Welcome! As you enter the room, please…

- Plug in your headset (if available).

- Enable your speakers and mic (the icons on the top bar should be green).

- Run the audio setup wizard (see the "Meeting" menu on the left of the screen).

- "Raise your hand" by clicking the icon to let the hosts know you are ready to test your mic.

- After testing your mic, mute yourself by clicking the mic icon (to avoid background noise).

Feel free to use the chat at any time!
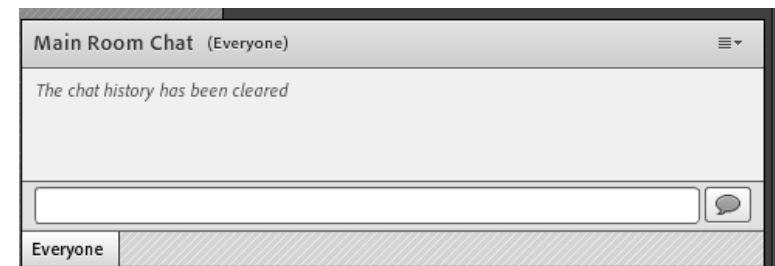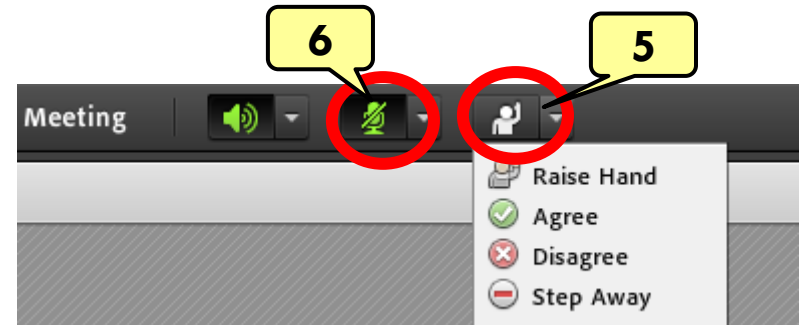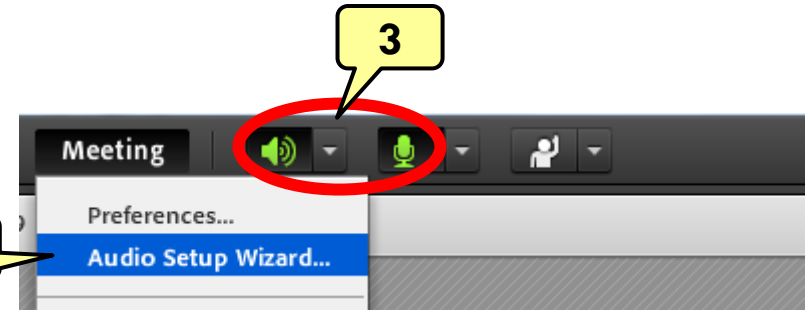
Start Recording!

ECE Virtual Community of Practice

Session 8

Preparing for Spring 2014
& Wrapping up Fall 2013

December 17, 2013

Tentative Agenda

- Logging in, welcome, session goals (10 minutes)
- Project Based Learning (PBL) Tips (10 min) (Matt W)
- Cooperative Learning Homework Teams (20 min) (Susan)
- CATME (20 min)
  - Overview by Susan
  - Discussion
- Questions for Formative Assessment (20 min)
  - Overview by Nathalia
  - Discussion
- Wrapping up Fall 2013 & Plans for Spring 2014 (10 min)

Rules of Engagement

Create your own bubble of solitude:

- Close your office door

- Use a "Do Not Disturb" sign

- Turn off e-mail

- Silence or forward phone

- Avoid any other potential distractions

ECE VCP Session 8 Goals

- ❑ Continue building our Community of Practice (CP)
  - ❑ As a whole (ECE VCP)
  - ❑ Within breakout groups
- ❑ Describe several tips for implementing Project Based Learning (PBL)
- ❑ Explain a procedure for implementing Cooperative Learning Homework Teams
- ❑ Explore using CATME with engineering student teams
- ❑ Explore using in-class questions for formative assessment

Problem-Based Learning (Matt Watkins)

- Chief idea: Realistic problem provides framework for class material
  - Motivate students
  - (Discern relevant topics)
- Structure
  - Introduction lecture
  - Multiple later possibilities

Motivated lecture → Topic on Demand

  - Possibly move along spectrum as semester progresses

Problem-Based Learning (Matt Watkins)

- Problem scope
  - Can vary
  - Suggested: 2-4 weeks
- What about "missing" topics?
  - Lecture
  - Targeted reading, video, etc.
  - Topic on review sheet
    - Students can request lecture or discussion

