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Preparing Graduate Student Instructors to Use Cooperative Learning Activities in the Classroom Ulrike Genschel, Kevin Kasper, Anna Peterson, and Laura Ziegler

Outline

- Cooperative Learning (CL)
- Exposing graduate students to CL
- Think-Pair-Share activity
- Academic Controversy activity
- Questions

Why Use Cooperative Learning?

- Lecture focused approaches are in direct contrast to the fourth recommendation in the GAISE College Report: "Foster Active Learning."
- Using a variety of cooperative learning strategies, this session aims to advance pedagogical skills for teaching statistical content.

Exposing Graduate Students to CL

- "History repeats itself."
 - It is natural and comfortable to teach how we were taught.
- Graduate student instructors should confront their misconceptions about how people learn.
- We would like to encourage graduate student instructors to stretch beyond a lecture focused environment.
- We demonstrate how to engage graduate student instructors in CL techniques.

Exposing Graduate Students to CL

- Weekly meetings can be used to create a safe environment where graduate student instructors can experience CL activities.
- Discussions can extend how to use the activities in their classroom.
- Our intention is these meetings will help graduate students transfer this knowledge into their classrooms.
- Example CL activities are presented in the remainder of the talk.

Think-Pair-Share

- A Think-Pair-Share (Lyman, 1981) is a CL activity used to purposefully think about and discuss a question.
- The following four steps can be used to guide people through a Think-Pair-Share activity:
 - 1. Present people with a question.
 - 2. Individuals think about the question.
 - 3. In pairs, they discuss the question.
 - 4. Thoughts are shared with the larger group.

Think-Pair-Share

- Ideally, a Think-Pair-Share activity will solidify and expand your understanding of a topic.
- Graduate student instructors:
 - become comfortable with the topic,
 - are more prepared to work with their students, and
 - are also more likely to implement this strategy in their courses.
- Faculty members learn about their graduate students' understanding.

Creating Pairs

- Note the color of your card.
- Form groups of 2 by pairing up with someone who:
 - has the same suit (♠ ♣ ♥ ♦) as your card and
 - you typically do not work with.

• Please return your card before you leave.

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Your Turn: Think-Pair-Share

- 1. Working with your partner, choose a question:
 - A. Do you teach the way you were taught?
 - B. How do you actively engage students in the classroom?
- 2. Think about the chosen question (1 minute).
- 3. Turn to your partner and discuss (3 minutes).
- 4. Share with the larger group.

Think-Pair-Share: Graduate Student Experiences

- Weekly meetings were held with four graduate student instructors of an introductory statistics course.
- The course included simulation-based methods and was taught with the Lock et. al. text.
- Prior to teaching a new topic, we used Think-Pair-Share activities to consider questions such as:
 - What is most important about the topic?
 - What do you think students will struggle with when discussing the topic and why?
 - What can we do to help them with these struggles?

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Think-Pair-Share: Graduate Student Experiences

- Graduate student instructors were very active in these discussions.
- Repeat instructors reflected on their experiences from previous semesters.
- New instructors gained wisdom from repeat instructors.
- The two pairs often had different ideas so it was helpful to share across groups at the end.
- Discussions were particularly helpful for topics the instructors were not as familiar with (i.e., bootstrapping and randomization tests).

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Academic Controversy

- An Academic Controversy (Johnson & Johnson, 1997) is a CL activity used to explore two sides of a provocative topic.
- The purpose is to increase knowledge and try to gain better understanding of both sides.
- The Academic Controversy is a way to start the conversation.
- "Difference of opinion leads to inquiry, and inquiry to truth."-Thomas Jefferson

The following five steps were presented by Johnson and Johnson (1997):

- 1. Research And Prepare A Position
 - Address whether participants should prepare ahead of time.
 - Present the topic briefly summarizing both sides of the controversy.
 - Form groups of two, ideally using random assignment.
 - Randomly assign half of all groups to each side.
 - Groups discuss and develop an argument in favor of their assigned side.
 - *Seek additional ideas from groups arguing the same side.

- 2. Present And Advocate Their Position
 - Two groups of opposing sides merge to form one group of four participants.
 - One at a time, each pair presents their developed arguments (without interruption).

- 3. Engage In An Open Discussion In Which They Refute the Opposing Position And Rebut Attacks On Their Own Position
 - Advocate and refute assigned side within merged group.
 - Evaluate sides; do not criticize people and their ideas.

- 4. Reverse Perspectives*
 - Groups split back into original pairs and reverse assigned perspective to identify new arguments/ideas.

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- 5. Synthesize And Integrate The Best Evidence And Reasoning Into A Joint Position
 - Merge back into groups of four. Present any newly developed arguments.
 - Reach consensus.
 - Account and prepare to discuss with larger group of participants.
 - Process the activity.

Your Turn: Academic Controversy

- There are two sides for this discussion:
 - We should keep the term "Statistically Significant in Introductory Statistics Courses"
 - We should abandon the term "Statistically Significant in Introductory Statistics Courses"

Assign Position (Step 1)

- Red cards → We should keep the term "Statistically Significant in Introductory Statistics Courses"
- Black cards → We should abandon the term "Statistically Significant in Introductory Statistics Courses"
- Make a case for the side you were assigned with your partner (regardless of your personal opinion).

Merge Groups (Step 2)

- Merge with a group of the opposite color.
- Red group presents their case for keeping the term "Statistically Significant" without interruption (3 minutes).
- Black group presents their case for abandoning the term "Statistically Significant" without interruption (3 minutes).

Merge Groups (Step 3)

- Together, discuss both sides.
 - What do you want to add to the other side?
 - What would you change about the arguments of the other side?
 - Attempt to reach a consensus.

Bring Everyone Together (Step 5)

- Share your thoughts with the group.
- Can we, as a group, reach a consensus?

Reflections for Graduate Instructors

- How has your understanding of the term "Statistically Significant" changed through this activity?
- Did any aspect of the discussion help you see things from a different perspective?

Learning Community Experiences

- In a meeting of approximately 50 faculty and graduate students from several disciplines, we conducted the *statistically significant* Academic Controversy.
- Overall, the experience was very positive. People were passionate and animated during the activity.
- Some people struggled at the end because they wanted a final decision.

Academic Controversy: Undergraduate Classroom Experiences

- The statistical significance Academic Controversy was conducted in an upper-level undergraduate regression course.
- Discussions were rich, but not as much as when the activity was presented in the group with instructors and graduate students.

Questions?

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References

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- Johnson, D. W. & Johnson, T. J. (1997). Academic controversy: Increase intellectual conflict and increase the quality of learning. In W. E. Campbell & K. A. Smith (Eds.), *New paradigms for college teaching*. Edina, MN: Interaction Book Company.
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