



# The Teaching Center



## *Adding Active Learning to your Lecture (including Group Work)*

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What is your picture of teaching?

Describe your class session.

# Effective Teaching

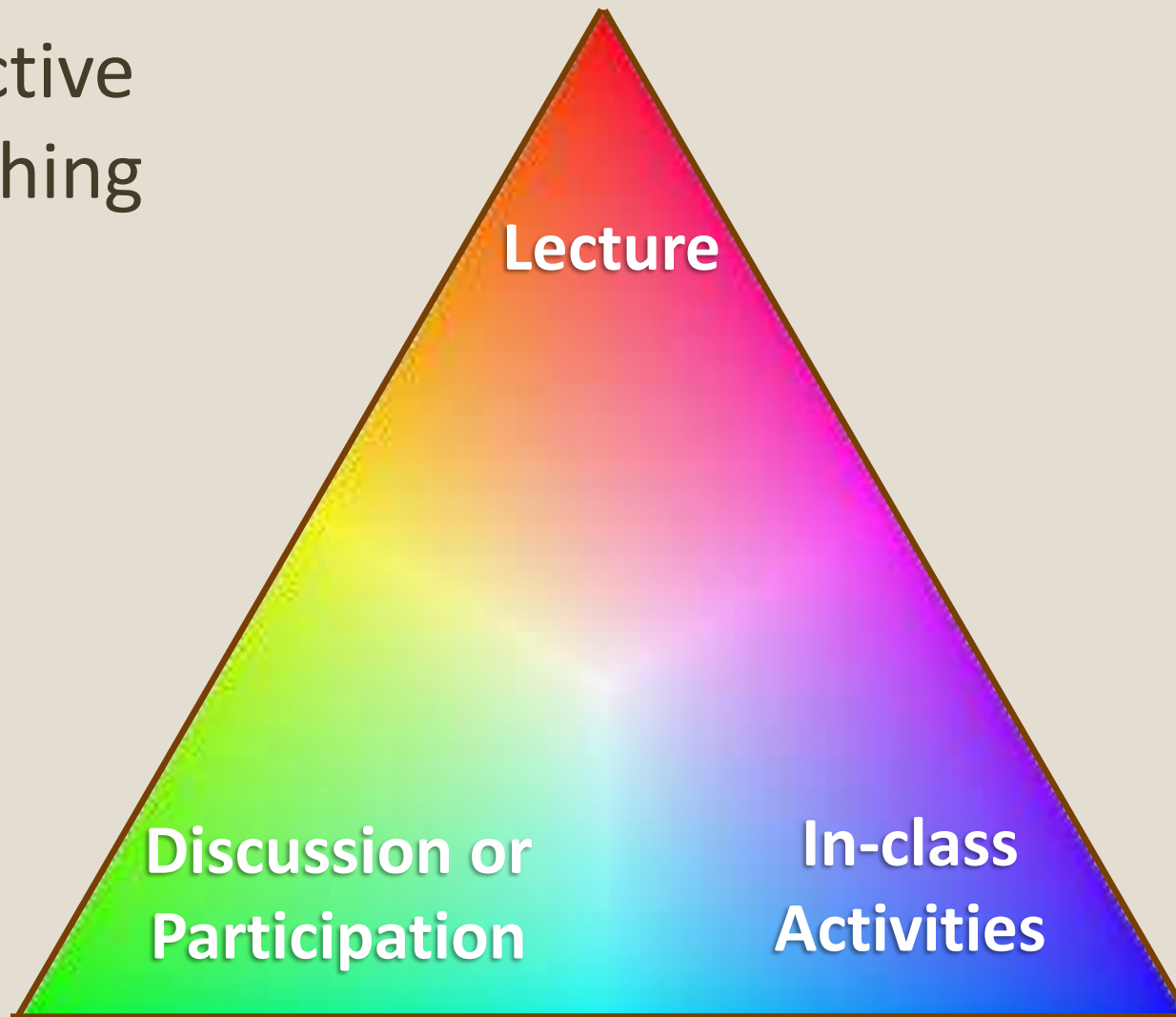


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(Raghav Gupta, <http://raghavgupta.wordpress.com>)

# Outline



- Data on Learning and Memory
- Structure of Class Session
- Examples of Active-Learning Activities
- Strategies for Incorporation into Class
- Incorporating Group Work into Class

# Limits: Attention and Memory



- How many chunks of information can a person process at once?
  - 3-5 units of information
  - FBICIAIRS
- How do students gather information?
  - Independent processing streams
  - Dual process is better than single channel
  - Describe new topics multiple ways and introduce new topics different ways

# Limits: Attention and Memory



- Is visual or verbal information easier to remember?

