forming groups, use the "Turn-to-your-neighbor" approach. In this approach, the instructor poses a discussion question or problem and asks students to turn to their

neighbor to discuss or solve it. After allowing time for discussion, the instructor calls on pairs randomly to provide their answer. This method can be modified to fit any class size and any situation. Students do not have to move from their current seats and discussion can be guided.

11. Adapting to the physical environment – In order to do this, you need to:
    a. provide each group with a space that becomes their home – this is important because having students know where they belong helps maintain order, having a home allows groups to develop an identity, and it provides groups with time to develop procedures for overcoming the limitations.

    b. ensure that group members are able and willing to arrange themselves so that they can make eye contact with each other – ensuring eye contact helps with the development of the group as a team.

    c. provide access to the group space for students and instructors – if the environment makes it impossible for you to reach each group, you could have each group make an appointment to come see you at the front of the room. Walk around the room as much as possible to allow for better observations so that you can discuss any problems you see with the group during their appointment. It is also a good idea to ask each group to determine ways that they can access you and you can access them.

    d. have a set process for distributing and collecting materials – this process can take a significant amount of class time if it's not organized. One way to overcome this issue is to have team folders. These folders, with that day's handouts or assignments that need to be returned, can be passed out to a group member at the beginning of the activity. After the activity, students return the folders to you with their assignment inside. Another possibility is to electronically communicate with students. Utilizing programs like GoogleDocs and Dropbox easily allow group collaboration as well as an easy medium for you to provide feedback directly on the assignment. It would be easy to adapt the team folders to electronic communication as well.

12. Invite student groups or partners to present an assigned reading and lead the class discussion. Groups and partnerships can be formed based on those who want to present. Presenters can begin the discussion with questions you provide as a start. Although only a small number of students may have or take the opportunity to present, many more will participate when their peers lead the discussion.

13. Use "rows" instead of "groups" in the interactive techniques

Objection C: "It's too hard to call attention back when it's time to return to lecture."

A high level of noise is not necessarily a bad thing. It can serve as a motivator for teams as they hear their peers working and a team builder because groups have to work together to be productive. However, in large groups it can become difficult to regain student attention.

Solutions
14. It is important for the instructor to develop and communicate ways to move students from group discussion to whole class discussion. A good way to deal with this is to establish a

signal. Regardless of the time it takes, it is important to wait for silence to insure student learning. Possible ways to restart attention include:

- Raising your hand
- Standing in one spot
- Dimming the lights
- Use an actual timer with a loud bell (or smartphone timer, if you have a microphone to catch the sound)
- Out-shouting the students for attention (not always the best choice). Variation: shout loudly "OK!" or "Let's get started again!" and wait a few moments before speaking a regular (loud) voice.
- Saying "shhh!" loudly (or into the microphone)
- Simply start your lecture again, speaking softly. Those in the front will shush the others for you.
- The phrase "if you can hear me, clap once. [pause] If you can hear me, clap twice [pause] If you can hear me, clap three times." (note: some students may be insulted by this one without careful contextualization the first time).
- Cut off the background music suddenly. This works especially well if you slowly increase volume toward the end of the work time but then turn it off all at once. The sudden absence of (loud) noise will catch their attention.

15. Provide students with an allotted amount of time to complete the group assignment and stick to it. It is easy to find an online stopwatch and some of them come with alarm settings. Set the timer to countdown and then project it on the screen in the front of the class. Instruct students to keep track of the time and when time is up they are to stop talking and face the front of the room.

Objection D: "Too many students; they will get off-task since I can't watch all of them."

During group work, it is easy for students to get off task. This is the case in large or small classes especially if the instructor spends time talking to each group.

Solutions

16. One solution for this problem is to <u>let</u> students get off task. You should be explicit in your expectations of student conduct during group work. If students choose to get off topic or not complete the assignment, then their grade will reflect that.

17. Another solution is to walk around the room as much as possible; get out from behind the lectern and walk up and down the aisles. Even if you cannot directly walk past or hear what students are talking about, your obvious observation of group work will make them feel like they should stay on task.

Objection E: "I can't access the middle of the row by walking in there."

Another problem associated with large lecture halls is the difficulty it presents for the instructor to move around the room and access students as they work individually, in pairs, or groups.

