

Facilitating Active Learning in Large Lecture Courses: The Flipped Method

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Session Outline

- Brief introduction to the flipped method.
- Personal experience with flipping a large lecture course.
 - Video lecture considerations
 - Impact on students and instructor
- Tools to facilitate flipping a large lecture course.
 - Video production tools
 - Case resources
- Discussion/Questions

The Flipped Method

The Traditional Classroom: Teacher's Role: Sage on the Stage
LECTURE TODAY

The Flipped Classroom: Teacher's Role: Guide on the Side
ACTIVITY TODAY

www.knewton.com/flipped-classroom

Tackling the Flipped Method in a Large Lecture Course

- Introductory Biology I for majors
- Two sections: 200 students and 250 students
- Large auditorium lecture hall

Strategy:

- Record lecture for the students to view prior to coming to class.
- Do case study during class using PowerPoint and classroom response system (clickers).

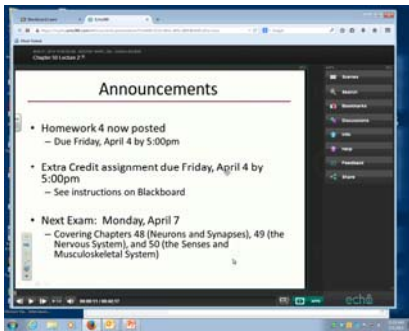


http://commons.wikimedia.org/wiki/File:Weinstock_Lecture_Hall.JPG by Hobicat93

Tools for Video Production

- Lecture Capture Software
 - Echo360
 - Panopto

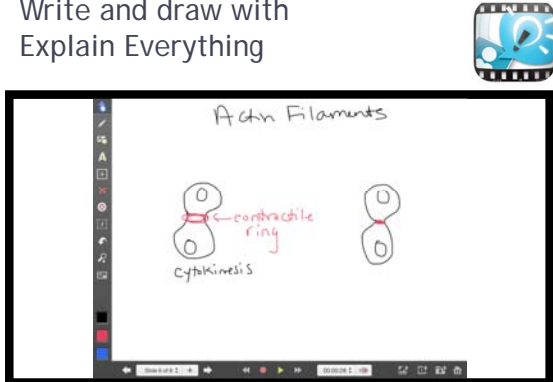
Echo360 Student Interface



Tools for Video Production

- Lecture Capture Software
 - Echo360
 - Panopto
- Presentation Apps for iPad
 - Doceri
 - Explain Everything


Write and draw with Explain Everything



The screenshot shows a digital whiteboard interface. At the top, the text 'Actin Filaments' is written. Below it, two hand-drawn diagrams of a cell in the process of cytokinesis are shown. The left diagram has a red ring drawn around its center, with a red arrow pointing to it and the label 'contractile ring'. Below the diagrams, the word 'cytokinesis' is written. The interface includes a toolbar on the left with various drawing tools and a video player control bar at the bottom.

A good video....

- is engaging.
- is tied to specific learning objective.
- can be easily accessed and viewed by students.
- doesn't necessarily have to be made by you!
- is short.



Case Study Resources



Impact on Students

Response Rate: 412/446	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
This case study helped me to better understand the concepts of enzyme function and inhibition.	47%	39%	10%	2%	2%
I enjoyed learning about biology concepts through a case study.	60%	27.5%	9.5%	1.5%	1.5%
I would like to do more clicker cases in this course.	64%	21.5%	9%	3%	2.5%

Impact on Students

"The case study portion of the class was wonderful."

"I really enjoyed the case studies. I liked them because it allowed me to apply the information I learned in class and understand it on a deeper level."

"The case studies were fun!"

"Case studies are an excellent idea to further engage the students in the course."

"I really enjoyed the case studies because it gave a different medium to learn the material throughout the course."

Final Remarks

- Start small
- Get student buy-in
- Manage time
- Seek and offer support

- Questions? Comments?

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Sources for Case Studies

Source	Link	Disciplines	Peer-Reviewed?
National Center for Case Study Teaching in Science	http://sciencecases.lib.buffalo.edu/cs/collection/	All science disciplines including graduate/clinical - many cases also have social science, behavioral & humanities perspectives	Yes
Centers for Disease Control Epidemiologic Case Studies	http://www.cdc.gov/epicasestudies/	Epidemiology/Public Health	
University of Pittsburgh - Dept. of Pathology	http://path.upmc.edu/cases.html	Pathology	
UCLA Statistics Case studies	http://www.stat.ucla.edu/cases/	Statistics	
University of Washington School of Public Affairs	http://hallway.evans.washington.edu/	Public Policy (including health/healthcare)	Yes
ShiPS Resource Center at University of Minnesota	http://www1.umn.edu/ships/modules/index.htm	Sociology, History and Philosophy of Science	
National League for Nursing	http://www.nln.org/facultyprograms/facultyresources/aces/unfolding_cases.htm	Nursing Cases	
American Sociological Association	http://www.asanet.org/ethics/detail.cfm?id=all	Sociology/Ethics	
Rutgers Resources-Master Educator's Guild	http://meg.rbhs.rutgers.edu/cte/active_learning/active_case_based_learning.html	Several links to case study sites/repositories- variety of disciplines	
University of Missouri School of Health Professions	http://shp.missouri.edu/vhct/studies.htm	Medical cases in diverse specialties/disease areas	
U.S. Pharmacist Case Study Challenge	http://www.uspharmacist.com/case_study/	Pharmacy	

