

**FLIPPING MY COURSE:
ENGAGING STUDENTS TO
PROMOTE DEEPER LEARNING
& ACADEMIC SUCCESS**

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AGENDA

- Background Info & Obstacles
- What is a “Flipped” Classroom?
- My Approach
- Results
- Takeaways

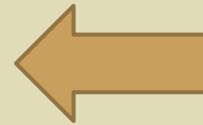
BACKGROUND

- **Introductory Microbiology (MIB03500)**
- **Up to 600 students per term**
 - **2 sections (300 seat capacity each)**
- **Meets 2x week**
 - **75 minutes each**
- **Students are highly motivated**
- **High level of peer pressure**

OBSTACLES

- Large enrollment
- Making connections with students
- Learning spaces
- Motivation & engagement of students

TRANSFORMING LEARNING

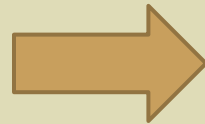


TRADITIONAL

- Faculty speaks
- Students 'listen'



FLIPPED



- Students speak
- Faculty facilitates

MY FLIPPED CLASS DESIGN

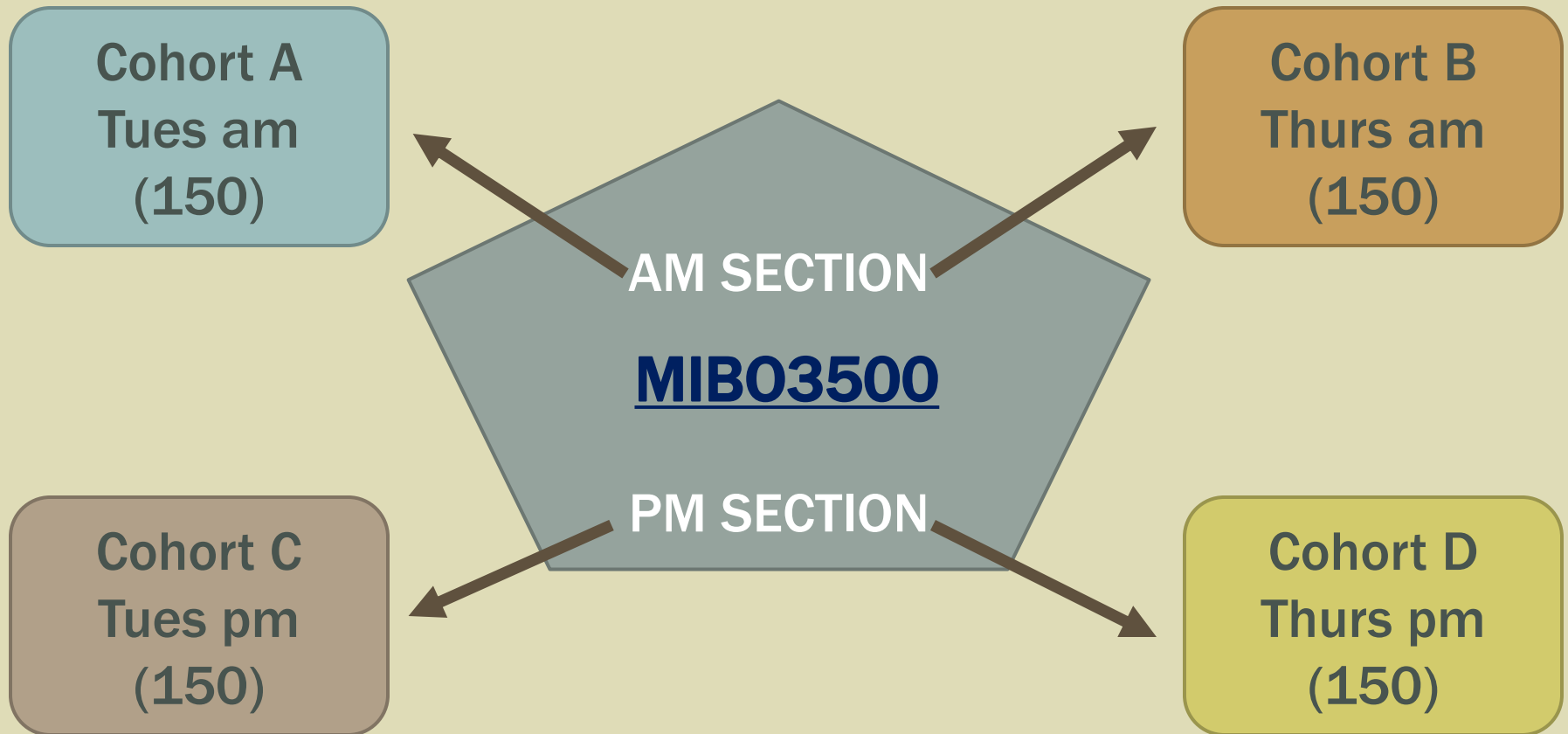
VIRTUAL INSTRUCTION

- Read assigned materials
- View podcasts & take own notes
- Self-assess learning
- Review & reflect on success

