


## Rigorous Learning with Technology: Elementary Edition



"Kobe Reading" by Apefurlismo on Flickr. CC-BY-SA.  
<http://flickr.com/photos/aepfurlismo/4483288832/>


Kristin Fontichiaro, University of Michigan School of Information  
Slides: [bit.ly/fontblog](http://bit.ly/fontblog) ~ [font@umich.edu](mailto:font@umich.edu) ~ @activelearning  
AIMS - OCTOBER 7, 2013 - 8:35 - 10:05AM -ROEPEP

“connecting people, information,  
and technology in more valuable  
ways”



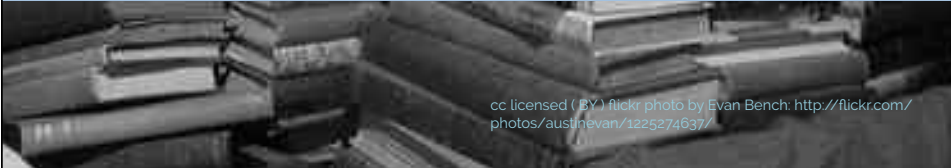
**Today's Road Map**

- **An Unfocused Lens:**  
The Dizzying Choices
- **Refocusing Our Lens:**  
What Do We Mean by Rigor?
- **Testing Our Lens:**  
Student Work Samples



What does it mean to be literate today?  
(Said differently: what skills do you need to navigate the physical and virtual worlds?)

<http://todaysmeet.com/aims>



cc licensed (BY) flickr photo by Evan Bench: <http://flickr.com/photos/austinevan/1225274637/>

We have  
been  
in the  
ed tech  
business  
for a  
lonnnnnng  
time.



Rhombic Dodecahedron Calendar 2013 by Philip Chapman  
CC-BY-NC-SA. <http://flickr.com/photos/oschere/833427757>



## Any guesses?

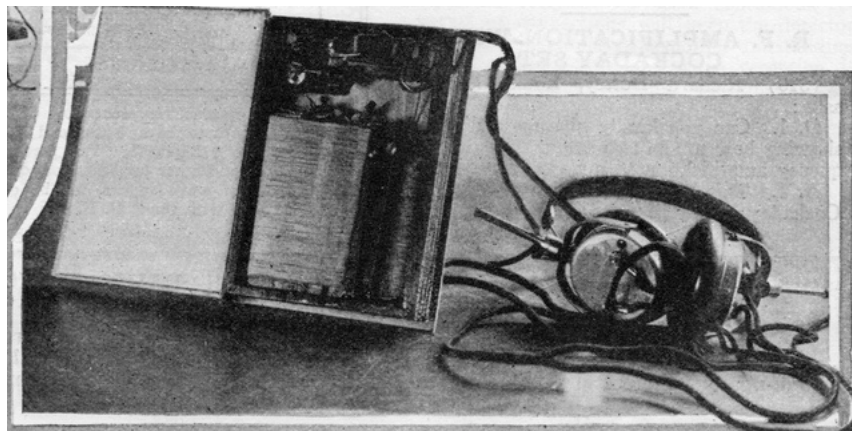
"With the everyday added perfections in the transmission and reception... Mary ... will enjoy her ... lessons as much as she now enjoys her bedtime stories. Everything will be an "open book" to her. [It] will take the place of bulky primers and readers. Home work will now be a great joy ... and lessons will be learned with much greater facility."



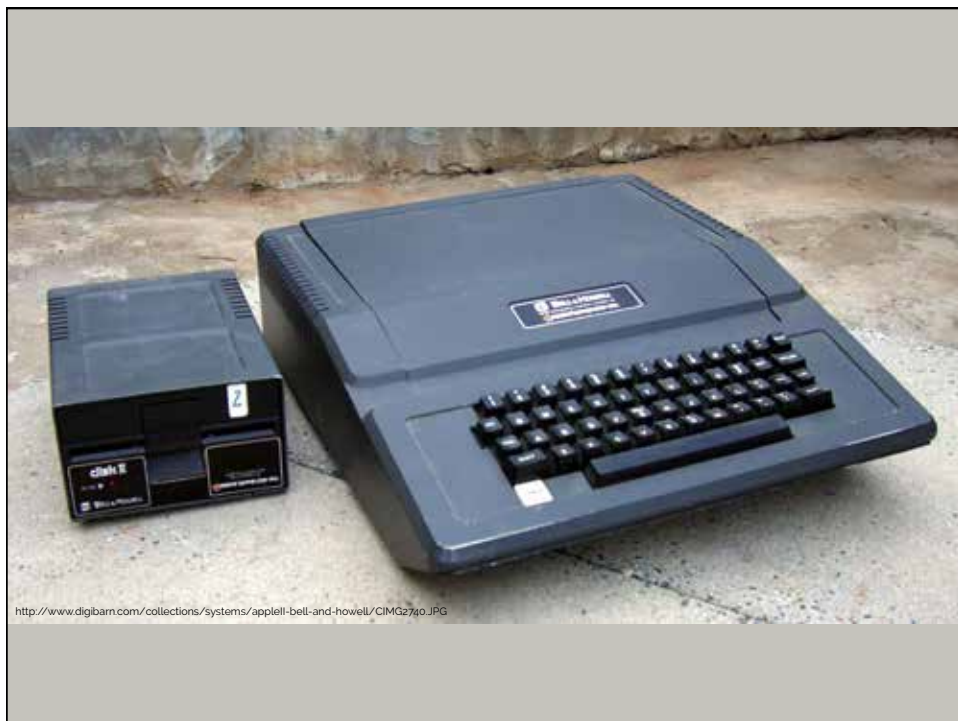
## The Game-Changing Technology!



