

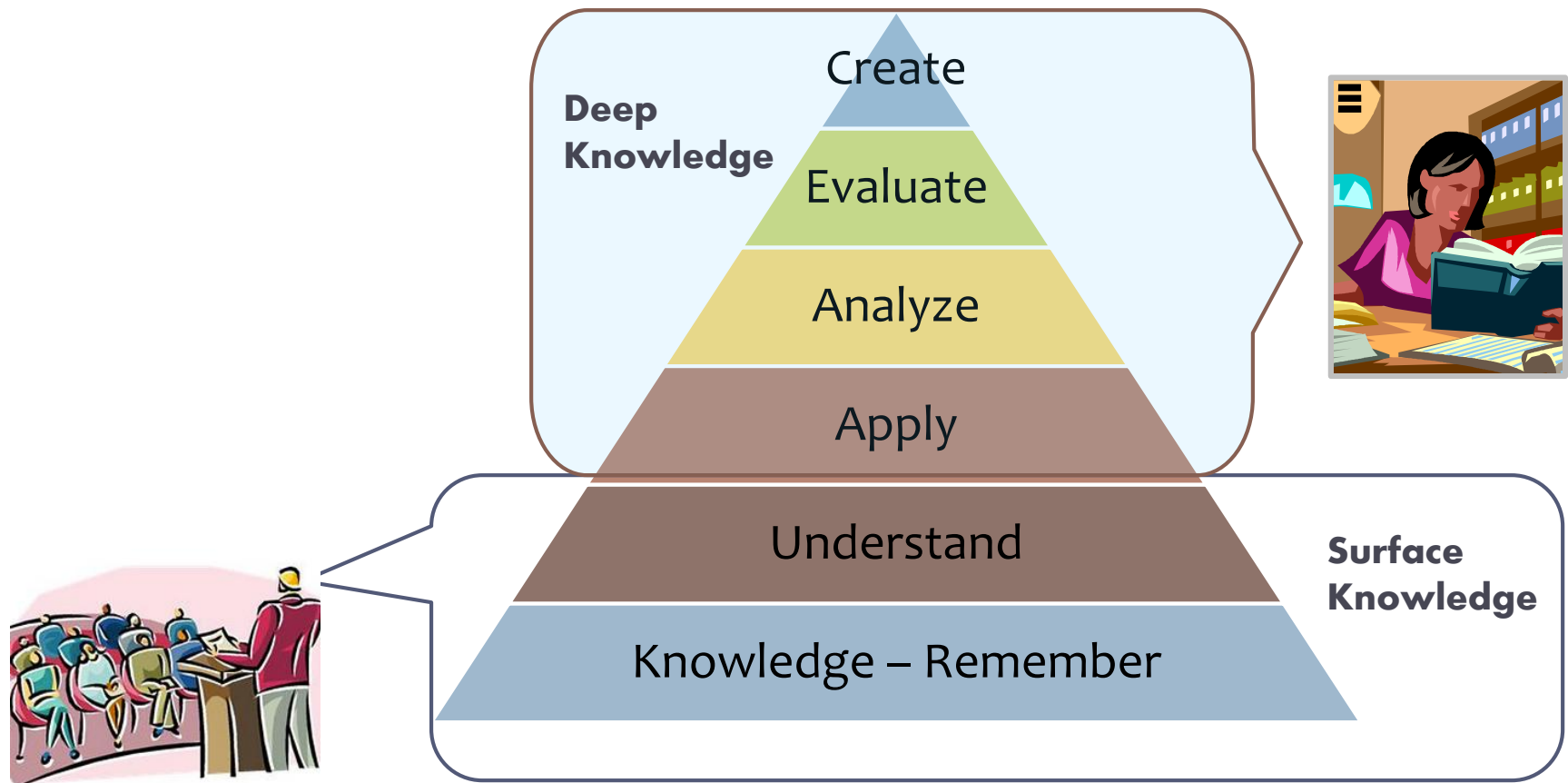
California State University
SAN MARCOS



Rethink Teaching

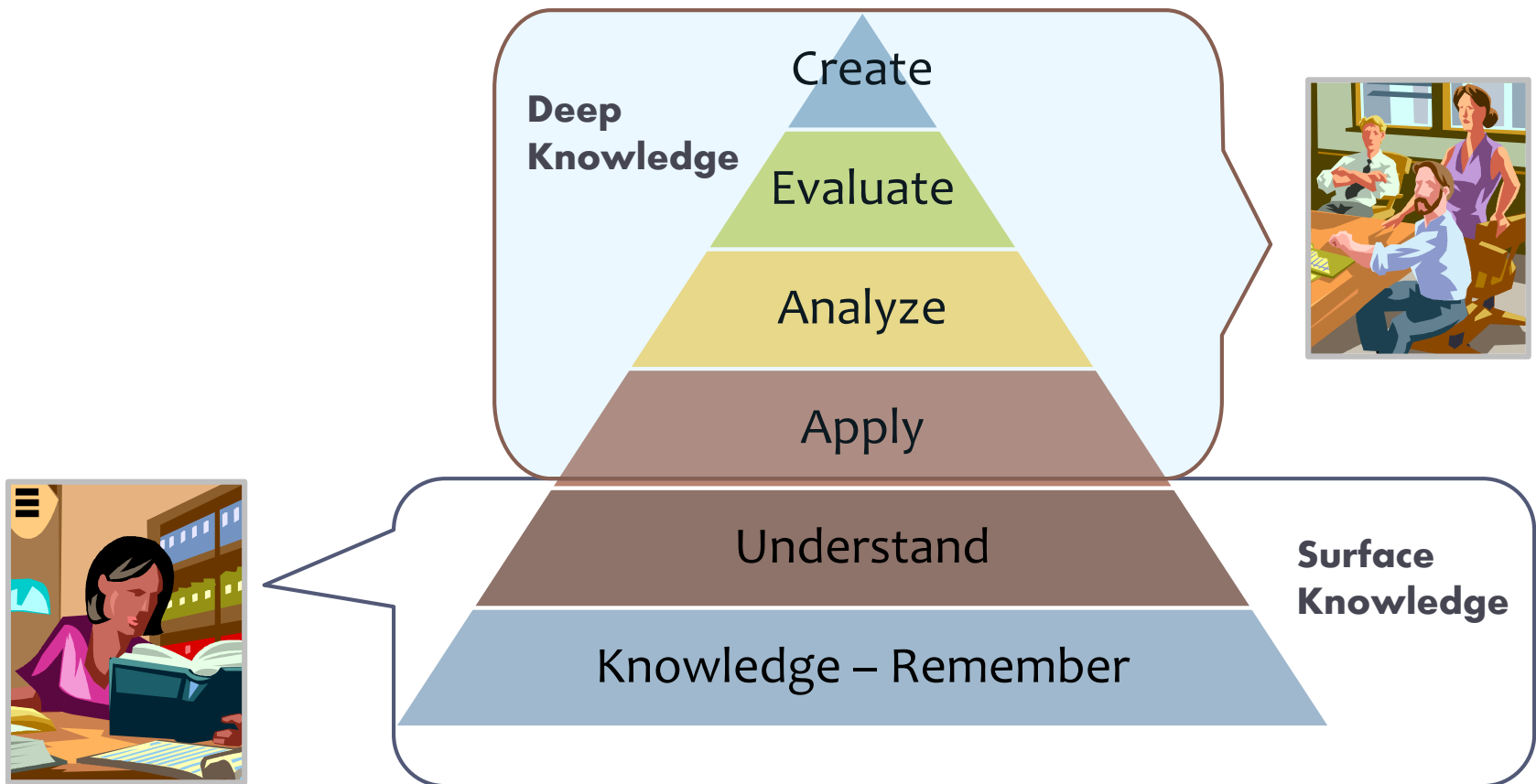
