

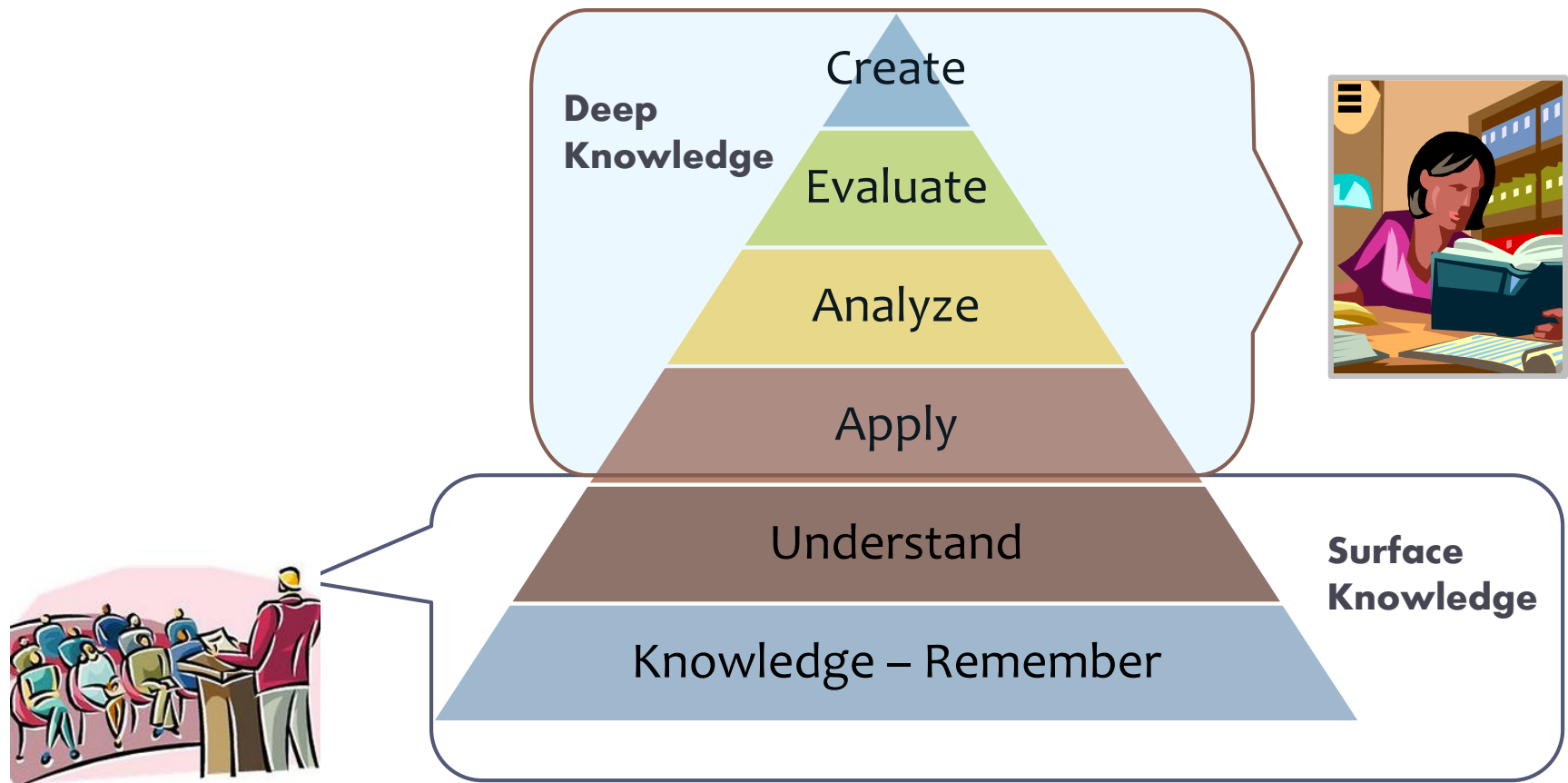
California State University
SAN MARCOS



Rethink Teaching

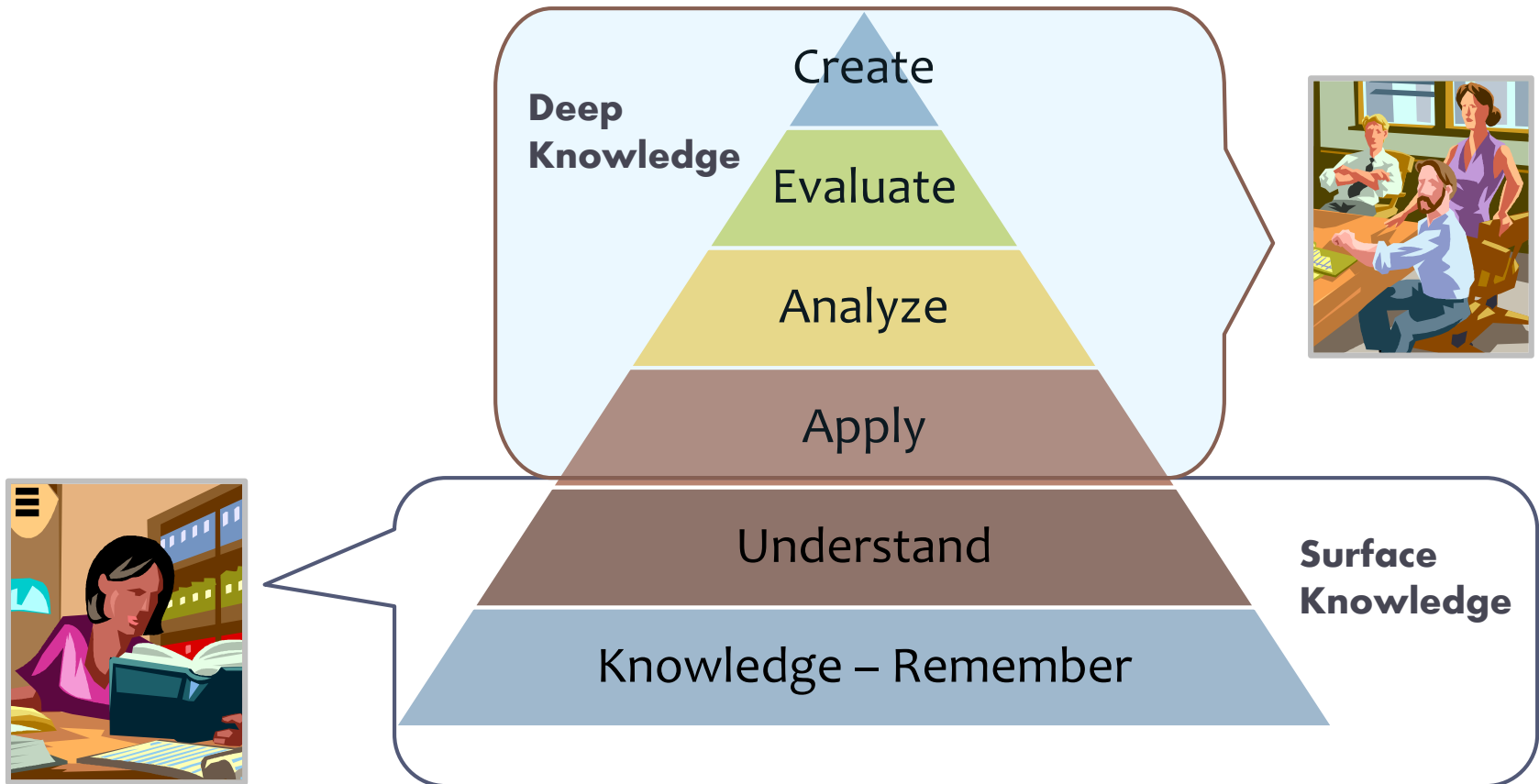
