



کلاس وارونه

## Flipped classroom

مدل پدراگوژیک نوین در یادگیری الکترونیکی

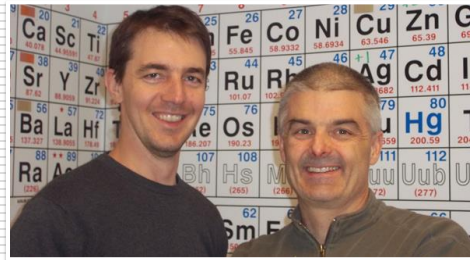
دکتر آبین محمدی

دانشکده مجازی دانشگاه علوم پزشکی تهران

Aeen Mohammadi MD MPH PhD

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❖ **Johnathan Bergmann and Aaron Sams (2007), science teachers at Woodland Park High School in Colorado, are considered the originators of the Flipped classroom.**



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what time is it?  
*it's*  
**SHOWTIME!**



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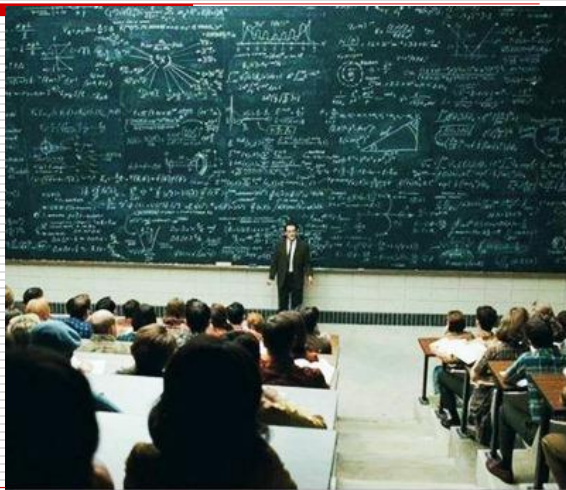
- ❖ Just since January 2012, the number of active members on the **Flipped Learning Network** site has grown from 2,500 to more than 15,000.



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## The Traditional Classroom

Teachers: Lecturing ✓  
Students: Listening ✓



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## The Traditional Result

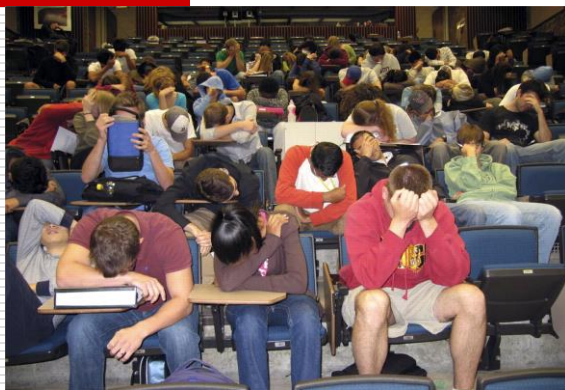


- ✓Teachers: Still Lecturing
- ✓Students: Out Cold

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## The Problem

- ✗Students: Passive Learners
- ✗Teachers: "Sage on the Stage"



## The Solution

- ✓Students: Active Learners
- ✓Teachers: "Guide on the Side"

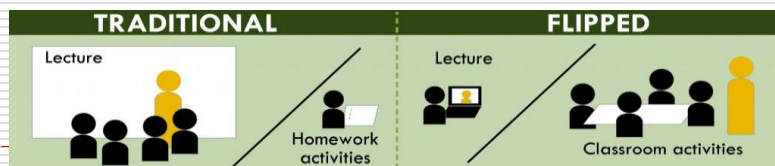
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## The Steps

1. Record Lecture & Post Online
2. Assign Video as Homework
3. Use Class for Activities

## The Method

Lecture      Class  
Activities      Home

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## What is flipping?

**FLIPPED  
CLASSROOM  
FLIPPED**

**Flipped learning** is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.

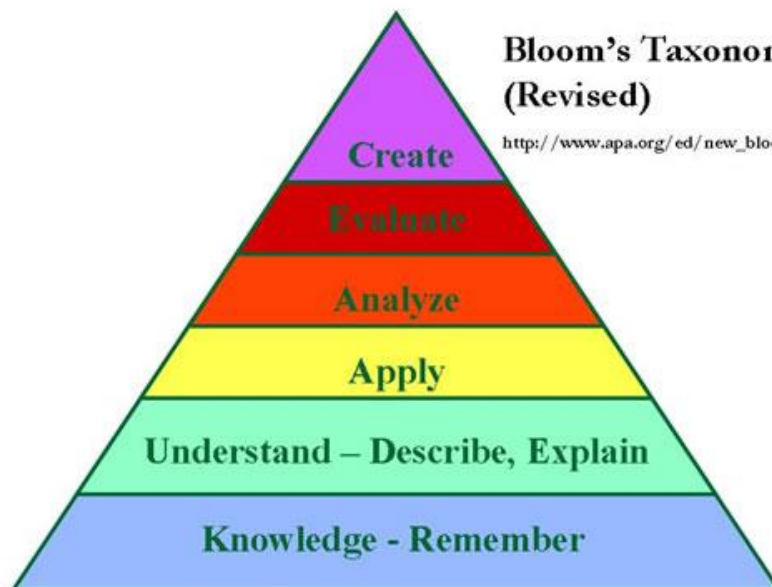
Flipped Learning Network Definition, 13/03/14

