Active Learning:

What it is, does it work, and how to do it.

Advancing your Confidence as an Educator (ACE) in Geriatrics and Gerontology

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THE TEACHING CENTER

Introducing Julia

- PhD in Chemistry with a Certificate in College Teaching from Duke University
- Consults with engineering, mathematics, physics, earth and planetary sciences, and chemistry graduate students
- Extensive experience in utilizing Team Based Learning (TBL) to teach general chemistry and biophysical chemistry

Introducing Denise

- Develop, implement, and evaluate professional-development programs for graduate students and postdoctoral fellows
- Consults with graduate students and postdocs
- Saint Louis University with a PhD in Biology

Goals for this Webinar

- Understand the key features in active learning approaches.
- Develop awareness of the evidence base that supports active learning.
- Describe strategies to facilitate active learning across a range of teaching contexts.

What is Active Learning?

What is Active Learning?

1

More Student-to-Teacher Interaction

- "Bookending" lectures with questions that prompt discussion
- Student response systems (high-tech and low-tech)
- Case studies

2

More Student-to-Student Interaction

- Peer discussion
- Collaborative-learning groups
- Cooperative-learning groups

3

More Student Assessment & Self-Reflection

- Incorporating classroom assessment techniques
- Encouraging students to assess their own learning

Active Learning in Action

Traditional Classroom

- Instructor spends most time transmitting information; students are passive listeners
- Instructor's questions are often rhetorical/self-answered
- Students listen and take notes independently

Active Learning Classroom???

Active Learning in Action

Traditional Classroom

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Active Learning Classroom

- Instructor periodically pauses for structured activities; students actively engaged in the learning
- Instructor's questions require responses and instructor elicits responses
- Students often work in groups or with partners

Why do Active Learning?

- Several national reports, committees, and research are recommending **more engagement** in the classroom because learning is enhanced when existing knowledge is used to build new knowledge
  - It promotes development of **critical-thinking skills** and a **sense of ownership in the learning.**
  - It reflects the **spirit** and the process of science.
  - It enhances student **conceptual understanding** and **application**.
  - It promotes positive attitudes towards learning, and **increase retention** of course material.
  - **Diverse learners** learn well with diverse strategies.

Examples of Active-Learning Techniques

- Group Work
- Peer Review
- Problem-based/ Case-based learning
- Reading and Discussing Primary literature
- Think-Pair-Share
- Clickers/Peer Instruction
- Role playing
- Flipped classroom approach
- Demonstrations
- Inquiry-based activities
- Jigsaw
- One-minute paper

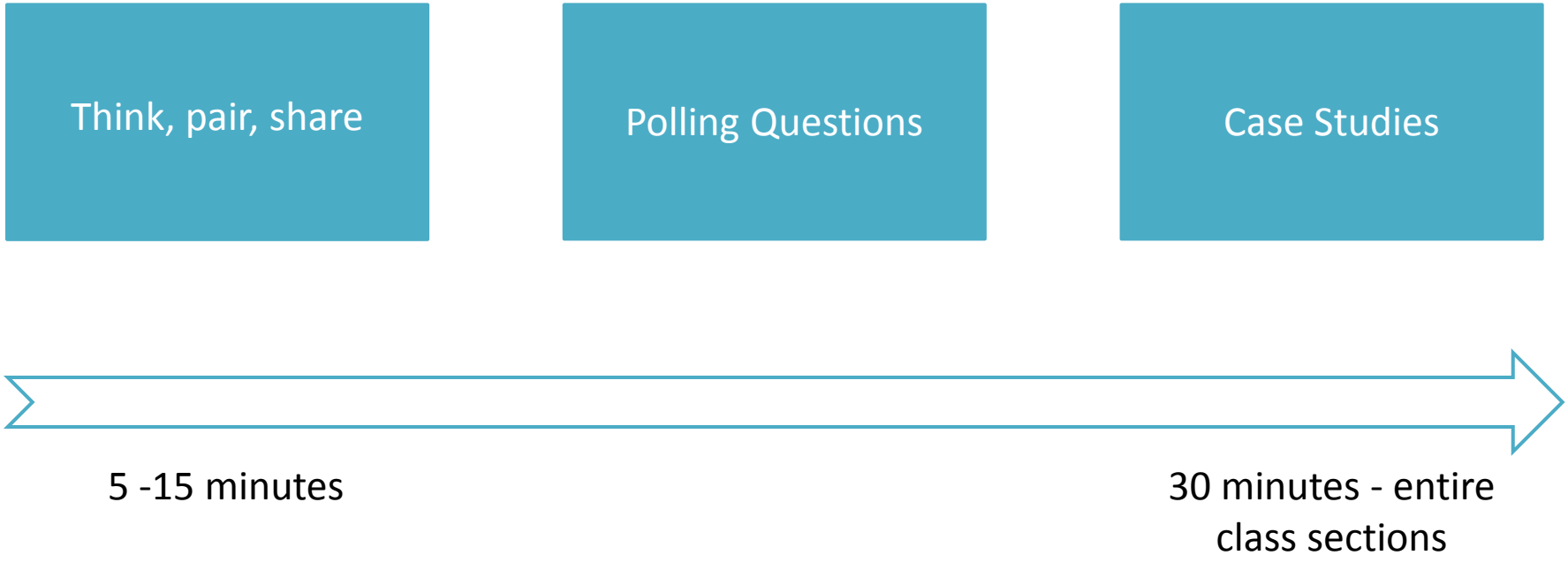
Which will take the most class time?