with a Flipped Classroom

Traditional Lecture Format



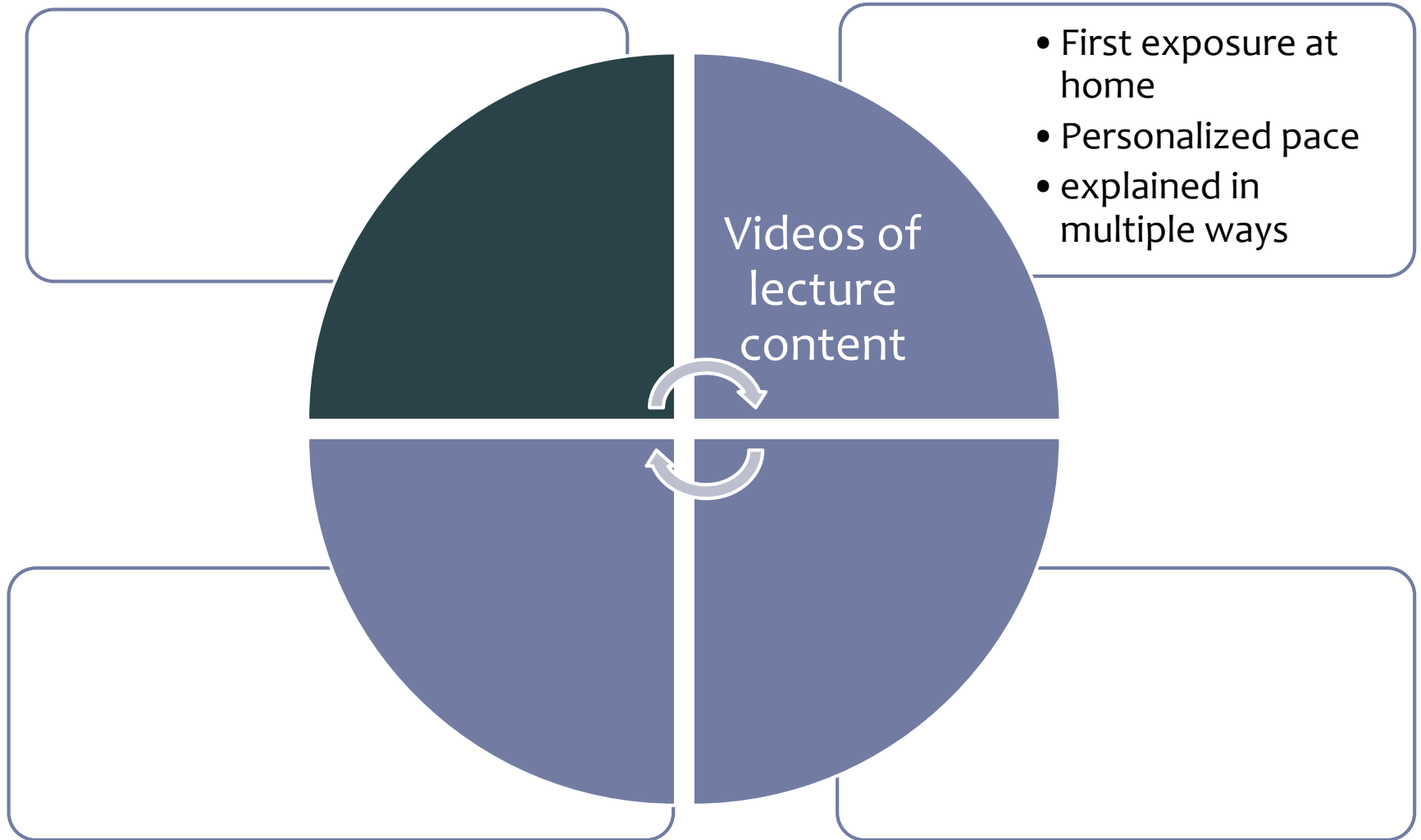
**Bloom's Taxonomy
Levels of Intellectual Learning**