Solutions

18. Ask students to leave every other row empty. For example ask them to sit in rows 1, 3, 5, and so on. This allows you the opportunity to move around the room easily. If you have too

many students to skip every other row, then have them leave three or four rows of your choosing empty.

19. Another option is to have a target section for each lecture. The targeted section can be called on to answer questions, asked to summarize the reading, and participate in a role-play or simulation (whatever kind of activity you have planned for the day). The target can be a location in the room, gender, age, major, where they are from, or any number of other groups (sensitivity to stereotypes and prejudices should be applied). This allows you to make a connection with a small group of students during each class. If you cannot get to them physically due to environmental constraints, then you can access them by targeting their group. It would be just as easy to call on students by name. However, some students are not comfortable talking to the large group. By narrowing the size based on a group characteristic, then you not only gain the students attention, but you still allow students the opportunity to participate or not.

20. Climb over anyway. Even when students are in the middle of the row, it's possible to seek forgiveness and climb in.

21. Or, do not wander into rows but pay more attention to them when calling for volunteers, raised hands, or unwilling participants. Those on the aisles may be more likely to be paying attention anyway.

Objection F: "I have too much content to cover and no time for interactions."

A pressing issue in both small and large classes is the amount of possible material to cover. Instructors regularly make decisions about what must be included, what should be included, and what would be good to include given the time frame. Even when a lot of material is intentionally left out of a syllabus in order to make it accomplishable in a semester, typically, there is still a large amount of material to work through in 15 weeks.

Solutions

22. One option for dealing with the amount of content one must teach is to make the students responsible for some of the material outside of class. You could provide them with links to videos that explain the information and assign it as reading or homework.

23. Taking that option further is to flip your classroom. In a flipped classroom, instructors require students to watch pre-recorded lectures online before class begins. This frees up class time for application, synthesis, and evaluation activities rather than dissemination of facts and concepts. This process can be applied to the entire course for the whole semester or to several days of the semester depending on the comfort level of the instructor.

24. Another option is to read through your syllabus and mark everything as essential or helpful. Remove all the helpful information and place it under a suggested further reading list. If you mark everything as essential, ask a colleague to mark your syllabus the same way.

25. Make sure that you have clear and measurable learning goals and outcomes. Only include in your syllabus the content that helps reach the goals and outcomes of the course.

26. Accept that group interactions may, in fact, take longer than if it were a small class. In some cases, the additional time is nonetheless worth the effort and loss of "coverage" of material.

Objection G: "Students can't hear other students; they aren't loud like me (or lack the microphone)."

Solutions

27. This is another place that asking students to turn to their neighbor to discuss a question would be useful. See above.

28. In the event that forming groups or pairs really doesn't work for you and the environment makes it especially difficult for students to hear each other, you can get students involved by calling for a vote. Ask students for a show of hands for questions like how many believe this or how many agree with this position. Select a student from each side and ask them to justify their response. The polls get everyone involved even they do not get to speak for the entire course.

29. Vote with clickers or clicker alternatives (see below).

Resources

- The Schreyer Institute for Teaching Excellence at Penn State University has a webpage devoted to teaching large classes. It can be found at: http://www.schreyerinstitute.psu.edu/Tools/Large/.
- The Center for Teaching Excellence at University of Maryland has a teaching guide for large classes at: http://www.cte.umd.edu/library/teachingLargeClass/guide/index.html.
- The Center for Research on Learning and Teaching at University of Michigan has a website that describes ways interactive techniques have been employed by instructors. It can be found at: http://www.crlt.umich.edu/category/tags/large-courses.
- Teaching and Learning Excellence at University of Wisconsin-Madison has a webpage that discusses best practices for interactive lectures at: https://tle.wisc.edu/solutions/lecturing/quick-thinks-interactive-lecture.