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# FLIPPED CLASSROOM FLIPPED

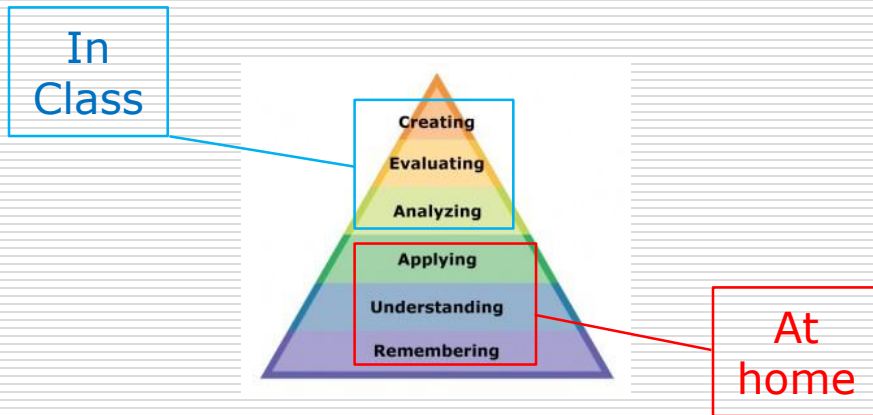


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Based on an APA adaptation of Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001)

# What is flipping?



Aeen Mohammadi: Flipped Learning Network Definition, 13/03/14

## Traditional Model

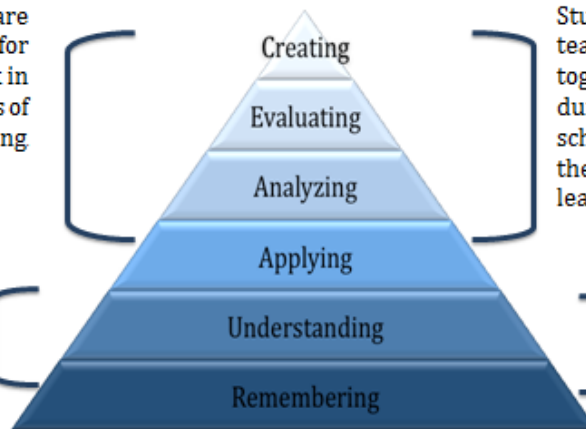
Students are responsible for homework in these levels of understanding

Teachers introduce new material to students.

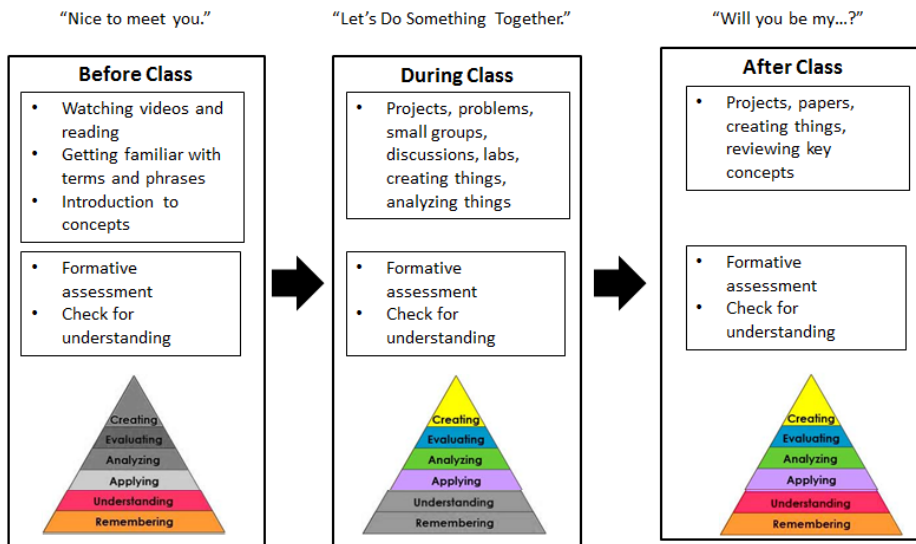
## Flipped Model

Students and teachers work together during the school day on these levels of learning.

New material is introduced to students outside of class as their homework.



## Blooms Taxonomy



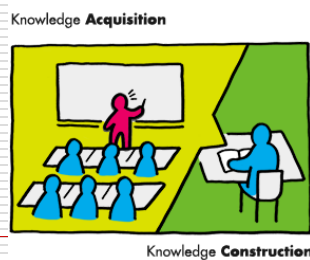
<http://turcosclass.weebly.com/flipped-classroom.html>  
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- ❑ We move **lectures out of the classroom**. We tape them in advance and post them on a website. Students **watch lectures** before coming to class. Frequent **low-stakes quizzes** motivate students to keep pace and watch the videos.
  - ❑ Classroom contact hours are for **coached activities, discussions**, and student presentations.
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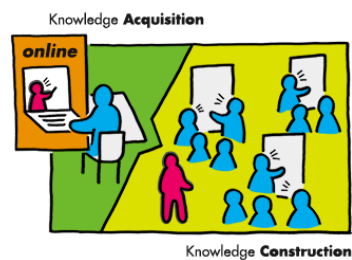
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- Students are incentivized, but not required, to **work in groups** on all types of homework. Students write examinations on their own, but most students prepare for exams in teams.



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- We draw **exam questions from a published pool**, handed out as a study guide. Students prepare for exams by writing answers to the study guide questions. Because students have had plenty of open-book preparation time and opportunity **for peer-review**, we can require more carefully considered, better written answers.”

Kaner C and Fiedler R L (2005) Inside Out: A computer Science Course Gets a Makeover.

Association for Educational Communication and Technology International Conference

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## The UPRM model :

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- 1- a set of pre-Lecture Modules and Exercises, delivered online;
- 2- a Lecture that responds to the students' experience in the pre-Lecture activities,
- 3- a Problem-Solving Session after each Lecture.

