



My class is too big to actively engage students ... all I can do is lecture

Higher education has traditionally focused on providing instruction, but in the 21st century, the paradigm has shifted toward producing learning. Compared to passively receiving lectures, active engagement of students promotes deeper learning and more long-term retention, enhances critical-thinking skills, provides feedback to students and instructors, and promotes social and emotional development. Hake (1998) showed that active learning in physics caused greater gains in learning than lecture. In fact the lowest gains from active learning courses were still superior to those of the best lecture courses.

We may think that our classes are too large to accommodate active learning. The reality is that active-learning strategies can be used in any classroom setting or size. One way to

make your large class more engaging is to shrink it by using small group activities.

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Informal Small-Group Learning

The typical student’s attention span is 15 minutes or less. If you lecture for long stretches of time, students will lose focus. One way to regain focus is to incorporate informal small-group activities or classroom assessment techniques such as the following.

Write/Think – Pair – Share

Pose a question or problem for students to contemplate individually for 30 seconds to a couple of minutes. Then have pairs of students share and compare their answers. After a minute or two of discussion, several students or pairs are asked to share their answers with the class. See a demonstration of this technique at www.pharmacy.unc.edu/ceep.

Quick Thinks

Ask students to do something with factual information or concepts introduced in the lecture, such as ordering a set of randomly sequenced steps, paraphrasing ideas, supporting or challenging a statement made by faculty or other students in class, correcting errors in an incorrect statement or

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How do I know if my students have learned? Basics of assessment

“*Test questions did not seem to reflect the information taught. I felt like I knew enough going into the exams, then there would be questions I did not even remember seeing information about in the notes.*”

You may have seen a comment like this on a course evaluation. A primary purpose of assessment is to communicate your views of what is important to your students. Examinations can be a powerful motivator, and students will learn what they believe you value. Because of this powerful influence on student learning, it is important to develop tests that promote your educational goals. Exam content should match course objectives and instructional emphasis, with important topics and key concepts weighted more heavily than minor topics. If your course format emphasizes acquisition of knowledge

(i.e. is lecture heavy without incorporating opportunities to apply learning), then your assessments should emphasize knowledge acquisition rather than application.

Assessment can be categorized as formative or summative and as traditional or authentic. There are numerous assessment techniques within each classification, each having its own advantages and disadvantages.

Formative assessments include informal (usually nongraded) opportunities for

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Why don't students read before class?

Lecturing can efficiently impart knowledge. So can reading. As McKeachie states, “We do not need to lecture when concepts are available in printed form at an appropriate level for our students.” Class time can be better used to help them develop thinking, communication, teamwork, and lifelong learning skills. The challenge is getting students to come to class with the foundational knowledge needed to develop these other skills.

Tip 1. Not every course is well served by requiring a textbook.

Consider not requiring a textbook if no available text offers a good fit with the course or if multiple texts would be required to address all course content. Instead, consider custom

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Important Dates

- Dec 6 - 12: Final exams
- Jan 5 '09: Last day for course proposal/changes for Fall
- Jan 5: Classes begin
- Jan 19: Martin Luther King holiday
- Mar 9 - 13: Spring Break begins

More important dates can be found on the faculty Blackboard page

The Teaching Professor CONFERENCE

June 5-7, 2009 Washington, D.C.

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Goldsboro, NC

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publishing options to create a tailored course reading packet. While this may require additional effort and time, a set of focused, relevant readings will enable students to better prepare for classroom learning.

Tip 2. Less is more.

A triaged reading list of a few, carefully chosen selections or concise readings will enhance the probability that students will read and grasp key concepts. Remember, students are real people too with obligations outside of your classroom and finite time. On average, it takes two to three minutes to read a page of text for comprehension. A 30 page chapter requires 60 to 90 minutes versus less than 10 minutes for a two or three page synopsis. Is it important for student to read entire chapters, or can you direct them to specific pages or passages to prepare them for class?

Tip 3: Choose materials that are appropriate for your students.

Look for or create materials with a structure and language that clearly focuses student's attention on key information. If students view assignments as poorly written, badly organized, or beyond their cognitive reach, they will likely become frustrated and conclude—rightly so—that reading is not an optimal use of their limited study time. Students may have trouble comprehending assigned readings due to unfamiliarity with the discipline and its language, poorly written or structured materials, lack of clarity in the goal of the reading assignment, or some combination of these. While instructors (because of



years of practice and content expertise), are able to differentiate key concepts from less important information, students who are novices to the field of study often can't make that distinction.

Tip 4. Explain the relevance of reading assignments.

Students are more likely to read when they know what's in it for them. An explanation is important to novices because they may not be adept at making inferential connections between seemingly dissimilar or loosely related items.

Tip 5. Guide student's reading so they know where to focus attention.