Traditional Lecture Format

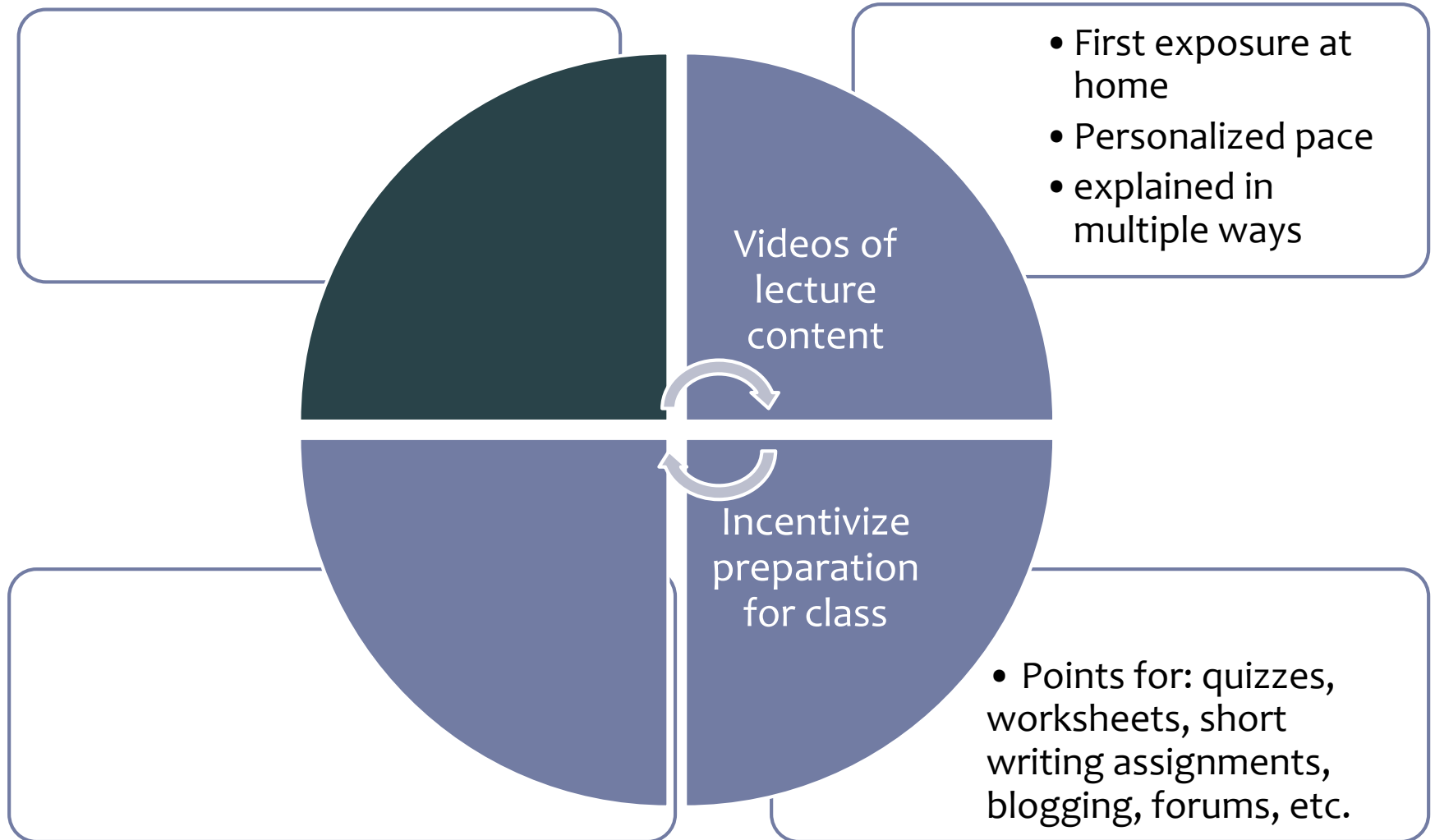


**Bloom's Taxonomy
Levels of Intellectual Learning**

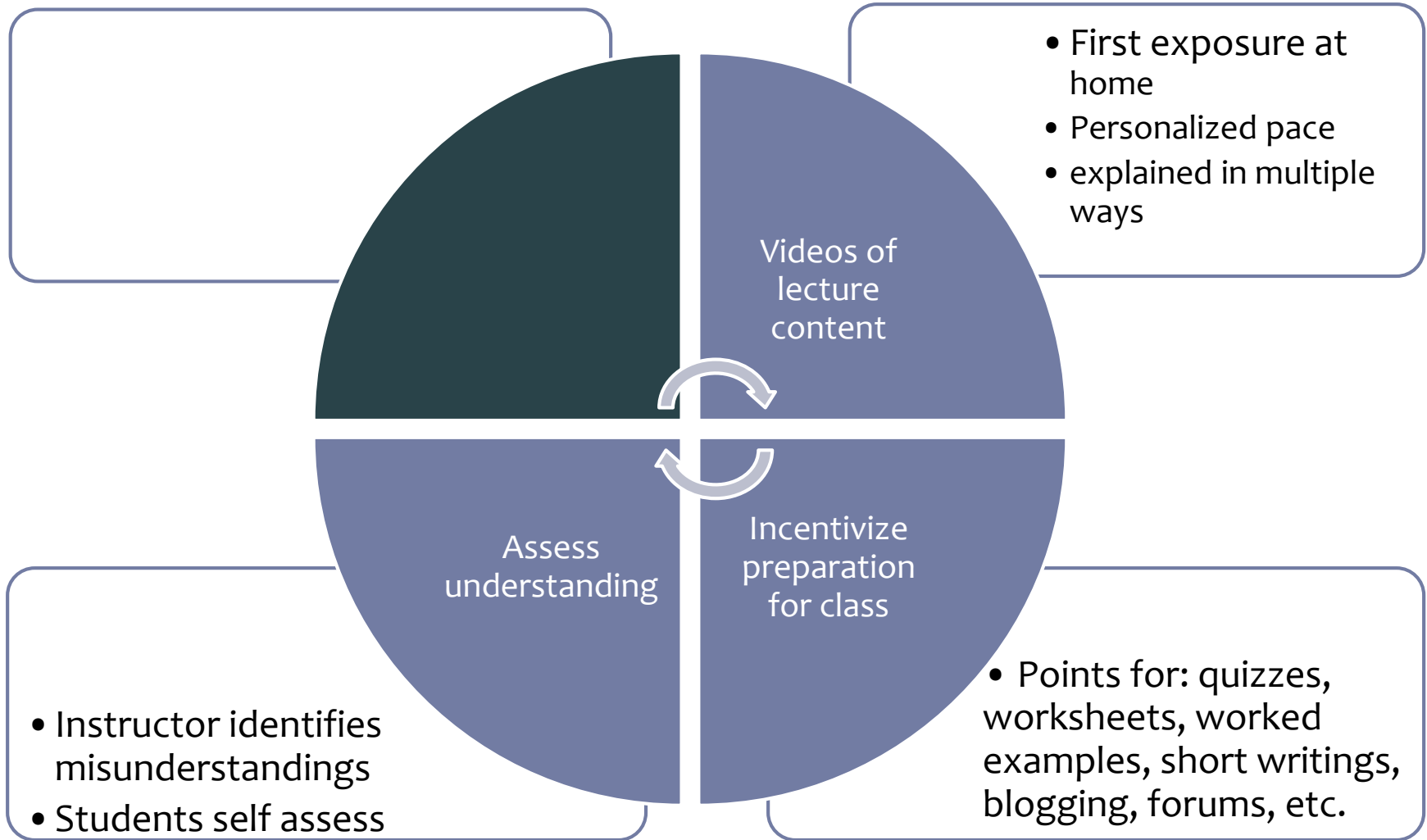
Flipped Course Elements



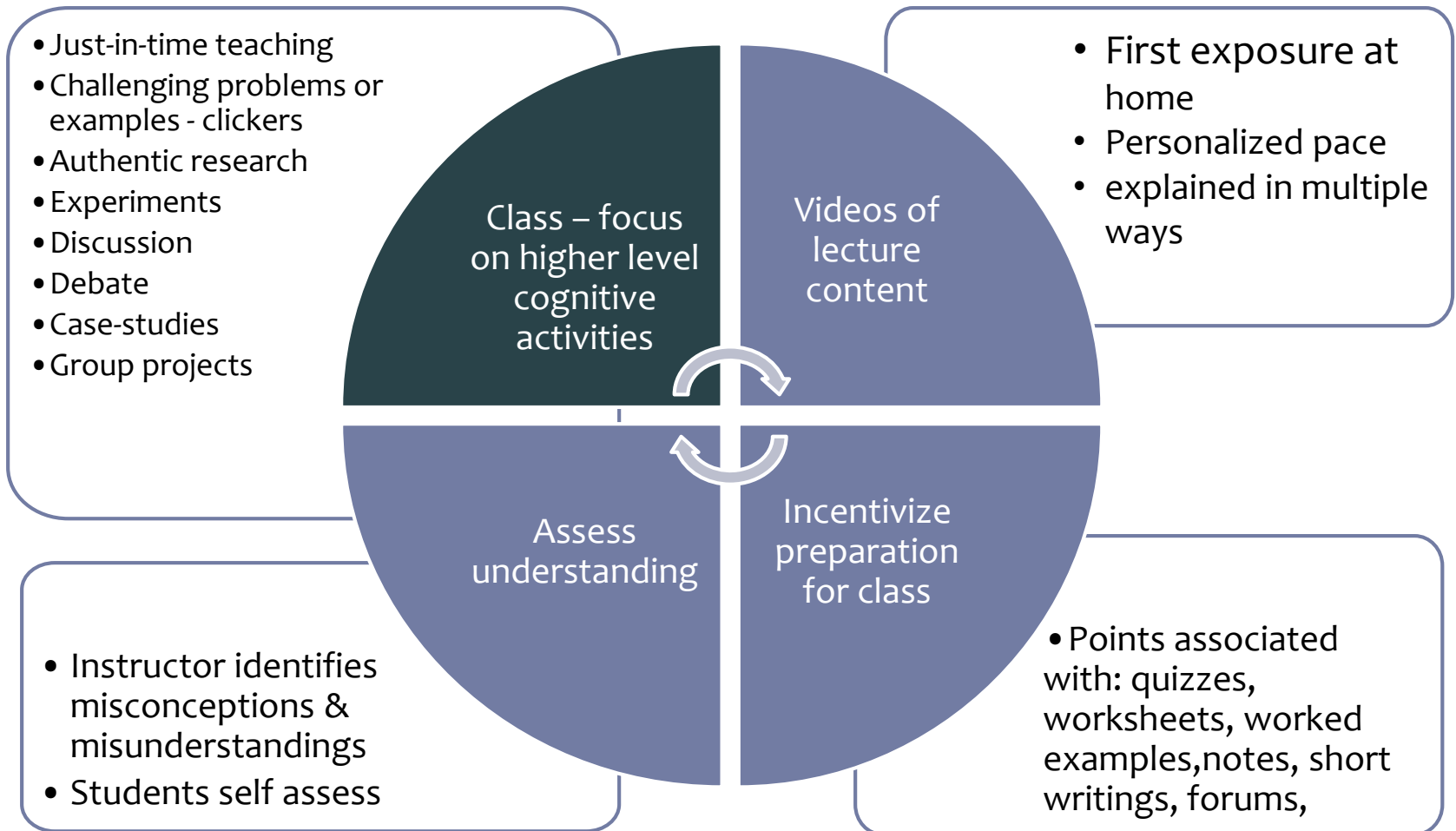
Flipped Course Elements



Flipped Course Elements



Flipped Course Elements



Considerations & Concerns

- ▶ Your learners
- ▶ Course content and place in the curriculum
- ▶ Why am I lecturing?
- ▶ Breadth vs. depth of content coverage
- ▶ What about readings?
- ▶ How much – start small or go all in?



Considerations & Concerns

- ▶ Change in teaching style
- ▶ Requires careful preparation
- ▶ Preparing students to be active participants



- ▶ Student pushback

“If I’m paying for a class and a professor to teach me, then I do not want to teach myself for homework and have homework for class.”

Student Perceptions

- ▶ Survey of flipped class studies (11) [Bishop and Verleger, 2013](#)
“Despite differences among studies, general reports of student perceptions were relatively consistent. Opinions tended to be positive, but there were invariably a few students who strongly disliked the change.”
- ▶ Clarisa Bercovitch Guelman’s flipped class
 - ▶ *“Very hands on. Awesome! Videos are a lot of help because I can watch them multiple times.”*