□ Papadopoulos C, Santiago-Roman A and Portela G (2010) Work in progress — Developing and implementing an Inverted Classroom for Engineering Statics. *Frontiers in Education Conference (FIE), 2010 IEEE*

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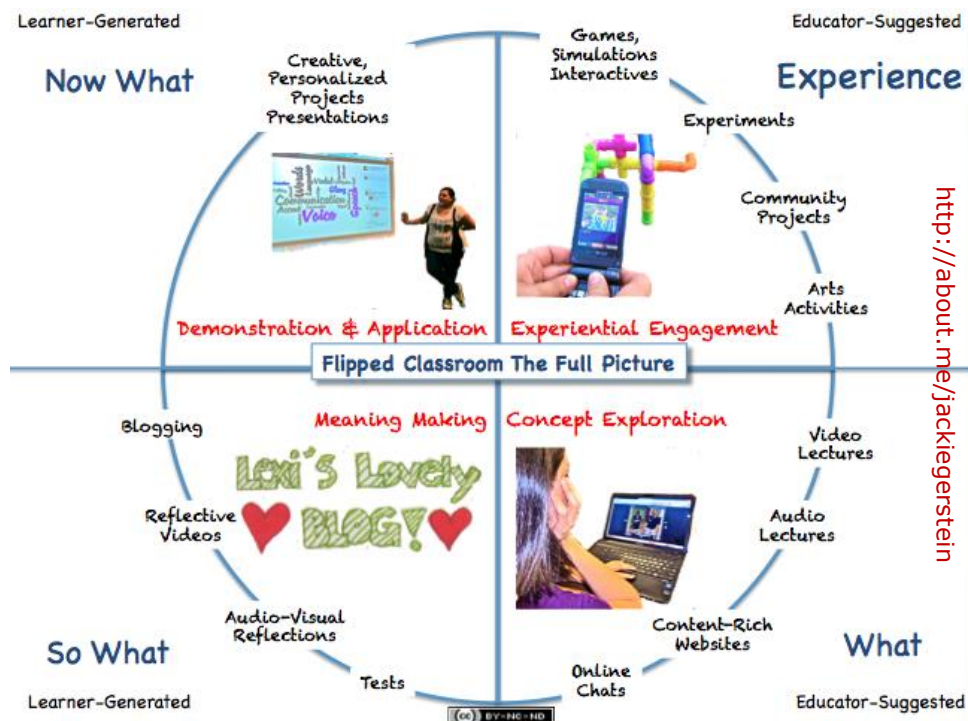
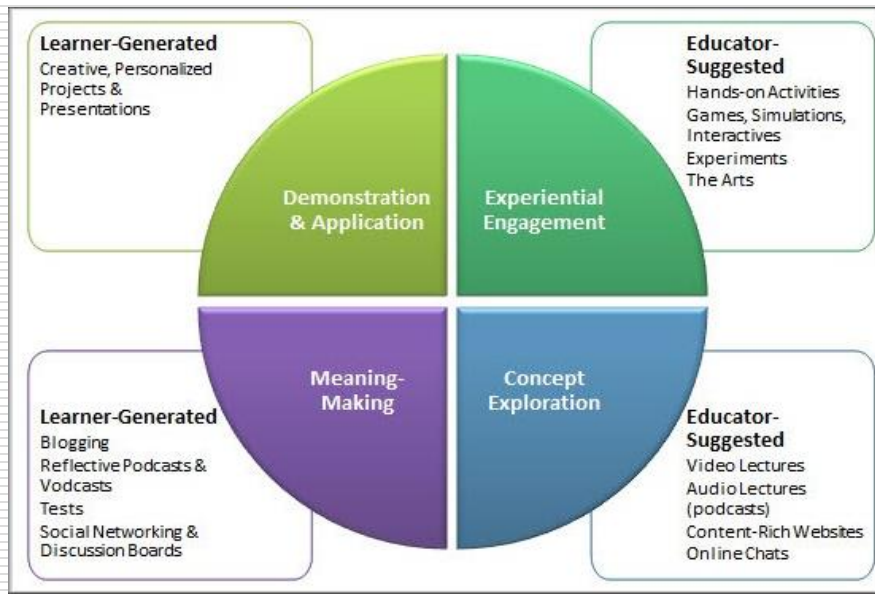
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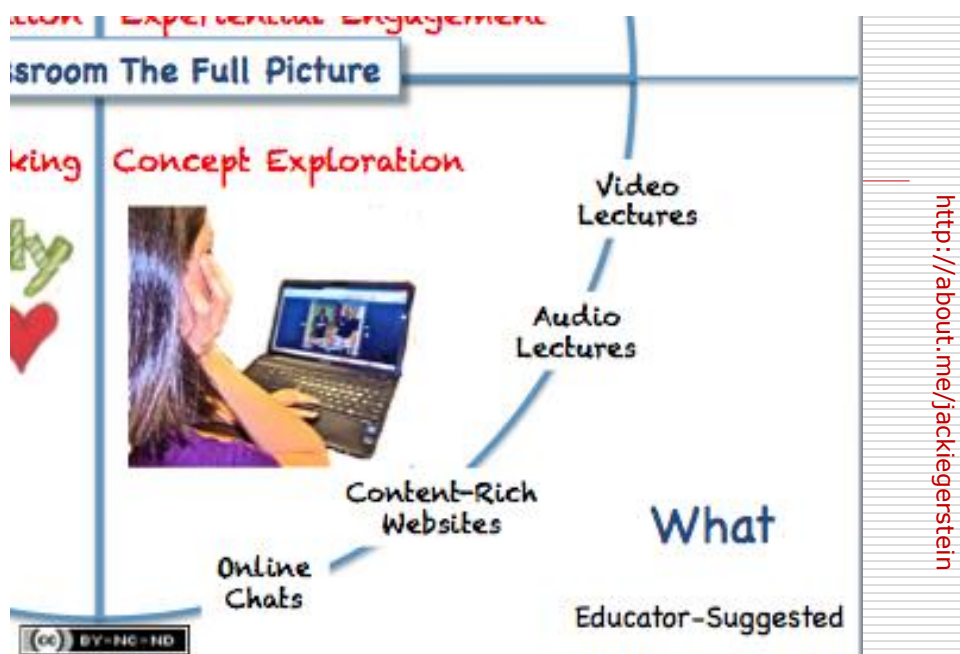
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- ❖ Today, it seems, there is **no one correct** way to flip the classroom, and approaches vary both by subject and educational philosophy.
