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ACTIVE LEARNING

Northeastern University
Center for Advancing Teaching and Learning Through Research

Active Learning Techniques for Deep Learning

DOING SOMETHING with course material is essential for learning and the "visible thinking" it produces can give the instructor valuable feedback on student progress.

There are many ways to introduce active learning in your class--different techniques are effective for different purposes, can be used by individuals or groups, and require different levels of preparation.

Here is an overview of several popular active learning techniques, followed by descriptions of how they can work with and without the use of technology.

OVERVIEW OF TECHNIQUES:

	TECHNIQUE	GOOD FOR:	FORMAT	PREP TIME
1	"Warm Calling"	• Thoughtful Q&A	Individuals	Low
2	Think-Pair-Share	• Thoughtful Q&A • Peer instruction	Individuals + Groups	Low
3	Visible Quiz	• Thoughtful Q&A • Comprehension check	Individuals + Groups	Low
4	Concept Maps	• Comprehension check • Peer instruction	Individuals + Groups	Low
5	Informal Writing	• Comprehension check • Peer instruction	Individuals + Groups	Low
6	Gallery Walk	• Comprehension check • Peer instruction	Individuals + Groups	Medium
7	Jigsaw	• Self-directed learning • Peer instruction	Groups	Medium
8	Debates	• Self-directed learning • Peer instruction	Groups	Medium
9	Team Based Learning	• Student accountability • "Flipping" the class	Groups	High

ACTIVE *QUESTION & ANSWER* APPROACHES

1. WARM-CALLING (as opposed to "cold calling") – Before the class is asked a question, the teacher tells them "I'm going to give you all a minute to think about it, then I'm going to call on someone." *This prompts everyone do the thinking necessary to prepare a response.*

2. THINK-PAIR-SHARE – Students are given a moment to think or write about something before being asked to confer with other students and compare their thoughts before all-class discussion. *This enables cognitive rehearsal and peer-instruction.*

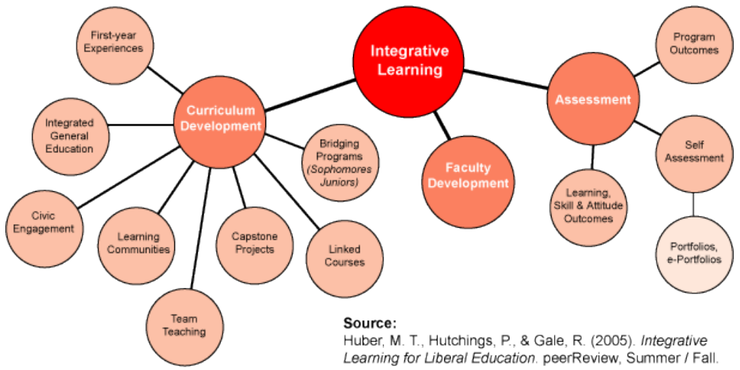
3. VISIBLE QUIZ – Students are given a multiple-choice question upon which they must answer individually or in groups. At reporting time, they hold up lettered cards indicating their answer. *This allows discussion across individuals and groups to compare their thinking.*

CLASSROOM RESPONSE SYSTEMS (sometimes called "clickers") can be used to facilitate active Q&A by allowing anonymous individual responses. This anonymity allows for broader student participation and therefore gives the instructor a better understanding of student comprehension.

SOCIAL MEDIA can be used to generate and display an ongoing "backchannel" (a secondary forum for the exchange of ideas and questions during class; particularly in large classes) to provide another means for students to ask (and answer) questions during class. Students are provided the opportunity to pose questions online during class that can be addressed during a time devoted to questions. Some forum software (like Piazza) give a class the ability to both create and rank order questions, raising to the surface topics that are confusing and need clarification. This provides the opportunity for students to ask questions in "public" situations where they might not otherwise do so.

