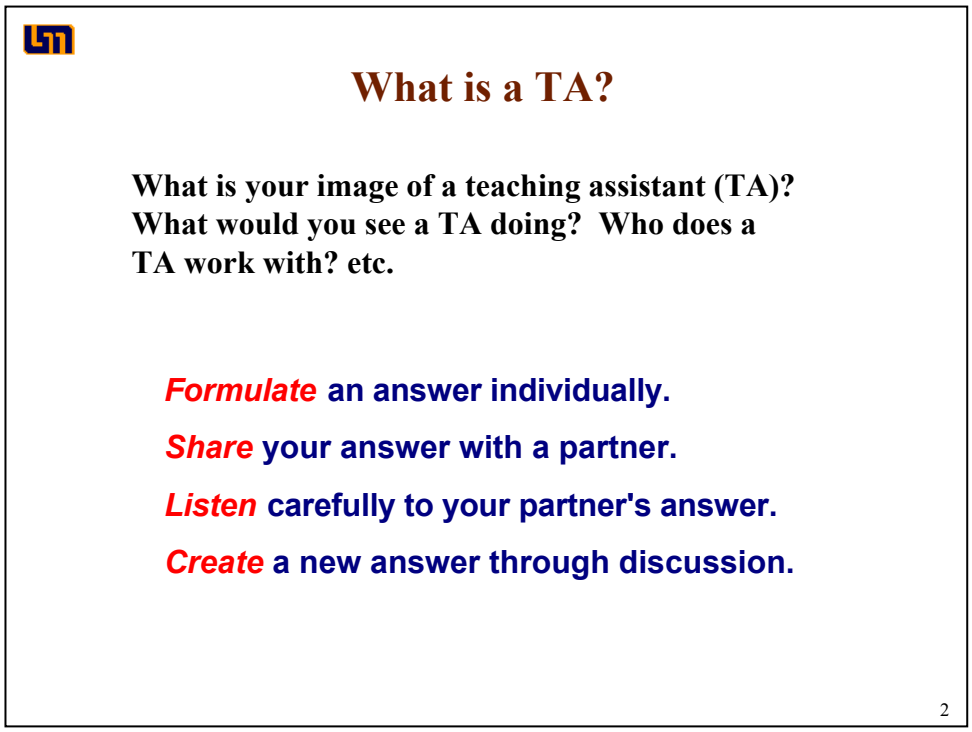

What is a TA?
What is your image of a teaching assistant (TA)? What would you see a TA doing? Who does a TA work with? etc.
Formulate an answer individually.
Share your answer with a partner.
Listen carefully to your partner's answer.
Create a new answer through discussion.
2

Notes: _____

University of Minnesota Model for Teaching Introductory Physics

Research-based Models for Teaching Introductory Courses

Teaching Physics with the Physics Suite by E. Redish

Recitations

- Tutorials in Introductory Physics (University of Washington PER Group)page 146
- Activity Based Tutorials (University of Maryland PER Group) page 152
- Cooperative Problem Solving (University of Mnnesota PER Group) page 158