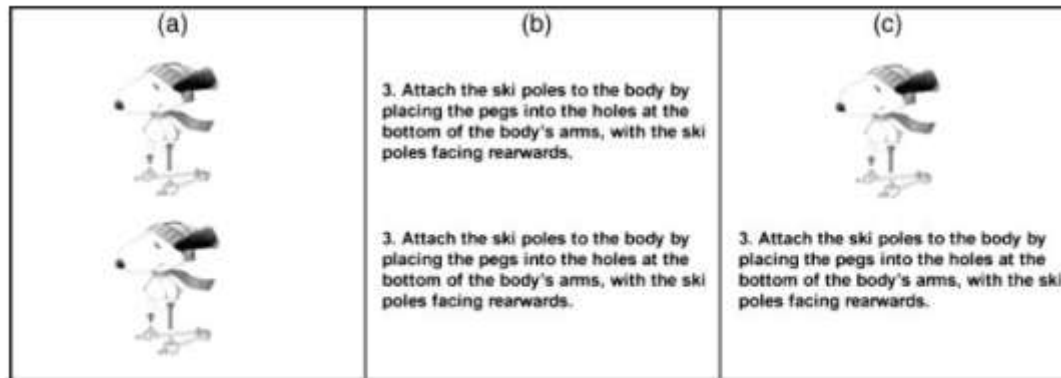


Figure 1. a-c. Picture only (a), text only (b), and multimedia (c) versions of a single step in a given assembly sequence

- How long is a typical attention span?
  - Depends on time-of-day, motivation, enjoyment, emotion

Organize session to help students to listen effectively and remember new ideas

# Studies about Learning



- Retrieval practice as a form of active learning
  - Associated with long term retention of information and better learning than elaborative study.
- Build on prior knowledge
  - Better memory for new information with previous exposure to key issues, concepts or theories.
- Better learning is achieved through more in-class engagement

# Studies about Learning



- Amount of new material per lecture
  - No more than 50%
  - Rest of class time should be devoted to activities to reinforce the new material
  - Based on medical school studies: Hendricson et al. (1984) J. Med. Edu.
- Use of In-class exercises (group or individual)
  - Over 10 year period, Calculus. Average of 16% increase in pre/post exam scores over no in-class exercises
  - Crouch and Mazur. (2001). Amer. J. Physics.



# Organization of Content



- For entire semester
  - Determine the course goals and plan the content
  - Organize overall course content with a theme or storyline (narrative)
- For each class session
  - Have a learning objective
    - ✦ What do you want the students to go away with today?
  - Provide a structure for each class
    - ✦ Have an introduction, the body, and a conclusion
  - Provide an outline at the beginning
  - Build in questions and activities

# Structuring Your Class Session



- Write an outline on the board at the beginning of class
- Use brief lectures to introduce complex topics or to clarify the larger concepts
- Intersperse mini-lectures/brief discussions with active-learning exercises
- Write summary ideas on the board at appropriate points during the session

# Detail of Structure



- Present and explain the new material
- Subdivide the material into mini-lectures
  - Each mini-lecture focuses on one major topic/concept
  - A mini-lecture should last 10-15 minutes
  - A student activity lasting 2-15 minutes should separate mini-lectures
- Each student activity should elucidate the major point just discussed in the prior mini-lecture

# Examples of Activities (small groups or individual )



- Answer questions
- Write questions about reading or mini-lecture
- Answer questions about reading
- Write or answer a short question or problem
- Solve a problem
- Discuss main idea with a peer; write a “one-minute paper”
- Note/homework comparison/sharing
- Identify the “muddiest” point or the most important idea

Angelo & Cross,1993; Middendorf & Kalish,1996

# Techniques – Some First Steps



- Beginning of class
  - Reading or Review “quiz” with voting
  - Clarification questions – determined by group work
- Clarification after mini-lecture
  - Work a problem together; give a problem to solve
  - Clarification “quiz” with voting
  - Clarification questions – determined by group work
- Throughout class
  - Questions with voting
  - Student summary of another student’s answer

# Incorporation into Class – First Day



- Start on the first day of class and use continually
- Explain on the first day of class your philosophy of active learning and participation
- Create a comfortable, non-threatening (but challenging) environment
  - Explain the rules of participation and discussion
  - Encourage students to think aloud
- Be confident in the use of active-learning exercises and group exercises

# Group Work - Providing Direction



## Organizing the Groups

- Decide how the groups will be formed
  - Self-selected versus instructor-formed
- Select group size
  - Groups of 3-4 work best for in-class groups
  - Pairs also can work well
- Decide if groups will remain together or change with activity
- Give group roles

# Group Work - Small Group Roles



Role	Description
Facilitator (group manager)	Keeps the group focused on the activity and ensures that all members participate and understand.
Recorder/ Scribe	Keeps notes of what the group has done in consultation with the others.
Spokesperson (or presenter)	Presents reports and discussion to the class.
Questioner	Questioner: Determines if group members have questions; collects questions group has for the instructor