## Close-Up!



Text and images from: <http://paleofuture.gizmodo.com/this-radio-book-was-the-future-of-education-509067457> used under Fair Use exemption







<http://upload.wikimedia.org/wikipedia/commons/e/e7/>





## **TURN AND TALK:**

How have past technology initiatives improved student learning?

What made them succeed?

Where have we fallen short?

Scribe at <http://todaysmeet.com/aims>

<http://bit.ly/bridger-ipad>





## TURN AND TALK!

If a two year-old can use an iPad, what are the implications for our work?

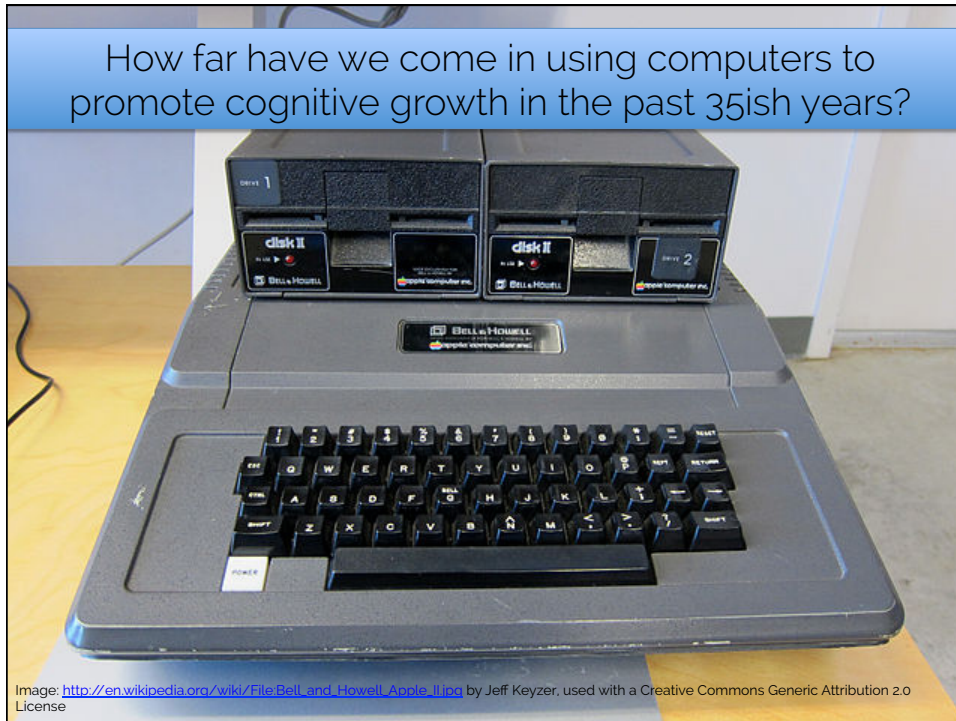
Image: 'whoa' <http://www.flickr.com/photos/54021469@N00/653976303>



## SHARE OUT!

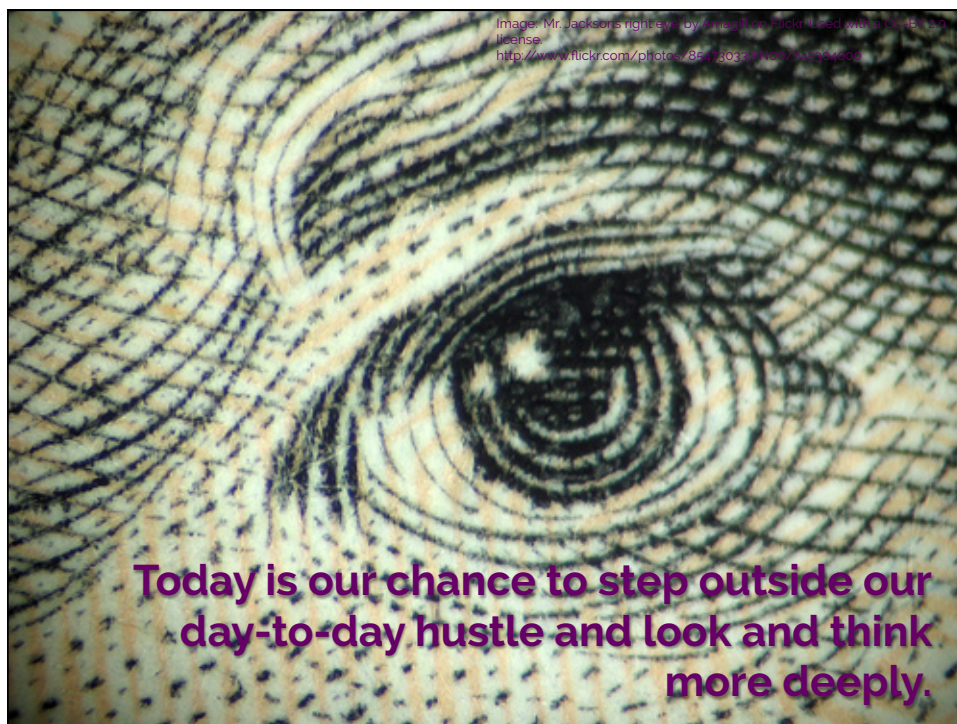
Image: 'whoa' <http://www.flickr.com/photos/54021469@N00/653976303>

How far have we come in using computers to promote cognitive growth in the past 35ish years?



Sometimes, to be seen as "current," we've leapt into multimedia or technology projects without calibrating the quality of the new experience against the quality of the traditional modality.





**TWO COMMON  
OBSERVATIONS**

***FANCY NANCY syndrome:***

Students make minimal cognitive investment and plug a few trivial infobits into a Web 2.0 tool. They are lauded for their "creativity" ... even though the software engineer did the hard work, not the student.

***E-EFFORT syndrome:***

Students make minimal cognitive investment and plug a few trivial infobits into a tool where they do a lot of the aesthetic construction.



