ACTIVE LEARNING: HOW TO GET STUDENTS ON BOARD

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Motivation

How do you motivate your students to learn in your class?
Motivation

What was your motivation to learn at university?

OR

What keeps you motivated when you learn something new?
Kinds of motivation

EXTRINSIC driven by external factors, such as rewards or grades

INTRINSIC driven by the individual, such as interest, ownership, and achievability
What kind of motivation are you using (more)?
EVERYONE HAS MOTIVATION; IT IS ABOUT SCULPTING IT.

https://www.physport.org/recommendations/
Moving from extrinsic to intrinsic

You cannot force motivation, but you can influence it

Interest
  • subject, learning, future career

Ownership
  • involvement, decisions, project, project,

Achievability
  • sense one can master the subject
Best use of time: your time, my time, and our time together

These questions are aimed at INTEREST and OWNERSHIP; motivate students with logical arguments to think about their own goals and what they want to achieve in class.
Good Trainer, Bad Trainer

Personal trainers push you
→ out of the comfort zone
→ at your level
→ spread over time

(students set their goal)
Learning is in the doing

Getting better at baseball?
Learning is in the doing

Getting better at playing the piano?
Learning is in the doing

Getting better at physics?
Why study this course?
(using clicker questions)

These questions are aimed at INTEREST and ACHIEVABILITY;
   to motivate students to engage in the course.
Thinking of what you want to get out of your college education and this course, which of the following is most important to you?

A. Acquiring information (facts, principles, concepts)
B. Learning how to use information and knowledge in new situations
C. Developing critical thinking skills for my future career
D. Developing lifelong learning skills

All three of these goals are clearly important. However, let’s think for a moment of how best to accomplish these goals. Learning takes work, both inside and outside of the classroom.

So, which of these do you think you can make headway on outside of class (by doing your own reading and studying)?

A. Acquiring information (facts, principles, concepts)
B. Learning how to use information and knowledge in new situations
C. Developing critical thinking skills for my future career
D. Developing lifelong learning skills
All three of these goals are clearly important. However, let’s think for a moment of how best to accomplish these goals. Learning takes work, both inside and outside of the classroom.

Which of these would be best achieved in class, working with your classmates and me?

A. Acquiring information (facts, principles, concepts)
B. Learning how to use information and knowledge in new situations
C. Developing critical thinking skills for my future career
D. Developing lifelong learning skills

The origins of the lecture

These questions are aimed at OWNERSHIP;
to make students reflect on the best way to deliver lectures.
Why do we have lecture?
Why do we have lecture?
Why do we have lecture?

Is this still the best way to transfer knowledge?

Beth Simon, UCSD
Learning from listening?

How much do students, on average, learn in traditional physics classes (as measured by performance on conceptual survey)?

a) 90% or more of material
b) 75% of material
c) 50% of material
d) 25% of material
e) 10% or less of material

Courtesy Douglas Duncan, and Noah Finkelstien University of Colorado Boulder
Learning from listening?

How much do students, on average, learn in traditional physics classes with an interesting, clear, engaging teacher (as measured by performance on conceptual survey)?

a) 90% or more of material
b) 75% of material
c) 50% of material
d) 25% of material
e) 10% or less of material

Courtesy Douglas Duncan, and Noah Finkelstien University of Colorado Boulder
Which activity best corresponds to what people with real jobs do?

a. Multiple choice exams.
b. CAPA or WebAssign electronic homework.
c. Clicker questions.
d. Working with others in small groups to solve problems that aren’t usually clearly stated.

If you can’t convince someone your right, it’s the same as if you were wrong.
How can we increase our heart rates in class?


Courtesy of Ian Beatty, UNC Greensboro
commonality:
All these slides get the students involved and begin discussions
Ways to generate student participation

• Use student quotes praising PI (including the typical complaints)
• Show research results; how brain works
• Set up an ‘expectation contract’
• Discuss fair grading & accountability
• Discuss how to make this class an open, safe space for learning
• Invite them to challenge themselves
Extrinsic motivation:
So, what about grades?
Student Currency

Student currency = grades
Priorities are made

→ realistic expectations from instructors

(even from your dream job, you still need to earn a living)
Extrinsic: Grades

Sometimes fractions of points can add up to real participation

for JiTT → 0.03 pts/Q.
for clickers → 0.03 pts/Q.
In-class worksheets → NO points

This may lower the need for cheating and break the "Us vs Them" mentality
Best of both worlds

• Discuss with your students their motivation
• Review how you distribute points for learning, effort, and correctness
• Talk to colleagues (and go WATCH) how they teach and interact with students
• Go down the rabbit hole of Physport (I promise, it’s worth it)

https://www.physport.org/recommendations