  - ❖ But no matter what the underlying philosophy, creating, curating, and maintaining a trove of video resources is central to success.
  - ❖ *Bergmann & Sams coauthored the book: Flip Your Classroom: Reach Every Student in Every Class Every Day*
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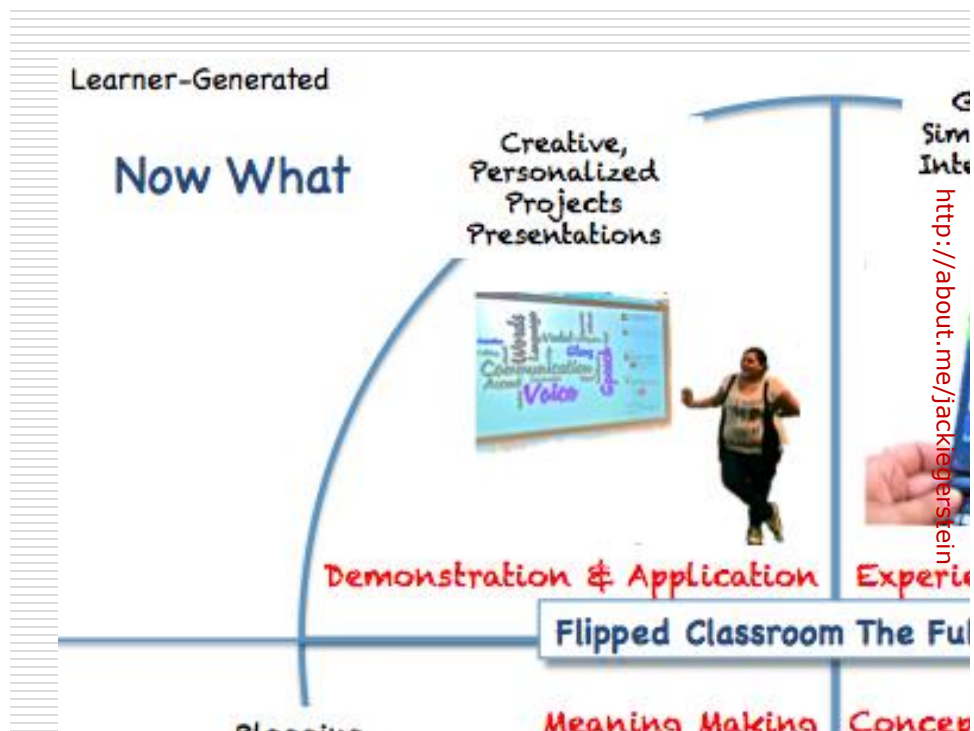
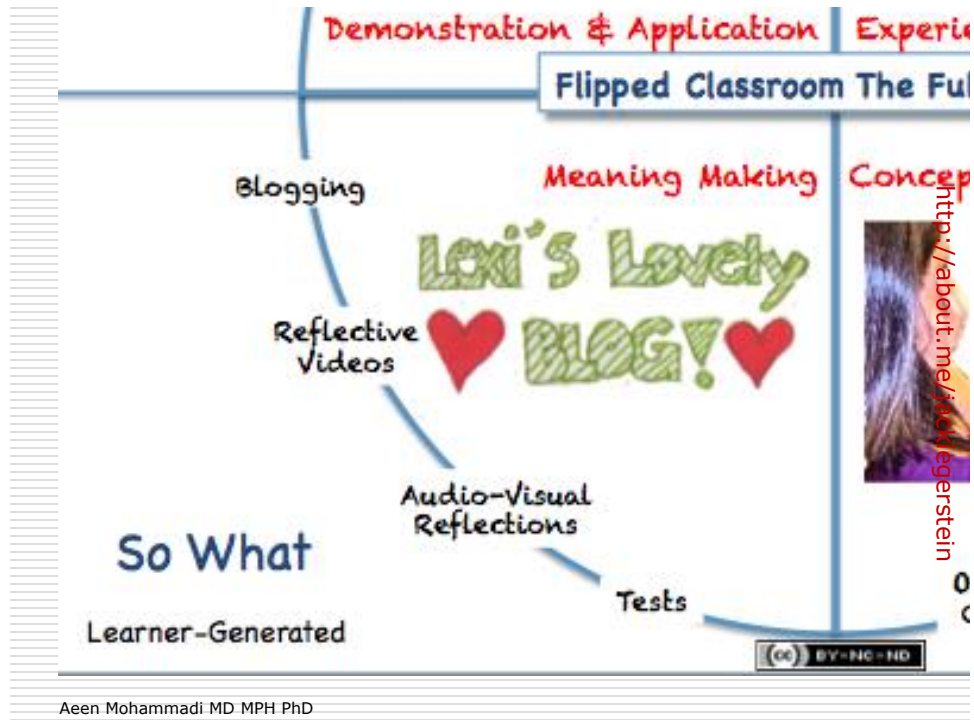
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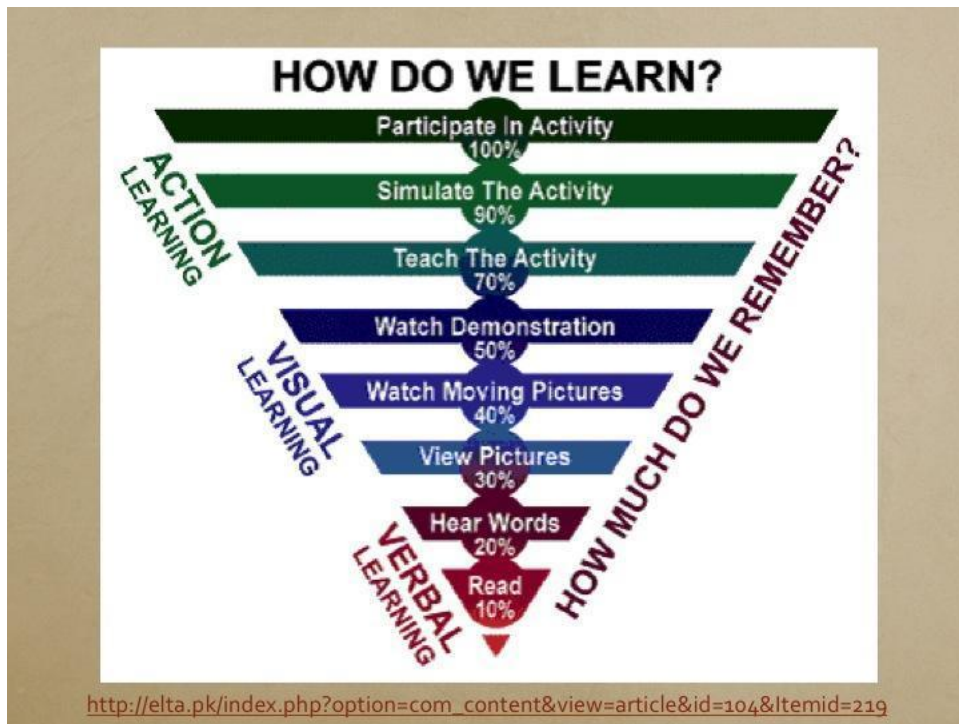
## LEARNING CYCLES OF THE FLIPPED CLASSROOM