Students are more likely to read when they know what they need to extract from the reading. Study questions and short writing assignments can focus students' attention. Study questions aimed at key points in the reading can increase the numbers of students who read and successfully learn from course material. Writing assignments asking students to explore links between assigned reading and the topics addressed in class helps place the reading in context. Requiring students to turn these in to be reviewed or

graded may further encourage students to read. However, students shouldn't do worse in the course for having read and answered study questions!

Tip 6. Use class time.

Allow time during class for students to review material that is high priority, particularly if that material will form the core of the class presentation or activities that follow. Most students can read about twice as fast as you can speak so a 30-minute lecture can be read in about 15 minutes.

Tip 7. Assess compliance.

Testing students on material contained in assigned reading is one strategy to increase student compliance with course reading. Failure to monitor reading compliance sends a message to students that this aspect of learning is optional and of little concern to the instructor. Keep in mind that not all assignments have to be graded.

Tip 8. Use class time for discussion or application of knowledge.

One of the main reasons students do not read is because they know you will cover the material in class. If class time is used to discuss or apply what students read, then students will have to read to keep up. Not being lost or embarrassed in class can be a very good motivator to complete reading.

The preceding was adapted from the Educational Discussion Forum.

For more information:

- McKeachie, WJ. (1999) Teaching Tips
- www.theideacenter.org/IDEAPapers

Assessment *from PAGE 1*

students and faculty to see how student learning is progressing. The results of formative assessment and feedback are used to modify and validate instruction and facilitate deep learning. Examples of formative assessment include reviews, homework, classroom or laboratory observations, quizzes using audience response systems, or other forms of classroom assessment techniques discussed briefly in “My class is too big to engaged students.”

Feedback from formative assessment helps students improve their learning and helps instructors improve their instructional practices. For example, if an instructor sees that some students do not understand a key concept, she or he can design a review activity or use a different strategy to clarify the concept. Likewise, students can monitor their own progress with periodic quizzes and performance tasks.

Summative assessments are typically used to evaluate the effectiveness of instruction at a predetermined time, at the end of course, for example. The goal of summative assessments is to make a judgment of student competency after an instructional phase is complete. Summative evaluations are used to determine if students have mastered specific competencies and to identify instructional areas that need additional attention.

Authentic assessments are used to evaluate students’ capacity to integrate and translate knowledge into real-world practice. Authentic assessments require students to demonstrate meaningful application of essential knowledge and skills under circumstances that closely mimic field conditions. e.g., standardized patient exams such as objective structured clinical exams aka OSCEs.

Traditional Assessments include a variety of formats such as papers and exams. The following are the advantages and disadvantages of common traditional classroom examination formats:

Multiple Choice Questions

Advantage: MCQ method can sample a wide range of knowledge quickly and has the potential for measuring comprehension, application, analysis, and evaluative skills. MCQ

Take-Home Message

1. Student learning depends as much on your assessments as your teaching because your assessments reflect what you view as important.
2. Student assessment should be tied to course objectives and key principles.
3. Assessments should facilitate learning for you and your students
4. Traditional methods such as exams are not effective at measuring all learning goals. Find other approaches that are clearly matched to learning goals.
5. Clearly specify your expectations on any assessment. For example, do you want the student to provide the answer or provide both the answer and the justification?
6. Clearly specify how the assessment will be evaluated at the time it is assigned.

results are easy to mark and analyze, even with large numbers of students. They are also useful for self assessment and screening since feedback can be easily standardized to keyed responses. MCQs have potentially high reliability, validity, and manageability, and feedback to students can be fast.

Disadvantage: They are typically used to assess knowledge only, with a danger of emphasizing trivial knowledge. More complex MCQ formats (e.g K type questions) are not recommended: they are time-consuming to design, unnecessarily confuse students and may not discriminate between knowledge deficit and test confusion. MCQs should not be used for content for which a correct answer may legitimately be disputed. MCQs aimed at the higher levels of knowing require significant time and test-writing skill to construct.

Short Answer

Advantage: Short answer questions have the potential for measuring analysis, application of knowledge, problem-solving and evaluative skills. They are typically easier to design

than complex MCQs. Marking to model answers is relatively fast compared with marking problems or essays but not compared with MCQs. Marking for feedback (i.e. formative assessment) can be relatively fast.

Disadvantage: Designing effective questions for testing higher-order thinking can be complex; more often these types of questions are constructed to test the lower cognitive levels. Scoring and feedback is more time consuming than MCQs. If used too frequently, students get into a learning habit of producing answers the instructor seems to want instead what they believe the answer should be.

Cases

Advantage: These can range from simple vignettes illustrating issues in practice to complex information sets that require analysis and research. They have potential for measuring real-world application of knowledge and principles, analysis, problem-solving, evaluative skills. Short cases are relatively easy to design and mark.