 - ▶ *“The “Reverse” layout kept important learning time in the class with examples instead of covering material. The questions and activities solidified concepts for me.”*
 - ▶ *“ I also liked the group learning structure that this class used. I learned much more from my fellow students because of this.”*

Who is Doing it?

- ▶ CSU Chico - [Accounting](#), [Political Science](#)
- ▶ CSU Northridge – Multimedia Design
- ▶ CSU Los Angeles – [Management](#)
- ▶ CSU Long Beach - [Anatomy](#)
- ▶ Cal Poly Pomona- [Physics](#)
- ▶ SDSU – [Pre-calculus](#)
- ▶ SJSU – Engineering Electronics and Circuits
- ▶ Colorado State University at Pueblo – World History
- ▶ UC Irvine – Biology
- ▶ U. of Colorado at Boulder – Ecology and Evolutionary Bio
- ▶ Miami U. – Microeconomics and Software Engineering

Getting Started

Technology, Process and Examples

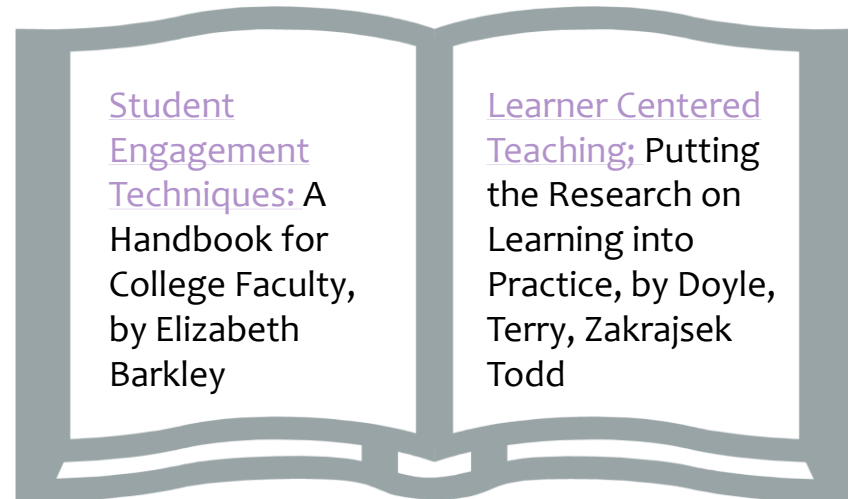
Before the Classroom

- ▶ Lecture Content Videos:
 - ▶ Tools:
 - ▶ TechSmith Relay, Camtasia Studio, SoftChalk, YouTube, Screencast.com, Jing
 - ▶ Tablets, iPad with apps like Doceri
- ▶ Open Educational Resources (OER)
- ▶ Publishers online products
- ▶ Incentivize preparation & assess understanding
 - ▶ Cougar Courses activities:
 - ▶ quizzes, forums, assignments, database, glossary
 - ▶ Publishers online exercises