Sarah Gilbert, available from: <https://ileighanne.wordpress.com>







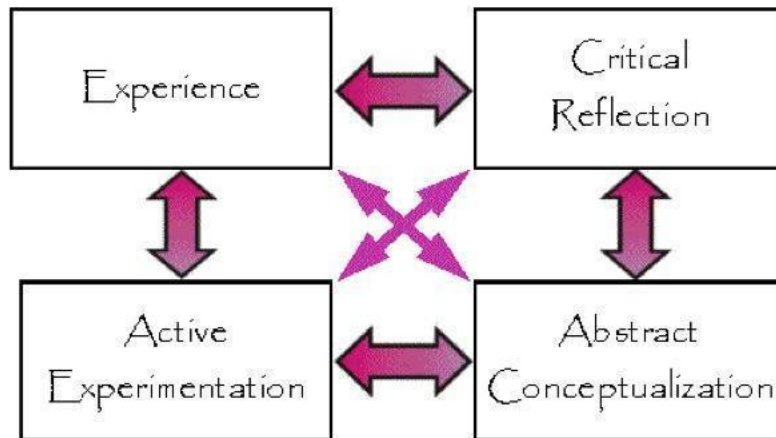


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- ❖ Lectures should **support** the learning, not be central to it, or drive it.





## Model: David Kolb



1. Learning is best conceived as a process, not in terms of outcomes.
2. Learning is a continuous process grounded in experience.
3. Learning is a holistic process of adaptation to the world.
4. Learning involves transactions between the person and the environment.

<http://leadershipchamps.wordpress.com/2008/04/17/learning-styles-for-better-leadership/>

## The flipped classroom is NOT:

Ernest Reynolds, MS, RN, RRT; December-2012

- A synonym of online videos. It is the interaction and the meaningful learning activities that occur during the face-to-face time.
- About replacing teachers with videos.
- A completely online course.
- Students working without structure.
- Students spending the entire class starting at a computer screen.
- Students work in isolation.

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## There are Many Ways to Flip Your Classroom

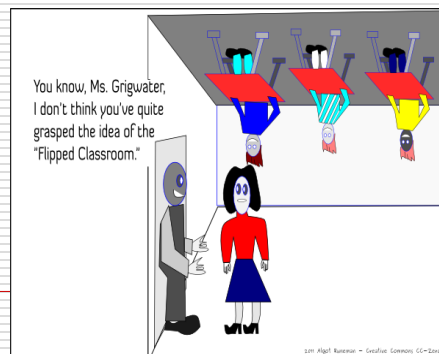
- Don't think you have to make your own videos—there is much available now on line (Khan Academy, YouTube, ...)
- Takes time to plan on what "parts" of your content/classroom you want to flip—not everything fits with flipping"
- Find out what is the "best" way to access your students—what access to they have at home, do some need to have the information "burned" on a disc, do all have the capability of Elluminate, etc?
- Find a way to engage students in the videos, not just "listening" to lectures on tapes. Should follow by some sort of discussion questions, etc.

