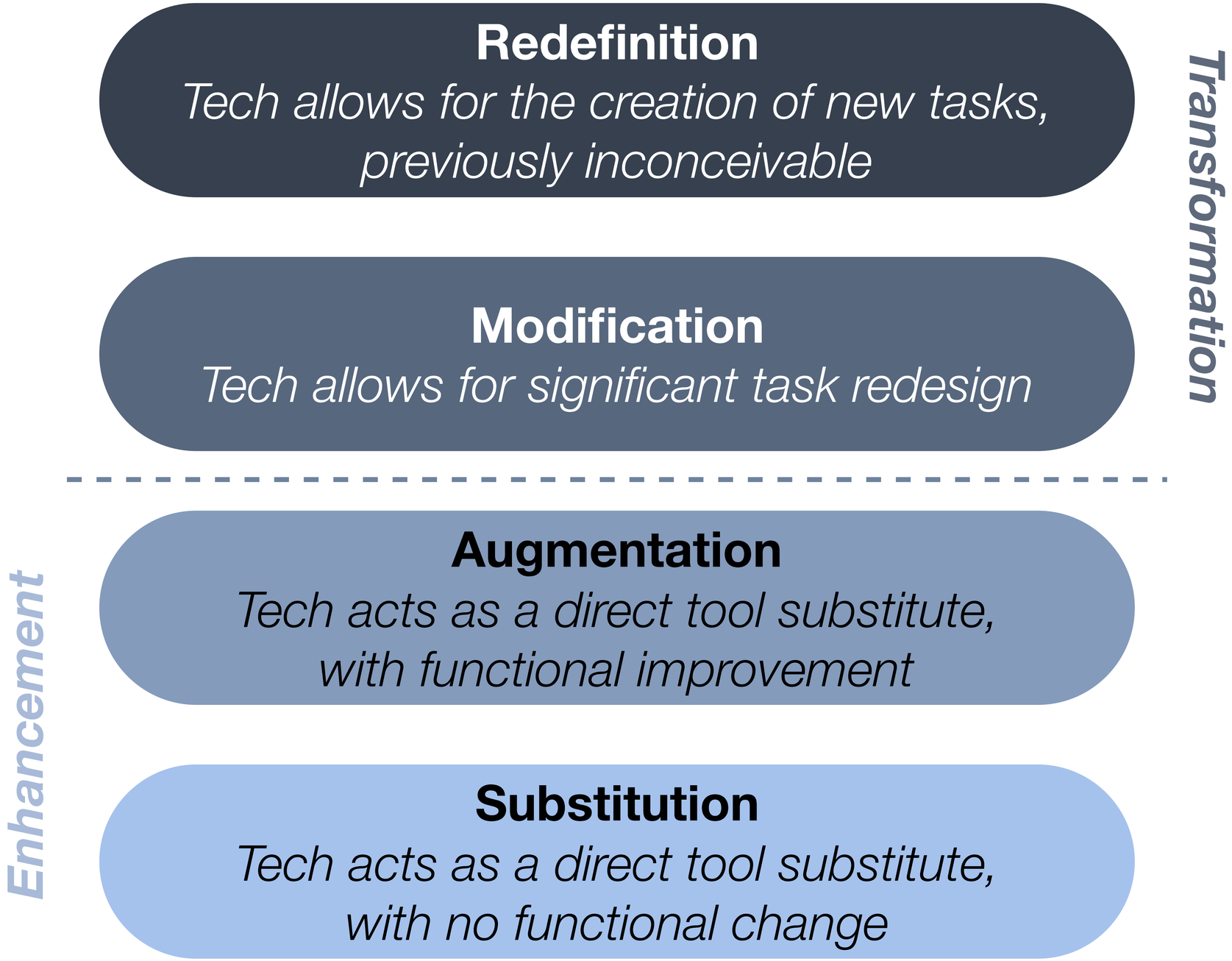
Innovation in Schools, Empowered by SAMR

Ruben R. Puentedura, Ph.D.