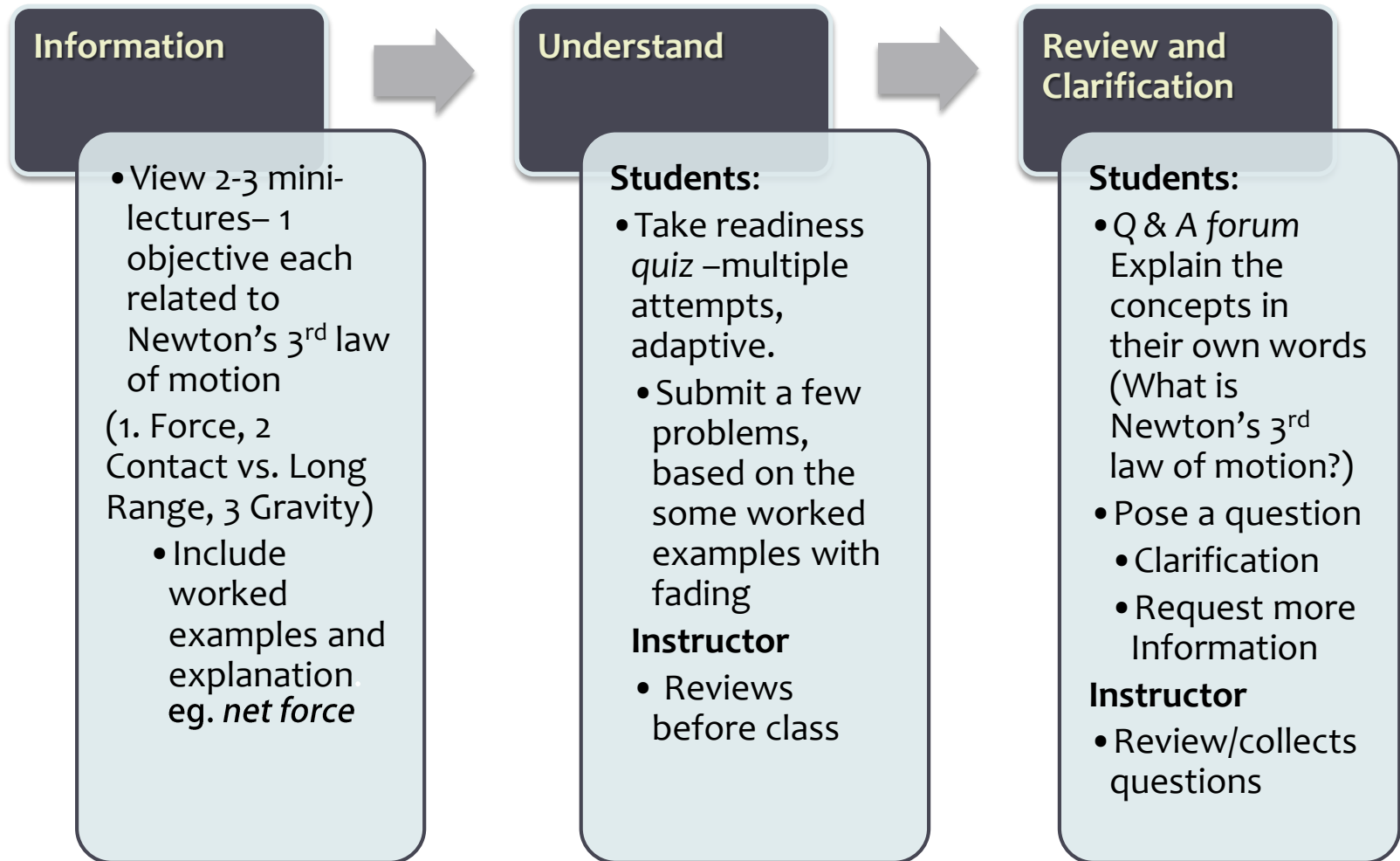
INSIDE the Classroom

Active Learning Techniques & Activities

- ▶ Peer Instruction
- ▶ Team Based Learning
- ▶ Structured Debates
- ▶ Problem based learning
- ▶ Case study/mini-case study
- ▶ Simulations, Experiments, Labs
- ▶ Jigsaw Group Projects

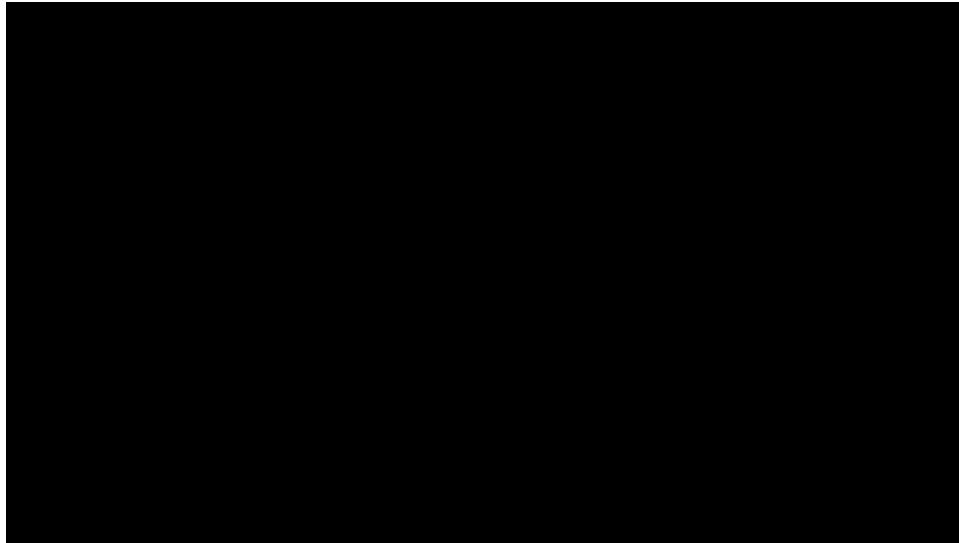


Case 1 : Peer Instruction – Physics, before class



Case 1: Peer Instruction – a Playlist

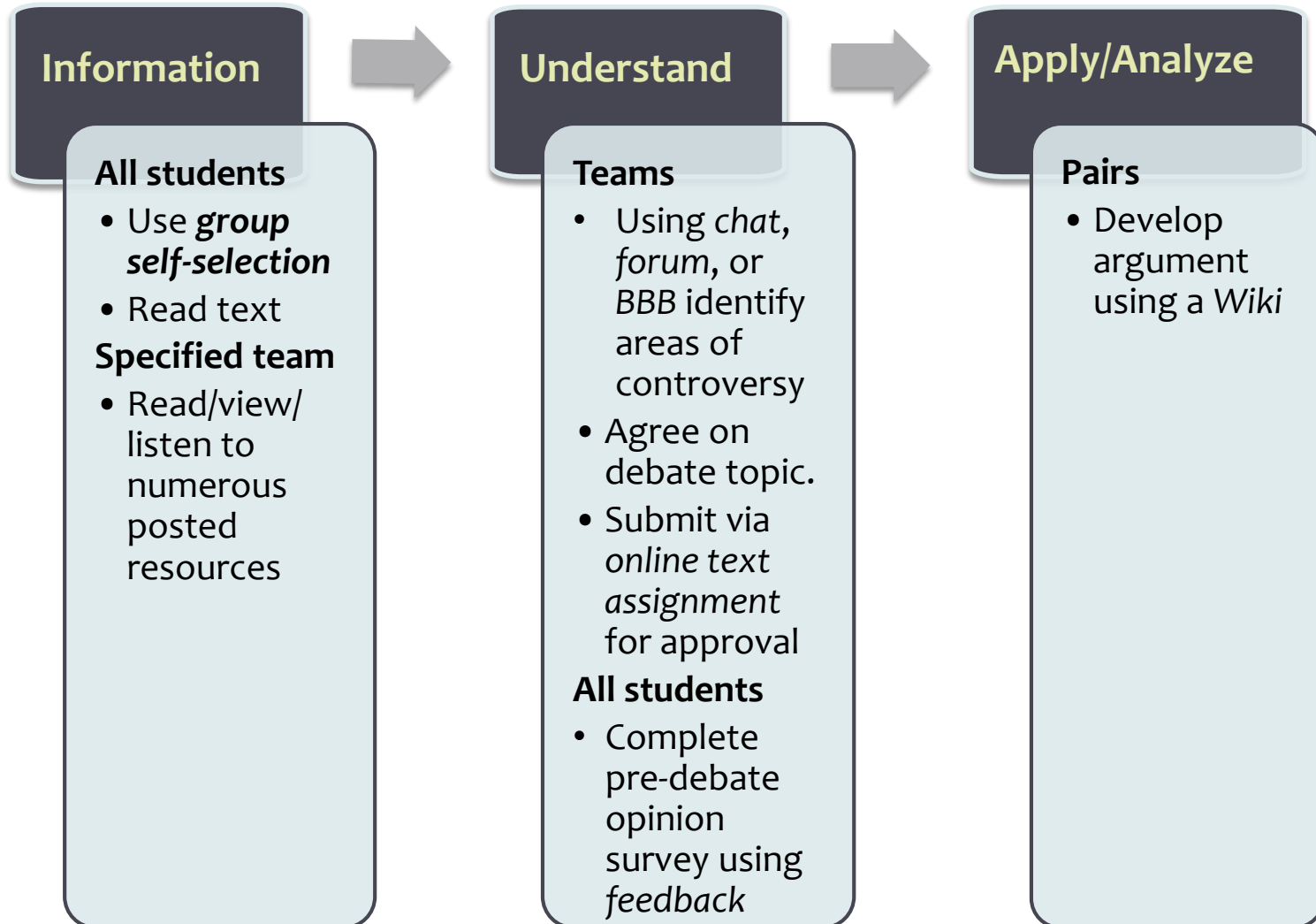
You Tube
[View playlist](#)