5 Tenets of Cooperative Learning

- ☐ Mutual Interdependence

- ☐ Individual Accountability

- ☐ Face to Face Supportive Interaction

- ☐ Guided Practice of Teamwork Skills

- ☐ Regular Self-Assessment of Team Functioning
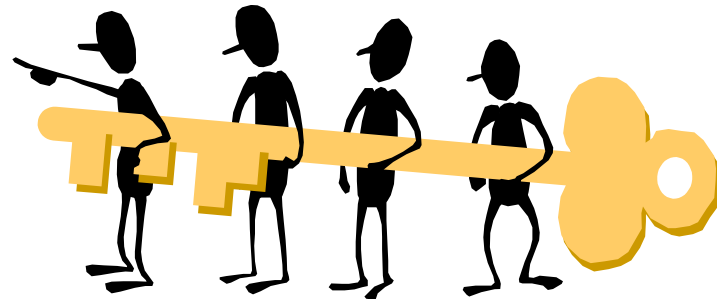
Cooperative Learning Homework Teams

- Instructor assigns students to teams of 3-4 to work on homework for semester
  - Each Team submits 1 solution
  - Rotates roles: Recorder, Coordinator, Checker, Monitor
- Benefits for **Students**:
  - Students see and learn different perspectives and strategies
  - Students, like professors, learn best what they teach!
- Benefits for **Teachers**:
  - Fewer and better papers to grade!

Comments on Homework Teams

"Before this class, I rarely worked as a team especially learning something new. I think what this course helped me most is that it makes me realize that team-learning is an efficient way to learn."

"Do not have to study alone. Help others and be helped."

"Discussion in homework teams really helps me learn things."

"I think it's great to learn from all the excellent students from different departments."

"I have my teammates and my helpful neighbor, so whenever I am stuck in the problems I can go to them."

"I can learn from my teammates and they are really excellent."

From Southeast University, Nanjing China, Spring 2012

Effectiveness of Cooperative Learning

- Hundreds of studies conducted

- Meta-analyses consistently show that cooperative learning
  - Improves individual student achievement
  - Improves student attitudes about their learning
  - Improves student retention in academic programs
  - Improves interpersonal skills needed for effective teamwork

From M. Prince, Bucknell Univ.

Cooperative Learning Homework Teams Logistics on Syllabus

- Roles
  - **Coordinator** organizes work sessions, makes sure everyone knows when and where to meet and what they are supposed to do, keeps everyone on task and makes sure everyone is involved during the meeting.
  - **Recorder** prepares final solution to be turned in
  - **Monitor** checks to make sure all team members understand both the solution and the strategy used to get it
  - **Checker** double-checks and submits the final solution
- *Agree on a common meeting time and what each member should do before the meeting*
- *Do the required individual preparation.*
- *Meet and work.* Agree on next meeting time and roles for next assignment before you end.
- **Checker** turns in the solution with the names of every team member who participated actively in completing it.
- *Review returned assignments.* Make sure everyone understands why points were lost & how to correct errors.
- *Consult with your instructor if a conflict arises that can not be worked through by the team.*

Logistics for Homework Teams

□ Assign Roles for each Assignment

Group #	Group Members	Roles for HW 2, 6, 10	Roles for HW 3, 7, 11	Roles for HW 4, 8, 12	Roles for HW 5, 9
1	Calypso Lord Ulysses Lord Ylektra Lord Hurrycane Lord	Coordinator Recorder Checker Monitor	Monitor Coordinator Recorder Checker	Checker Monitor Coordinator Recorder	Recorder Checker Monitor Coordinator

□ If 3 people on a team, combine checker and monitor

□ Team Expectations Contract
  ◘ Including weekly meeting time!!
  ◘ *Idea*: Offer to drop lowest homework assignment if they do it

Any more questions, comments, or concerns about cooperative learning homework teams?

Measuring team-member effectiveness
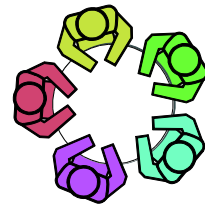
Matthew Ohland, Engineering Education, Purdue University
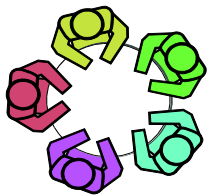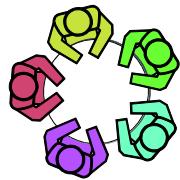
The **CATME** System incorporates two web-based instruments to facilitate better practice in managing engineering students in team-based activities.
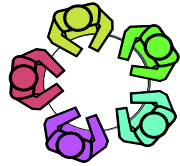
CATME Team-Maker is designed for automating the assignment of students to teams to meet weighted criteria set by the instructor.