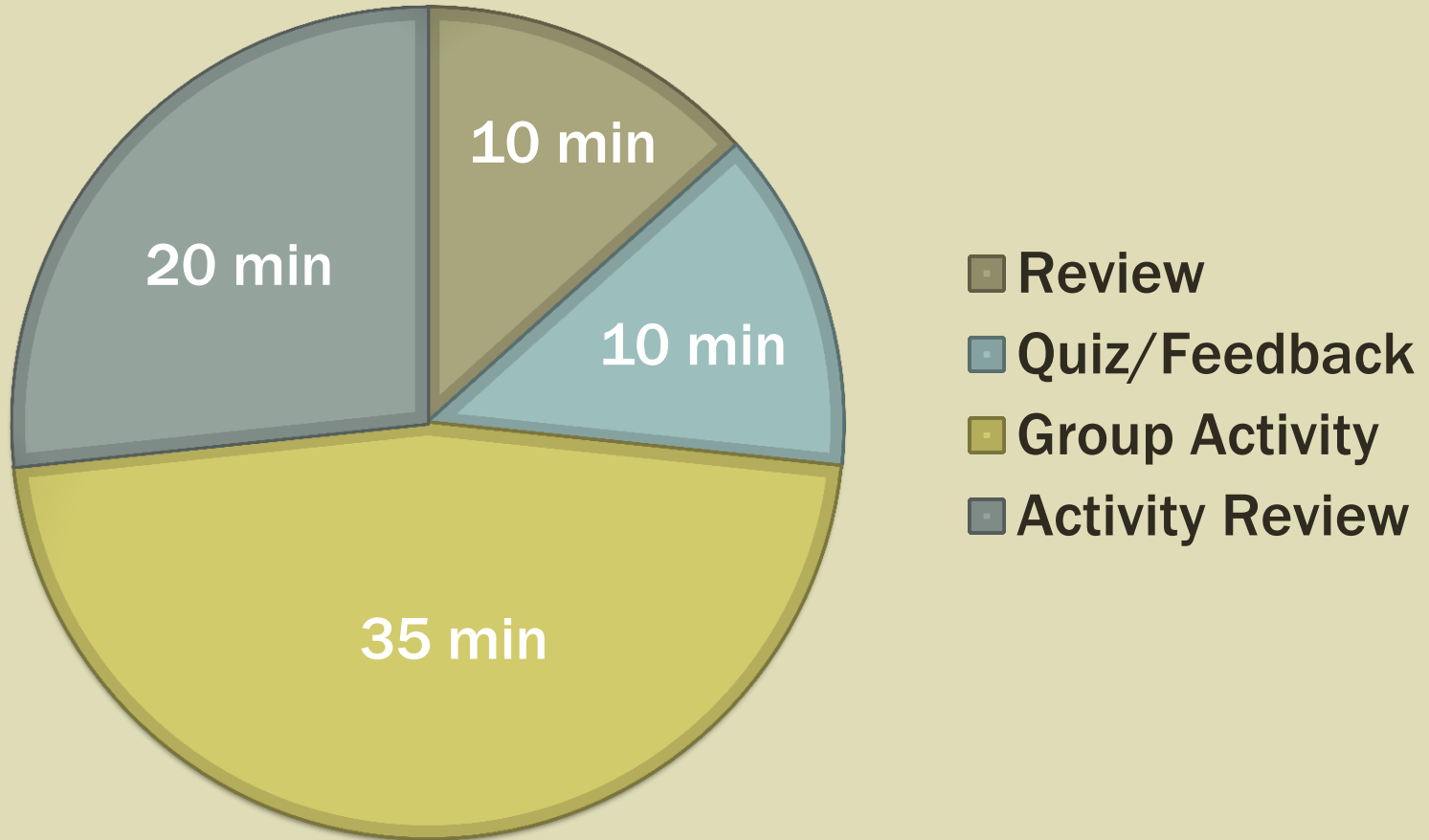
FACE-TO-FACE INSTRUCTION

- Assess preparation
- Group learning activities
- Discuss answers & problem-solving process as a class