Note. Small group roles should change



# Group Work - Providing Direction



## During Group Work

- Check students
  - Ask students about what their “role” is in the group
- Be an “active listener”
  - Listen for “peaks” and “valleys” in the discussion
- Be a facilitator
  - Let students know how much time they have to work in small groups
  - Give a 1-minute warning
  - Provide additional activities for groups that finish early
- **Constant monitoring without interfering**

# Group Work - Bringing the Groups Back Together



- Provide structure
  - e.g., 1 group provides 1 idea or piece of information
  - Write ideas on the board
- Ask the group to explain their reasoning
  - “Why does your group think that?”
- Promote participation and elaboration on ideas
  - “Would someone like to add on?”
- Use wait time
  - Let students have 3-5 seconds to think before they answer

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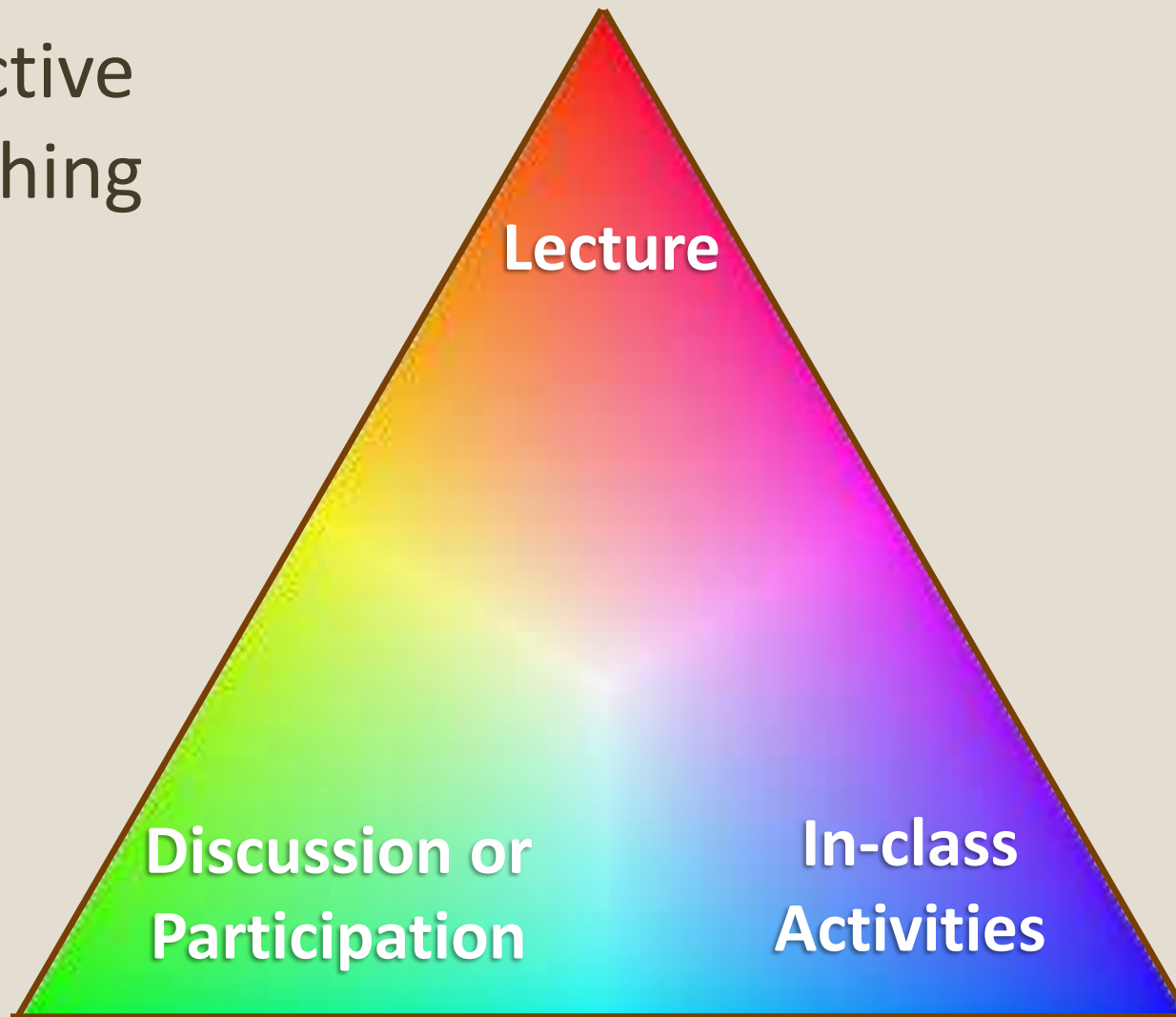


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