**My Explorers  
Report!!!!!!**  
**BY KRISTIN  
FONTICHIARO**



Christopher  
Columbus  
was born in  
1461.



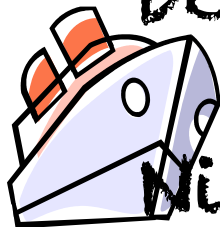


HE WAS  
BORN  
IN  
ITALY.



HOME OF PIZZA!!!!!!! yum!!!!

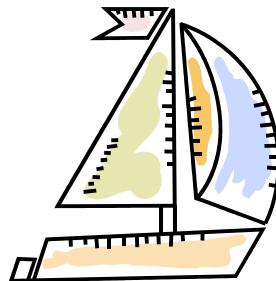
He had three  
boats:



Nina

Pinta

Santa Maria



**He**  
**discovered**  
**AMERICA!!!**

*He died in 1506.*

**It was sad.**







What are students gaining from this experience?

Image: Question mark made of puzzle pieces  
<http://www.flickr.com/photos/10361931@No6/4273168957>

## WHERE'S THE LEARNING?

Yes, they're using technology,  
and yes, it transcends pen-and-  
paper, but where is the  
knowledge-building?

## ED TECH MATH

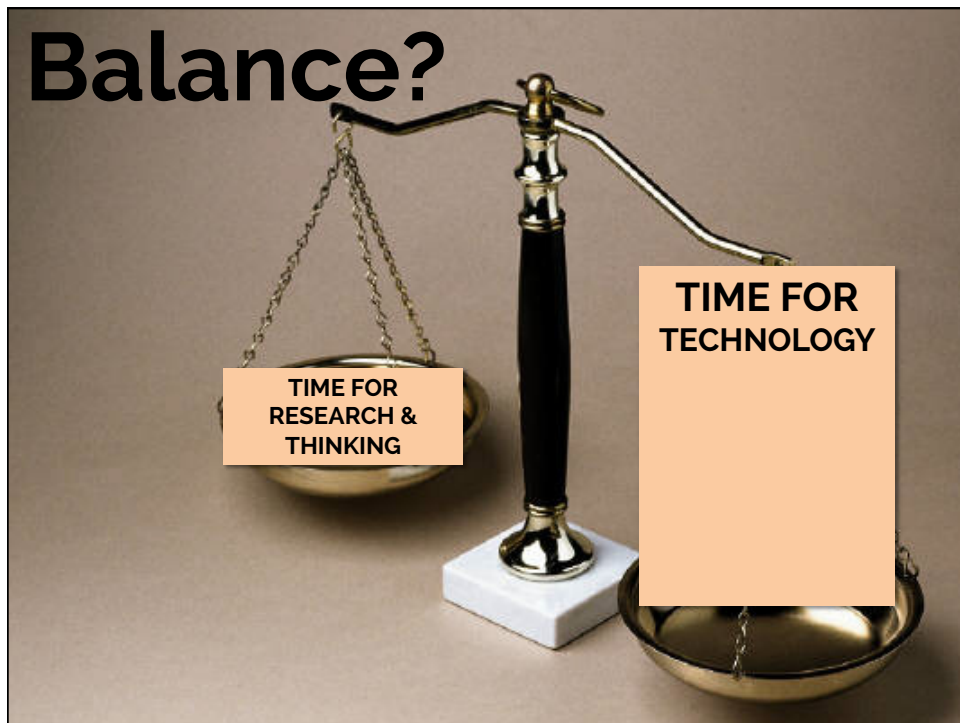
student + tech > student



Which parts of this project could NOT be outsourced to India? (And who would buy it?)



If I had turned in this assignment as a paper-and-pencil product, would you have been proud of me?





\* Bernajean Porter;  
\*\* Joanne Yatvin

Where's the Beef?\*

How Do We Know ~~Rigor~~ When We See It?

*Vigor*\*\*

We should have some agreement on what good, tech-rich learning looks like, right?



We need norms.

# Norms Matter.



"Harrison Roses" by Susan Noakes McCord, around 1860.  
From the collection of The Henry Ford.  
[http://www.thehenryford.org/exhibits/quiltinggenius/quilts/73\\_120\\_1.htm](http://www.thehenryford.org/exhibits/quiltinggenius/quilts/73_120_1.htm)



Quilt for Bobby Unser by "Racing's Quilt Lady" Jeanette Holder.  
From the collection of The Henry Ford.  
<http://www.thehenryford.org/exhibits/pic/2010/may/quilt.asp>

Rigor means  
exciting challenge,  
not rigor mortis!  
Insert VIGOR if you  
prefer

Rigorous  
Learning with  
Technology

(with thanks to Roberta Sibley, Laurie Olmsted, Jeff Stanzler, and Raya Samet for contributing their feedback!)

A diagram illustrating the concept of informatics. It features a person icon on the left, followed by a plus sign, a computer monitor and keyboard icon, a greater-than sign, and another person icon with an asterisk to its upper right. Below this sequence is a dark grey rectangular box with the text "Rigorous Learning with Technology" in white.

\* Charles Friedman, definition of Informatics

"Man" by Michael McMillan and "Computer" by Alyssa Mahlberg from thenounproject.com collection. Used under a Creative Commons CC-BY 3.0 license. (with thanks to Roberta Sibley, Laurie Olmsted, Jeff Stanzler, and Raya Samet for contributing their feedback!)

A diagram illustrating the relationship between decontextualized and authentic learning. A double-headed orange arrow connects the word "Decontextualized" at the top to the word "Authentic" at the bottom. To the right of "Authentic" is a dark grey rectangular box with the text "Rigorous Learning with Technology" in white. To the left of this box is a blue speech bubble containing the text: "What's in it for me? How does this apply to me? Why does this matter to me?"