Labs

- RealTime Physics (Tuffs University)page 164
- Cooperative Problem Solving Labs

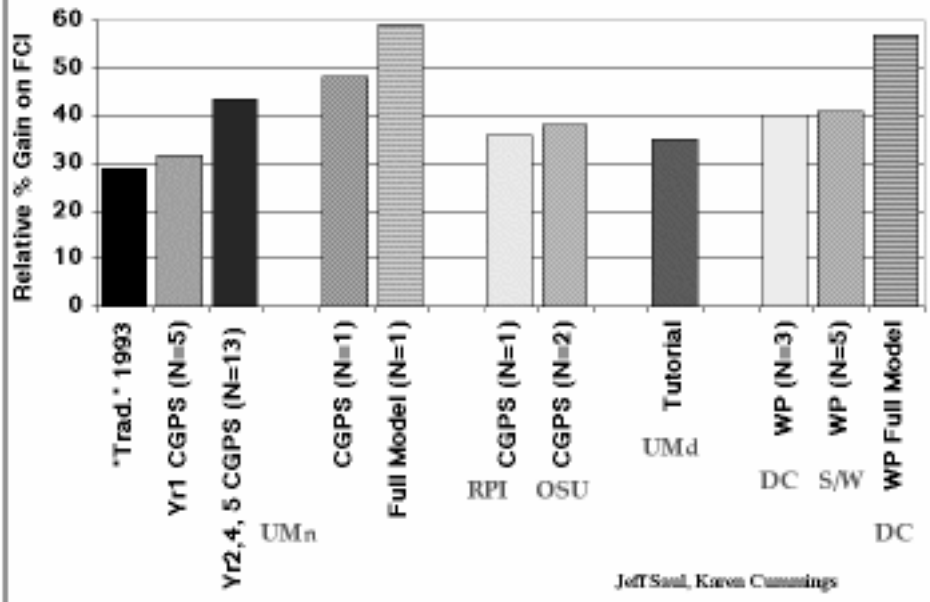
Workshop and Studio Methods

- Workshop Physics (Dickinson College)page 176

All models are effective in improving students' understanding of physics

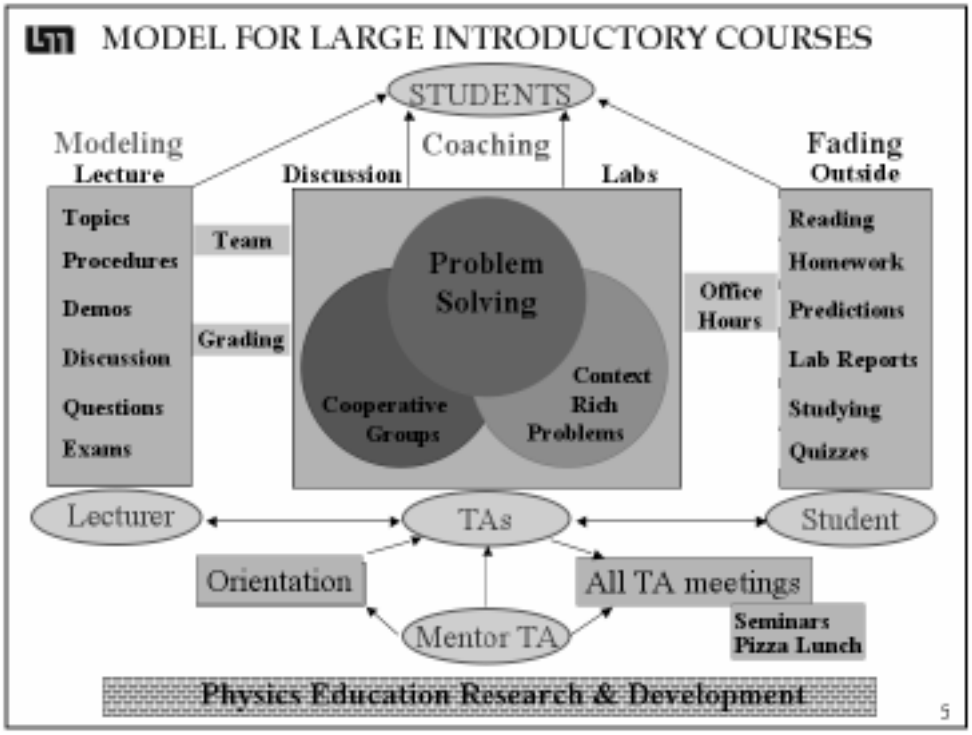
3

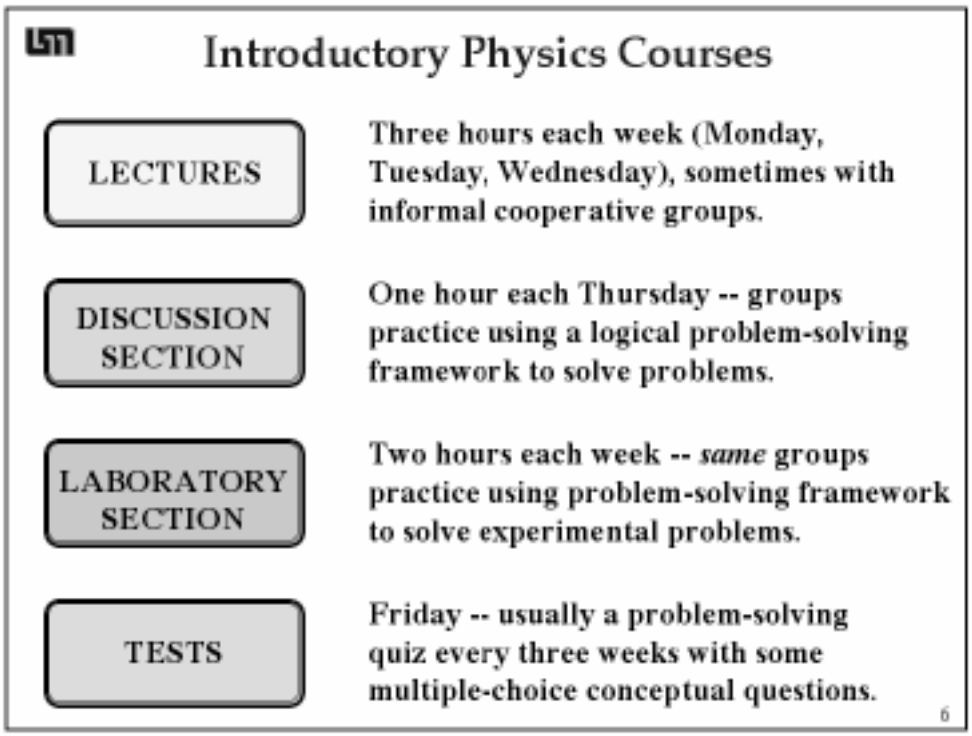
Comparisons of Full and Partial Models



Jeff Saul, Karen Cummings

4


MODEL FOR LARGE INTRODUCTORY COURSES
STUDENTS
Modeling
Lecture
Coaching
Discussion
Labs
Fading
Outside
Topics
Procedures
Demos
Discussion
Questions
Exams
Team
Grading
Problem Solving
Cooperative Groups
Context Rich Problems
Office Hours
Reading
Homework
Predictions
Lab Reports
Studying
Quizzes
Lecturer
TAs
Student
Orientation
All TA meetings
Seminars
Pizza Lunch
Mentor TA
Physics Education Research & Development
5