Interactive Techniques

Instructor Action: Lecture

1. **Picture Prompt** – Show students an image with no explanation, and ask them to identify/explain it, and justify their answers. Or ask students to write about it using terms from lecture, or to name the processes and concepts shown. Also works well as group activity. Do not give the "answer" until they have explored all options first.
2. **Think Break** – Ask a rhetorical question, and then allow 20 seconds for students to think about the problem before you go on to explain. This technique encourages students to take part in the problem-solving process even when discussion isn't feasible. Having students write something down (while you write an answer also) helps assure that they will in fact work on the problem.
3. **Choral Response** – Ask a one-word answer to the class at large; volume of answer will suggest degree of comprehension. Very useful to "drill" new vocabulary words into students.
4. **Instructor Storytelling** – Instructor illustrates a concept, idea, or principle with a real-life application, model, or case-study.
5. **Socratic Questioning** – The instructor replaces lecture by peppering students with questions, always asking the next question in a way that guides the conversation toward a learning outcome (or major Driving Question) that was desired from the beginning.
6. **Reverse Socratic Questioning** – The instructor requires students to ask him/her questions, and the instructor answers in such a way as to goad another question immediately but also drive the next student question in a certain direction.
7. **Pass the Pointer** – Place a complex, intricate, or detailed image on the screen and ask for volunteers to temporarily borrow the laser pointer to identify key features or ask questions about items they don't understand.
8. **Empty Outlines** – Distribute a partially completed outline of today's lecture and ask students to fill it in. Useful at start or at end of class.
9. **Classroom Opinion Polls** – Informal hand-raising suffices to test the waters before a controversial subject.
10. **Discussion Row** – Students take turns sitting in a front row that can earn extra credit as individuals when they volunteer to answer questions posed in class; this provides a group that will ALWAYS be prepared and interact with teacher questions.
11. **Total Physical Response (TPR)** – Students either stand or sit to indicate their binary answers, such as True/False, to the instructor's questions.
12. **Student Polling** – Select some students to travel the room, polling the others on a topic relevant to the course, then report back the results for everyone.
13. **Self-Assessment of Ways of Learning** – Prepare a questionnaire for students that probes what kind of learning style they use, so the course can match visual/aural/tactile learning styles.
14. **Quote Minus One** – Provide a quote relevant to your topic but leave out a crucial word and ask students to guess what it might be: "I cannot forecast to you the action of _____; it is a riddle, wrapped in a mystery, inside an enigma." This engages them quickly in a topic and makes them feel invested.
15. **Everyday Ethical Dilemmas** – Present an abbreviated case study with an ethical dilemma related to the discipline being studied.
16. **Polar Opposites** – Ask the class to examine two written-out versions of a theory (or corollary, law of nature, etc.), where one is incorrect, such as the opposite or a negation of the other. In deciding which is correct, students will have to examine the problem from all angles.
17. **Pop Culture** – Infuse your lectures, case studies, sample word problems for use during class with current events from the pop culture world. Rather than citing statistics for housing construction, for instance, illustrate the same statistical concept you are teaching by inventing statistics about something students gossip about, like how often a certain pop star appears in public without make-up.
18. **Make Them Guess** – Introduce a new subject by asking an intriguing question, something that few will know the answer to (but should interest all of them). Accept blind guessing for a while before giving the answer to build curiosity.

19. **Make It Personal** – Design class activities (or even essays) to address the real lives of the individual students. Instead of asking for reflections on Down's Syndrome, ask for personal stories of neurological problems by a family member or anyone they have ever met.
20. **Read Aloud** – Choose a small text (500 words or less) to read aloud, and ask students to pay particular attention during this phase of lecture. A small text read orally in a larger lecture can focus attention.
21. **Punctuated Lectures** – Ask student to perform five steps: listen, stop, reflect, write, give feedback. Students become self-monitoring listeners.
22. **Word of the Day** – Select an important term and highlight it throughout the class session, working it into as many concepts as possible. Challenge students to do the same in their interactive activities.
23. **Recall, Summarize, Question, Connect, and Comment** – This method of starting each session (or each week) has five steps to reinforce the previous session's material: recall it, summarize it, phrase a remaining question, connect it to the class as a whole, and comment on that class session.
24. **Focused Listing** – List several ideas related to the main focus point. Helpful for starting new topics.
25. **Background Knowledge Probe** – Use questionnaire (multi-choice or short answer) when introducing a new topic.
26. **Goal Ranking and Matching** – Students rank their goals for the class, then instructor combines those with her own list.
27. **Interest/Knowledge/Skills Checklist** – Assesses interest and preparation for the course, and can help adjust teaching agenda.
28. **Documented Problem Solutions** – Keep track of the steps needed to solve specific *types* of problems. Model a list for students first and then ask them to perform similar steps.
29. **Provocative Picture** – Begin the lecture with a picture meant to provoke discussion or emotion (another option: a cartoon).
30. **Pass the Chalk** – Provide chalk or a soft toy; whoever has it must answer your next question, and they pass it on to the student of their choice.
31. **Pass the Dart** – Like Pass the Chalk, use a real dartboard to decide which student must answer the next question (student names are arranged on the dartboard already).
32. **Beach Ball Bingo** – Write questions or prompts onto all surfaces of a beach ball (or tape them on). When the next student catches the ball, he/she answers one of the questions where fingers are touching the ball.
33. **Quaker Meeting** – Students highlight key passages of the reading, and there is silence (like a Quaker meeting) until someone wants to read his/her out, and others follow. End with brief writing about what they learned from the sentences.
34. **Town Hall Meeting** – Abdicate the front of the room for a student willing to speak out on a controversial subject, and when she is done with her comment, she selects the next speaker from the hands raised.
35. **The Half Class Lecture** – Divide the class in half and provide reading material to one half. Lecture on that same material to the other half of the class. Then, switch the groups and repeat, ending with a recap by pairing up members of opposite groups.
36. **Tournament** – Divide the class into at least two groups and announce a competition for most points on a practice test. Let them study a topic together and then give that quiz, tallying points. After each round, let them study the next topic before quizzing again. The points should be carried over from round to round. The student impulse for competition will focus their engagement onto the material itself.
37. **Three Part Interview** – Pose the following question to the entire class: "What do you think are the three biggest issues related to _____." Choose the student with the birthday closest to today's date and have them stand and share their 3 responses to the question for one minute. Move clockwise around the room until all have shared.