CATME Peer Evaluation is designed for the creation, administration, and evaluation of student self- and peer-evaluations using a behaviorally-anchored rating scale.

From M. Ohland, Purdue Univ.

CATME Team Tools have been used by many faculty and students.

CATME users have surveyed over 191,747 unique students in 52 countries.

4129

faculty

Users

Oct-13

Oct-05

institutions

803

0

0

Years

8
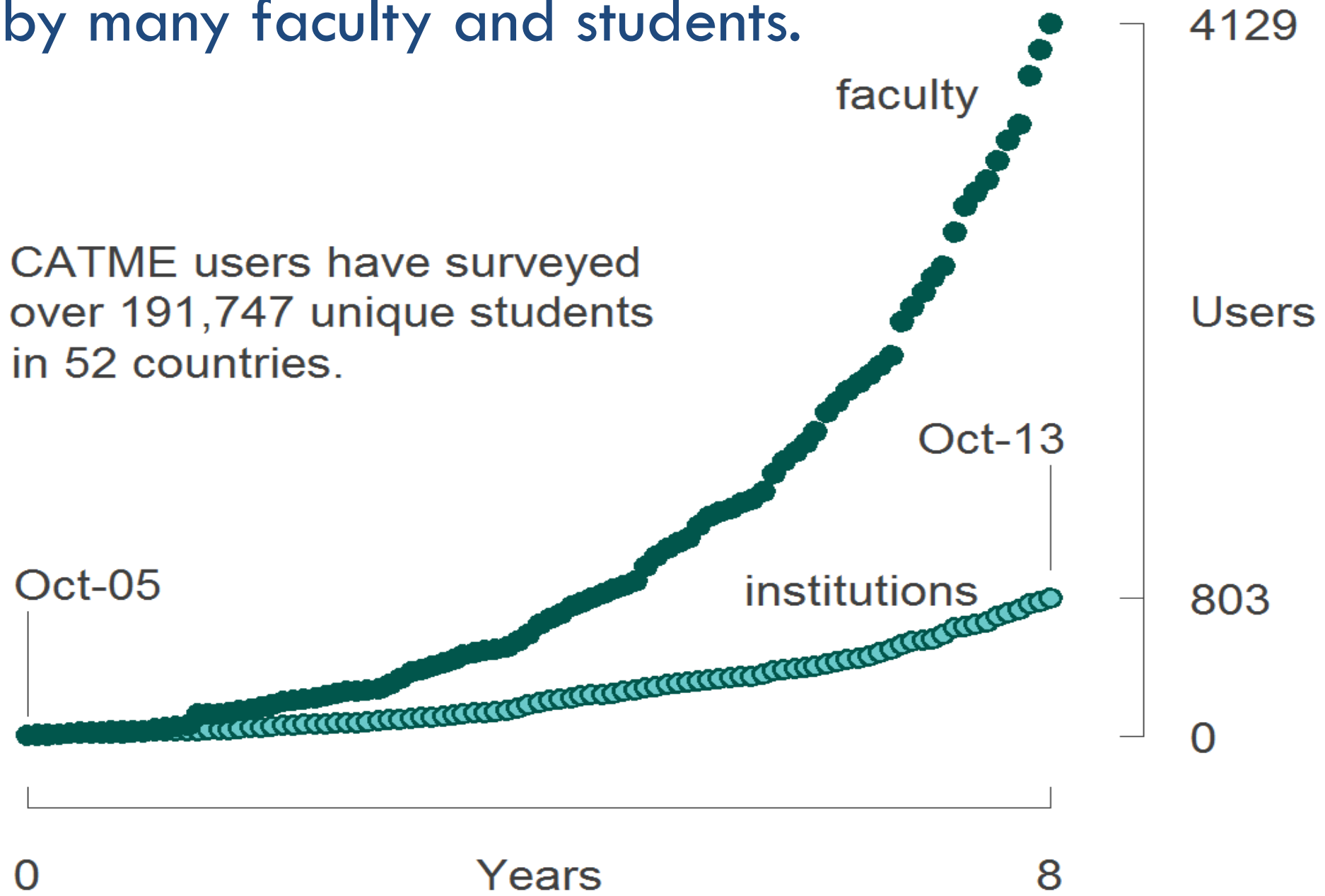
Forming teams

- Never let students self-select if they don't know each other
- Don't isolate minorities and women
- For learning, students should have heterogeneous ability
- Schedule compatibility is a high priority if teams meet outside of class
- Left on their own, students will assume functional roles that align with their comfort and expertise – and may avoid learning
- In a learning situation, rotate roles – whether functional or process roles.

From M. Ohland, Purdue Univ.