Ruben R. Puentedura, *As We May Teach: Educational Technology, From Theory Into Practice*. (2009)

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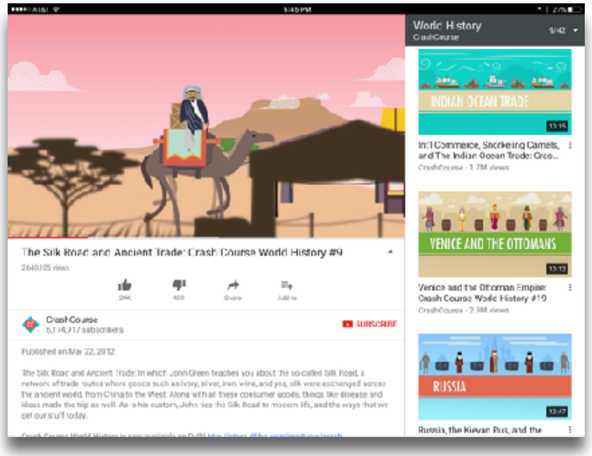

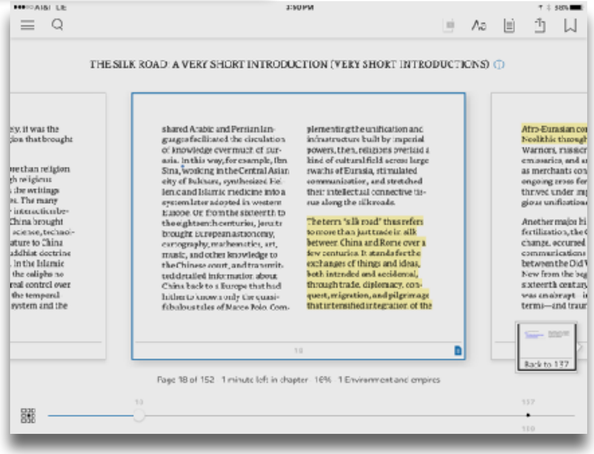

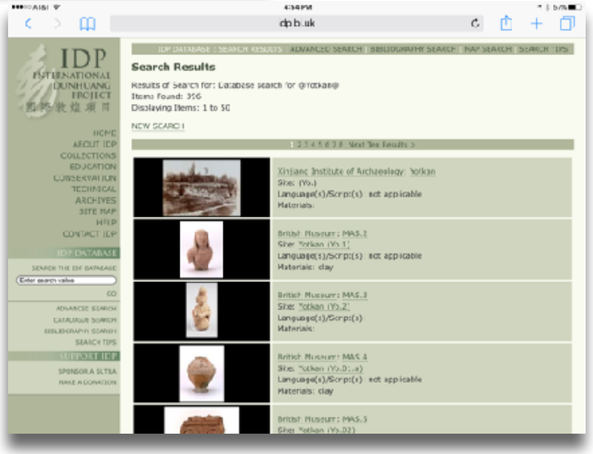

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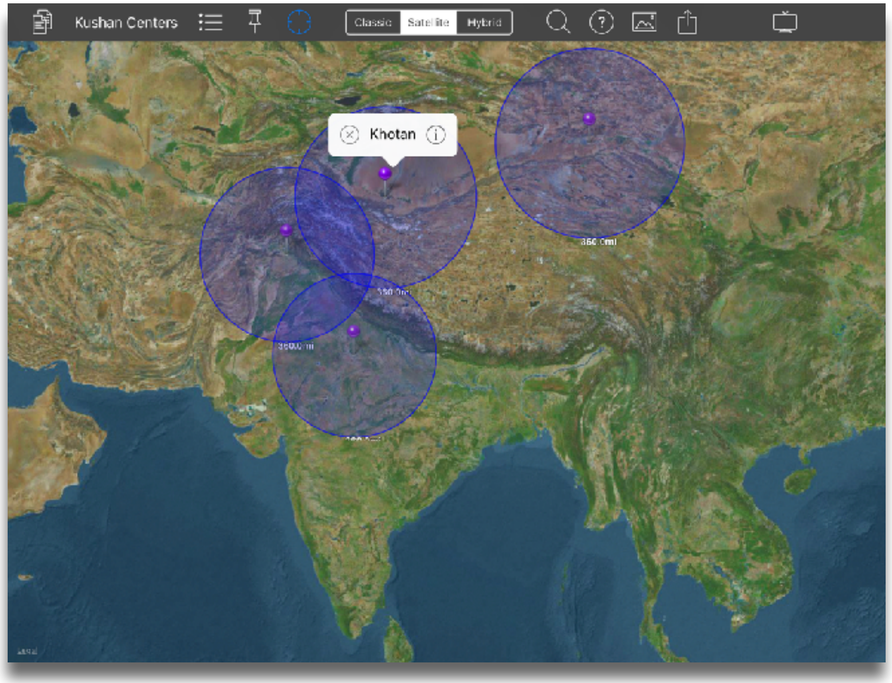