Student Action: Individual (many of these can be used as partnerwork or groupwork instead; or may escalate to that after some individual effort)

38. **One-Minute Papers** – Students write for one minute on a specific question (which might be generalized to "what was the most important thing you learned today"). Best used at the end of the class session.
39. **Muddiest Point** – Like the Minute Paper, but asks for the "most confusing" point instead. Best used at the end of the class session.
40. **Misconception Check** – Discover class's preconceptions. Useful for starting new chapters.
41. **Drawing for Understanding** – Students illustrate an abstract concept or idea. Comparing drawings around the room can clear up misconceptions.
42. **Turn Taking Reading** – Instead of the instructor reading a paragraph on screen (or leaving silence for students to do it), instruct them we will sit in silence until someone is moved to read ONE sentence, then someone else – anyone – will start the next sentence. Adds "good" tension and raises energy.
43. **Haiku** – Students write a haiku (a three-line poem: 5-syllables, then 7, then 5) on a given topic or concept, and then share it with others.
44. **Board of Artwork** – Post publicly the collected drawings / abstract concepts that students turned in for a previous activity and create an opportunity for discussion and debrief.
45. **Voting Dots** – Provide colored dot stickers to students and ask them to "vote" on statements they agree with the most, by using up their limited dot supply on the pre-written topics displayed around the room on poster boards.
46. **Circle the Questions** – Pre-make a handout that has a few dozen likely student questions (make them specific) on your topic for that day and ask students to circle the ones they don't know the answers to, then turn in the paper.
47. **Ask the Winner** – Ask students to silently solve a problem on the board. After revealing the answer, instruct those who got it right to raise their hands (and keep them raised); then, all other students are to talk to someone with a raised hand to better understand the question and how to solve it next time.
48. **What's the Principle** – After recognizing the problem, students assess what principle to apply in order to solve it. Helps focus on problem TYPES rather than individual specific problems. Principle(s) should be listed out.
49. **Infographic** – Students use online services (visual.ly, infogr.am) to create an infographic that combines flowchart logic and visual presentation
50. **Bookmark Notes** - Distribute full-length paper to be used as a bookmark for the current chapter. On it, record prompts and other "reading questions", and require students to record their notes, observations, and objections while reading onto these bookmarks for collection and discussion in class.
51. **True or False?** – Distribute index cards (one to each student) on which is written a statement. Half of the cards will contain statements that are true, half false. Students decide if theirs is one of the true statements or not, using whatever means they desire. Variation: designate half the room a space for those who think their statements are true, and the other half for false.
52. **"Real-World"** – Have students discuss in class how a topic or concept relates to a real-world application or product. Then have students write about this topic for homework. Variation: ask them to record their answer on index cards.
53. **Concept Mapping** – Students write keywords onto sticky notes and then organize them into a flowchart. Could be less structured: students simply draw the connections they make between concepts.
54. **Advice Letter** – Students write a letter of advice to future students on how to be successful students in that course.
55. **Tabloid Titles** – Ask students to write a tabloid-style headline that would illustrate the concept currently being discussed. Share and choose the best.
56. **Bumper Stickers** – Ask students to write a slogan-like bumper sticker to illustrate a particular concept from lecture. Variation: can be used to ask them to sum up the entire course in one sentence.
57. **One-Sentence Summary** – Summarize the topic into one sentence that incorporates all of who/what/when/where/why/how creatively.

