Novel Approaches to Teaching Medical Physics

2017 Education Council Symposium

Vic Montemayor
Germantown Academy
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

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

Objective: The workshop is designed to help medical physicists become better teachers of physicians, graduate students and technologists. In addition to featuring a number of invited 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
Instructor: Alvin H. Levinson, MD, FACR
July 26-29, 2010 • University of Pennsylvania • Philadelphia, PA

Items of Interest

Welcome!
AAPM Annual Meeting
29 JUL – 02 AUG 2018

AAPM Teaching Workshop
26 – 27 JUL 2018

Workshop on Improving the Teaching and Mentoring of Medical Physics

Monday, 1:45 PM, Room 201
Innovation in Medical Physics Education Session

MPESC Wiki
wikifull.aapm.org/index.php/MPESC