IN-CLASS BREAKOUT SESSIONS



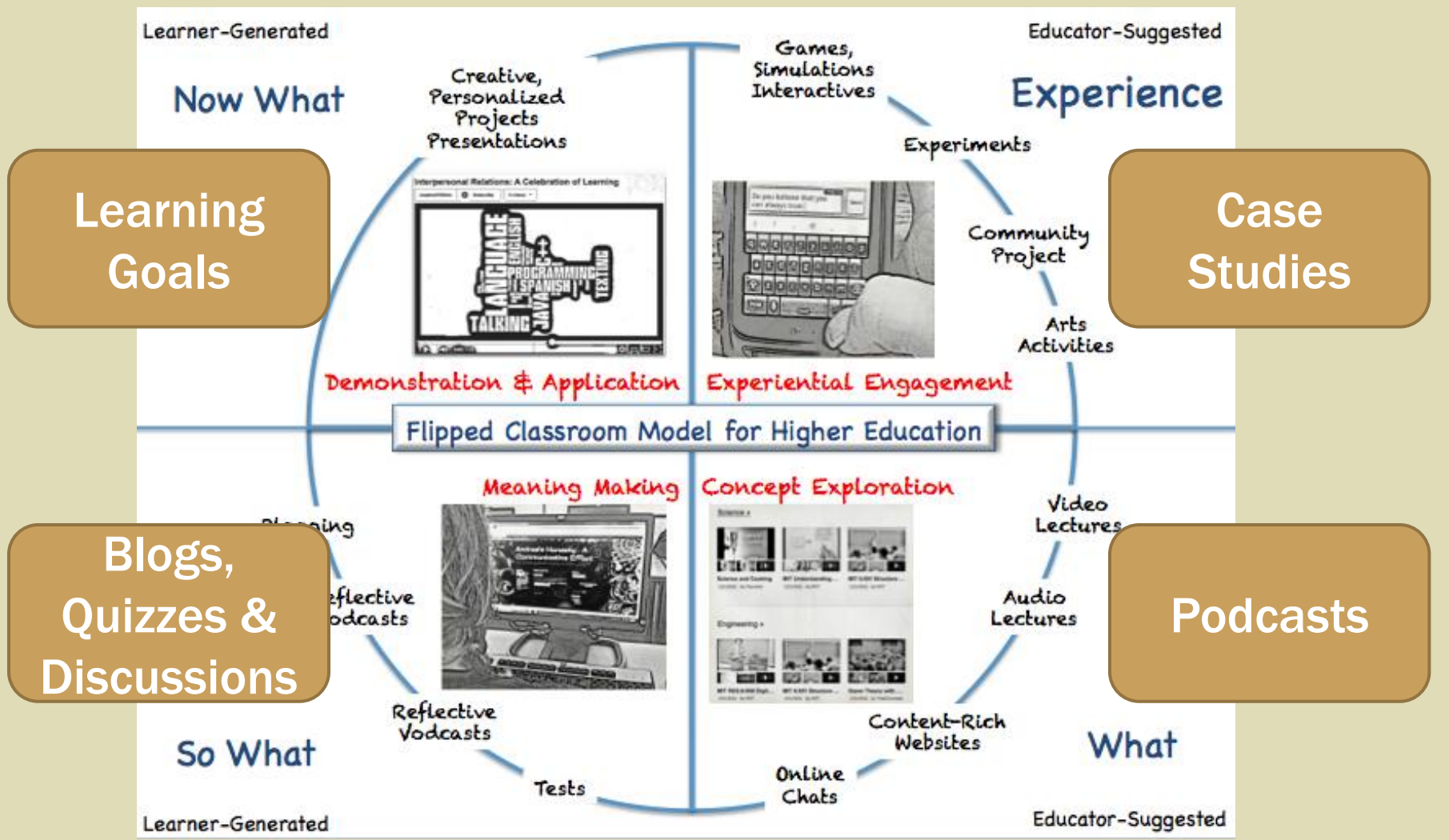
FACE TO FACE INSTRUCTION USAGE



TOP HAT MONOCLE RESPONSE SYSTEM

- Easier to use than clickers for short free response
- More flexible choices for students
- Functions/Uses
 - Quizzing/Polling:
 - MC, short answer, sorting, matching, etc.
 - Collaborative Work Response Postings:
 - Allows real-time detection of misconceptions
 - Can be set up for anonymous submissions
 - Live Review Session Discussions:
 - Can be set up for anonymous posting

MY FLIPPED CLASSROOM MODEL



RESULTS: BIO-CLASS SURVEY

- **Biology - Colorado Learning About Science Survey**
 - Done at beginning and end of each term
- **Survey asks for level of agreement with 32 beliefs:**
 - Overall
 - Real-World Connections
 - Enjoyment
 - Problem-Solving Effort
 - Problem-Solving Strategies
 - Problem-Solving Difficulty
 - Reasoning
 - Conceptual Connections/Memorization