Case 2: Structured Controversy in Accounting

- ▶ Topics are aligned with core text. (Corporate social responsibility, Sustainability of Euro, International Taxation, etc.)
- ▶ Teams of 4, further broken into pairs.
- ▶ Topics assigned/selected
- ▶ Team identifies the controversial issue(s) within topic.
- ▶ Each pair takes one side and develops position.
- ▶ Present to whole class
- ▶ Team merges opposing perspectives into cohesive, reasoned position

Case 2: Structured Controversy -Before Class



Case 2: Structured Controversy -Before Class

Pre-Debate Opinion survey

*1

Sustainability of the Euro 1

Should Greece leave the Euro currency system?

Yes No

*2

Sustainability of the Euro 2

If Greece is required (or chooses) to exit the Euro currency system, do you believe it should leave immediately (as opposed to a phased departure over time)?

Yes No

*3

International Taxation 1

Do you believe that tax competition, as it stands, is fair?

Yes No

*4

International Taxation 2

Do you believe that tax competition can be effectively regulated?

Yes No

*5

Sustainable Capitalism 1

Does the government have the tools and resources for a transition to a new sustainable model of capitalism?



Case 2: Structured Controversy -In Class

Controversial Issues Report Survey

*1

Rate the effectiveness of five minute presentations to clearly explain the positions taken by groups in debate on a scale of 0-100.

*2

Rate the effectiveness of rebuttal/critique responses to address concerns or issues identified on a scale of 0-100.

*3

Rate the relevance of questions asked by groups in the debate on a scale of 0-100.

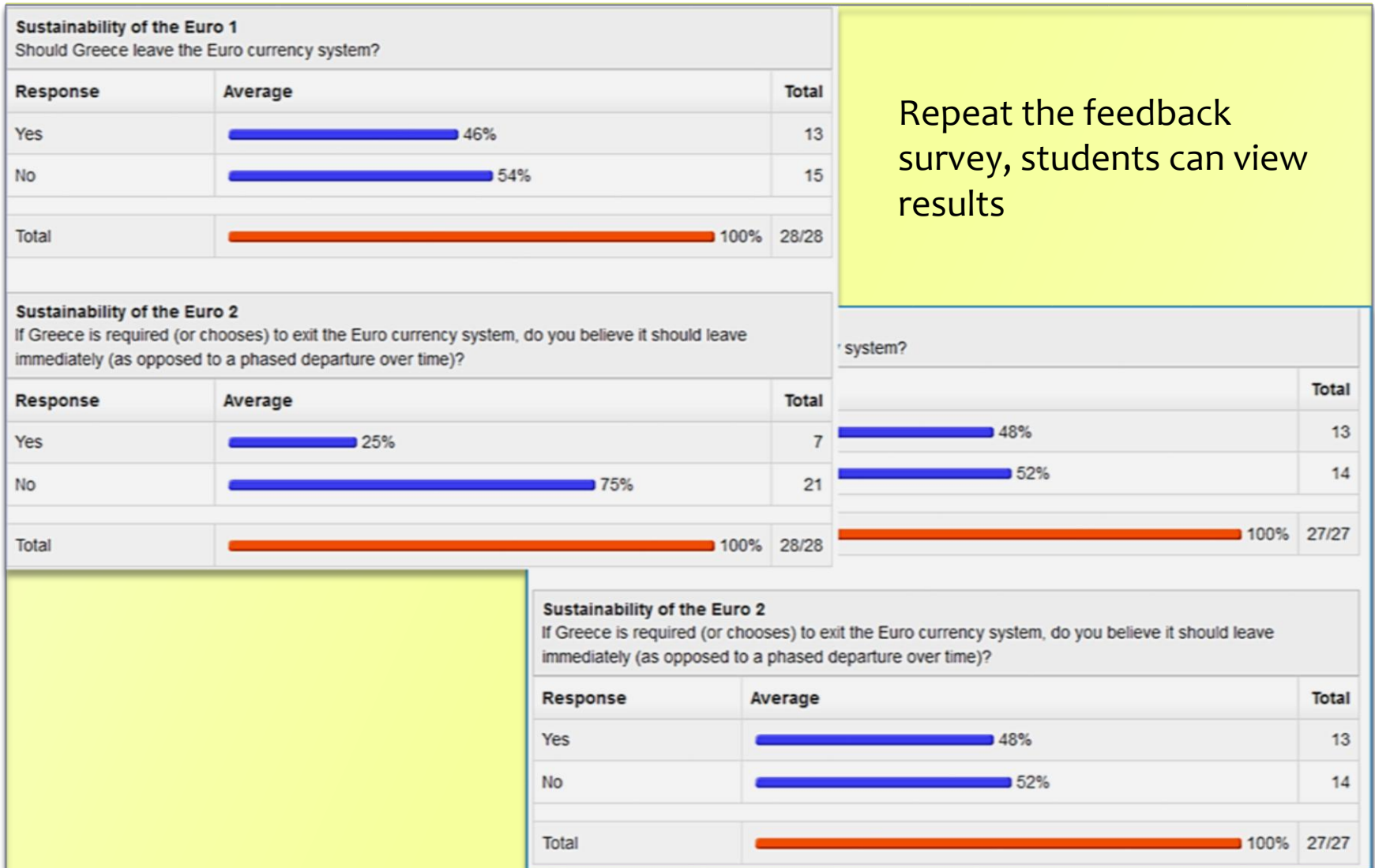
*4

Rate the level of knowledge of controversial issue covered by the team in the debate on a scale of 0-100.