Barb Penprase [penprase@oakland.edu](mailto:penprase@oakland.edu)

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## Problems:

- ✓ We don't know what to do with the extra time if we do not lecture in the class.
- ✓ Time is needed to develop the videos and discussions as well as activities that will be done in the classroom



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## Perceived Challenges

Rebecca Hamlett, [hamlett@william.jewell.edu](mailto:hamlett@william.jewell.edu)

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- ✓ **Faculty buy-in**
    - ✓ Faculty may not be open to a different pedagogical method of teaching
    - ✓ Faculty may be unwilling to assign out-of-class material for instruction sessions
  - ✓ **Student resistance**
    - ✓ Students may be resistant to completing video assignments
    - ✓ Students may not be at their “point of need”
  - ✓ **MONEY – who has any?**
- 

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## Benefits of the flipped classroom

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- ✓ Students are able to watch recorded lectures/tutorials any time, any place
  - ✓ Students are able to review the material as many times as necessary to understand the content without frantic note-taking
  - ✓ Different learning styles can be better accommodated by instructors and applied by students
  - ✓ Instructors are able to devote class time to the application of skills instead of “telling” students the information
  - ✓ Collaborative activities can be better designed to further peer teaching
  - ✓ Students have an opportunity to ask questions during application rather than after class or from graded feedback
- 

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# The Net Generation

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- Highly deiced
- Highly networked
- Highly interactive
- Highly social



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# Media saturated lives (8-18 year olds)

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- **6:21** hours with media per day
- **26%** of the time kids use more than 2 media simultaneously
- **3:51** tv/video per day
- **1:44** music per day
- **1:02** using computer other than for school work
- **49** minutes playing video games
- **43** minutes of recreational reading

– Kaiser Family Foundation, 2005  
<http://www.kff.org/entmedia/upload/Executive-Summary-Generation-M-Media-in-the-Lives-of-8-18-Year-olds.pdf>

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## Comparison Traditional to Flipped

Traditional		Flipped	
Activity	Time	Activity	Time
Warm-up Activity	5 min	Warm-up Activity	5 min
Go over previous night's homework	20 min	Q&A time on video	10 min
Lecture new content	30-45 min	Guided and independent practice and/or lab activity	75 min
Guided and independent practice and/or lab activity	20-23 min		

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## Flipping

- Speaks the language of today's students
- Helps busy students
- Helps struggling students
- Helps students of all abilities excel
- Allows students to pause and rewind their teacher
- Increases student-teacher interaction
- Allows teachers to know their students better

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## Why You Should Not Change--If

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Because you  
think it is  
cutting edge

Because it is  
easier

Because  
everyone is  
doing it!

Because it  
exempts us  
from being  
good teachers

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## What's Next?

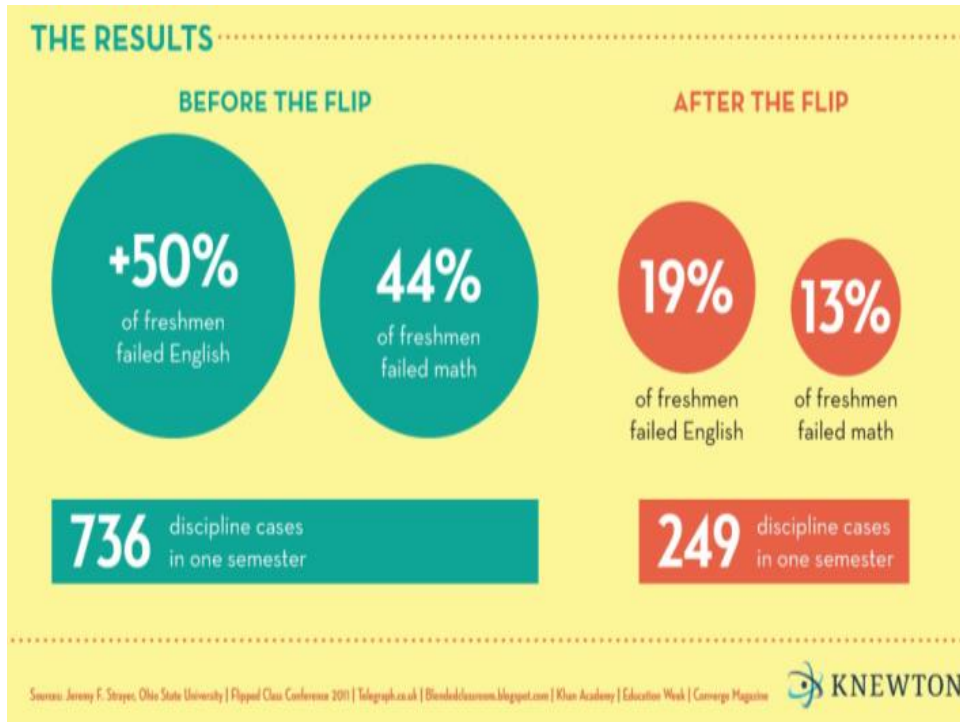
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## Flipped Classroom: Yes or No?



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"[the] use of deliberate practice teaching strategies can improve both learning and engagement in a large introductory physics course as compared with what was obtained with the lecture method."

DesLauriers L, Schelew E, and Wieman C (2011). Improved learning in a large-enrollment physics class. *Science* 332: 864

"The flipped classroom is an easy model to get wrong. Although the idea is straightforward, an effective flip requires careful preparation. Recording lectures requires effort and time on the part of faculty...Students, for their part, have been known to complain about the loss of face-to-face lectures, particularly if they feel the assigned video lectures are available to anyone online."

EDUCAUSE 7 Things You Should Know About Flipped Classrooms, February 2012

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"Although it is difficult to appeal to the learning styles of every student in the classroom, the inverted classroom implements a strategy of teaching that engages a wide spectrum of learners... Evidence suggests that students generally preferred the inverted classroom to a traditional lecture and would prefer to take future economics classes using the same format."

Lage M J, Platt G J and Treglia M (2000) Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment. *JEE* 31:41

"Still others railed that the model is nothing transformative at all and that it still emphasizes sage-on-the-stage direct instruction rather than student-centered learning. "

Hertz M B (2012) The Flipped Classroom: Pro and Con. Edutopia blog post

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## 9 Video Tips for a Better Flipped Classroom

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### ***T.H.E. Journal* 9 Video Tips for a Better Flipped Classroom:**

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#### **1- Devise a flipped strategy.,**

- ❖ Will teachers make their own videos, curate others' material, or a combination of the two?
- ❖ One teacher can spend hours looking for the perfect video online or spend the same amount of time creating one of his own.
- ❖ Bergmann says: "We need to have professional development for teachers to learn how to create videos."