RESULTS: BIO-CLASS SURVEY

■ Overall

- No significant differences between beginning and end of term for either instruction style

■ Conceptual Connections/Memorization

- Traditional: Students shifted towards a belief that memorizing facts is key to successfully solving biology problems ($p= 0.017$)

■ Problem-Solving Strategies

- Traditional: Students shifted to believing that thinking through the problem from different perspectives is key to solving biology problems ($p= 0.038$)

RESULTS: BIO-CLASS SURVEY

■ Enjoyment

- Flipped: Students reported increased enjoyment and deeper interest of biology topics ($p=0.016$)

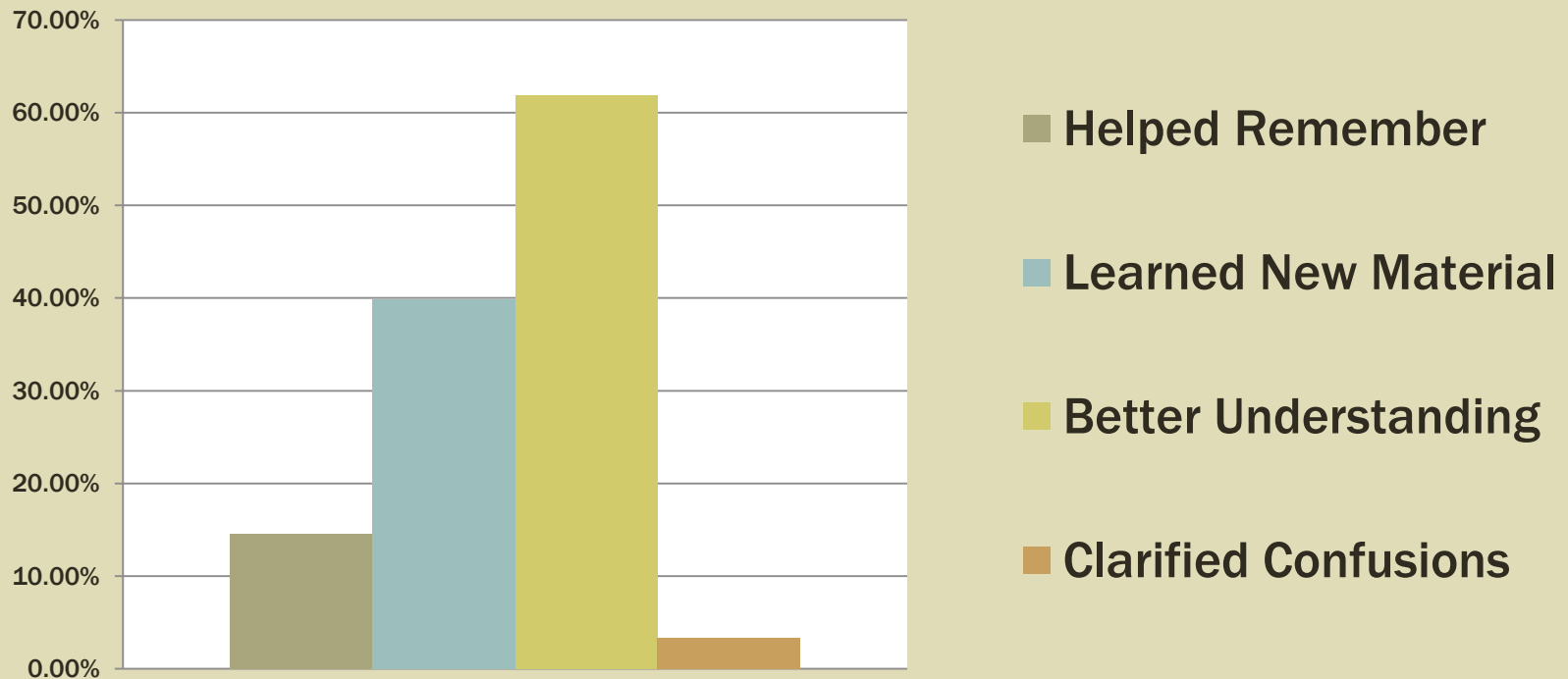
■ Problem-Solving Difficulty

- Flipped: Students shifted to a belief that based on their level of understanding biology concepts, they could apply that information to a biology problem to solve it ($p=0.014$)

RESULTS: ACTIVITY BENEFITS

From reflective blogs – only traditional course shown

■ Activity 9



RESULTS: MY OBSERVATIONS

- Far less disengagement
- More questions & discussions
- More connections between content & current events
- Study groups persist

TAKEAWAYS

- Blogs show increased satisfaction
- Lecture is now a discussion
- Lowers student to instructor ratio
- Attendance increased
- Takes advantage of peer instruction

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