with a Flipped Classroom

Traditional Lecture Format



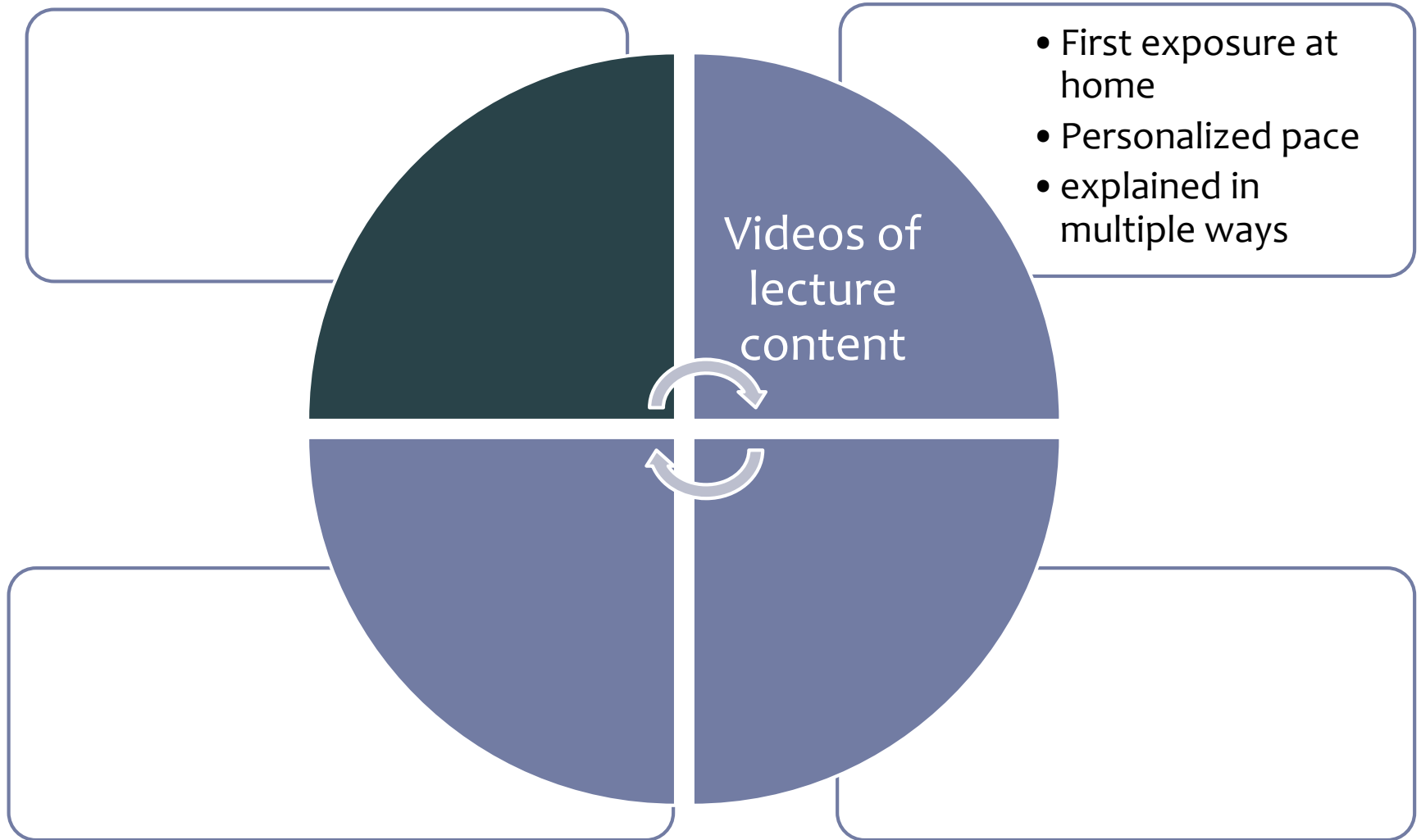
**Bloom's Taxonomy
Levels of Intellectual Learning**