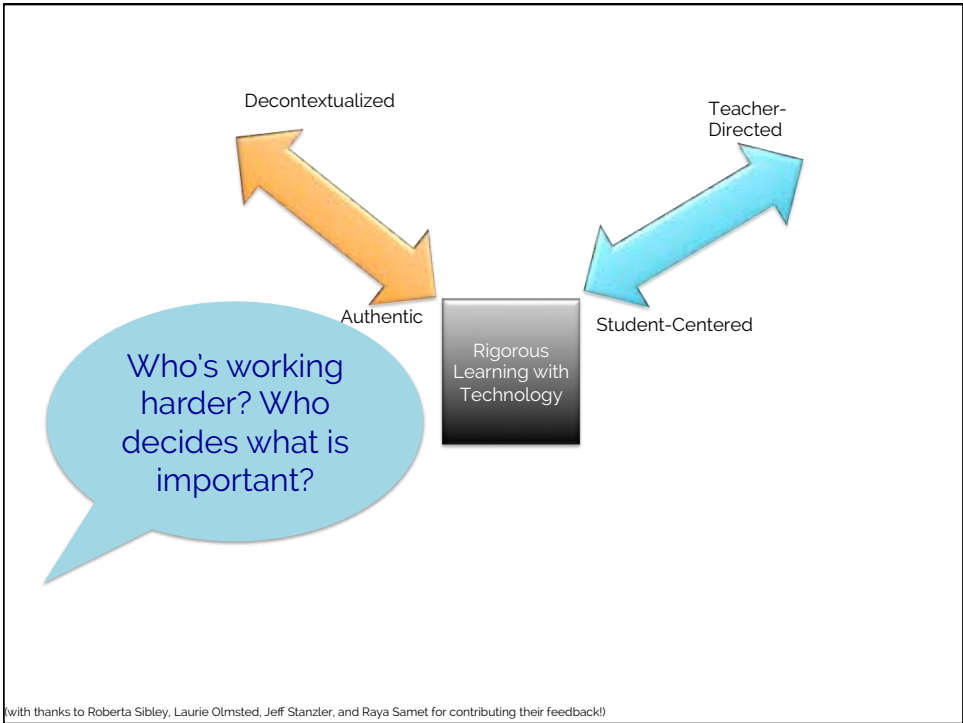
(with thanks to Roberta Sibley, Laurie Olmsted, Jeff Stanzler, and Raya Samet for contributing their feedback!)

My Albania Report

The Thrilling Life of Millard Fillmore

South Dakota!!!!!!!!!!

Francis Poulenc: Mid-Century  
French Composer and My Personal  
Hero





**Research Guide: The Presidents**

Name \_\_\_\_\_

Name of President \_\_\_\_\_

When was he born? \_\_\_\_\_

When did he die? \_\_\_\_\_

When was he in office? \_\_\_\_\_

What number president was he? \_\_\_\_\_

Draw a picture of your president here.

How are we  
doin' on Bloom's?

**Research Guide: The Presidents**

Name \_\_\_\_\_

Name of President \_\_\_\_\_

When was he born? \_\_\_\_\_

When did he die? \_\_\_\_\_

When was he in office? \_\_\_\_\_

What number president was he? \_\_\_\_\_

Draw a picture of your president here.

[http://epitt.coe.uga.edu/images/1/1e/Bloom\\_1.jpg](http://epitt.coe.uga.edu/images/1/1e/Bloom_1.jpg)

**Old Version**                      **New Version**

**Research Guide: The Presidents**

Name \_\_\_\_\_

Name of President \_\_\_\_\_

When was he born? \_\_\_\_\_

When did he die? \_\_\_\_\_

When was he in office? \_\_\_\_\_

What number president was he? \_\_\_\_\_

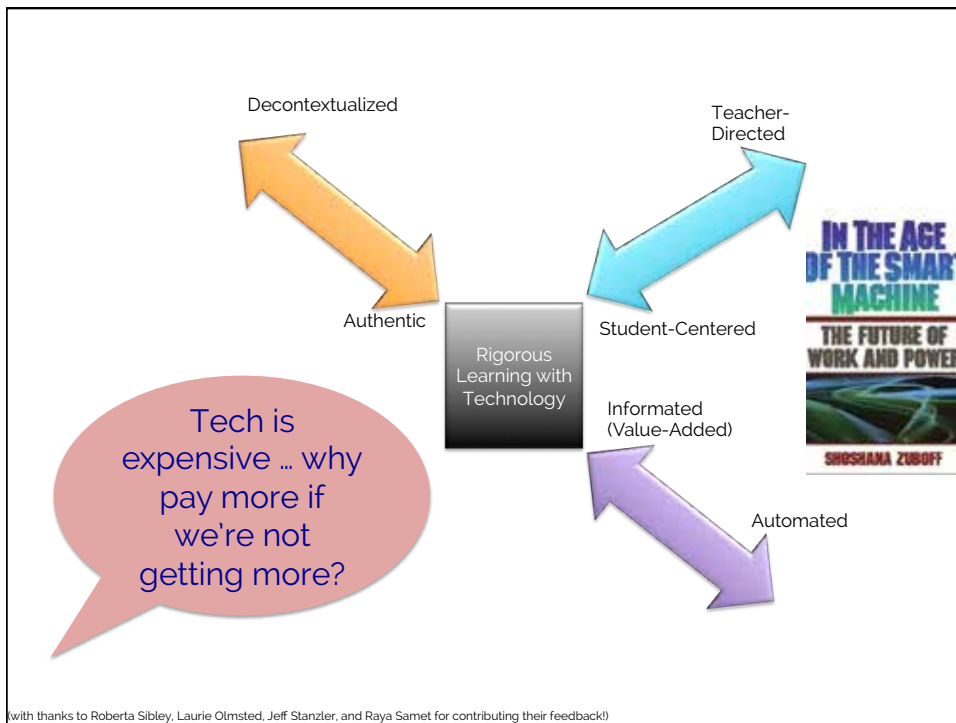
Draw a picture of your president here:

How are we helping students see the essence of the presidents?