58. **Directed Paraphrasing** – Students asked to paraphrase part of a lesson for a specific audience (and a specific purpose).
59. **Word Journal** – First, summarize the entire topic on paper with a single word. Then use a paragraph to explain your word choice.
60. **Truth Statements** – Either to introduce a topic or check comprehension, ask individuals to list out "It is true that…" statements on the topic being discussed. The ensuing discussion might illustrate how ambiguous knowledge is sometimes.
61. **Objective Check** – Students write a brief essay in which they evaluate to what extent their work fulfills an assignment's objectives.
62. **Opposites** – Instructor lists out one or more concepts, for which students must come up with an antonym, and then defend their choice.
63. **Student Storytelling** – Students are given assignments that make use of a given concept in relation to something that seems personally relevant (such as requiring the topic to be someone in their family).
64. **Application to Major** – During last 15 minutes of class, ask students to write a short article about how the point applies to their major.
65. **Pro and Con Grid** – Students list out the pros and cons for a given subject.
66. **Harvesting** – After an experience/activity in class, ask students to reflect on "what" they learned, "so what" (why is it important and what are the implications), and "now what" (how to apply it or do things differently).
67. **Chain Notes** – Instructor pre-distributes index cards and passes around an envelope, on which is written a question relating to the learning environment (i.e., are the group discussions useful?) Students write a very brief answer, drop in their own card, and pass the envelope to the next student.
68. **Focused Autobiographical Sketches** – Focuses on a single successful learning experience, one relevant to the current course.
69. **Course-Related Self-Confidence Surveys** – Simple questions that measure how self-confident students are when it comes to a specific skill. Once they become aware they can do it, they focus on it more.
70. **Profiles of Admirable Individuals** – Students write a brief profile of an individual in a field related to the course. Students assess their own values and learn best practices for this field.
71. **Memory Matrix** – Identify a key taxonomy and then design a grid that represents those interrelationships. Keep it simple at first. Avoid trivial or ambiguous relationships, which tend to backfire by focusing students on superficial kinds of learning. Although probably most useful in introductory courses, this technique can also be used to help develop basic study skills for students who plan to continue in the field
72. **Categorizing Grid** – Hand out rectangles divided into cells and a jumbled listing of terms that need to be categorized by row and column.
73. **Defining Features Matrix** – Hand out a simple table where students decide if a defining feature is PRESENT or ABSENT. For instance, they might have to read through several descriptions of theories and decide if each refers to behaviorist or constructivist models of learning.
74. **What/How/Why Outlines** – Write brief notes answering the what / how / why questions when analyzing a message or text.
75. **Approximate Analogies** – Students provide the second half of an analogy (A is to B as X is to Y).
76. **Problem Recognition Tasks** – Offer case studies with different types of problems and ask students to identify the TYPE of problem (which is different from solving it)
77. **Switch it up**! – Ask students to work on one problem for a few minutes and intentionally move to a second problem without debriefing the first one, then solve the second one and only then return to the first one for more work. A carefully chosen second problem can shed light on the first problem, but this also works well if the problems are not directly related to each other.
78. **Reading Rating Sheets** – Students fill out a ratings sheet on the course readings, on how clear, useful, and interesting it was.
79. **Assignment Assessments** – Students give feedback on their homework assignments, and evaluate them as learning tools.

80. **Exam Evaluations** – Students explain what they are learning from exams, and evaluate the fairness, usefulness, and quality of tests.
81. **Group-Work Evaluations** – Questionnaires asking how effective groupwork has been in the class.
82. **Teacher-Designed Feedback Forms** – Rather than use standardized evaluation forms, teachers create ones tailored for their needs and their classes. Especially useful midway through the term.
83. **Writing Fables** – Students write an animal fable (or at least sketch its outline) that will lead to a one-sentence moral matching the current concept discussed in class. May be done verbally instead.