Traditional Lecture Format

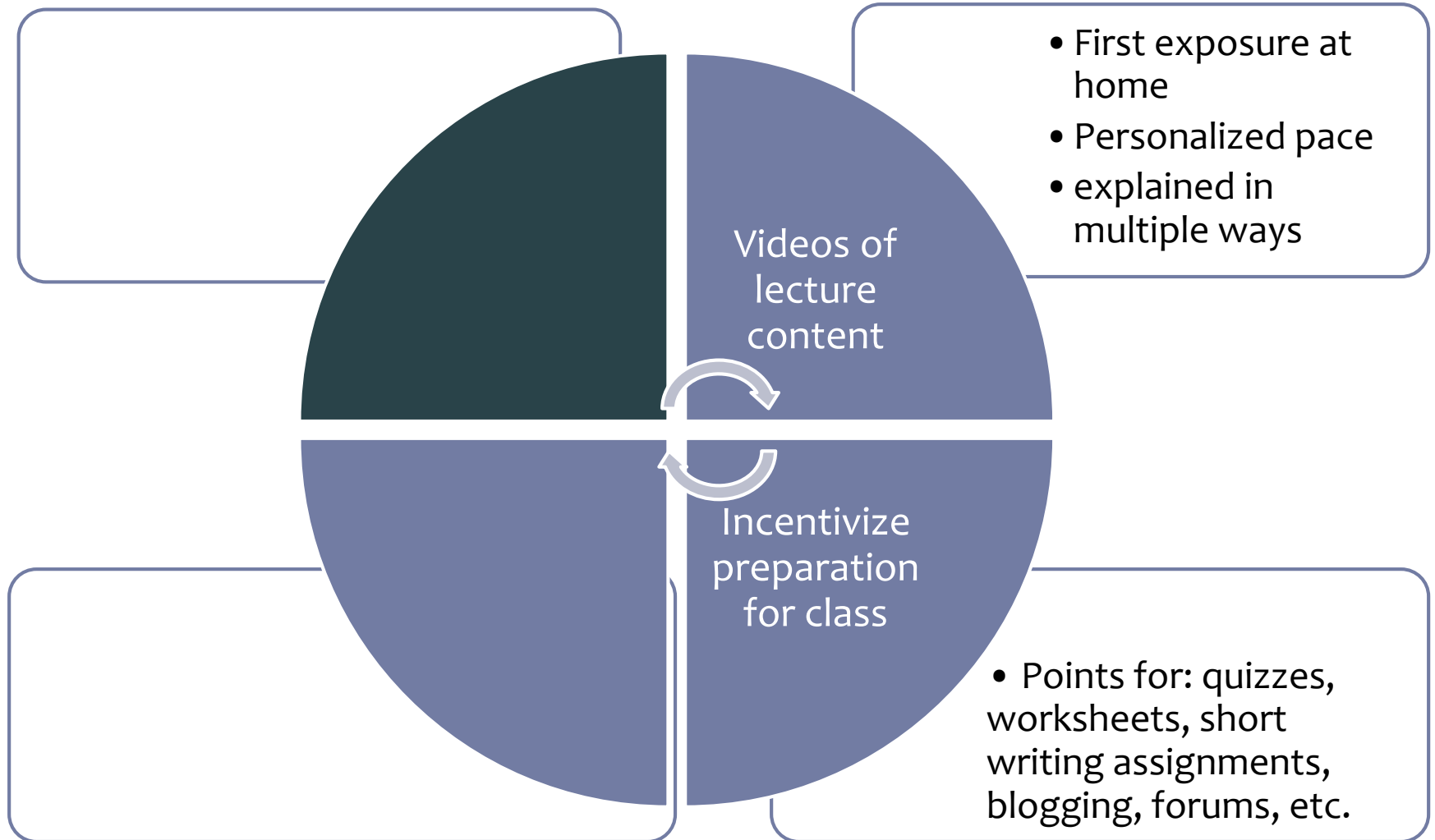


**Bloom's Taxonomy
Levels of Intellectual Learning**

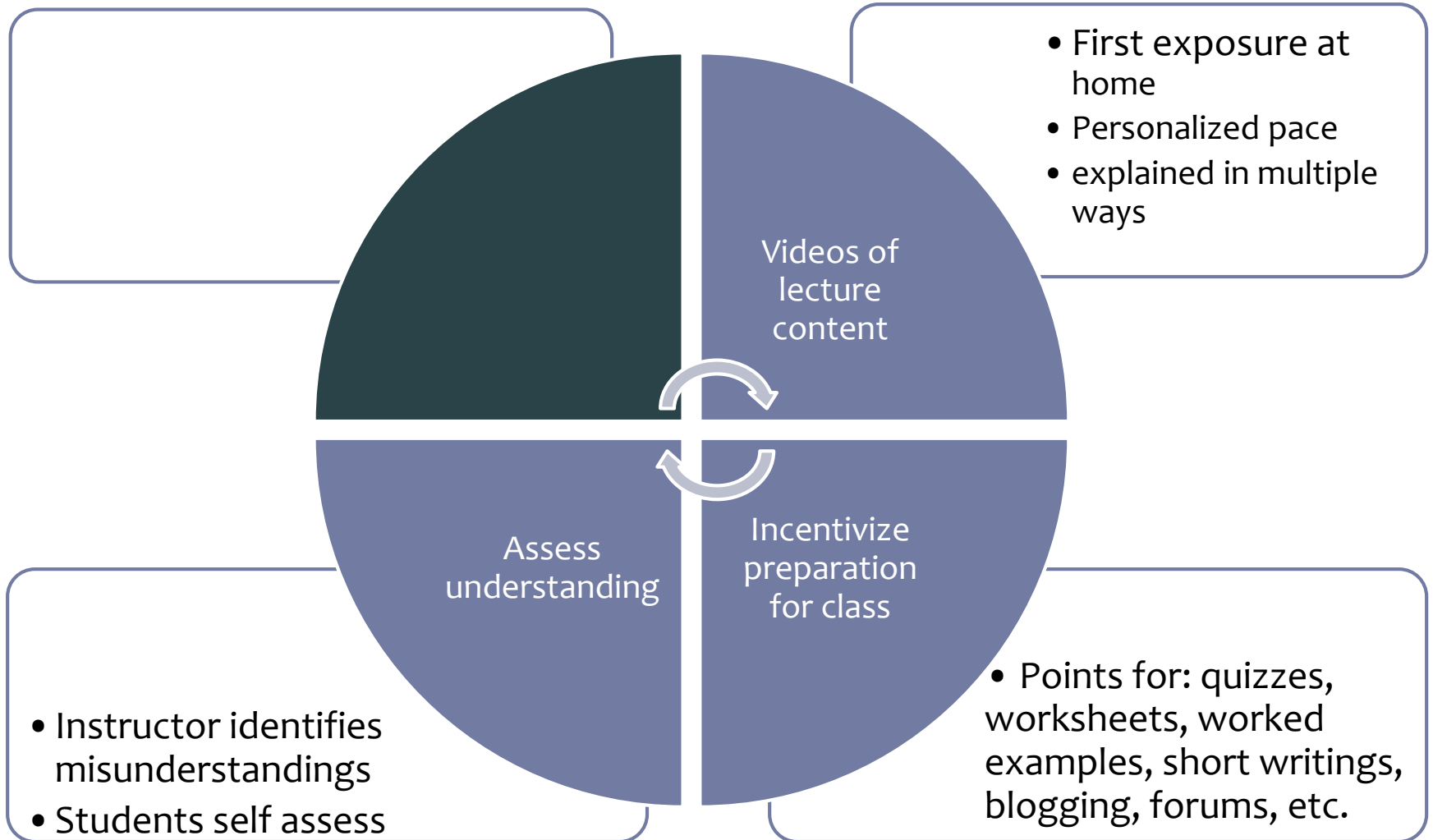
Flipped Course Elements



