Large Classroom Engagement

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THE UNIVERSITY OF TENNESSEE KNOXVILLE

TEACHING & LEARNING INNOVATION

Describe your thoughts on teaching large classes here at UTK.

TLI Large Classroom Facilitators

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- Lecturer, Engr Fund
- PhD, Engr Education
- Student, GTA, and Faculty in Engr Fund

Richard Bennett

- Director, Engr Fund
- PhD, Civil Engineering
- At UT since 1983

Learning Objectives

- Explain benefits and challenges of active learning in large classrooms
- Identify techniques for implementing small changes in active learning in large classrooms
- Develop plan for implementing one or two small changes to current large classroom practice

Challenges with Large Classrooms

- Students may become accustomed to adopting a passive anonymous role
  - Physical distance
  - Limitations in active learning
  - Limitations in timely feedback
- Students dissatisfied with:
  - Lack of interaction with course instructor (impersonal nature)
  - Lack of frequent testing and graded assignments (lack of accountability)
  - Problems with classroom environment (noises and disruption)

Messineo, Melinda, et al. "Inexperienced versus experienced students' expectations for active learning in large classes." *College Teaching* 55.3 (2007): 125-133.

Classroom Engagement

- Attention
- Curiosity
- Interest
- Optimism
- Passion

- Generate motivation to continue in the learning process

https://www.edglossary.org/student-engagement/

How do we implement active learning in large classes? First Day Practices

- Introduction including background
- Set the tone for the class
  - Respect for others
  - End of class; do not leave early
- Have clear learning objectives

How do we implement active learning in large classes? Arriving Early to Class

- Chat with students
- Fun videos before class
- Crazy Clicker questions
- Introduce GTAs
- Meta Mondays, Well-rounded Wednesdays, Fun Fridays

How do we implement active learning in large classes? Clickers

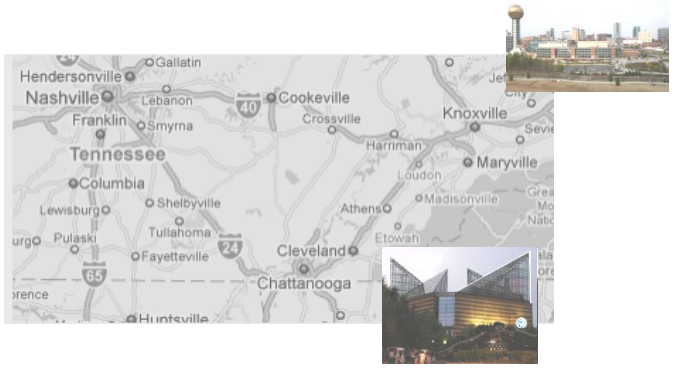
- Think-Pair-Share (Think Pair Vote)
- Refuting Misconception (giving discussion time, re-voting)
- Section competitions
- 100% correct and class is cancelled

How do we implement active learning in large classes? Classroom Management

- Means for students to ask questions
  - Questions during class to e-mail address
  - Throwing tennis balls to those that asked good questions
  - Discussion board
- Co-teaching (co-writing for more speak engagement)
- Break class up
  - Clicker questions
  - Switch speakers
  - Bad jokes
  - Physical demonstrations
- Providing short discussion time with neighbors (being ok with chaos)

Today's Topics

- Vector definition
- Graphical addition
- Components



Let's take a road trip:

Knoxville to Chattanooga

What do we have to specify for the trip?

_____ and _____

Definitions

- Vector: something that has _____ and _____
- Scalar: something that just has a _____

What do we have to specify for the trip?

time; distance

magnitude; direction

magnitude; distance

direction; time

Collaborative Learning in Large Classrooms

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Why Collaborative Learning?

- Collaboration engages students in a way that just listening cannot
- Challenges them to apply their understanding
- Teaches students to work with others
- Evidence of higher engagement and improved performance

Challenges Associated with Collaborative Learning in Large Classes

Goal: Brainstorm a list of challenges associated with collaborative learning in large classrooms

Groups of **3** (people sitting close to you)

Team Roles: Facilitator (ensure everyone has a chance to provide input), 'Devil's Advocate' (challenge members of the team to think in a different way), Recorder (record the ideas of the group)

Time: 3 Minutes

Deliverable: List of at least 6 challenges; select member of team to report out

Challenges in Collaborative Learning

Report Out Time

Challenges Associated with Collaborative Learning in Large Classes

1. Space not conducive to collaborative learning
2. Wasted time to ‘get started’
3. Group monitoring
4. Chaos! Noise, out of control
5. Discipline
6. Unequal participation
7. Student buy-in

Major Principles of Cooperative/Collaborative Learning

1. Positive Interdependence
2. Individual Accountability
3. Heterogeneous Groups
4. Collaborative Skills
5. Equal Participation
6. Simultaneous Interaction
7. Group Autonomy
8. Collaboration as a Value

Jacobs, George M., and Loh Wan Inn. "Using Cooperative Learning in Large Classes." *Online Submission* (2003).

Positive Interdependence

‘We can do better together than we can apart.’

1. Provide a common goal (that requires collaboration)
2. Encourage teams to adopt a common identity
3. Divide resources so each member has a knowledge contribution
4. Encourage (or assign) roles and seats
5. Have a common celebration

Individual Accountability

Each member is responsible for their own understanding and contribution.