Context in history?

Relevance to how life is today?

[http://epitt.coe.uga.edu/images/1/1e/Bloom\\_1.jpg](http://epitt.coe.uga.edu/images/1/1e/Bloom_1.jpg)



Which of these automate paper and pencil? Informate?



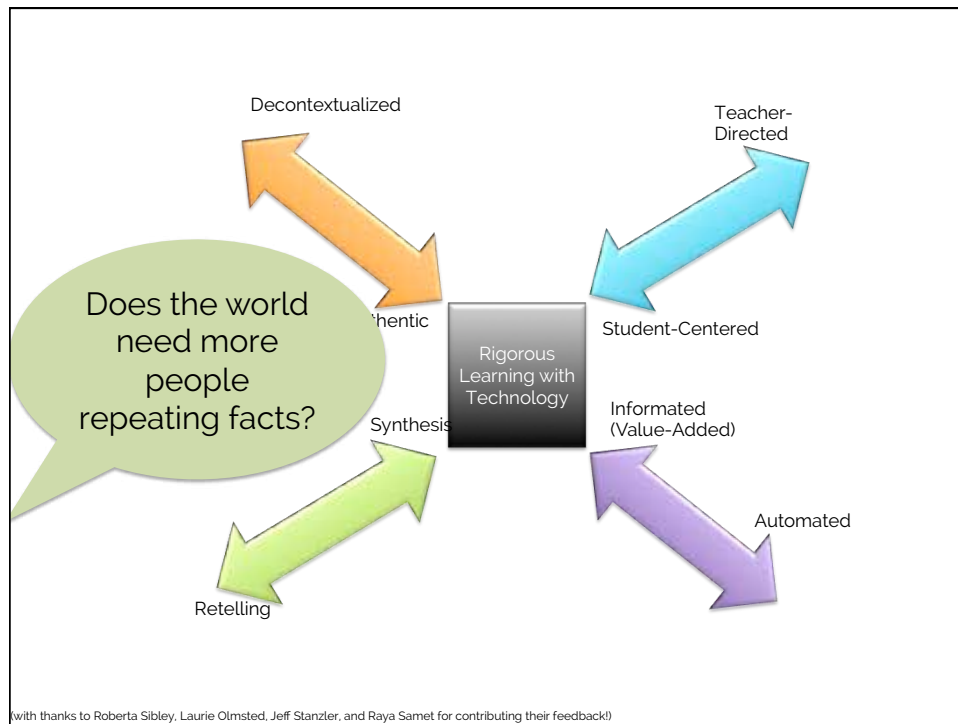
Kristin



*Created with TuxPaint, a free, open-source version of KidPix*

*TuxPaint.org*

In other words,  
how can technology take students  
beyond where they can go  
without technology?



## Compare and Contrast

Gerald Ford was the 38<sup>th</sup> President. He died in 2006. He was from Michigan. He was Vice President before he was President. He lived longer than any other U.S. President. His wife was named Betty.

Have you ever had to forgive someone but you didn't want to do it? I wonder if that is how Gerald Ford felt when he pardoned Richard Nixon. We learn something different from every U.S. President. From Gerald Ford, I learned that it is important to .....

By Liz Kirsch Koltz

## Engage, Enhance, and Extend Learning!

I find out what these terms really mean when you integrate technology into your lessons.

**Engage** often uses that technology to assist that a general "engage" response in a novel learning or even that traditional tools do not. So we can help engage in active learning, and they can be working, especially for teachers and previous teachers. Research is continuing on how to best integrate technology into learning and technology integration responses with a focus on instruction. We asked a group of our student teachers to create technology-enhanced performance assessments for eighth graders who had been in our "engage-enhance-or-extend" the learning to create problem for that traditional strategies could not.

After the performance assessments were finished, we found the student teachers' definition of "engage," the based on extended learning would greatly. For example, one student teacher wanted to have the eighth graders create a story where the students would pick a character from a novel and act out scenes from the book to explain the character's position in the story to answer the book club reading question was about technology to assist.

The student teacher explained that this was "real" technology integration because the eighth graders were "engaged" in the act of using an interactive and like there is some kind of presentation.

The teacher's intention and it could not be while the using technology in and of itself is always always a lot more facilitating of engaging, it does not necessarily mean that students will engage more or their understanding of the learning goals. How the teacher chooses to use and adapt use the difference between using technology and learning with it is no longer clear the value, she worried. Should all technology integration engage enhance, or extend to be effective engagement?

I realized that I needed to be specific with the student teachers as well as with my teaching colleagues about the difference between "engaging, enhancing, and extending learning when integrating technology."

While we have made that focus on the importance of technological, pedagogical, and content knowledge, we rarely discuss the difference between engaging and enhancing or extend whether one is better than the other when using technology.

That's why I had it important to understand what we mean by these words. Below I have defined the terms engagement, enhancement, and extension as they relate to technology integration practice.

**Engage:** The teacher is trying to find a way to motivate or interest disengaged students.

**Enhance:** This is using technology to develop understanding of learning goals that could not have been accomplished without these tools.

**Extend:** The technology usage learning towards the classroom and use students' everyday lives, where they can continue to grow after they leave a class.