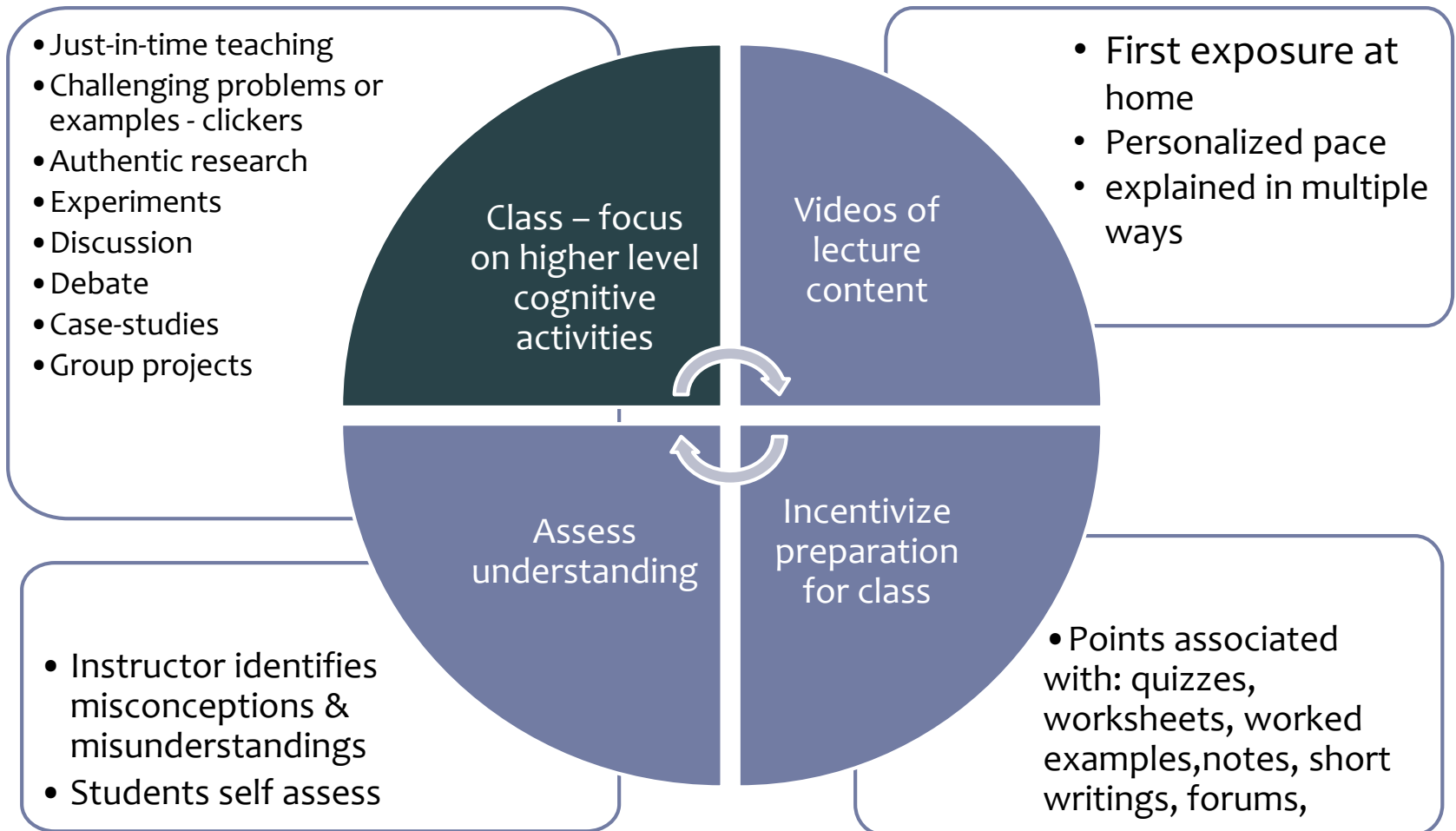
Flipped Course Elements



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

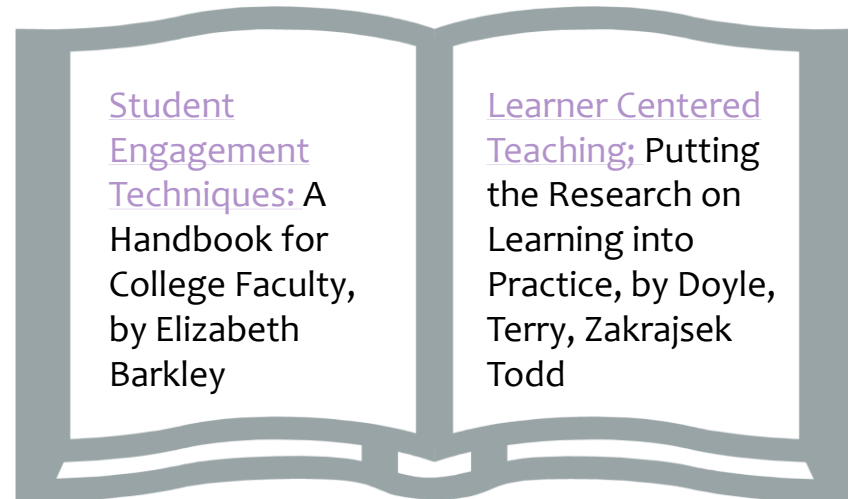
Before the Classroom

- ▶ 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