Student Action: Pairs

84. **Think-Pair-Share** – Students share and compare possible answers to a question with a partner before addressing the larger class.
85. **Pair-Share-Repeat** – After a pair-share experience, ask students to find a new partner and debrief the wisdom of the *old* partnership to this *new* partner.
86. **Wisdom of Another** – After any individual brainstorm or creative activity, partner students up to share their results. Then, call for volunteers of students who found their partner's work to be interesting or exemplary. Students are sometimes more willing to share in plenary the work of fellow students than their own work.
87. **Forced Debate** – Students debate in pairs, but must defend the opposite side of their personal opinion. Variation: half the class take one position, half the other. They line up and face each other. Each student may only speak once, so that all students on both sides can engage the issue.
88. **Optimist/Pessimist** – In pairs, students take opposite emotional sides of a conversation. This technique can be applied to case studies and problem solving as well.
89. **Teacher and Student** - Individually brainstorm the main points of the last homework, then assign roles of teacher and student to pairs. The teacher's job is to sketch the main points, while the student's job is to cross off points on his list as they are mentioned, but come up with 2-3 ones missed by the teacher.
90. **Peer Review Writing Task** – To assist students with a writing assignments, encourage them to exchange drafts with a partner. The partner reads the essay and writes a three-paragraph response: the first paragraph outlines the strengths of the essay, the second paragraph discusses the essay's problems, and the third paragraph is a description of what the partner would focus on in revision, if it were her essay.
91. **Invented Dialogues** – Students weave together real quotes from primary sources, or invent ones to fit the speaker and context.
92. **My Christmas Gift** – Students mentally select one of their recent gifts as related to or emblematic of a concept given in class, and must tell their partners how this gift relates to the concept. The one with a closer connection wins.
93. **Psychoanalysis** – Students get into pairs and interview one another about a recent learning unit. The focus, however, is upon analysis of the material rather than rote memorization. Sample Interview Questions: Can you describe to me the topic that you would like to analyze today? What were your attitudes/beliefs before this topic? How did your attitudes/beliefs change after learning about this topic? How will/have your actions/decisions altered based on your learning of this topic? How have your perceptions of others/events changed?
94. **Get One, Give One** – Students fold a piece of paper in half and write "Give One" on one side and "Get One" on the other side. On the "Give One" side, as them to write four insights from today's material. Have them stand up and find a partner. Each student shares one idea from their "Give One" side of the paper and writes down one idea on the "Get One" side of the paper. Find a new partner until your "Get One" side of paper is full of new ideas!
95. **Comparing Notes** – At regular intervals in the lecture, allow students to share and compare notes to review and reinforce understanding.

Student Action: Groups (or done as "rows" in the lecture hall?)

96. **Board Rotation** – Assign groups of students to each of the boards you have set up in the room (four or more works best), and assign one topic/question per board. After each group writes an answer, they rotate to the next board and write their answer below the first, and so on around the room. Variation: pass around flipchart paper with the same task.

97. **Pass the Problem** – Divide students into groups. Give the first group a case or a problem and ask them to identify (and write down) the first step in solving the problem or analyzing the case (3 minutes). Pass the problem on to the next group and have them identify the next step. Continue until all groups have contributed.

98. **Pick the Winner** – Divide the class into groups and have all groups work on the same problem and record an answer/strategy on paper. Then, ask groups to switch with a nearby group, and evaluate *their* answer. After a few minutes, allow each set of groups to merge and ask them to select the better answer from the two choices, which will be presented to the class as a whole.

99. **Layered Cake Discussion** - Every group works on the same task for a few minutes, then there's a plenary debrief for the whole class, and finally repeat with a new topic to be discussed in the groups.

100. **Student Learning Communities** – Like faculty learning communities, these communities of practice are meant to invest the participants with ownership and a focus on sharing and joint discovery. Can be structured or unstructured.

101. **Lecture Reaction** – Divide the class into four groups after a lecture: questioners (must ask two questions related to the material), example givers (provide applications), divergent thinkers (must disagree with some points of the lecture), and agreers (explain which points they agreed with or found helpful). After discussion, brief the whole class.

102. **Movie Application** – In groups, students discuss examples of movies that made use of a concept or event discussed in class, trying to identify at least one way the movie-makers got it right, and one way they got it wrong.

103. **Student Pictures** – Ask students to bring their own pictures from home to illustrate a specific concept to their working groups.