**DEFINITIONS**

**Engage** the technology:

- allows students to learn on their own or with their instructor
- allows students to work on their own or with their instructor
- allows a group of students to work on their own or with their instructor

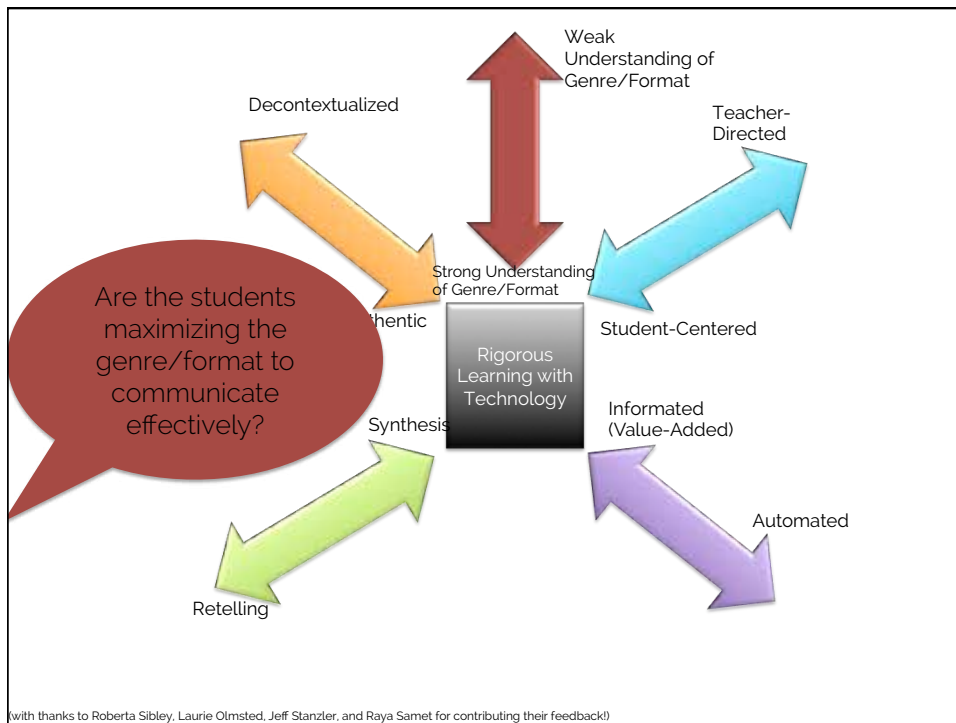
**Enhance** the technology:

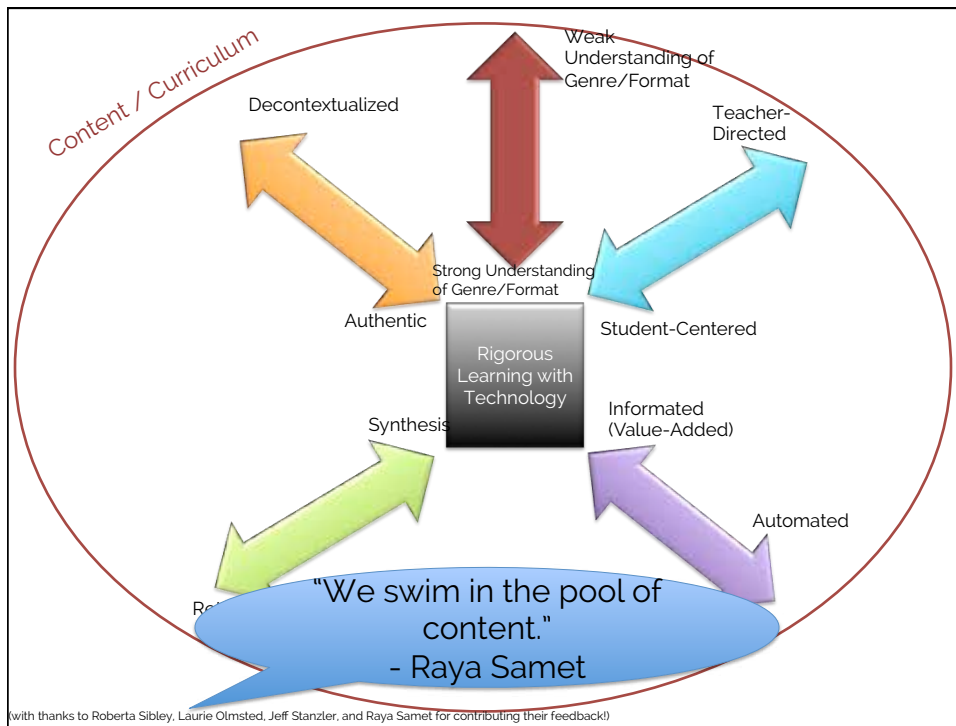
- lets students bring a more sophisticated understanding of the content
- allows a way to extend a lesson on traditional concepts or ideas
- allows students to demonstrate their understanding in a way that they could not with traditional tools

**Extend** the technology allowing students to:

- learn content or their typical lesson step
- bring their own learning with their individual life experiences
- show an ongoing interest, without the need for the teacher or parent to control the use of the tool

