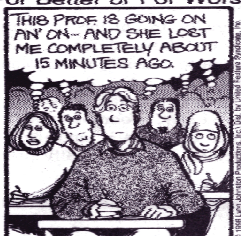


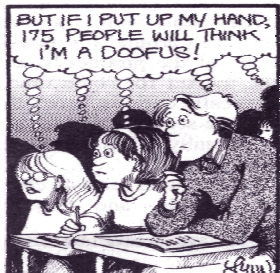
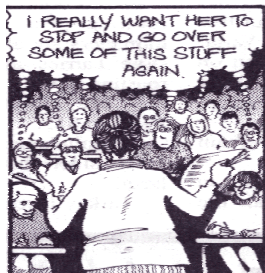
Novel Approaches to Teaching Medical Physics

2017 Education Council Symposium

Vic Montemayor
Germantown Academy

For Better or For Worse





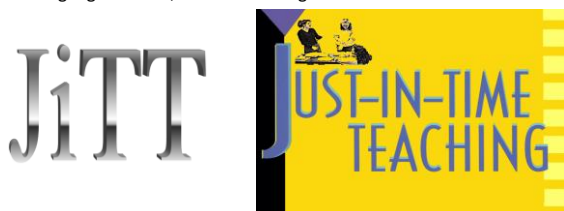
Five Easy Lessons: Strategies for Successful Physics Teaching
by Randall D. Knight (Pearson Education, Inc., 2004)

1. Keep students actively engaged and provide rapid feedback.
2. Focus on phenomena rather than abstractions.
3. Deal explicitly with students' alternative conceptions.
4. Teach and use explicit problem-solving skills and strategies.
5. Write homework and exam problems that go beyond symbol manipulation to engage students in the qualitative and conceptual analysis of physical phenomena.

“During the past decade, data has built up that demonstrates that as physics teachers we fail to make an impact on the way a majority of our students think about the world.”

Edward F. Redish
“The Implications of Cognitive Studies for Teaching Physics”, *AJP*, **62** (1994)

Gregor Novak, IUPUI/USAFA
Andy Gavrin, IUPUI
Evelyn Patterson, USAFA
Wolfgang Christian, Davidson College

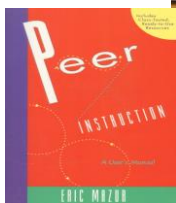


JiTT

- Pre-class reading assignment
- 3-question web submission prior to class (2 on subject, one on what was most interesting or confusing)
- Instructor designs classroom activities according to pre-class feedback
- Web components encourage frequent work on physics in short sessions
- In class students work in groups on active learning assignments



Eric Mazur
Harvard



The Basics of Peer Instruction

- Students are expected to read material before class
- Class begins with brief overview of topics
- Lecture is broken up with **ConcepTests**, brief MC questions that focus on the key topics in the lecture
- Answers to ConcepTest questions provide feedback to instructor

What makes a good CT question?

- Based on common student **misconceptions or difficulties**
- Focus on single concept
- Cannot be solved by simply applying equations
- Clearly and concisely stated
- Not too easy, not too hard

Examples

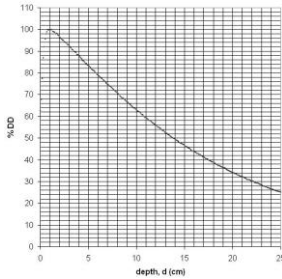
A battleship simultaneously fires two shells at enemy ships. If the shells follow the parabolic trajectories shown, which ship gets hit first?



1. A
2. both at the same time
3. B
4. need more information

Taken from *Peer Instruction* by E. Mazur (p. 110)

An x-ray beam is incident on tissue surface at 100 cm SSD.

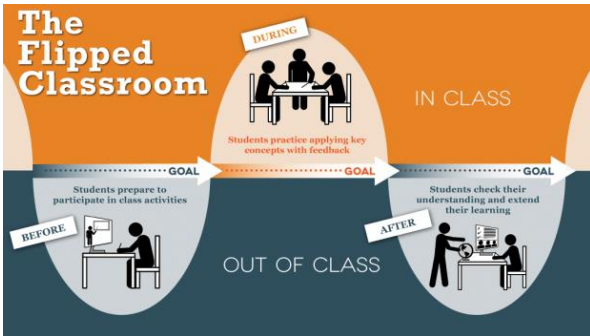


What would happen to the %DD at 15-cm depth if the SSD were increased to 110 cm?

- A. It would increase.
- B. It would decrease.
- C. It would stay the same.
- D. It depends on the x-ray energy.

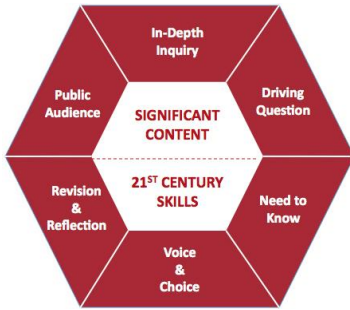
The Flipped Classroom






Project/Problem/Practice-Based Learning (PBL)











AAPM 2008 WORKSHOP
 BECOMING A BETTER TEACHER OF MEDICAL PHYSICS
 SOUTH SHORE HARBOUR RESORT & CONFERENCE CENTER
 LEAGUE CITY, TX
 JULY 31 - AUGUST 3, 2008



Program Information

PROGRAM DESCRIPTION

Objectives: This workshop is designed to help medical physicists become better teachers of physicians, graduate students and technologists. In addition to featuring a number of keynote and plenary speakers, participants will engage in several work sessions designed to learn from one another. The objective of the workshop is that each participant will leave with an action plan he or she has designed to be a better teacher.

52nd Annual Meeting
July 18-22, 2010

 Pennsylvania Convention Center
 Philadelphia, Pennsylvania





2010 AAPM Summer School
Teaching Medical Physics: Innovations in Learning
 Immediately following the AAPM Annual Meeting
 July 22-25, 2010 • University of Pennsylvania • Philadelphia, PA



- General Information
- Program Information
- Registration & Housing Information
- Travel Information
- Social Program
- Scholarships Available
- Contact Us
- Meeting Home

Items of Interest

Welcome!

This 2.5 day program is designed to help medical physicists become better teachers of physicians, graduate students and technologists. In addition to hearing several keynote speakers, participants will engage in work sessions where they will share experiences and learn from one another. Each participant will leave with an action plan he or she has designed to be a better teacher. There will be plenty of opportunity to interact with the Summer School faculty, who have been chosen for their teaching expertise. The Summer School will take place on the historic and scenic University of Pennsylvania campus.





MPESC Wiki

wikifull.aapm.org/index.php/MPESC

Monday, 1:45 PM, Room 201

Innovation in Medical Physics Education Session