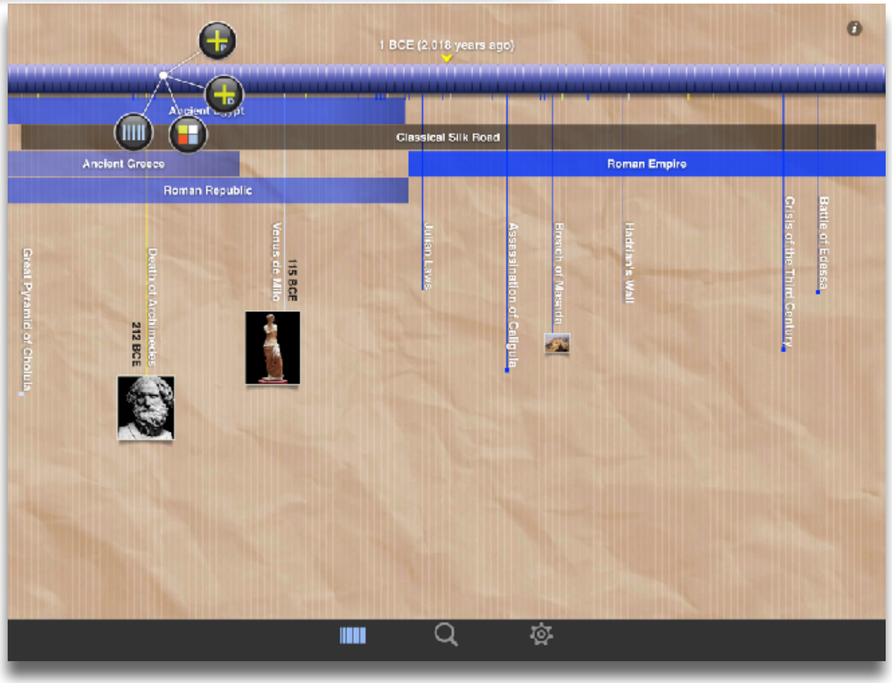

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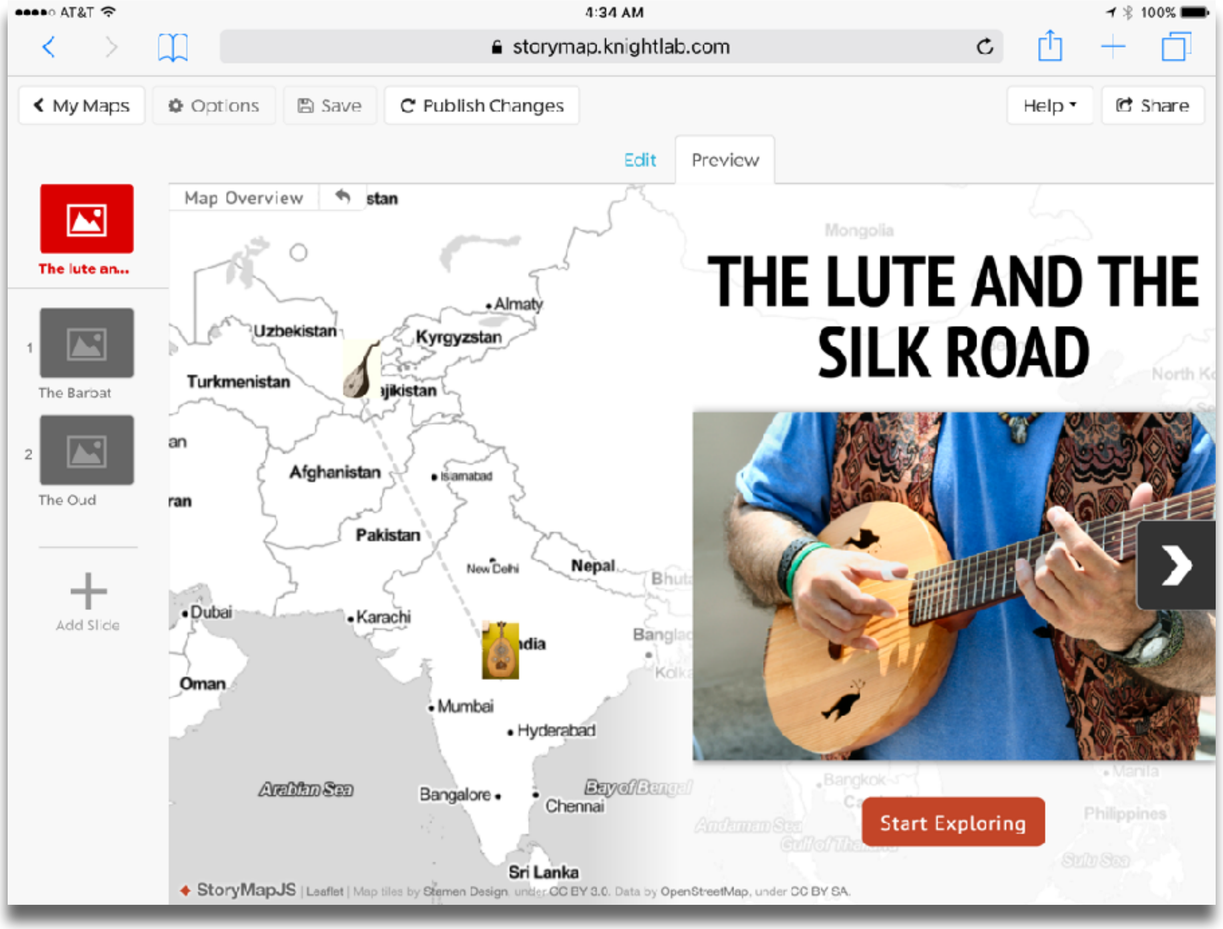