© 2013 Learning Technology and Technology / May 2013

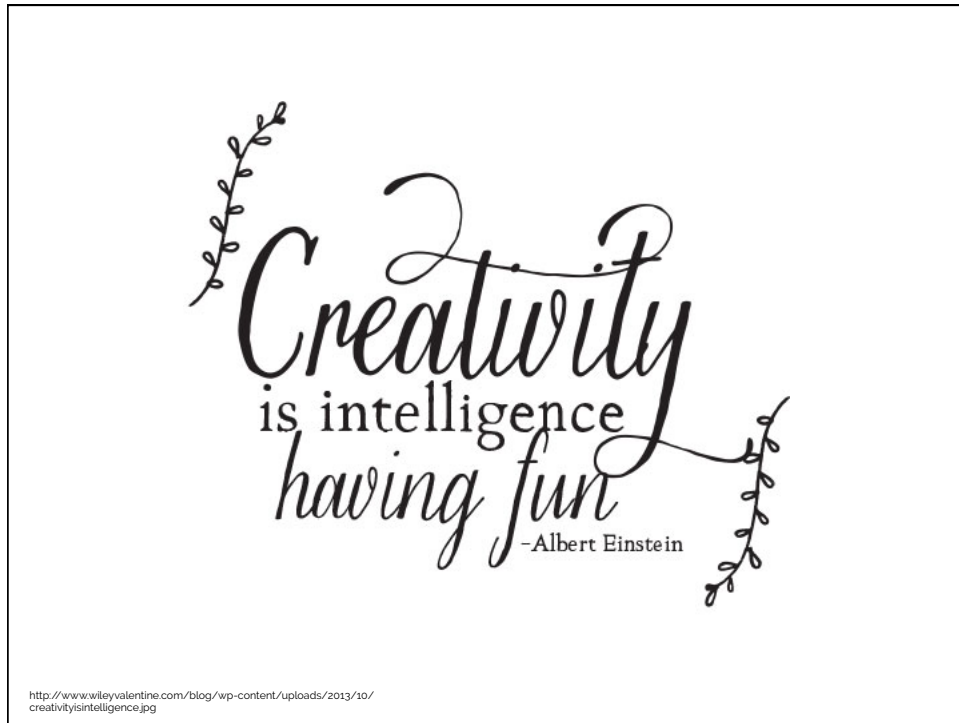




## Silent Partners

- Creativity
- Motivation
- Enthusiasm
- Engagement
- "Hands on keyboards"

Image: Talk Shows On Mute  
<http://www.flickr.com/photos/44538772@Noo/678658>









<http://bit.ly/watsons1963>

CLICK HERE!!!!

The bombing happened at Sunday, 15<sup>th</sup> September, 1963. At the 16<sup>th</sup> Baptist Church.

Check it out!!!!!!!!!!

Addie May Collins, Carole Roberston [sic], Denise Mcnair, and Cynthia Wesley had all died the day of the bombing.

The explosion blew a hole in the church's rear wall, destroyed the back steps, and left intact only the frames of all but one stained glass window.

<http://bit.ly/watsons1963>


CLICK HERE!!!!

The bombing happened at Sunday, 15<sup>th</sup> September, 1963. At the 16<sup>th</sup> Baptist Church.

Check it out!!!!!!!!!!

Addie May Collins, Carole Roberston [sic], Denise Mcnair, and Cynthia Wesley had all died the day of the bombing.

The explosion blew a hole in the church's rear wall, destroyed the back steps, and left intact only the frames of all but one stained glass window.



Copied verbatim from Timelines.com



## Reflective Blogging

Fred's students are required to blog weekly for fifth grade social studies. They summarize what they have learned and then are asked to think about how what they are learning relates to their lives today. They are also required to comment productively on each others 'blogs.



In Maria's science class, students conduct experiments in small groups. Then, they go to the class wiki, where Maria has already set up a table with a row where each group can report its data. By pooling data onto a single table, students can clearly see if their data follows the patterns of other groups.

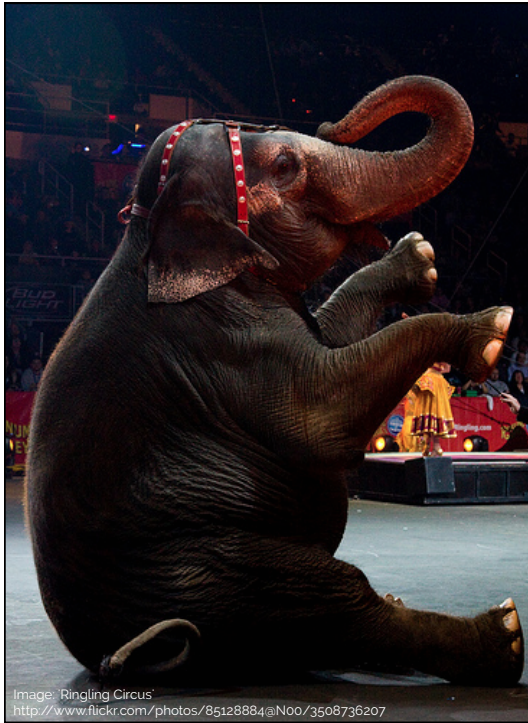
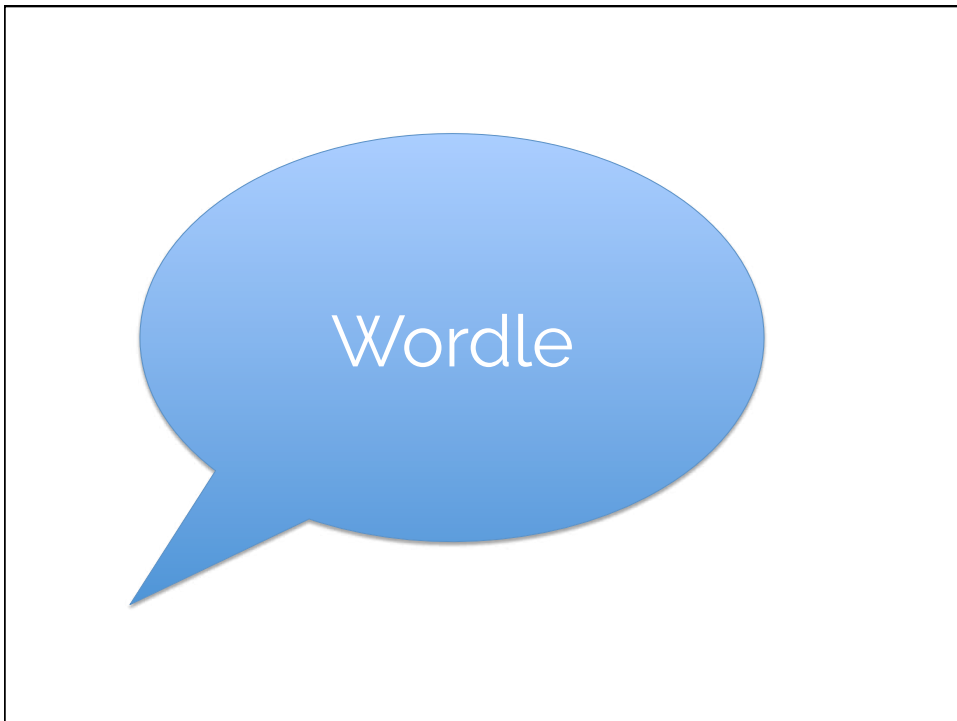