104. **Definitions and Applications** – In groups, students provide definitions, associations, and applications of concepts discussed in lecture.

105. **TV Commercial** – In groups, students create a 30-second TV commercial for the subject currently being discussed in class. Variation: ask them to act out their commercials.

106. **Blender** – Students silently write a definition or brainstorm an idea for several minutes on paper. Then they form into groups, and two of them read their ideas and integrate elements from each. A third student reads his, and again integration occurs with the previous two, until finally everyone in the group has been integrated (or has attempted integration).

107. **Human Tableau or Class Modeling** – Groups create living scenes (also of inanimate objects) which relate to the classroom concepts or discussions.

108. **Build From Restricted Components** – Provide limited resources (or a discrete list of ideas that must be used) and either literally or figuratively dump them on the table, asking students in groups to construct a solution using only these things (note: may be familiar from the *Apollo 13* movie). If possible, provide red herrings, and ask students to construct a solution using the minimum amount of items possible.

109. **Ranking Alternatives** – Teacher gives a situation, everyone thinks up as many alternative courses of action (or explanations of the situation) as possible. Compile list. In groups, now rank them by preference.

110. **Simulation** – Place the class into a long-term simulation (like as a business) to enable Problem-Based Learning (PBL).

111. **Imaginary Show and Tell** – Students pretend they have brought an object relevant to current discussion, and "display" it to the class while talking about its properties.

112. **Six Degrees of "RNA Transcription Errors"** – Like the parlor game "Six Degrees of Kevin Bacon" (in which actors are linked by joint projects), you provide groups with a conceptual start point and challenge them to leap to a given concept in six moves or fewer. One student judge in each group determines if each leap is fair and records the nature of the leaps for reporting back to the class.

113. **Sticky Note Discussions** – Divide students into cooperative groups and have them read individually. Ask them to use sticky notes to mark places that they want to talk about in the text. Then direct them to reread as a group and discuss the parts they have marked.

Clickers, Student Responses, and Alternatives

114. **Handheld Clicker** – External vendors provide hardware (receivers) to faculty for free, and students buy a handheld device (usually $20) and maybe also online access by semester. Vendors include iClicker, CPS, and Turningpoint
115. **Cloud-Based Clicker Alternatives** – External vendors that use a website to track student input data using their own devices (laptop, smartphone, etc) and the campus wi-fi. Vendors charge students per semester (usually $20); there is no hardware for faculty members. Examples include LearningAnalytics, Top Hat Monocle, and Via Response.
116. **Social Media Backchannel** – Use Facebook (page) or Twitter (#hashtag) to let students in large lecture communicate with each other on your content even while in the lecture directly.
117. **PollEverywhere** – Cloud-based clicker alternative that uses cell phone texting (SMS) for student responses. Business model calls for faculty-centered payment by user, but the free option suffices for anonymous polling of up to 35 students.
118. **Hand Held Response Cards** – Distribute (or ask students to create) standardized cards that can be held aloft as visual responses to instructor questions. Example: hand-write a giant letter on each card to use in multiple choice questions.
119. **Color Boards** – Students are issued (or create their own) a set of four paper-sized cards. These can be used to vote on questions raised in class by lifting the appropriate board into the air. Optionally, the back of each card should be white so students do not see what others have answered.
120. **Fingers on Chest** – Students vote on multiple choice questions by showing a finger count (1 through 4). Rather than raise them into the air, they hold their fingers across their chests so other students don't see what the majority is voting.

Games

121. **Crossword Puzzle** – Create a crossword puzzle as a handout for students to review terms, definitions, or concepts before a test. Some online websites will automate the puzzle creation.
122. **Jeopardy** – Play jeopardy like the TV show with your students. Requires a fair amount of preparation. Can be used also for icebreakers (such as finding out what participants already know about your subject, your university, etc).
123. **Pictionary** – For important concepts and especially terms, have students play pictionary: one draws images only, the rest must guess the term.
124. **Super-Password** – Also for concepts and terms; one student tries to get his partner to say the key term by circumlocution, and cannot say any of the "forbidden words" on a card prepared ahead of time.
125. **Guess the Password** – The instructor reveals a list of words (esp. nouns) one at a time and at each point, ask students to guess what key term they are related to. The hints become increasingly specific to make the answer more clear.
126. **Twenty Questions** – Assign a person, theory, concept, event, etc to individual students and have the partner ask yes/no questions to guess what the concept is. Also works on a plenary level, with one student fielding the questions from the whole class.
127. **Hollywood Squares** – Choose students to sit as "celebrities" at the front of the class. Variation: allow the celebrities to use books and notes in deciding how to help the contestants.
128. **Scrabble** – Use the chapter (or course) title as the pool of letters from which to make words (e.g., mitochondrialdna) and allow teams to brainstorm as many words as possible from that list, but all words must be relevant to this test. Variation: actually play scrabble on boards afterward.
129. **Who am I**? - Tape a term or name on the back of each student, out of view. Each student then wanders about the room, posing yes/no questions to the other students in an effort to guess the term on his own back.

