Workshop for
New Physics & Astronomy
FACULTY

Nov. 6-9, 2003
College Park, MD
BISWAS & LEE

- ~90 New Faculties
- 9 Plenary Sessions
- 7 Breakout Sessions
- 1 Physics IQ Test
- 8 Meals

* Resources will be collected & posted on our webpage!
J. Stith

> $0 < t \leq 20 \text{ min.}$

Audience listens attentively.

> $20 \leq t \leq 40 \text{ min}$

Starts getting bored.

> $t \geq 40 \text{ min.}$

Falls in sexual fantasy.
INSTRUCTORS $z_i$

STUDENTS $z_s$

REALIZE $z_i \gg z_s$ or $z_i \ll z_s$!

GOAL DELIVERY & RETENTION OF KNOWLEDGE.
WHAT DO DEPARTMENT WANT?
K. HELLER
UMN

ENG.
- BASIC PHY. PRINCIPLES
- QUAL. PROB. SOLVING SKILL
- QUAN. " " "
- APPLY PHYSICS TO NEW...

BIO.
- BASIC PHY. PRINCIPLES
- QUAL. PROB. SOLVING SKILL
- QUAN. PROB. SOLVING SKILL
- OVERCOME MISCON. IN PHYSICAL URL.
- PREPARE MCAT.
WHAT DOES NOT WORK?

- EVERYTHING ELSE!
- STANDARD LECTURES → REINFORCE MEM!
- UNSTRUCTURED DISC.
  - SUPERVISED IND. STUDY
  - SELF STUDY
- AUDIO-TUTORIALS
  - COMP. BASED INSTRUCTION!
  - TV, WEB BASED INSTRUCTION!

WHAT WORKS?

- DISCUSSION
- DEBATES
- GAMES
- COOPERATIVE LEARNING
- ONE-ON-ONE TUTORING

ASSESSMENT!!!

EVALUATION.
Pre-Test $S_i$  \[ G = \frac{S_f - S_i}{100 - S_i} \]  Post-Test $S_f$

**FORCE CONCEPT INVENTORY**

- Revised in 1995
- 30 M.C. Problems
  "Basic Concepts in Newtonian Mech."
- Nationwide
  Pre: 25% - 70%
  Post: 40% - 85%

85% Mastery 60% Understand

Traditional Class: \( G \approx 0.25 \)

Interactive Class: \( 0.36 < G < 0.68 \)
MAIN STREAM

ADVIL
Ibuprophen

"SHAPING INPUT"
"PARTICIPATION"

"PHYS BY INQUIRY"
CONCEPTUAL LEARNING
SELF-CONTAINED LAB-BASED

PROB SOLVING STRATEGY

S-MATCHING "CONCRETING"

"PEER INST.
GROUP DISC. IN CLASS
VERBALIZATION"

JITT
PREPARATION!
FORCE STUD. TO READ BEFORE CLASS.
AND KNOW WHERE THEY ARE.
"GET THEM READY"

TECHNOLOGY
PRS WEB-BASED JITT

ENGAGE STUDENTS IN LEARNING!