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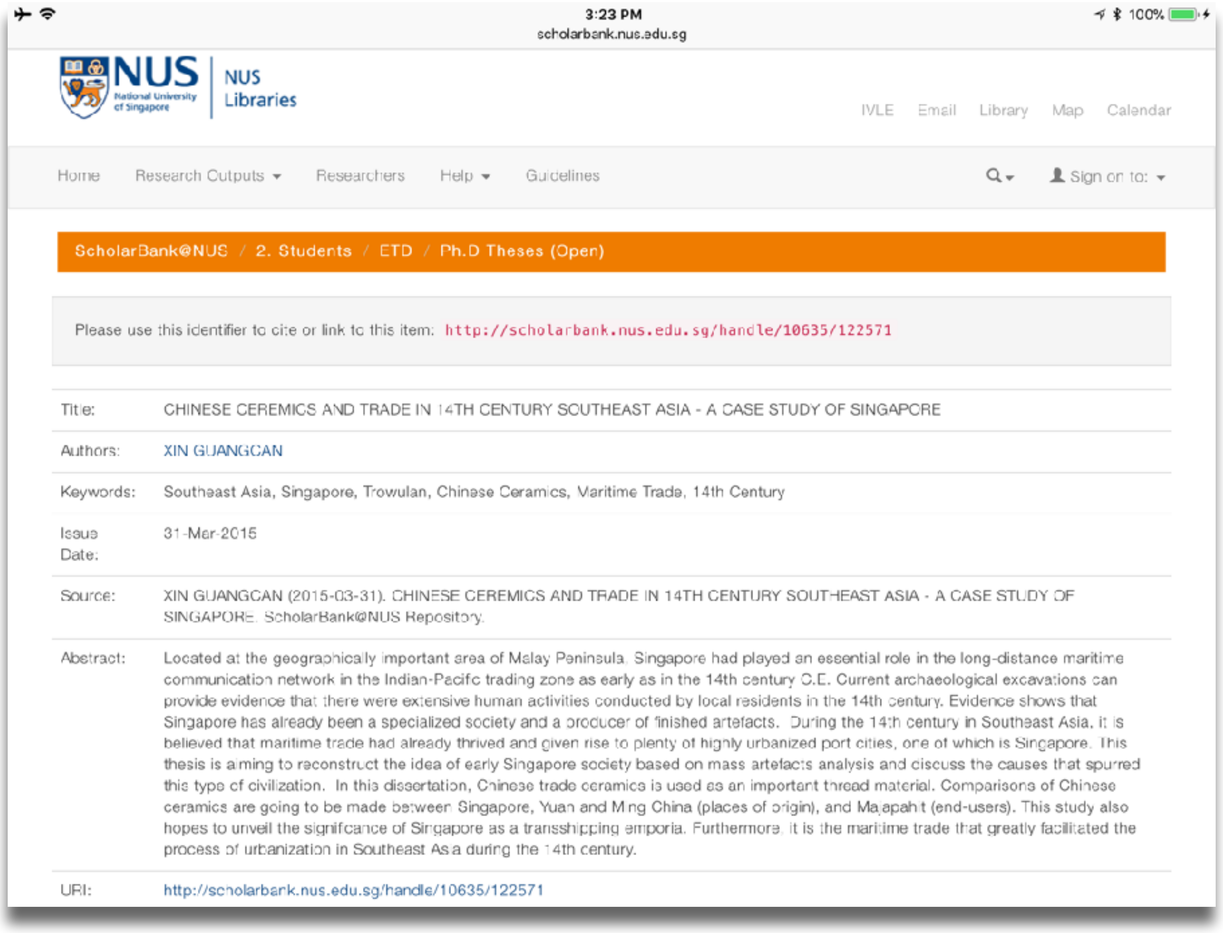
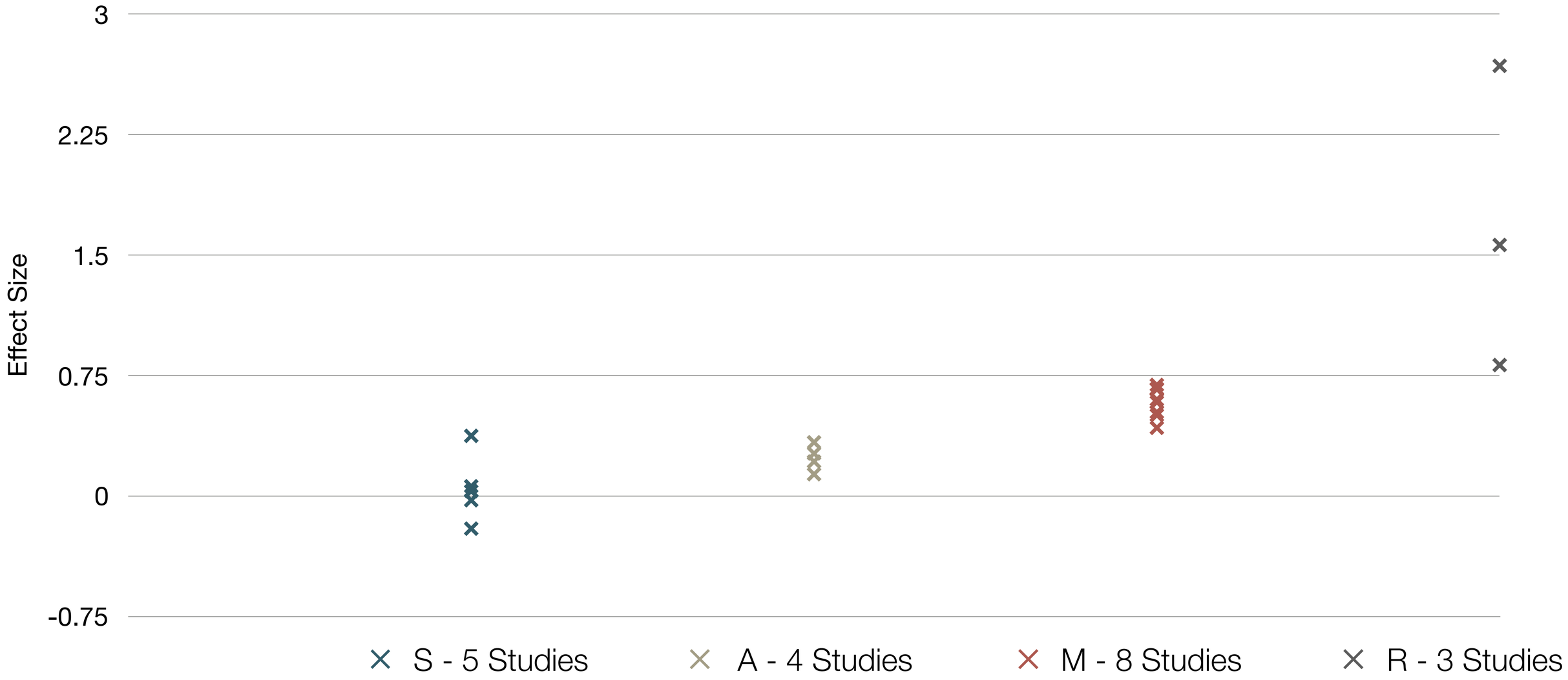