Think, pair, share

Case Studies

Polling Questions

Which will take the most class time?



Think, Pair, Share

- Pose a question
  - Prompts discussion
  - No obvious ‘right’ answer
- Give time for students to THINK
  (~2 minutes)
- Ask them to PAIR with neighbor and discuss
  (~5 minutes)
- Bring class together and have students SHARE
  (~5 minutes)

Think, Pair, Share

- **Think**
  - Time for personal reflection
  - Reason: Gives individuals time to formulate response—encourages diverse learning styles
- **Pair**
  - Time for individuals to discuss with small groups
  - Reason: Gives time for feedback and discussion—lower stakes conversations, encourages participation
- **Share**
  - Time for larger conversation
  - Reason: Gives time for the class to come together—ensures that there is a consensus

Polling Questions: Peer Instruction

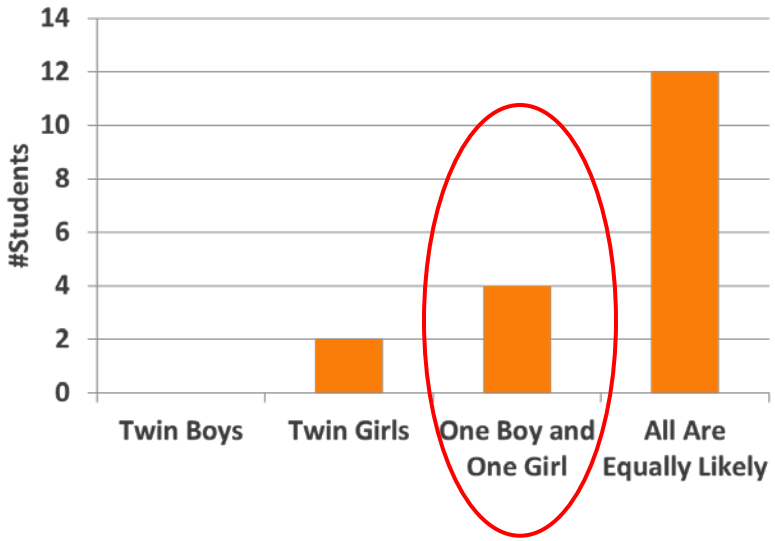
- Pose a question
- Students think and respond individually

> Your sister-in-law calls to say that she's having twins. Which of the following is more likely? (Assume she's not having identical twins.)
>
> A. Twin boys
> B. Twin girls
> C. One boy and one girl
> D. All are equally likely

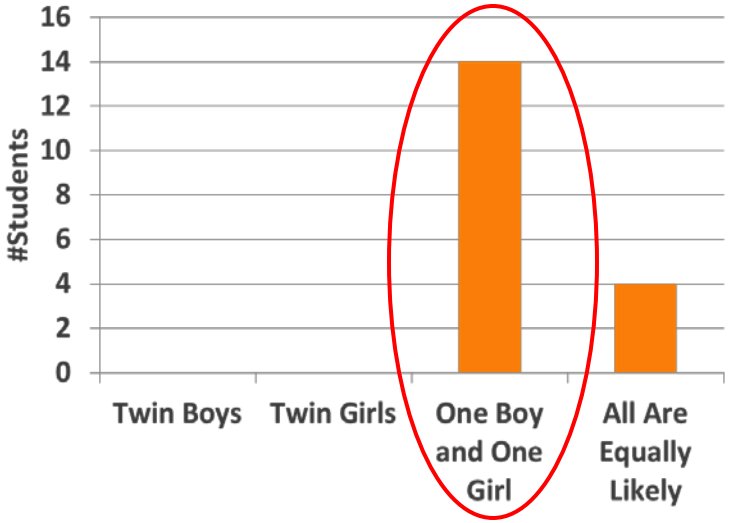
- Students discuss the question with peers
- Students respond again
- Show histogram (technology permitting)
- Instructor provides closure