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- ❖ Teachers should start out simple, with a basic tool, but move to more feature-rich applications.
  - ❖ What will teachers do with class time if they are not lecturing as much (or at all)?
  - ❖ "The important thing is to keep the lower-order things on Bloom's taxonomy to the videos and the higher-order things in class,"
- 

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## **2) Start small.**

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- ❖ Some teachers try to flip everything at once and end up feeling overwhelmed.
  - ❖ Making the videos is a very big time commitment. It is recommended that doing it in smaller chunks.
  - ❖ Teachers should create videos for their top few lessons and see how the students react before plunging ahead.
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### 3) Get student buy-in.

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- ❖ Students may initially react negatively to being asked to watch videos or do other work outside of class.
  - ❖ Successful teacher take time to explain why she flips her class and even included an explanation of Bloom's taxonomy.
- 

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### 4) Teach parents, too.

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- ❖ The biggest roadblock to flipping is with parents who don't initially get the concept.
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## 5) Teach students how to watch videos.

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- ❖ Students don't watch instructional videos in the same manner as a popular film.
  - ❖ WSQ framework: (Watch, Summarize, Question):
    - ❖ **W:** Students watch videos, making use of the pause and rewind buttons ...
    - ❖ **S:** They then complete a guided summary of the lesson online ...
    - ❖ **Q:** They are required to develop a question to bring to class.
- 

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## 6) Encourage (don't punish) students.

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- ❖ Bergmann recommends that teachers avoid lecturing in class if they find that students aren't watching the videos.
- ❖ He suggests having students who didn't do the homework watch videos in the back of the room while the other students get help on higher-level topics.

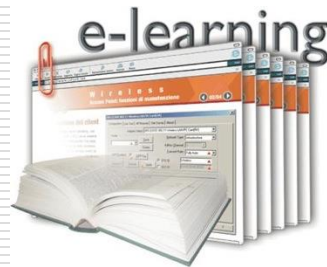


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## 7) Don't use videos as the only engagement tool.

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- ❖ Baugus recommends moving beyond a blog with just videos, because students may eventually perceive it as stale. (mobile devices, LMS, ...)



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## 8) Make videos short and interactive.

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- ❖ The videos should be short, with one video per discrete objective.
- ❖ Videos should be no longer than 6 to 15 minutes with interactive elements and a table of contents according to the students level.
- ❖ For instance, if a student answers quiz questions incorrectly, he or she will be led back to the lecture section on that topic for review.

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## 9) Find fellow flippers.

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- ❖ If you are the only teacher at your school flipping your class, it can be difficult to sustain enthusiasm and get new ideas.
- ❖ "Video is valuable, but it is just one tool. Flipping is defined by what you do in class and student-centered learning."



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## Some useful programs

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## Screencast-O-Matic:

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One-click screen  
capture recording  
on Windows or  
Mac computers  
with no install for  
FREE!



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## Jing (free, available for Mac or PC)

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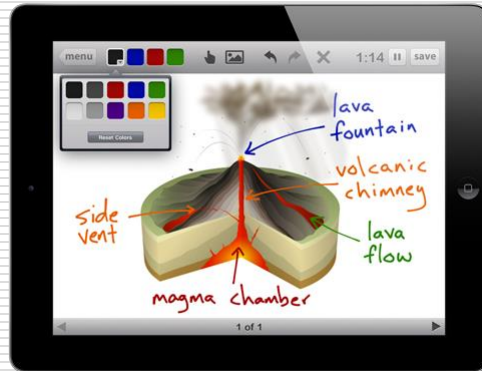
Captures anything you see  
on your computer screen,  
as an image or short video,  
and lets you share it  
instantly



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## Educreations (free, web-based)

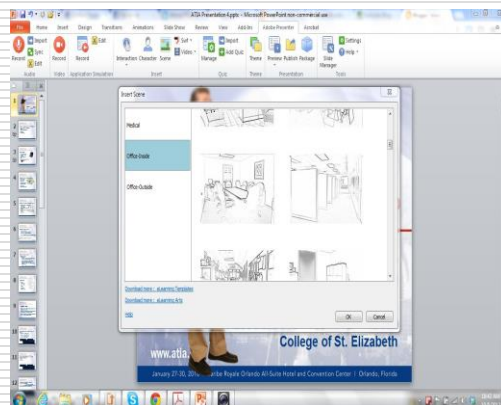
Record your voice and iPad® screen to create dynamic video lessons that students and colleagues can access any time, as needed.



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## Adobe Presenter (cost depends on platform)

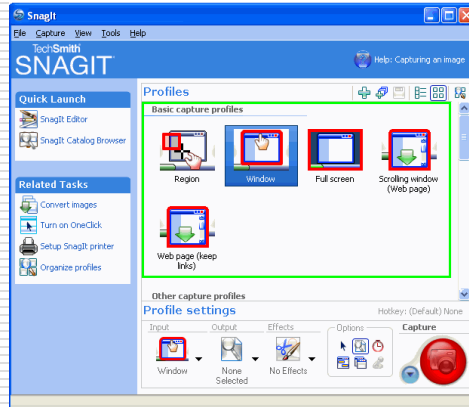
Lets you create HD video lectures for classroom teaching, distance learning, flipped learning and MOOC sessions.



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## Snagit (\$50, available for Mac or PC)

Allows you to grab an image or video of what you see on your computer screen, add effects, and share with anyone.