Image: Ringling Circus  
<http://www.flickr.com/photos/85128884@N00/3508736207>

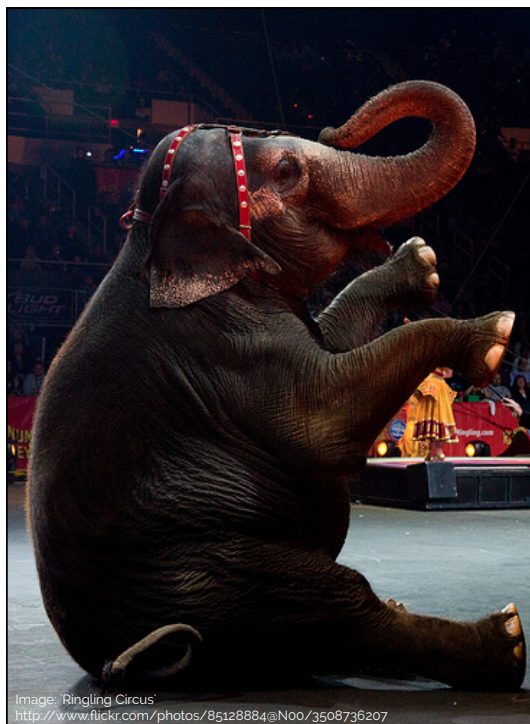
How are we doing with time?





With your group, choose one of the sample projects you saw and discuss

- how you could tweak it to deepen the level of cognition, problem-solving, decision-making, or critical thinking
- or**
- how you could build further discussions around the artifact so as to deepen the overall experience.



How are we doing with time?

Image: Ringling Circus  
<http://www.flickr.com/photos/85128884@N00/3508736207>

## My Ed Tech Manifesto

Finish one of these sentences:

I believe in using technology that

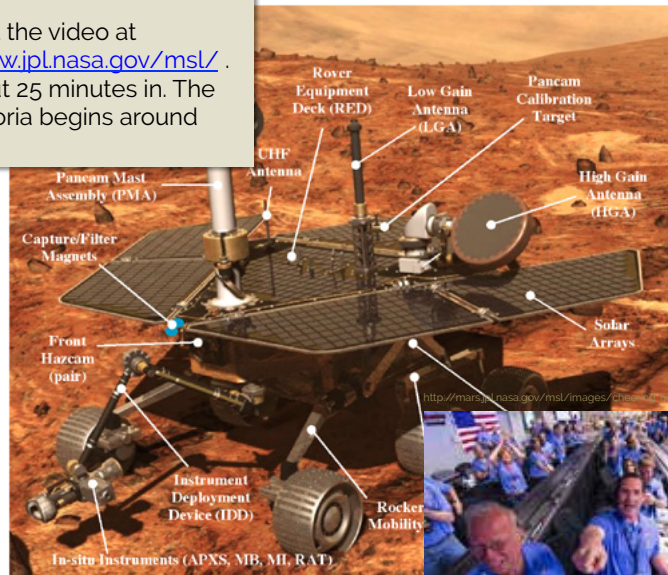
\_\_\_\_\_.

When using educational technology, I will maximize \_\_\_\_ and minimize \_\_\_\_\_.

(Or create your own!)

Aren't we really trying to get our students to be able to ...

Watch these engineers celebrate!  
Check out the video at <http://www.jpl.nasa.gov/msl/>.  
Start about 25 minutes in. The real euphoria begins around 28:45.



[http://marsrover.nasa.gov/mission/images/rover1\\_detail\\_50](http://marsrover.nasa.gov/mission/images/rover1_detail_50)



<http://mars.jpl.nasa.gov/msl/images/cheer/msl20120805-hpfeat.jpg>



http://news.cnet.com/8301-11386\_3-57488731-76/google-self-driving-car-300000-miles-and-counting/

CNET News Cutting Edge

### Google self-driving car 300,000 miles -- and counting

Company registers progress but cautions of "a long road ahead" (pun intended), especially when navigating snow-covered roadways and interpreting temporary construction signals.

by Charles Cooper | August 7, 2012 4:07 PM PDT

[Follow](#)



(Credit: Google)

Google screws around with a lot of far out, even cockamamie projects -- well, because it can and it's fun. Two good reasons that few can fault.

And it's also a good way to push the proverbial tech envelope. So it is that Google's update about the company's [self-driving car project](#) suggests this is turning into something more than Sergey & Larry's homebrew experiment.

Our vehicles, of which about a dozen are on the road at any given time, have now completed more than 300,000 miles of testing. They've covered a wide range of traffic conditions, and there hasn't been a single accident under computer control.



[http://cdn.ientry.com/sites/webprnews/pictures/magicarms\\_616.jpg](http://cdn.ientry.com/sites/webprnews/pictures/magicarms_616.jpg)

"Monday"  
Morning  
Takeaway?



<http://todaysmeet.com/aims>

Riced out  
<http://www.flickr.com/photos/65694461@N00/350982994>

**Questions?**  
font@umich.edu  
@activelearning  
<http://bit.ly/fontblog>