*5

Rate the enthusiasm for discussion of controversial issue by debate participants on a scale of 0-100.

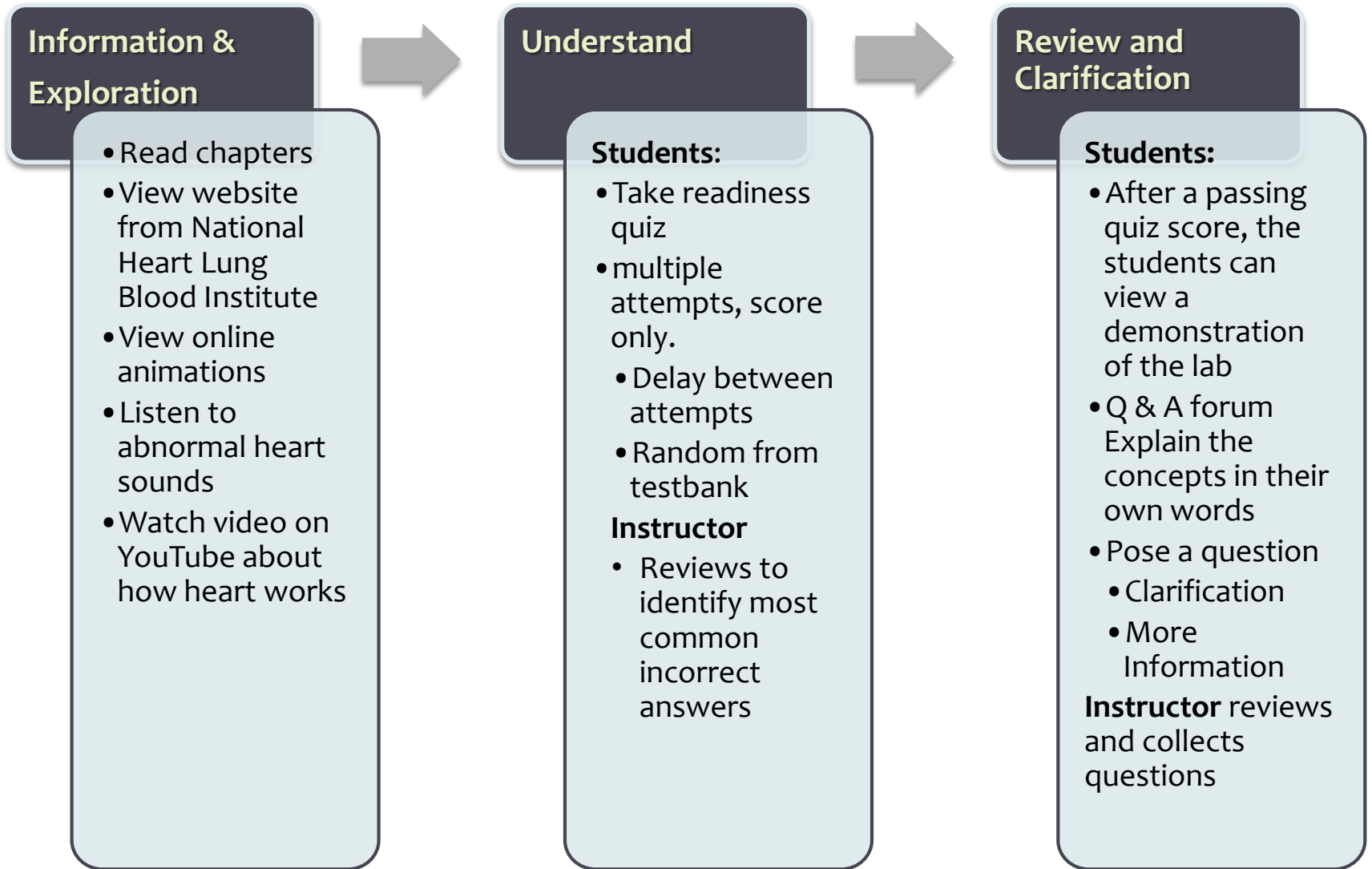
Case 2: Structured Controversy -After Class



Repeat the feedback survey, students can view results

system?

Case 3: Lab Course, Before Class



Case 3: Lab Course, In Class

Review and Clarification

Students:

- Ask any additional questions

Instructor:

- Short review of material/demo of the lab
- Reviews common misconceptions or errors from quiz results and forums
- Answers or poses forum questions to the class



