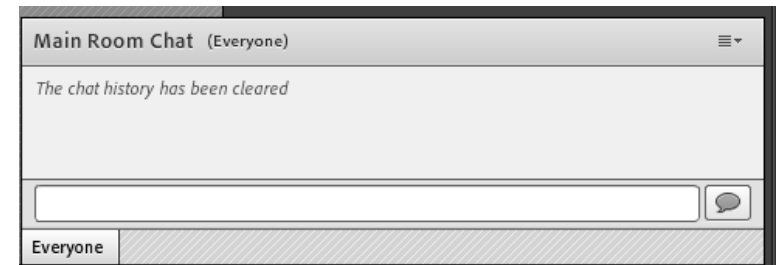
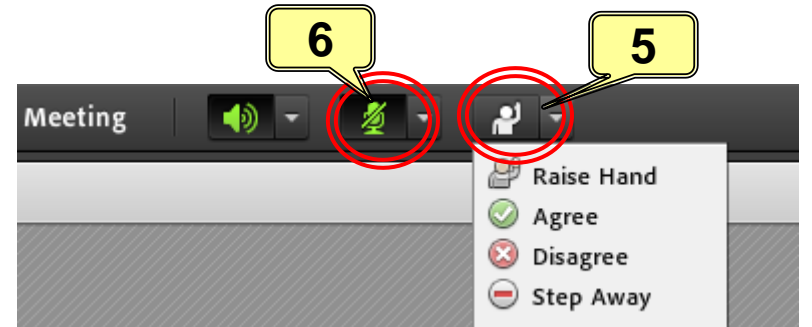
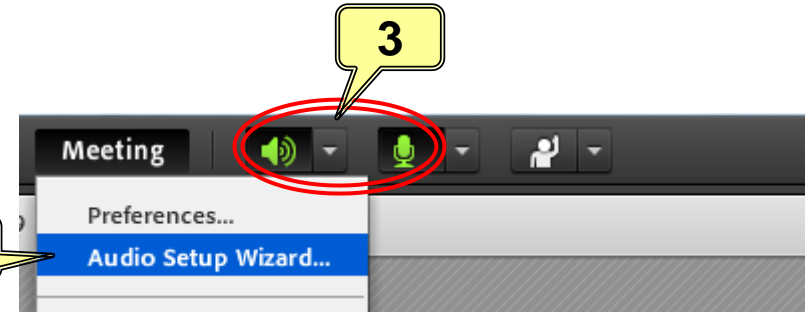


Welcome! As you enter...

1. Plug in your headset (if available).
2. Enable your speakers and mic
3. The top bar icons should be green).
4. Run the audio setup wizard (use “Meeting” menu on top left).
5. “Raise your hand” by clicking the icon to let the hosts know you are ready to test your mic.
6. After testing your mic, mute yourself by clicking the mic icon
7. Feel free to use the chat at any time!



Start Recording

Faculty Virtual Community of Practice

Computer Science & Computer Engineering

Session 8: Improving Teaching/Learning Using Teamwork

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Today's Agenda

- Welcome and learning objectives ~ 5 minutes
- Review of research ~ 10 minutes
- Discussion of Homework Assignment
- Discussion of Student Teams (20 minutes)
- Breakout Sessions (20 minutes)
- Summary
- Planning for Spring Semester (20 minutes)

CSE VCP Review

- The goal is to introduce faculty to research-based instructional practices in order to make a few changes to their teaching this term and more systemic changes next term
- Session 1: Seven Principles of Learning
- Session 2: Learning Outcomes
- Session 3: Student's Prior Knowledge
- Session 4: Pedagogies of Engagement
- Session 5: PI and Flipped Classroom
- Session 6: Technology to Facilitate Interaction
- Session 7: Student Motivation

Poll Question

Did you read any of the suggested material?

- I meant to but...
- Skimmed the material
- Read it closely

Poll Question

Did you watch the suggested demo movie on CATME?

- I meant to but...
- Skimmed the material
- Read it closely

Poll Question

Did you perform the demo survey exercise?

- I meant to but...
- Skimmed the material
- Read it closely

Formal Cooperative Learning



Poll Question

- Is evidence of working in teams part of the ABET criteria (student outcomes)?
 - Yes
 - No

Poll Question

- Is evidence of working in teams part of the ABET criteria (student outcomes)?
- Yes, For Engineering:(d) an ability to function on multidisciplinary teams - See more at:
<http://abet.org/eac-criteria-2014-2015/#sthash.C9ZMQT42.dpuf>
- Yes, for Computing Programs: (d) An ability to function effectively on teams to accomplish a common goal - See more at:
<http://abet.org/DisplayTemplates/DocsHandbook.aspx?id=3148#sthash.nrM9TrZp.dpuf>

Poll Question

- Is there research-based evidence that students who engage with course material by working in teams tend to learn more of what is taught and to retain it longer than when the same content is presented in other instructional formats, such as lecture?
 - Yes
 - No

Poll Question

- Is there research-based evidence that students who engage with course material by working in teams tend to learn more of what is taught and to retain it longer than when the same content is presented in other instructional formats, such as lecture?
 - Yes
 - Even more importantly, research shows students working in teams are more likely to attain higher-order thinking skills such as analysis, synthesis, evaluation, and problem solving.

Instructor's Role in Formal C.L.