Introductory Physics Courses
LECTURES
Three hours each week (Monday, Tuesday, Wednesday), sometimes with informal cooperative groups.
DISCUSSION SECTION
One hour each Thursday -- groups practice using a logical problem-solving framework to solve problems.
LABORATORY SECTION
Two hours each week -- *same* groups practice using problem-solving framework to solve experimental problems.
TESTS
Friday -- usually a problem-solving quiz every three weeks with some multiple-choice conceptual questions.
6

Algebra Based Physics Students
300 students/term

Pre-majors

Architecture	45%
Paramedical	26%
Physical therapy dentistry pharmacy chiropractic medical tech veterinary	
Agriculture / ecology	9%

equal female / male

50 % had calculus

40 % had chemistry

50% had high school physics

30% freshman

30% sophomore

30% junior

10% senior

7

Calculus Based Physics
1200 students/term

Majors

Engineering	75%
Physics/Astro	5%
Chemistry	6%
Mathematics	5%
Biology	9%

Male	79%
Had Calculus	80%
Had HS Physics	87%

Freshman	64%
Sophomores	22%
Juniors	10%

Expect A	61%
Work	53%
Work more than 10 hrs/wk	25%

8

Physics for Biology Majors
500 students/term

Majors	
Biological Science	49%
Pre-Med	37%
Allied Health	19%
Social Science	7%
Architecture	3%
Engineering	2%
Other	16%
Male	39%
Female	61%
Had U. Calculus	71%
(Had HS Calculus)	50%
Had HS Physics	71%



Freshman	7%
Sophomore	38%
Junior	19%
Senior	17%
Expect A	48%
Work	74%
Work more than 10 hrs/wk	50%

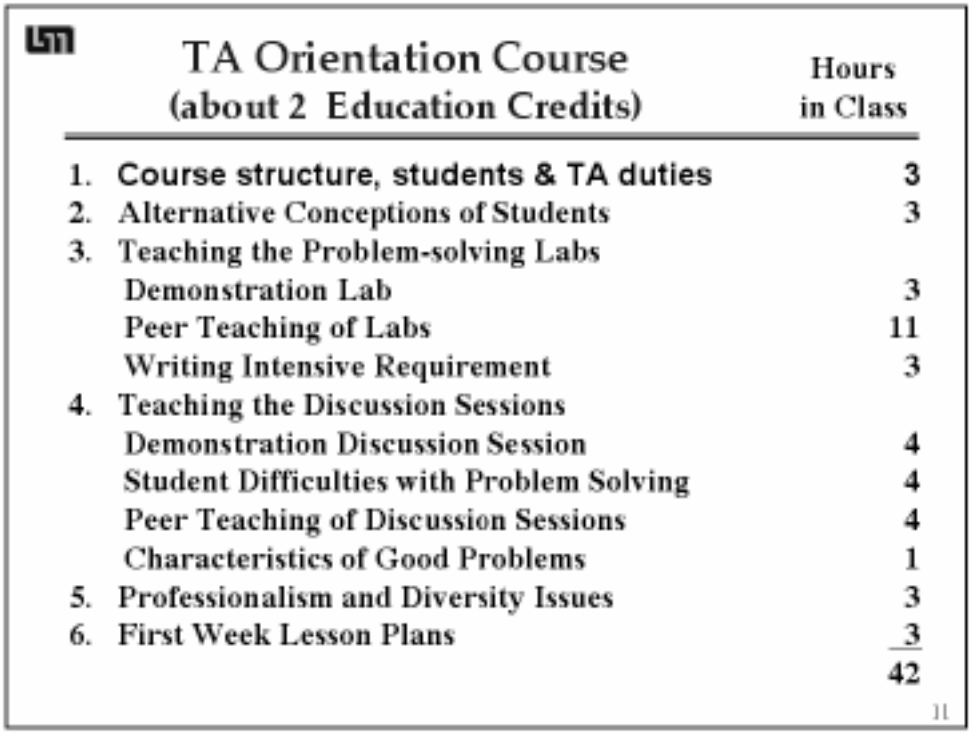
9

Learning Modes in UMn Model

Component	hours/week	Mode
Lecture	3	Individual
Discussion/Labs	3	Collaborative groups
Study/Homework	7 - 8	Individual

23% of course time spent in cooperative groups with TA

10



TA Orientation Course (about 2 Education Credits)

	Hours in Class
1. Course structure, students & TA duties	3
2. Alternative Conceptions of Students	3
3. Teaching the Problem-solving Labs	
Demonstration Lab	3
Peer Teaching of Labs	11
Writing Intensive Requirement	3
4. Teaching the Discussion Sessions	
Demonstration Discussion Session	4
Student Difficulties with Problem Solving	4
Peer Teaching of Discussion Sessions	4
Characteristics of Good Problems	1
5. Professionalism and Diversity Issues	3
6. First Week Lesson Plans	3
	42

11