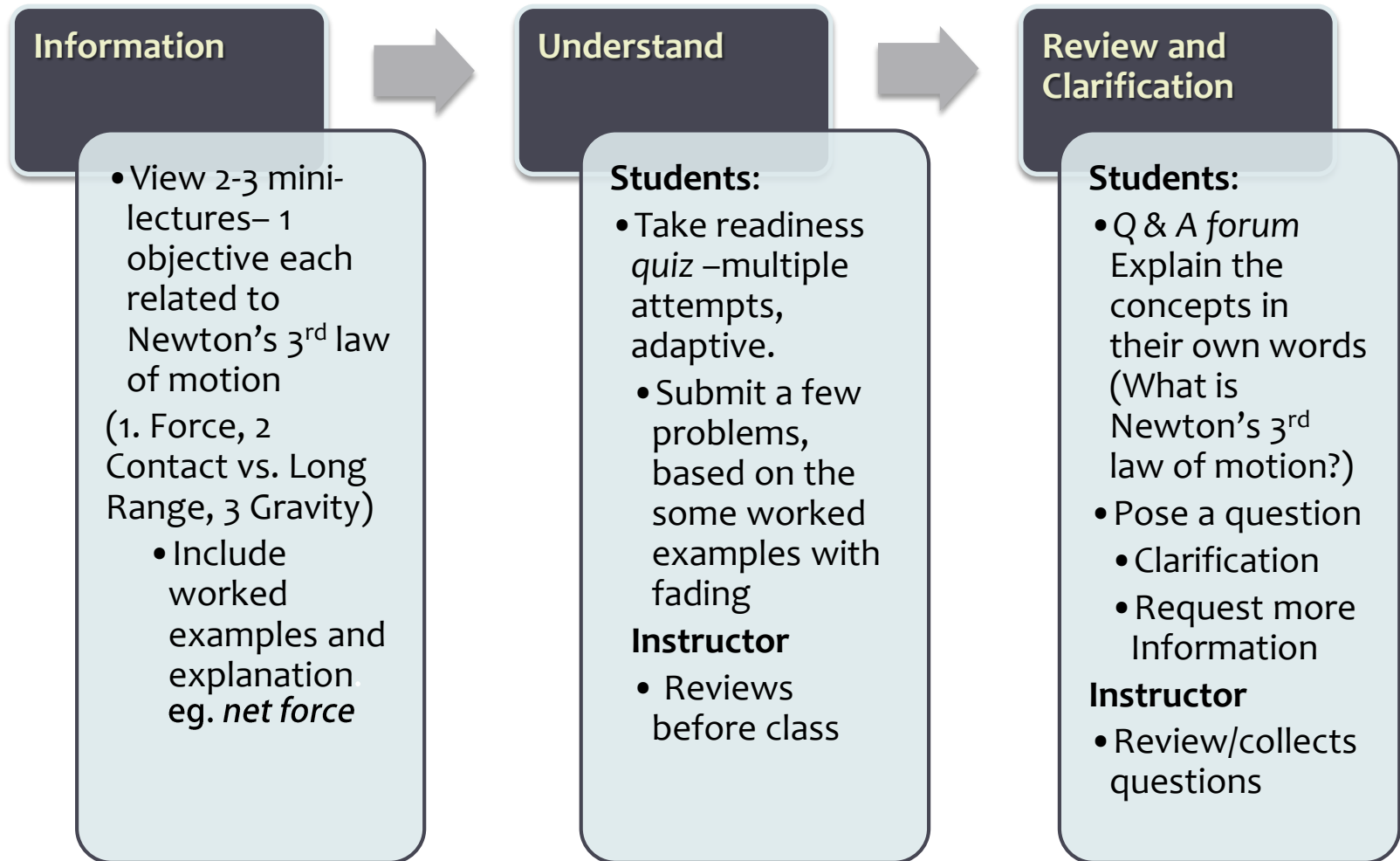
INSIDE the Classroom

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

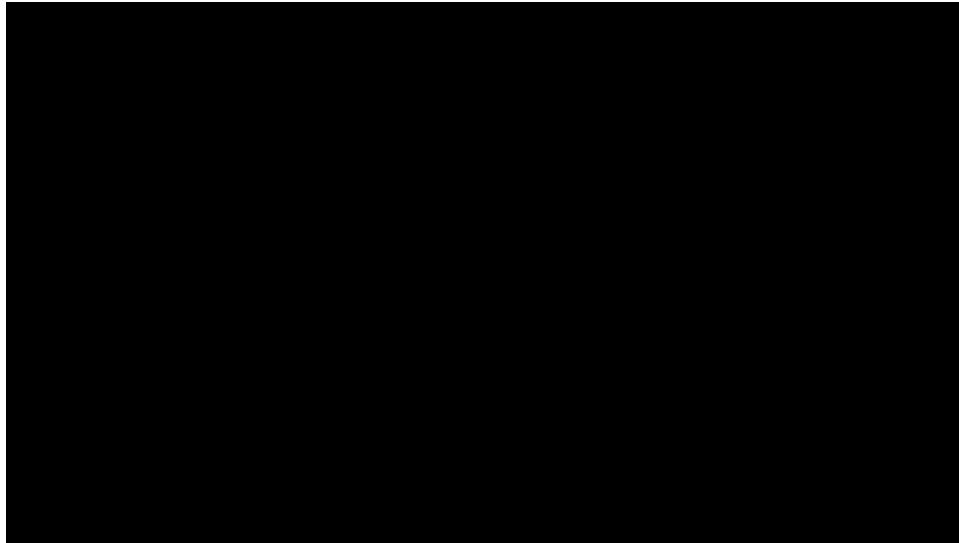