- Specify objectives
- Make pre-instructional decisions
- Explain task and cooperative structure (positive interdependence and individual accountability)
- Monitor and intervene to teach teamwork skills
- Evaluate students' achievement and group effectiveness

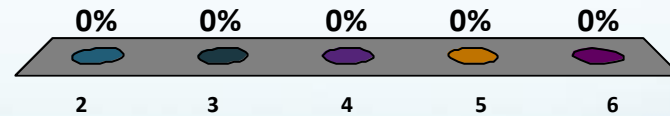
- See the FVCP portal for elaboration on Instructor's Role and a planning template

Decisions, Decisions...

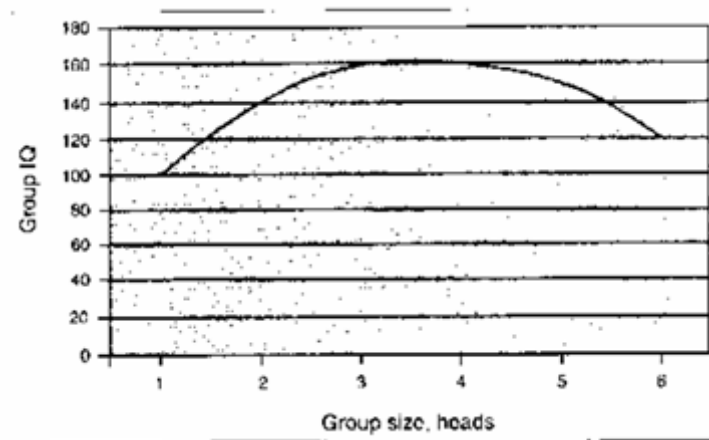
- Task group size?
- Group selection?
- Group member roles?
- How long to leave groups together?
- Type of task?
- Arranging the room?
- Providing materials?
- Time allocation?

Optimal Group Size?

- 2
- 3
- 4
- 5
- 6



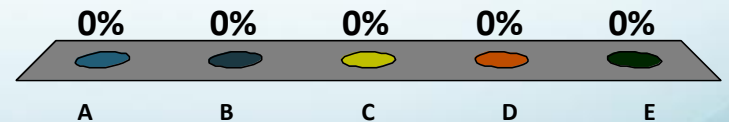
Formal C.L. Task Group Size



- Perkins, D. 2003. *King Arthur's Round Table: How collaborative conversations create smart organizations*. New York: Wiley.
- Hackman, J.R. 2002. *Leading Teams: Setting the stage for great performances*. Boston: Harvard Business School Press.
- Smith, K.A. 2014. *Teamwork and project management, 4th Ed.* New York: McGraw-Hill.

Group Selection?

- Self selection
- Random selection
- Stratified random
- Instructor assign
- Interest



Types of Formal C.L. Tasks

- Jigsaw – Learning new conceptual/procedural material
- Peer composition or editing
- Reading comprehension/interpretation
- Problem solving, project, or presentation
- Review/correct homework
- Constructive academic controversy
- Group tests

Constructive Academic Controversy

- Who is the public figure most responsible for implementing the US National Park System?
 1. John Muir
 2. Teddy Roosevelt
 3. Ansel Adams
 4. George W. Bush

Typical Engineering Examples

1. **Problem solving, project, or presentation** (goal, role and task interdependence)
2. **Jigsaw** – Learning new conceptual/procedural material (goal and task interdependence)
3. **Group Tests** – Individual exam followed by a cooperative exam (learning goal and single product interdependence)

Framing Problem-Based C.L. for Students

- Task
- Expectations for individuals
- Strategies for cooperation
- Criteria for success
- Evaluation methods
- Individual accountability
- Expected behaviors
- Intergroup cooperation

Application to Your Own Students

- To what extent and in what ways do you want to engage your students participants in formal cooperative learning, especially knowing:
 - the critical importance of teams in the engineering profession,
 - the increasing use of student teams in the classroom, and
 - the complexities involved with effectively implementing formal cooperative learning?
- General Discussion w/ your verbal comments (7 minutes max)

Team Processing

- What have you used to monitor group effectiveness?
 - Plus/delta format
 - CATME
 - Team charter or group ground rules contract form
 - Code of cooperation
- Examples are posted at the portal, please post more

Breakout Session

- Unmute your mics when you arrive
- Post a chat message along with your group number if you have technical problems
- Roles for today
 - Scribe (#3)
 - Reporter (#2)
 - Manager (#1)

Breakout Activity 1

- Write a well-designed Team Assignment statement for student teams that are required to write a program to perform a task.
 - For example the task could be use the Runga-Kutta method to solve an ordinary differential equation (don't use this one in your breakout activity, but create a new problem to be solved)
- Each breakout group member should contribute an idea or item that “must” be included in the statement.

Report Outs

Summary

- Student team activities are very important to learning and to job practices
- Careful planning of team activities is important for success
- Various tools can be found to support team activities
- Our discussions have only scratched the surface

Spring Semester Sessions

- Computer Engineering Monday 4 - 5
- Computer Science - Programming Tuesday 2 - 3
Computer Science - Upper Level Tuesday 4-5
Computer Science - Lower Level Wednesday 4-5

Breakout Activity 2

- What do you need to do before the first day of class?
 - Based on your plan to implement one of the teaching innovations discussed in the FVCP
 - Discuss
 - Bullet notes
 - Present to group

Report Outs