130. **Ticket out the Door** – At the end of class, ask students to summarize the lecture today, or provide one new personal significant learning outcome (in 3-5 sentences), and give their response to the professor for their ticket out of the door.

Student Questions

131. **Student Questions (Index Cards)** – At the start of the semester, pass out index cards and ask each student to write a question about the class and your expectations. The cards rotate through the room, with each student adding a check-mark if they agree this question is important for them. The teacher learns what the class is most anxious about.
132. **Questions as Homework** – Students write questions before class on 3x5 cards: "What I really wanted to know about mitochondrial DNA but was afraid to ask…"
133. **Student-Generated Test Questions** – Students create likely exam questions and model the answers. Variation: same activity, but with students in teams, taking each others' quizzes.
134. **Minute Paper Shuffle** – Ask students to write a relevant question about the material, using no more than a minute, and collect them all. Shuffle and re-distribute, asking each student to answer his new question. Can be continued a second or third round with the same questions.

Role-Play

135. **Role-Playing** – Assign roles for a concept, students research their parts at home, and they act it out in class. Observers critique and ask questions.
136. **Role Reversal** – Teacher role-plays as the student, asking questions about the content. The students are collectively the teacher, and must answer the questions. Works well as test review/prep.
137. **Jury Trial**. Divide the class into various roles (including witnesses, jury, judge, lawyers, defendant, prosecution, audience) to deliberate on a controversial subject.
138. **Press Conference** – Ask students to role-play as investigative reporters asking questions of you, the expert on the topic. They should seek a point of contradiction or inadequate evidence, hounding you in the process with follow-up questions to all your replies.
139. **Press Conference (Guest Speaker)** – Invite a guest speaker and run the class like a press conference, with a few prepared remarks and then fielding questions from the audience.
140. **Analytic Memo** – Write a one-page analysis of an issue, roleplaying as an employer or client.

Student Presentations

141. **Fishbowl** – A student unpacks her ideas and thoughts on a topic in front of others, who take notes and then write a response. Avoid asking questions.
142. **Impromptu Speeches** – Students generate keywords, drop them into a hat, and self-choose presenters to speak for 30 seconds on each topic.
143. **Anonymous Peer Feedback** – For student presentations or group projects, encourage frank feedback from the observing students by asking them to rip up a page into quarters and dedicating comments to each presenter. Multiple variations are possible in "forcing" particular types of comments (i.e., require two compliments and two instances of constructive feedback). Then, ask students to create a pile of comments for Student X, another pile for Student Y, and so on.

Brainstorming

144. **Round Robin** – Have groups silently list top 3 answers to a problem/question. Allow all groups to present one idea in a round robin format until all groups have exhausted their lists. Scribe all answers and then discuss how to reduce/re-categorize answers. Have groups vote on top three, provide results, discuss, and vote again.
145. **Brainstorming on the Board** – Students call out concepts and terms related to a topic about to be introduced; the instructor writes them on the board. If possible, group them into categories as you record the responses. Works to gauge pre-existing knowledge and focus attention on the subject.

146. **<u>Brainstorming Tree</u>** – While brainstorming on the board, circle the major concepts and perform sub-brainstorms on those specific words; the result will look like a tree blooming outward.
147. **<u>Brainstorming in a Circle</u>** – Group students to discuss an issue together, and then spend a few minutes jotting down individual notes. One person starts a brainstorming list and passes it to the student to the right, who then adds to the list and passes it along again.
148. **<u>Chalk Talk</u>** – Ask students to go to multiple boards around the room to brainstorm answers to a prompt/assignment, but disallow all talking. Can also be done in groups.