Apply

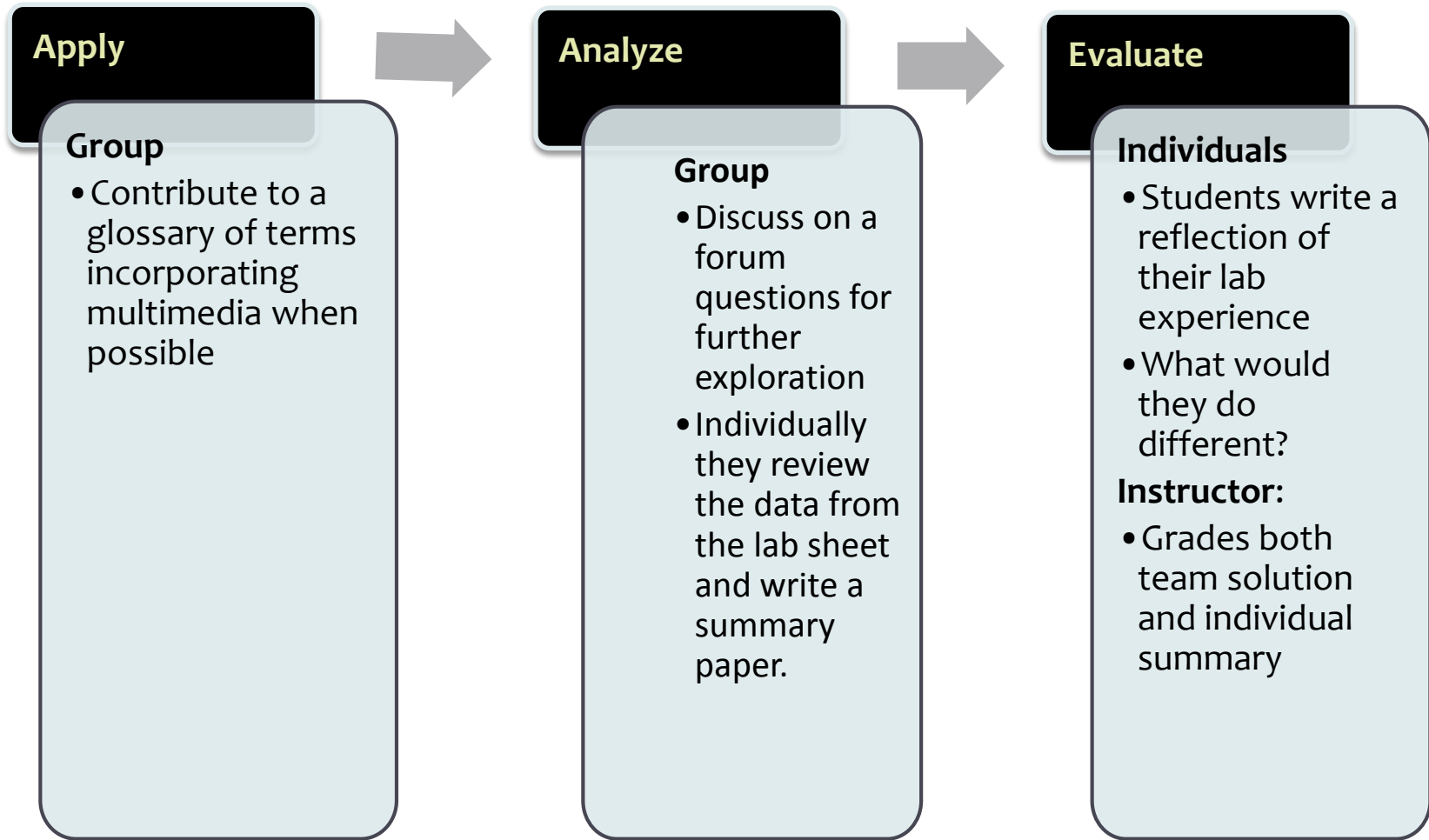
Individual/Teams

- Use a wiki page template as a lab sheet

Instructor

- Leads whole class review.

Case 3: Lab Course, After Class



Summary

- ▶ Videos are Information Transfer
 - ▶ Short, tightly focused
 - ▶ Use Cougar Courses to support and encourage viewing.
- ▶ Utilize open education resources

- ▶ Optimize use of classroom time – higher order thinking
 - ▶ Student-centered activities
 - ▶ Practice, active guidance and feedback
 - ▶ Individual support just- in- time
- ▶ Use Cougar Courses after class for reflection, demonstrated learning, sharing projects, etc.

Does it Work?

What does the Research Indicate?

Physics

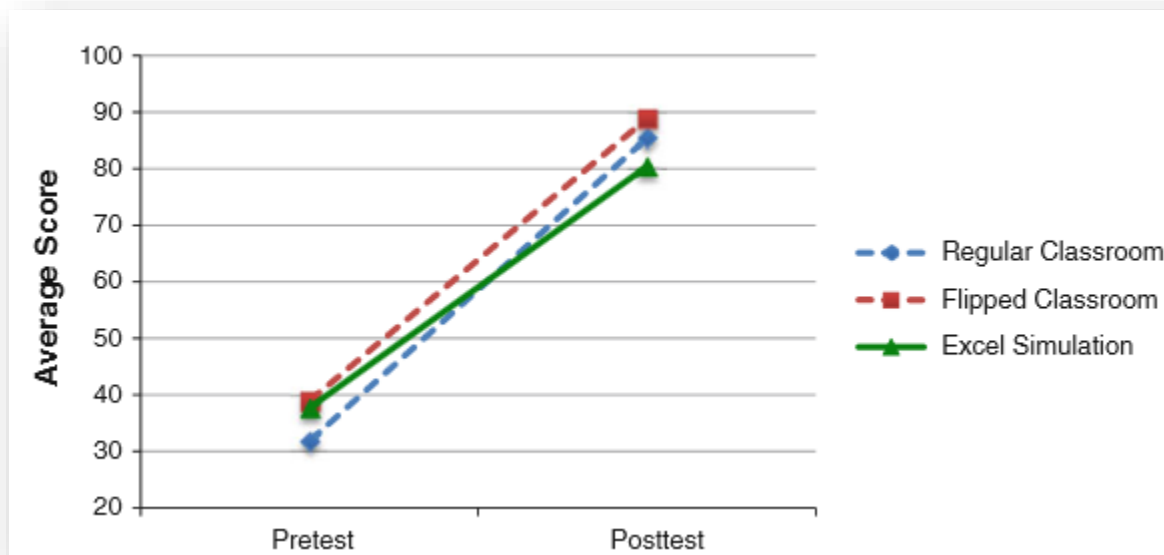
- ▶ Crouch CH and Mazur E (2001). Peer instruction: Ten years of experience and results. *American Journal of Physics* 69: 970-977.
- ▶ Students in PI courses showed learning gains ranging from 0.49 to 0.74 over eight years of assessment at Harvard University
- ▶ Two physics classes taught by traditional methods during the assessment period show much lower learning gains (0.25 in a calculus-based course in 1990 and 0.40 in an algebra-based course in 1999).

Physics

- ▶ DesLauriers L, Schelew E, and Wieman C (2011). *Improved learning in a large-enrollment physics class.* *Science* 332: 862-864
 - ▶ 2 sections of large enrollment physics, both taught via “interactive lecture”
 - ▶ Week 12, flipped 1 section,
 - ▶ Engagement increased from 45 +/-5% to 85 +/- 5MC test
 - ▶ Ave quiz score 74 in flipped vs. 41 in control.

Computer Information Systems

- ▶ Davies & Ball (BYU) – Compared 3 approaches to teaching a spreadsheet class
 - ▶ Large lecture
 - ▶ Independent study with My IT Lab videos and sims
 - ▶ videos/simulations s and optional flipped class



Computer Information Systems

Table 4 Results from students' end of semester course evaluations by instruction type

	<i>n</i>	Mean	SD
Overall course			
Regular classroom	35	6.8	1.0
Flipped classroom	37	7.0	0.9
Excel simulation	198	6.1	1.4
Overall instructor			
Regular classroom	35	7.2	0.9
Flipped classroom	37	7.4	0.9
Excel simulation	198	6.3	1.3

Responses based on an 8 point scale, with 1 as *extremely poor* and 8 as *outstanding*

- ▶ Davies R, Dean D, Ball N. Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Educational Technology Research & Development* August 2013;61(4):563-580.
- ▶ <http://ezproxy.csusm.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=88785048&site=ehost-live>

Active Learning

- ▶ Leads to better student attitudes, and improvements in thinking and writing. (Bonwell and Eison, 1991)
- ▶ Collaborative learning improves learning outcomes relative to individual work.

Reference	Learning Outcome	Effect Size
Johnson, Johnson and Smith [12] Meta-study 90 years of research	Improved academic achievement	0.64
	Improved quality of interpersonal interactions	0.60
	Improved self-esteem	0.44
	Improved perceptions of greater social support	0.70
Johnson, Johnson and Smith [13] Updated – 168 studies from 1924-1997	Improved academic achievement	0.53
	Improved liking among students	0.55
	Improved self-esteem	0.29
	Improved perceptions of greater social support	0.51
Springer et al. [43] 37 studies in STEM courses	Improved academic achievement	0.51
	Improved student attitudes	0.55
	Improved retention in academic programs	0.46

Reported in: Prince, M., J. of Engineering Education, 93(3), 223-231, 2004

References and Additional Resources

For More Information:



Use the QR code at left for..

- ▶ research on:
 - ▶ Flipped Courses
 - ▶ Active Learning
 - ▶ Use of lecture capture/video
- ▶ a compilation of Active Learning techniques

www.csusm.edu/ids >> Course Design & Instruction >> Flipped Class