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## Camtasia Studio (\$99-\$150, depending on platform)

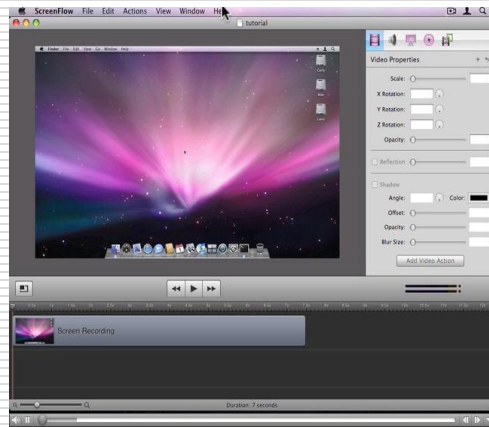
Gives you the tools to record your computer screen and then turn those recordings into professional-grade videos



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## ScreenFlow (\$99, available for Mac)

You can record the contents of your entire monitor while also capturing your video camera, iOS device, microphone and your computer audio.



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## A Sample



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## Experience “Flipping the Classroom” in an Introductory IT Course

David Black-Schaffer

Department of Information Technology  
Uppsala University



Aeen Mohammadi MD MPH PhD

David Black-Schaffer

### Flipping the Classroom

	At Home	In-Class	
<b>Traditional Lectures</b>	<b>Solve Problems</b> Active Alone	<b>Listen to Lecture</b> Passive With Teacher	Wasting a great resource
<b>Flipped Classroom</b>	<b>Listen to Lecture</b> Passive Alone	<b>Solve Problems</b> Active With Teacher	Much better use of the teacher
<b>Flipped Classroom + Technology</b>	<b>Interactive Lecture</b> Active (With Peers)	<b>Solve Problems</b> Active With Teacher With Peers	Ultimate goal: Fully active Peer teaching

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David Black-Schaffer

## Flipping the Classroom

- Goals
  - Use the **teacher time to help teach**, not read the book
  - Maximize **interactive learning** time
- Not a new idea
- Today: “Hybrid” or “Blended” learning
  - Combine the **best of online and in-class**
  - Use information from online lectures to direct in-class learning

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David Black-Schaffer

## Implementation

### At home

- Online **lectures** before class  
(Short 5-10 minute video segments)
- 10-20 self-assessment **quizzes**

### In-class

- Review self-assessment quizzes
- Answer **questions** from online lectures
- Practice **problems** in small groups

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David Black-Schaffer 12

## At Home: Interactive Online Lectures

**Control Hazards**

### Speeding up branches

- The problem is that it takes 3 cycles to resolve branches
- Can we improve on this by changing the pipeline or adding hardware?

Diagram illustrating branch resolution delays: 3 cycle delay from ID, 2 cycle delay from EX, 3 cycle delay from MEM.

Callouts:

- Self-assessment quizzes integrated into the video lecture
- Every student answers 10-20 questions for every lecture
- Can ask a question directly in the video or click "confused"
- Immediate feedback on correct/incorrect answers

**Maximize interactivity & Understand learning**

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David Black-Schaffer 13

## Teacher's View

**Quiz Results**

Identify where to spend class time

**Lecture Timeline**

Identify specific problems with the lecture

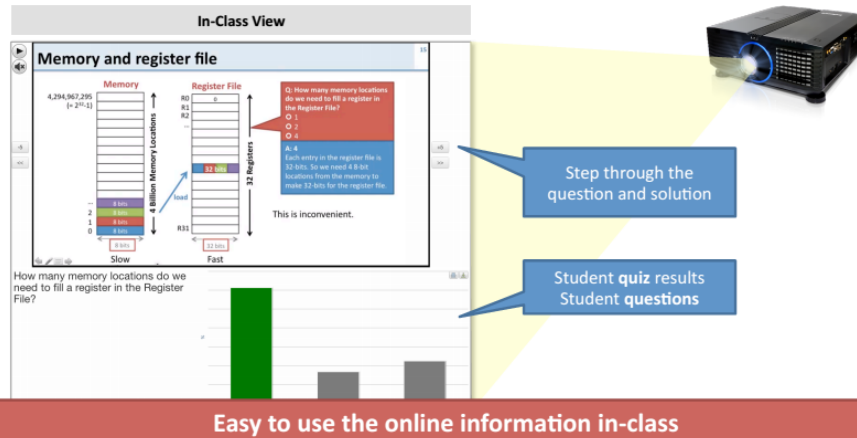
**Evaluation**

General feedback and questions

**What students learned & How to improve**

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## In-Class: Using the Data to Teach



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## Implementation: In-class

- **Review** self-assessment **quizzes**
  - Teacher knows which questions students had problems with
  - (Even good students felt this was worth the time)
- **Review** student **questions** and **feedback**
  - Can prepare ahead of time
  - Build trust with the students that you listen
- **Practice** **problems**
  - Small group practice problems
  - Interact with other students and teachers

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David Black-Schaffer

## 5 Lessons Learned (or almost learned)

- 1 Students love this approach
- 2 Awesome experience for the teacher
- 3 Recording isn't the time-consuming part
- 4 Producing questions is hard
- 5 Adapting to student feedback is hard

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## And the last



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# THE FUTURE?

Rebecca Hamlett, [hamletttr@william.jewell.edu](mailto:hamletttr@william.jewell.edu)

## The Future of Flipped Classrooms

- Flipped classroom methodology is being actively explored in all disciplines and levels of education
- Technology has expanded the number of tools, many free, to facilitate active learning and peer collaboration
- Flipped classroom pedagogy is currently being widely debated
- Is this a better method to deliver instruction? Just a different one? Not a method that fits your needs?

Why not try it and see?

Aeen Mohammadi MD MPH PhD



با تشکر