ACTIVE LEARNING OUTPUTS

4. CONCEPT MAPS – Students work on paper, flip-charts, or the board—individually or in groups—to visually depict important elements and relationships in material being covered. This prompts reflection, explicit focus on conceptual relationships, and is a very efficient learning diagnostic for the instructor. *Websites like Bubbl.Us allow students to create and share concept maps both in and out of class.*



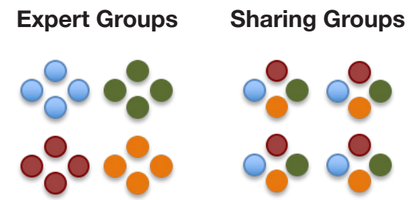
Source:
Huber, M. T., Hutchings, P., & Gale, R. (2005). *Integrative Learning for Liberal Education*. peerReview, Summer / Fall.

5. INFORMAL WRITING – Beginning class with students writing a few "observations" from the reading can prime the pump for thoughtful discussion. Likewise, concluding class with students writing a "one minute paper" in response to a prompt (e.g., "What was the most important thing discussed today and what is still the most unclear to you?") stimulates student reflection and is a very efficient learning diagnostic for the instructor. *Blogs and wikis can be used for informal writing both in and out of class, as can a quick Google Form.*

6. GALLERY WALK – Students or groups produce something on a large piece of flip-chart paper, e.g.: a short piece of writing, chemical chain, or diagram of a bridge or set of relationships. Students review others' work, putting "sticky notes" where they want to engage in discussion. *This enables peer review and engagement. Websites such as Prezi.com allow for co-creating presentations in class and sharing them in a "virtual gallery walk."*

ACTIVE LEARNING GROUPS

7. JIGSAW – Students belongs to two groups: an expert group and a sharing group. Expert groups are each assigned different materials to prepare. In class, expert groups convene to calibrate, then they adjourn into sharing groups comprised of one member from each expert group. Every expert must share what they know in order for the group to make a decision or complete a task. *This activity enables students to fluidly move between the roles of expert and learner.*

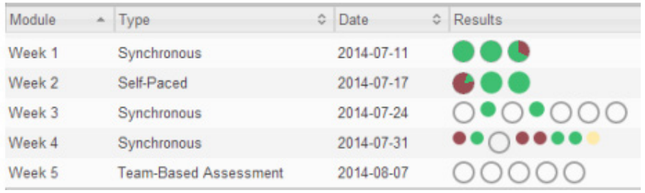


8. DEBATES – Students are assigned topics and sides to research and debate in front of the class. For additional critical thinking, after the first debate the teacher can require students to switch sides and argue counter to their original position. *Debates are an excellent way to promote perspective-taking in students in which they have to prepare arguments in a way that takes into consideration potential rebuttals from their opponents.*

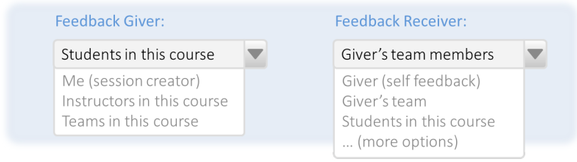
9. TEAM-BASED LEARNING – Students are strategically organized into permanent teams, and each unit begins with a quiz over preparation materials (e.g., readings or videos). Students first take the quiz on their own and then again as a team, coming to consensus on team answers and getting immediate performance feedback on the team quiz. *This sequence quickly builds trust and cohesiveness within the team, motivating students to prepare well outside of class, as they know they will be accountable to their team mates.*

Subsequent lecture is explanatory rather than didactic, and most class time is spent on carefully-designed application activities that apply material students acquired outside of class. Students occasionally give each other peer-evaluation feedback on one-another's preparation and contribution to team efforts. *Overall, this method creates a situation in which students' social and intellectual experience of the course are interlocked and amplified.*

Group Learning Facilitation Systems – Far beyond "clickers," a few systems exist to robustly support structured active learning in groups. Platforms like **Learning Catalytics** can pinpoint student misconceptions in real time and facilitate both the individual and team phases of team-based learning many different types of questions (not just multiple choice).



Module	Type	Date	Results
Week 1	Synchronous	2014-07-11	
Week 2	Self-Paced	2014-07-17	
Week 3	Synchronous	2014-07-24	
Week 4	Synchronous	2014-07-31	
Week 5	Team-Based Assessment	2014-08-07	



Furthermore, online systems like **TEAMMATES** make student peer-evaluation fast and efficient, enabling students to learn about their own performance from each other in ways that may never be able to learn from the instructor.