1. Individual quiz or assignment
2. Each team member summarizes their contribution in a reflection
3. Take turns sharing an idea around the group
4. Randomly select one team member to report out to the class

Heterogeneous Grouping

Students should work on teams with people with whom they have differences

1. Select criteria for differences
2. Assign teams/groups
3. Change groups for every project/major assignment

Collaborative Skills

Teach students ways to be successful in collaborative environments.

1. Managing the scope of work
2. How to disagree politely
3. How to supporting evidence for arguments
4. How to come to consensus
5. Listening and facilitating effective communication
6. Checking the understanding of others on the team

Equal Participation

Everyone has an equal part to play in success

1. Set rules for how the team communicates
    a. Encourage everyone to speak once before people get a second turn
2. Rotating team roles
3. Share ideas with one group member, then share with whole team
4. Group reporter role always changes
5. Peer review of team member contribution (middle and end)
    a. Feedback at mid allows students modify behavior

Simultaneous Interaction

Many speaking at once may seem like chaos...but it also gives students more opportunity to interact

1. Give teams in class time to work as a team
2. Minimize back a forth between teacher at front and only one student reporting out

Group Autonomy

Allow time for the teams to struggle with what they have been assigned - struggle is beneficial

1. Shift the responsibility of coordinating the pursuit of the goal to the teams
2. Walk around and monitor the conversations
3. Resist the urge to jump in at the first sign of struggle
4. Enjoy hearing the conversations of your students working through their understanding

Cooperation as a Value

Cooperation is a way to learn AND a value we should incorporate into everyday life

1. Assign one part of a larger project to each team
2. Define a class goal instead of an individual team goal
3. Assign projects that are connected to community concerns

Applying Principles of Collaborative Learning

Select one of the 8 principles and spend 2 minutes (individually) brainstorming ways to incorporate this into potential collaborative practice

After 2 minutes, get back in your groups of 3

Take 1 minute each to share your brainstorming

Listeners: Listen for how well the ideas fit with the principle that was identified by the reporter; challenge or ask for clarification to help solidify the idea

After 1 minute, rotate to the next member until everyone has reported

Select one person to be the timekeeper

Team Based Learning

Positive Interdependence Too large to be done alone; needs different areas of expertise Seminars for each area of expertise Team grade	Individual Accountability Individual grades Peer Feedback Review	Heterogeneous Groups Assign groups based on gender, race/ethnicity, expertise, schedule	Collaborative Skills Five part series on teamwork before starting this project (after completing one team project at beginning of semester)
Equal Participation Peer Feedback Review	Simultaneous Groups Provide multiple class sessions for teams to work on their project and get feedback from teaching team	Group Autonomy Provide multiple class sessions for teams to work on their project and get feedback from teaching team; no structured activity on these days	Collaboration as a Value Community service project Teamwork in engineering profession

Team Based Learning

Positive Interdependence Too large to be done alone; needs different areas of expertise Seminars for each area of expertise Team grade	Individual Accountability Individual grades Peer Feedback Review Individual grades could focus on descriptions of individual contributions	Heterogeneous Groups Assign groups based on gender, race/ethnicity, expertise, schedule	Collaborative Skills Five part series on teamwork before starting this project (after completing one team project at beginning of semester) Assess strengths of collaborative skills
Equal Participation Peer Feedback Review	Simultaneous Groups Provide multiple class sessions for teams to work on their project and get feedback from teaching team	Group Autonomy Provide multiple class sessions for teams to work on their project and get feedback from teaching team; no structured activity on these days	Collaboration as a Value Community service project Teamwork in engineering profession

Flipped Classroom Pedagogy

- Student Centered Pedagogy
- Move ‘content’ outside of regular classroom time (reading, videos, etc)
- Move ‘active learning’ activities inside the classroom - great opportunity for collaborative learning!
- Takes significant amount of time to transition
- More interaction between teaching staff and students
- Staff: 2 instructors, 1 graduate student, 3 undergraduate students

Challenges with Collaboration in Flipped Classroom

1. About 65-70% of students show up to class
2. Large gaps in knowledge from reviewing
3. Do not want to increase workload of students
4. Flipped classroom with 160+ students - large classroom to cover

Flipped Classroom Pedagogy

Positive Interdependence	Individual Accountability Each student must submit individual online assignment	Heterogeneous Groups	Collaborative Skills
Equal Participation	Simultaneous Groups We allow for 35 minutes of working time where we circulate and answer questions	Group Autonomy	Collaboration as a Value

Flipped Classroom Pedagogy

Positive Interdependence Team clicker quiz at end of class	Individual Accountability Each student must submit individual online assignment Individual clicker quiz at beginning of class	Heterogeneous Groups Assign groups/pairs	Collaborative Skills Teach metacognitive questioning for pair/group discussion
Equal Participation Quizzes that count toward individual/team grade	Simultaneous Groups We allow for 35 minutes of working time where we circulate and answer questions	Group Autonomy	Collaboration as a Value Lifelong learning; asking for helping; utilizing the expertise of peers

General Parting Thoughts

- Start small – try to incorporate one thing this semester that stretches you
- Get feedback from students early and often
- Be willing to investigate options like collaborative learning, problem based learning, project based learning, etc.

THANK YOU!

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