Assorted Literature on Case Studies

1. Rutgers Biomedical and Health Sciences Center for Teaching Excellence:
http://meg.rbhs.rutgers.edu/cte/active_learning/active_case_based_learning.html
In addition to linking to case studies, also links to articles on writing, teaching, and evaluating case studies.
2. Herreid, C.F. (Ed.) (2007). *Start with a story. The case study method of teaching college science*. Arlington, VA: National Science Teachers Association.
(A comprehensive collection of articles on teaching, writing, assessment, etc.)
3. Barnes, L.B., Christensen, C.R., and Hansen, A.J. (1994). *Teaching and the case method* (3rd ed.). Boston, MA: Harvard Business School Press.
4. Herreid CL. The Future of Case Study Teaching in Science. University at Buffalo http://www.ccce.divched.org/sites/www.ccce.divched.org/files/p1_herreid.pdf
5. Herreid CL. ConfChem Conference on Case-Based Studies in Chemical Education: The Future of Case Study Teaching in Science <http://pubs.acs.org/doi/pdf/10.1021/ed2008125>
6. Herreid CF. "Clicker" Cases: Introducing Case Study Teaching Into Large Classrooms. (2006) <http://sciencecases.lib.buffalo.edu/cs/pdfs/Clicker%20Cases-XXXVI-2.pdf>
7. Herreid, C.F. 2004. Can case studies be used to teach critical thinking? *Journal of College Science Teaching* 33(6): 12-14.
8. Ribbens, E. 2006. Teaching with jazz: Using multiple cases to teach introductory biology. *Journal of College Science Teaching* 36(2): 10-15.
9. Tanner, C.A. 2009. The case for cases: A pedagogy for developing habits of thought. *Journal of Nursing Education* 48(6): 299-300.

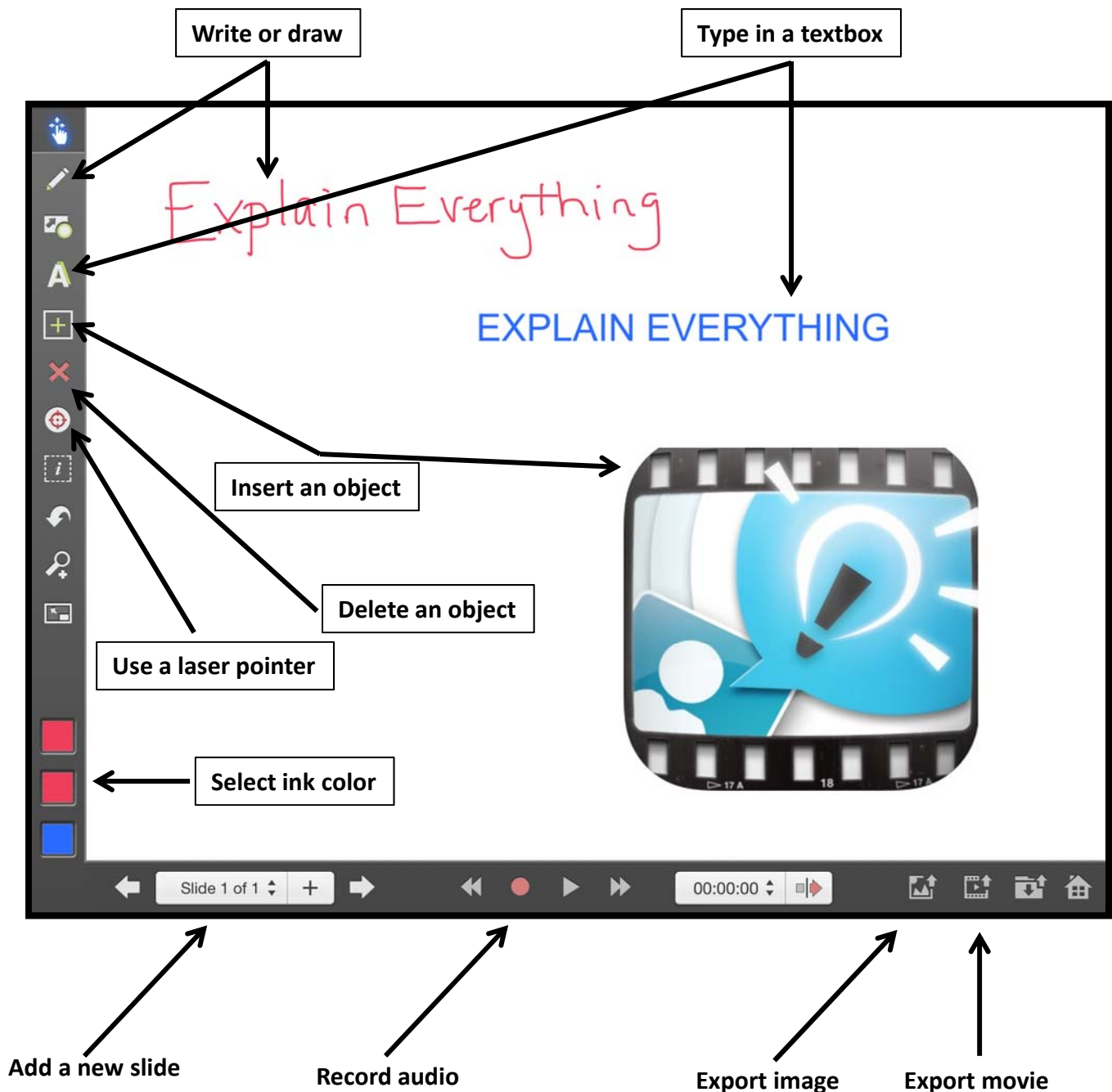
Assorted Literature on the Flipped Method