Disadvantage: Design and development of more complex cases and their marking schemes are more challenging and time consuming. Cases require a degree of intellectual and developmental maturity on the part of students when used at any level beyond the single-issue case; thus students need structured practice such as progressing from less open cases to more open ones. A cautionary note: it is important to have appropriate grading criteria when correct or successful answers are contestable or unclear. Assessing the process of solving the case is as important as the final answer. A key difficulty with writing cases is gauging the level of detail. Information that is distracting or not relevant may be legitimate but should be introduced with care.

For more information:

- <http://celt.ust.hk/ideas/afl/MExam/index.html>



weak argument, or selecting a response from an examination-like question.

Minute Paper

Integrate writing into class using this simple method. Ask students to write briefly on questions such as what was the most important thing you learned today, what was the muddiest point in today's session, or what questions remained unanswered. Answers may be collected for review at the end of the class or used as a starting point for the next class.

These informal activities can be used as a lecture break to reset attention or to gain or focus attention at the beginning or end of a class. For more information about these and similar techniques, refer to "Classroom Assessment Techniques" by Angelo and Cross (copies available from Kim DeLoatch and Adam Persky) or www.ntlf.com/html/lib/bib/assess.htm.

Formal Small-Group Learning

Large classes also can be converted into more formal small groups. While informal activities can be used on the fly—such as when students are losing focus—formal activities require planning. Most of these activities use a cooperative-learning format in which no individual can succeed at the task without the cooperation of others in the group. Cooperative learning, illustrated by the following examples, can be powerful learning tools:

Jigsaw

Students are responsible for researching and learning one aspect of the material then teaching it to other group members so everyone has a complete set of information. For example, in a discussion about managing cardiac arrhythmias, each student might become an "expert" on a class of anti-arrhythmic agents before the group meets, then share that information with the group in class.

Case-Based or Problem-Based Learning

We learn through our research because we are trying to solve a problem. In the classroom, learning around a case or problem with each group being responsible for analyzing it and finding solutions leads to deeper learning. In case-based learning, students apply information learned in pre-

Straight From the Literature Corner: Lecture Notes and Student Achievement

Ever wonder if providing lecture notes is useful for students? The answer is yes! Grabe (2005) found that students who had complete lecture notes and did not attend lecture performed the same as those who attended lecture. These results are in line with others (Knight and McKelvie, 1986). Why is this? Learning is about time on task; memorizing facts and concepts is better suited for self-paced efforts where students can repeatedly review the material. In addition, reading is more efficient for most students than lecture. What are the implications? Lecture is an efficient means to transmit factual information but if you plan to lecture, you may just as easily give them a concise reading assignment. What should you do? Instead of lecturing to students, help them apply the basic facts and concepts. One final piece of evidence, Birk and Foster (1998) found that in a lecture predominated course there was no correlation between number of absences and final course grade. The authors' suggest lecturing and learning are not necessarily connected for most students.

- Grabe (2005) Voluntary use of online lecture notes, *Comp Educ* 44(4): 409-421
- Knight and McKelvie., Effects of attendance, note-taking, and review on memory for a lecture, *Can J Behav Sci* 18(1): 52-61
- Birk and Foster, (1998) The importance of lecture in general chemistry course performance, *J Chem Educ*, 70(2): 180-182.

vious class sessions or assigned readings to generate solutions for problems that are focused and well-defined. Problem-based (discovery) learning scenarios are generally less clearly defined, and students are responsible for finding the resources and information needed to solve the problem on their own.

The wise teacher must recognize that students bring their own expectations to the large classroom setting. They may expect anonymity. They may be comfortable with passive learning or seek a setting in which they don't have to participate. Students may seek out large classes to avoid group work, attend class less regularly, or expend less effort compared with smaller classes. They may believe that less skill or effort is necessary for success, want to be told specifically what to do, or be unwilling to do work that isn't being graded. Thus, students' *initial* response to active learning may not be positive. Remember to discuss your expectations for the course up front, including teaching, learning, and assessment methods and how to be successful in the course. The good news is that most

students come to expect and appreciate active learning in large courses once they understand the reasons behind it and see the benefits of these activities.

For More Information

- MacGregor et al. (Spring 2000), Strategies for energizing large classes: from small groups to learning communities, *New Directions for Teaching and Learning*, #81
- www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/Coopreport.html
- www.cte.umd.edu/library/teachingLargeClass/guide/index.html
- www.uww.edu/learn/largeclasses.php
- Hake, RR. (1998). Interactive-engagement vs traditional methods, *Am. J. Phys.* 66(1), 64-74; on the Web at <http://www.physics.indiana.edu/~sdi/>

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