Case 1 : Peer Instruction – Physics, before class



Case 1: Peer Instruction – a Playlist

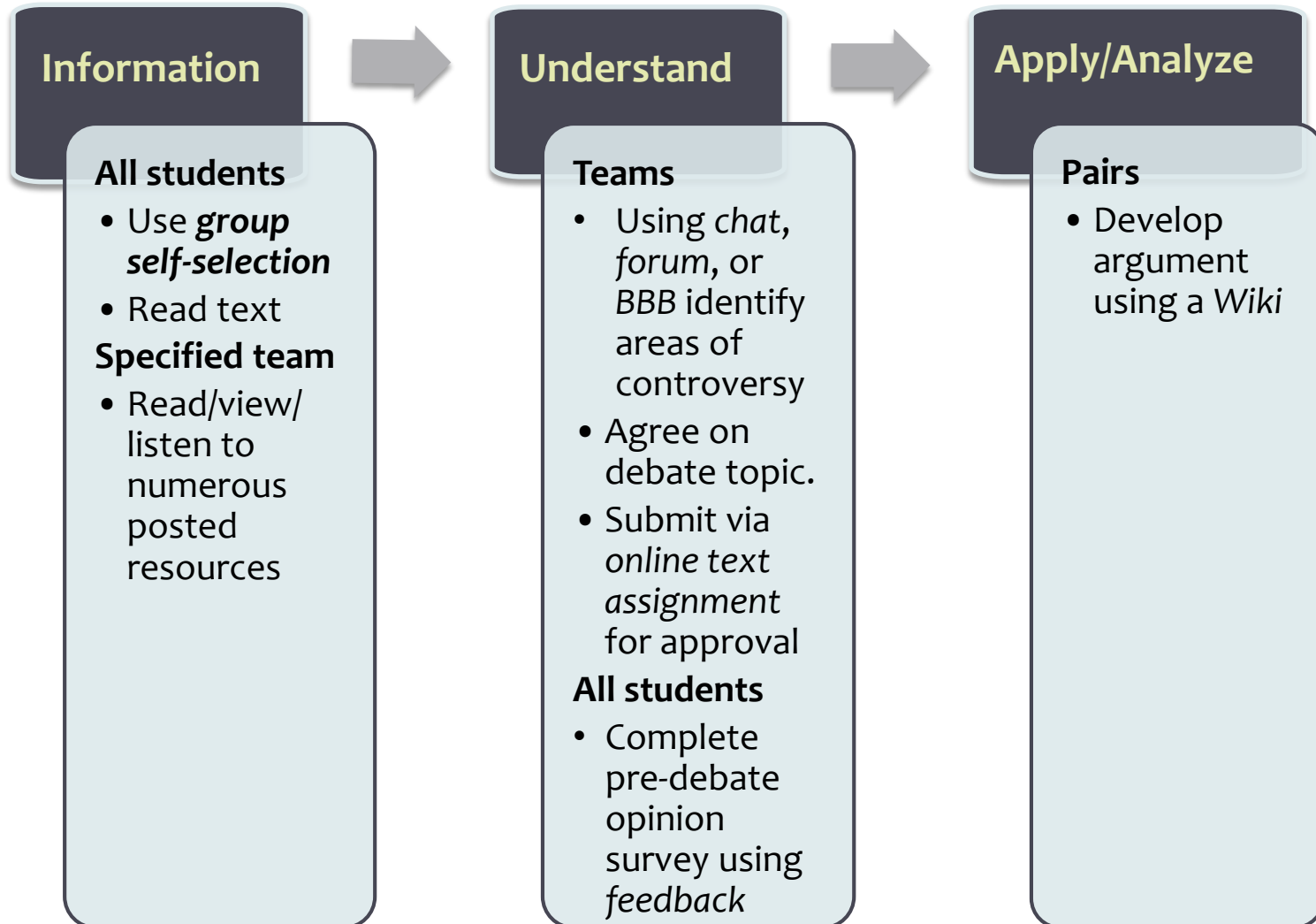
You Tube
[View playlist](#)



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.