1. Jensen, J.L., Kummer, T.A., and Godoy, P.D. 2015. Improvements from a flipped classroom may simply be the fruits of active learning. *CBE Life Sciences Education* 14(1): ar5.
2. Gilboy, M.B., Heinerichs, S., Pazzaglia, G. (2014). Enhancing student engagement using the flipped classroom. *Journal of Nutrition Education and Behavior* 47(1): 109-114.
3. Moraros, J., Islam, A., Yu S., Banow, R., & Schindelka, B. (2015). Flipping for success: evaluating the effectiveness of a novel teaching approach in a graduate level setting. *BMC Medical Education* 28(15): 27.
4. Leung, J.Y., Kumta, S.M., Jin, Y., & Yung, A.L. (2014). Short review of the flipped classroom approach. *Medical Education*, 48(11): 1127.
5. Moffett, J. (2015). Twelve tips for "flipping" the classroom. *Medical Teacher*, 37(4): 331-336.

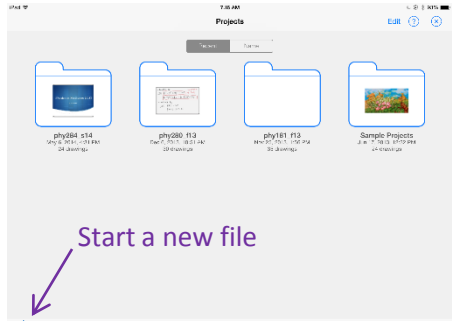
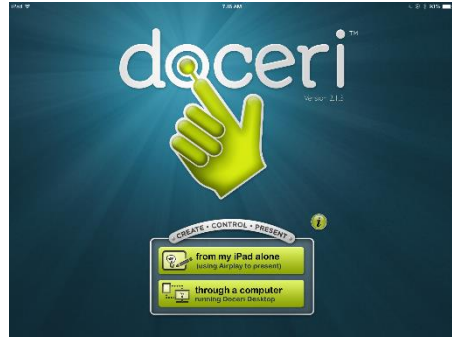


Explain Everything

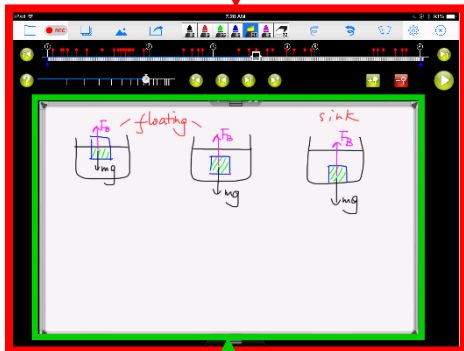
- Interactive whiteboard useful for creating instructional videos, tutorials, and lectures.
- Add powerpoint slides, pictures, videos, and documents. Narrate and annotate to create a multidimensional presentation.
- Export movie files to Dropbox, YouTube, Google Drive, iTunes, and more for sharing.



To Start



What you see



What students see

To Control

go to previous stop mark

stop mark

insert pictures

colors and shapes

undo and redo

go to next stop mark

record video

page mark

go to previous/next stroke

go to previous/next page

add/remove page mark

add/remove stop mark

play/pause



share/upload

also can