# Managing teams after they are formed

- Teach the students how their teamwork will be evaluated
- Evaluations should be confidential, but not anonymous—instructors should hold students accountable for accuracy
- Collect peer evaluations at least twice in a course. Don't count the first time much – use that for the students to practice giving feedback, learn the scale, and work to improve. After the first time, make it count – if you don't use the data, it doesn't matter
- For honest results, administer peer evaluations after significant deliverables
- When following up on peer evaluations, avoid violating the confidentiality of the ratings. Use the peer evaluation results to know which teams to observe yourself.

From M. Ohland, Purdue Univ.

Acknowledgments
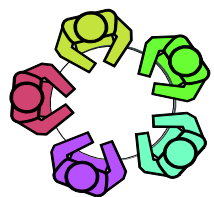
CATME Team-Maker
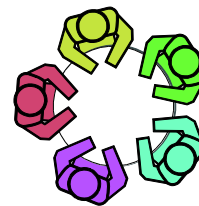
CATME Peer Evaluation

Deer Run Associates
a consulting company focusing on networked systems and security

NSF

From M. Ohland, Purdue Univ.

Any more questions, comments, or concerns about cooperative learning homework teams?

For those of you who did the CATME homework, what are your thoughts? Would you use it in your class?

Formative assessment

taking stock of what "we" accomplish.

"we" = student + instructor

Nathalia Peixoto

Assessment

- Complex function of time, and of (1) and (2):

  - (1) my success when understanding each student's situation (emotional, intellectual, social)

and

  - (2) how much the student knows the concept at that time.

Example

☐ Learning objective: Students will be able to distinguish short circuits from open circuits.

Example questions:

1. What is I2? (answer: zero, as the 5 Ω resistor is not part of the circuit, not part of any loop).
2. What is the potential drop between V2 and V3? (answer: zero, as that is a short circuit). There is no resistance between V1, V2, and V3, so there is no voltage drop).
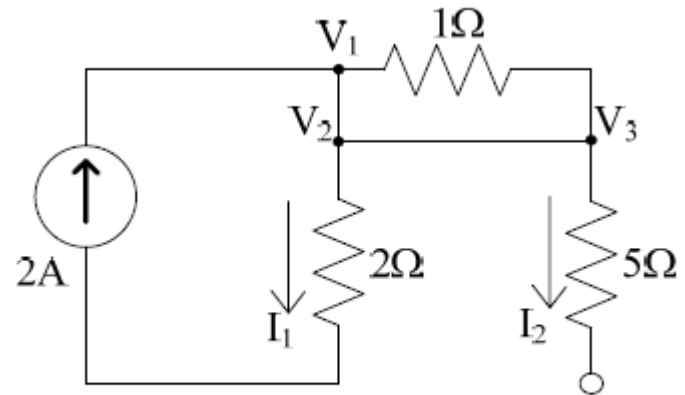

Figure 8. Testing Concepts of Short and Open Circuit

Adapted from Ogunfunmi T, Rahman M, "A Concept Inventory for an Electric Circuits Course: Rationale and Fundamental Topics", IEEE, 2804-2807, 2010.

Unfortunate reality

It takes a couple of iterations until most students realize the implications of shorts and opens.

Opportunity to learn

- Formative assessment = many quizzes. Or one quiz (sometimes slightly different circuits), many times.

- Shapes my methods of explaining (or of not explaining, and rather let their peers do the talking sometimes).

- *Forms* students' methods of solving circuits.

Formative assessments

- **When**: I use in-class questions and quizzes as often as I can. Even if I meet them in the *hallway* I'll ask them a question. Sometimes years later I ask them questions.

- **Feedback**: as soon as possible (always before the next class), usually online. Each student sees his/her grade, and *always* has a second chance*. (During my office hours, they come and try in front of me, the same problem, and I can ask more questions!)

□ **What** I learn from answers: a lot, probably everything I learn nowadays comes from formative assessments.

□ **What do I do with that learning?** I redirect teaching, by selecting examples that point out those problems. Sometimes I gain insights about the students (their perspectives, background, pre-requisites not well established).

More examples:

Obs. I welcome suggestions and more circuit ideas.

Any more questions, comments, or concerns about formative assessment?

Thanks, Nathalia!

Meetings for Spring 2014

- Meeting dates and times (from Doodle poll):
  - Friday, January 17, 3-4 pm EST (12-1 pm PST)
  - Friday, February 7, 3-4 pm EST (12-1 pm PST)
  - Friday, March 7, 3-4 pm EST (12-1 pm PST)
  - Friday, April 11, 3-4 pm EST (12-1 pm PST)
- Will focus on progress on S14 deliverable and ways we can support each other in achieving goals

Final Slide of Fall 2013

- Thanks for participating in this ECE VCP for Fall 2013!
- Happy Holidays!