Polling Questions: Benefits of Peer Instruction

- Individual



- Peer-instruction



What makes a case study?

Which of the following scenarios would NOT be considered a case study?

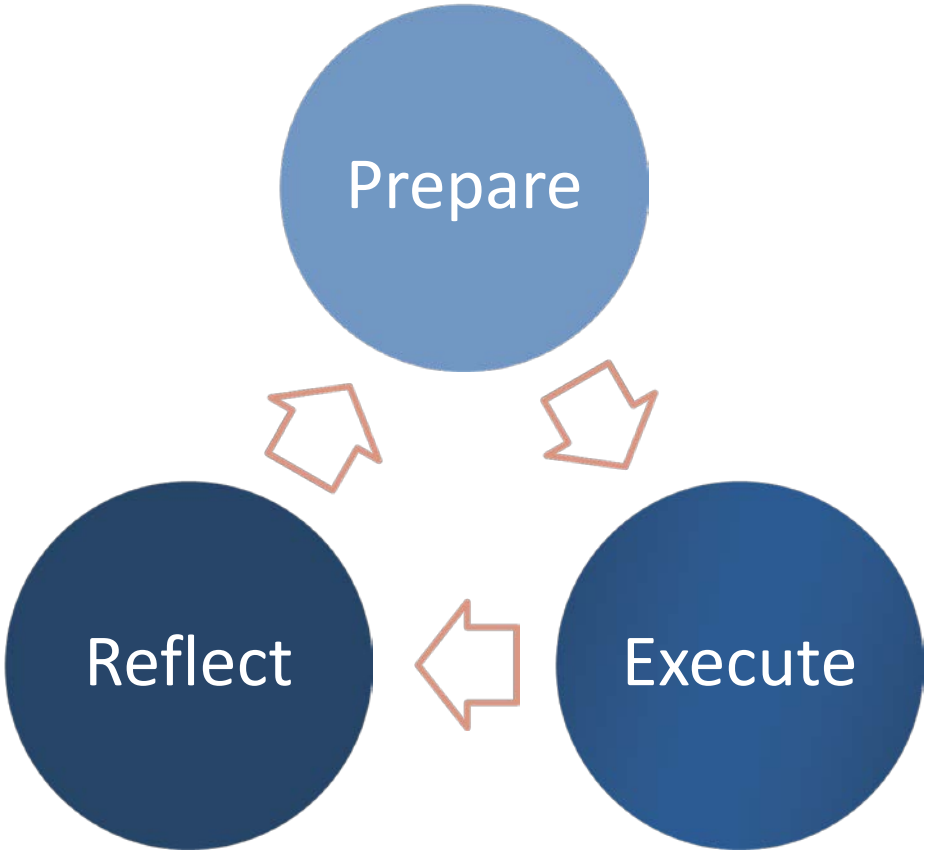
A. Students are given a case to review before lecture. In class they work in small groups to discuss a series of questions related to the case.
B. You show a video of a doctor gathering patient information. Students work in groups to arrive at next steps for the doctor to proceed.
C. Students are given a mock medical record during lecture and allowed to think individually about next steps. You then lead a class-wide discussion to determine appropriate procedure.
D. All of the above are case studies.
E. None of the above are case studies.

Case Study

- Present an engaging and relevant scenario
  - Explain why (learning objectives)
  - Written, role play, video
  - Can be provided before or during lecture
- Give students time to analyze and respond
  - Individually or in groups
    - Students feel they learn more and like it better when they work in groups (Gross Davis (2009), Tools for Teaching)
- Wrap up with a discussion
  - Allow students to respond before expressing your own opinion
  - Tie back to learning objectives
  - Provide closure

General Best Practices

- Tie active learning to course learning objectives
- Always provide closure



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Questions?