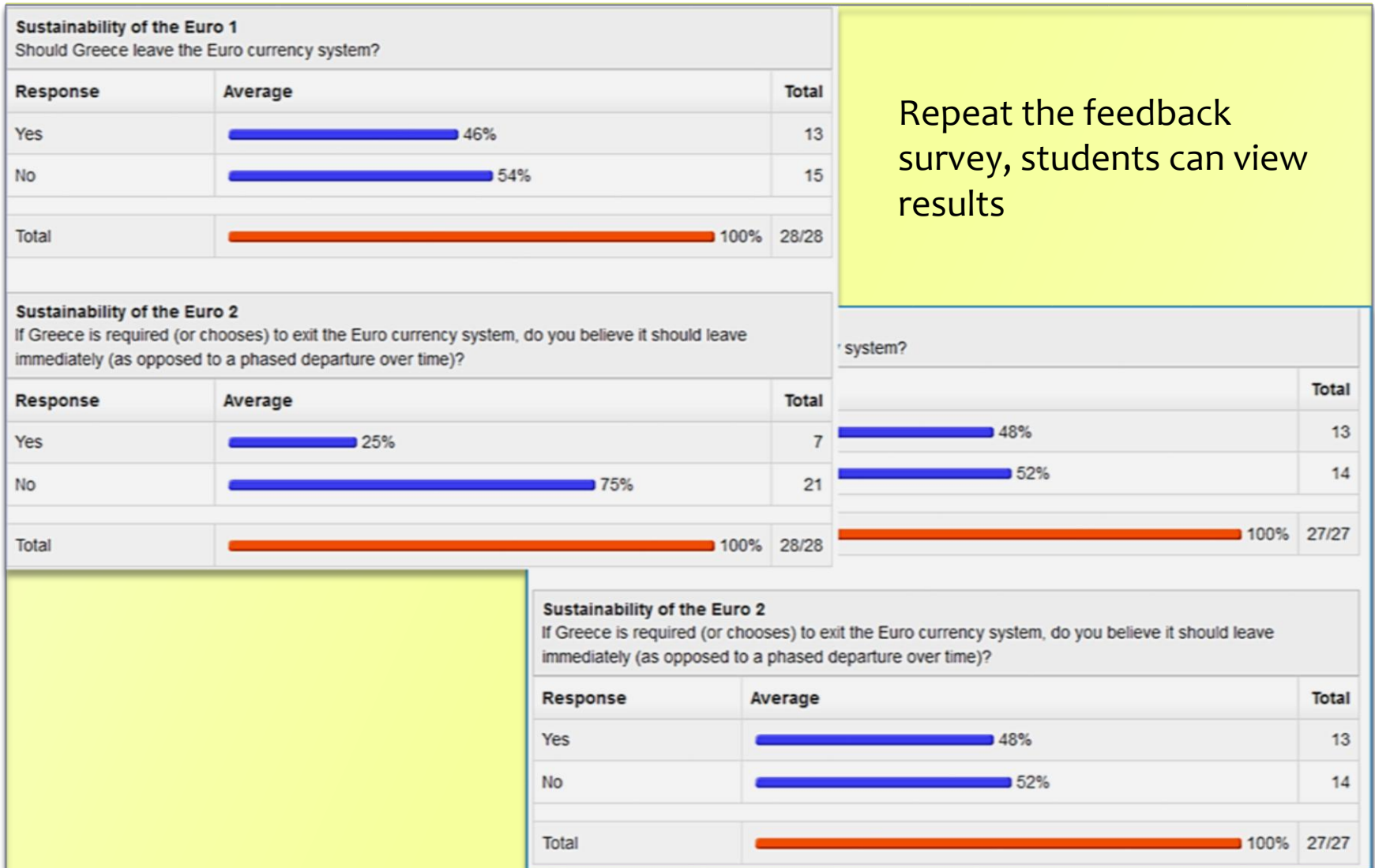
*4

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

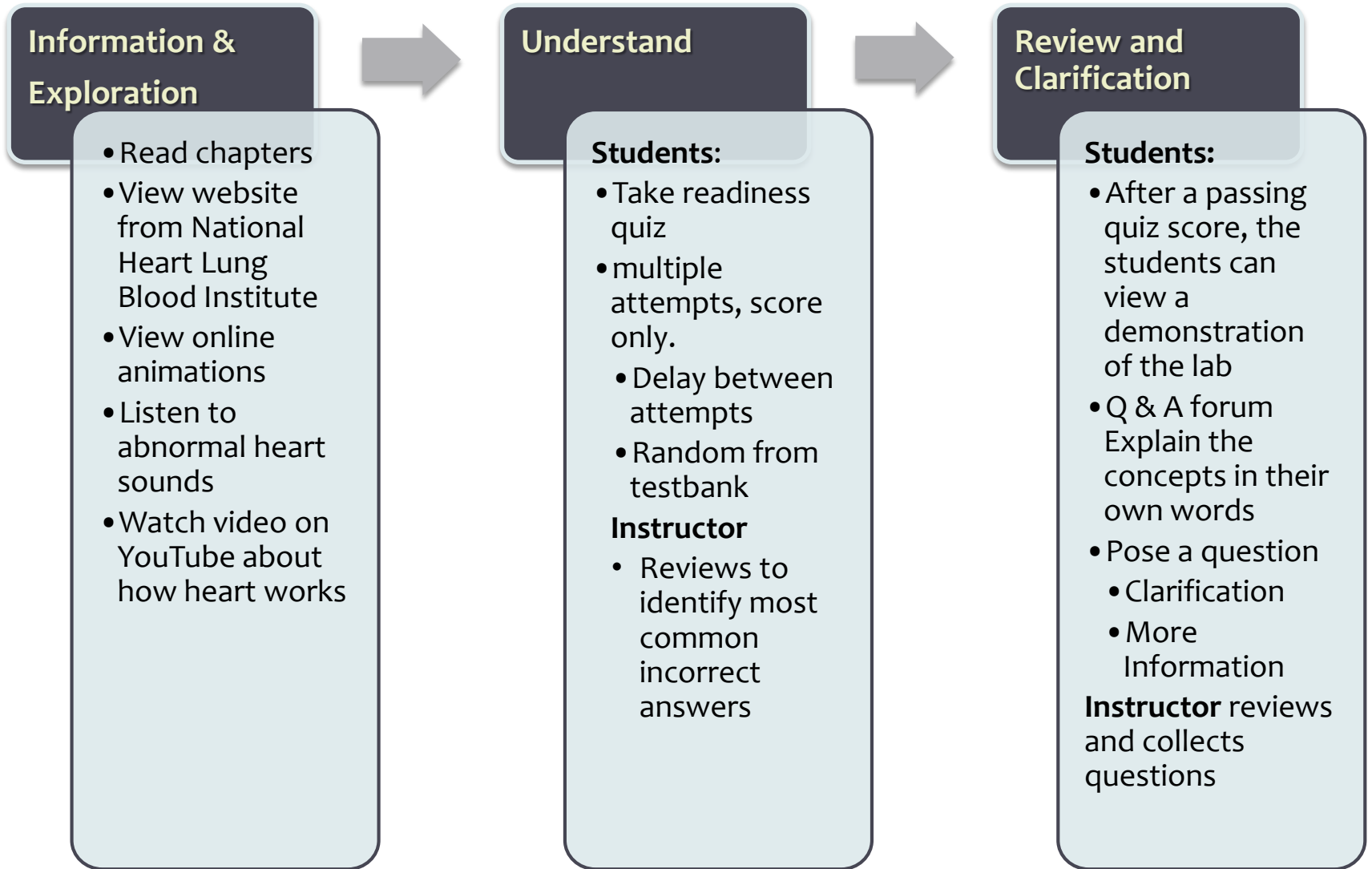
*5

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

Case 2: Structured Controversy -After Class



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

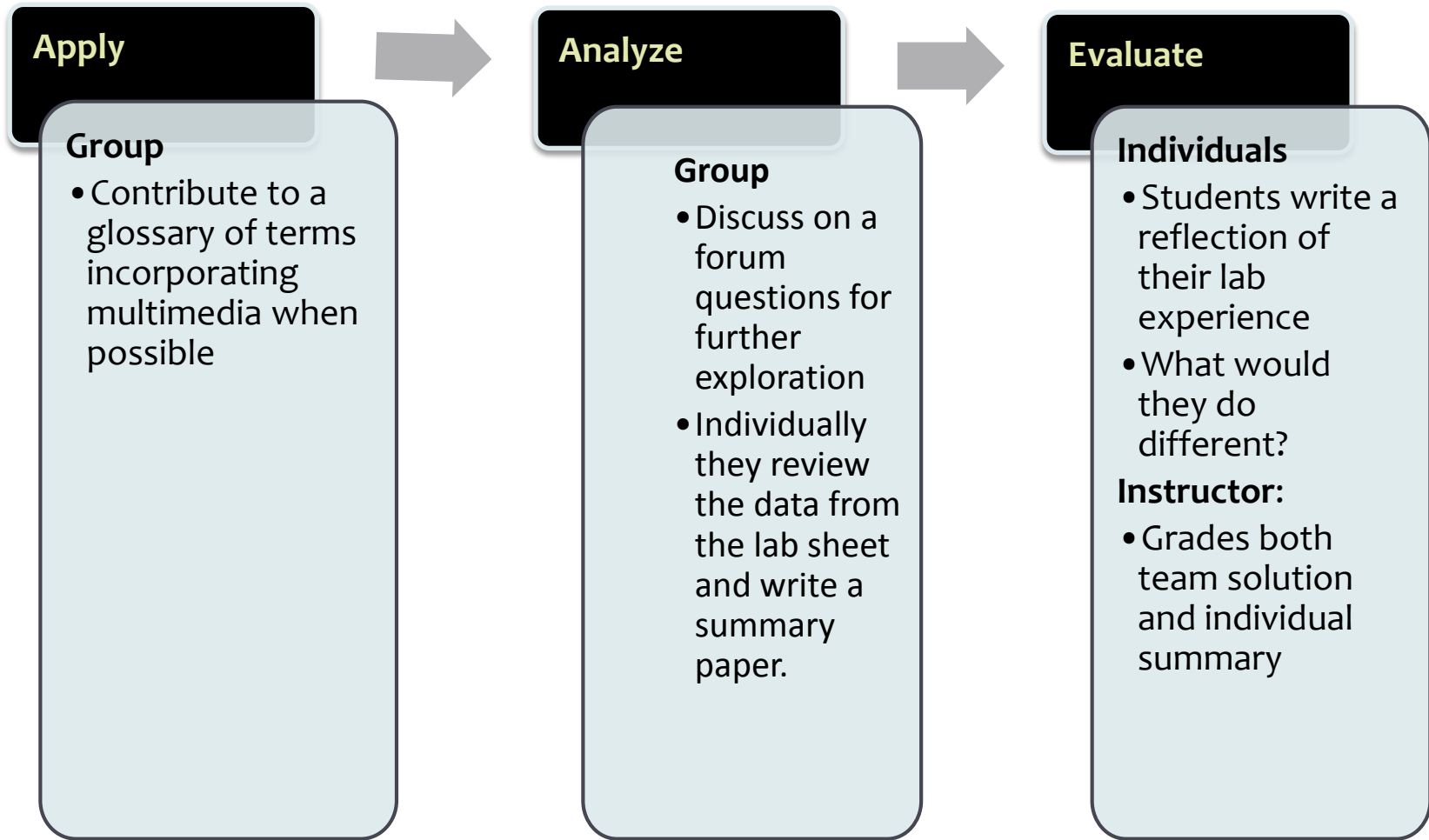
Individual/Teams

- 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

