

**Active participation in a large
introductory undergraduate
biology course**

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I was an excellent* lecturer in introductory biology—so why change what I was doing?

***Based on student evaluations.**

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1. Comments from upper division instructors.

2. Experiences in office hour.

**What was the cause of
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- 1. Being an excellent lecturer does not necessarily help (teaching versus learning).**
- 2. Lecturing promotes passive learning.**
- 3. Students do not prepare ahead of time or keep up.**

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1. Constructivism.

2. Students teaching students.

3. Faculty time at a research university is limited.

4. Funds are limited.

5. Ability to implement technology is limited.

What is my approach?

- 1. Make the students take responsibility—the reading quiz.**
- 2. Spend the majority of time on in-class group problem solving—focus on working with the material not on memorization (and understand the thinking process).**
- 3. Ensure active participation—the concept quiz.**

**Is the active learning-approach
that I am using a good method?**

Is this a good method?

A. Evaluation of method.

B. The seven principles for good practice in undergraduate education.

- 1. Encourages contact between students and faculty**
- 2. Develops reciprocity and cooperation among students**
- 3. Encourages active learning**
- 4. Gives prompt feedback**
- 5. Emphasizes time on task**
- 6. Communicates high expectations**
- 7. Respects diverse talents and ways of learning**

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If it is so obvious that active learning is a better method, why doesn't everyone use it—what are the obstacles to implementing active learning?

- 1. Lack of experience with active learning—we teach the way we were taught.**
- 2. It takes time to develop a new approach.**
- 3. Breadth versus depth.**
- 4. Large class size.**
- 5. Lack of support from administration.**
- 6. Fixation on technology.**
- 7. Need goals and a method(s) for assessment.**

The single most compelling conclusion from the BIO2010 report is that undergraduate education should foster interdisciplinary and integrative approaches to science. This type of approach will rely on collaborative efforts.

Unfortunately, the entire process of education does not reflect how scientists actually work: Scientists work in groups and success is often a team effort. We look up details in books rather than memorize them. We do experiments to answer unsolved questions rather than repeat previously published work.

Why do we teach using a style that is so different from the way we do research?

Changes in science education:

- 1. Shift of focus from teaching to learning.**
- 2. Movement from passive approaches to active ones.**
- 3. Emphasis on concepts and problem solving rather than on facts and memorization.**
- 4. Foster cooperative learning rather than individual competition.**