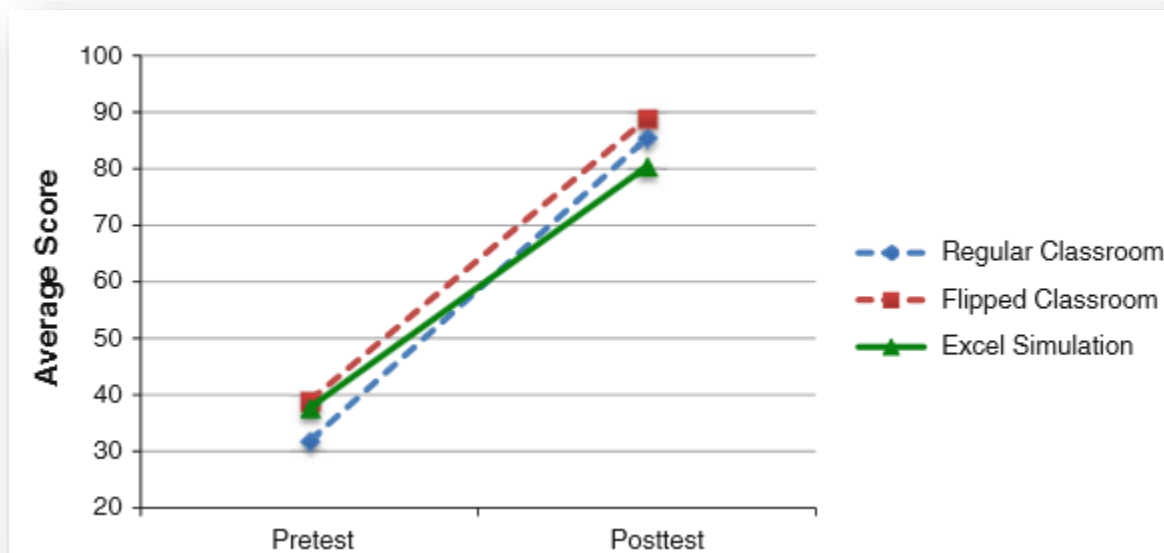
- ▶ Crouch CH and Mazur E (2001). Peer instruction: Ten years of experience and results. *American Journal of Physics* 69: 970-977.
- ▶ Students in PI courses showed learning gains ranging from 0.49 to 0.74 over eight years of assessment at Harvard University
- ▶ Two physics classes taught by traditional 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