Meta-analysis	Number of studies	*ES* type	Mean *ES*	*SE*
Bangert-Drowns (1993)	19	Missing	0.27	0.11
Bayraktar (2000)	42	Cohen's *d*	0.27	0.05
Blok, Oostdam, Otter, and Overmaat (2002)	25	Hedges's *g*	0.25	0.06
Christmann and Badgett (2000)	16	Missing	0.13	0.05
Fletcher-Flinn and Gravatt (1995)	120	Glass's Δ	0.24	0.05
Goldberg, Russell, and Cook (2003)	15	Hedges's *g*	0.41	0.07
Hsu (2003)	25	Hedges's *g*	0.43	0.03
Koufogiannakis and Wiebe (2006)	8	Hedges's *g*	−0.09	0.19
Kuchler (1998)	65	Hedges's *g*	0.44	0.05
Kulik and Kulik (1991)	239	Glass's Δ	0.30	0.03
Y. C. Liao (1998)	31	Glass's Δ	0.48	0.05
Y.-I. Liao and Chen (2005)	21	Glass's Δ	0.52	0.05
Y. K. C. Liao (2007)	52	Glass's Δ	0.55	0.05
Michko (2007)	45	Hedges's *g*	0.43	0.07
Onuoha (2007)	35	Cohen's *d*	0.26	0.04
Pearson, Ferdig, Blomeyer, and Moran (2005)	20	Hedges's *g*	0.49[a]	0.11
Roblyer, Castine, and King (1988)	35	Hedges's *g*	0.31	0.05
Rosen and Salomon (2007)	31	Hedges's *g*	0.46	0.05
Schenker (2007)	46	Cohen's *d*	0.24	0.02
Soe, Koki, and Chang (2000)	17	Hedges's *g* and Pearson's *r*[a]	0.26[a]	0.05
Timmerman and Kruepke (2006)	114	Pearson's *r*[a]	0.24	0.03
Torgerson and Elbourne (2002)	5	Cohen's *d*	0.37	0.16
Waxman, Lin, and Michko (2003)	42	Glass's Δ	0.45	0.14
Yaakub (1998)	20	Glass's Δ and *g*	0.35	0.05
Zhao (2003)	9	Hedges's *g*	1.12	0.26

a. Converted to Cohen's *d*.

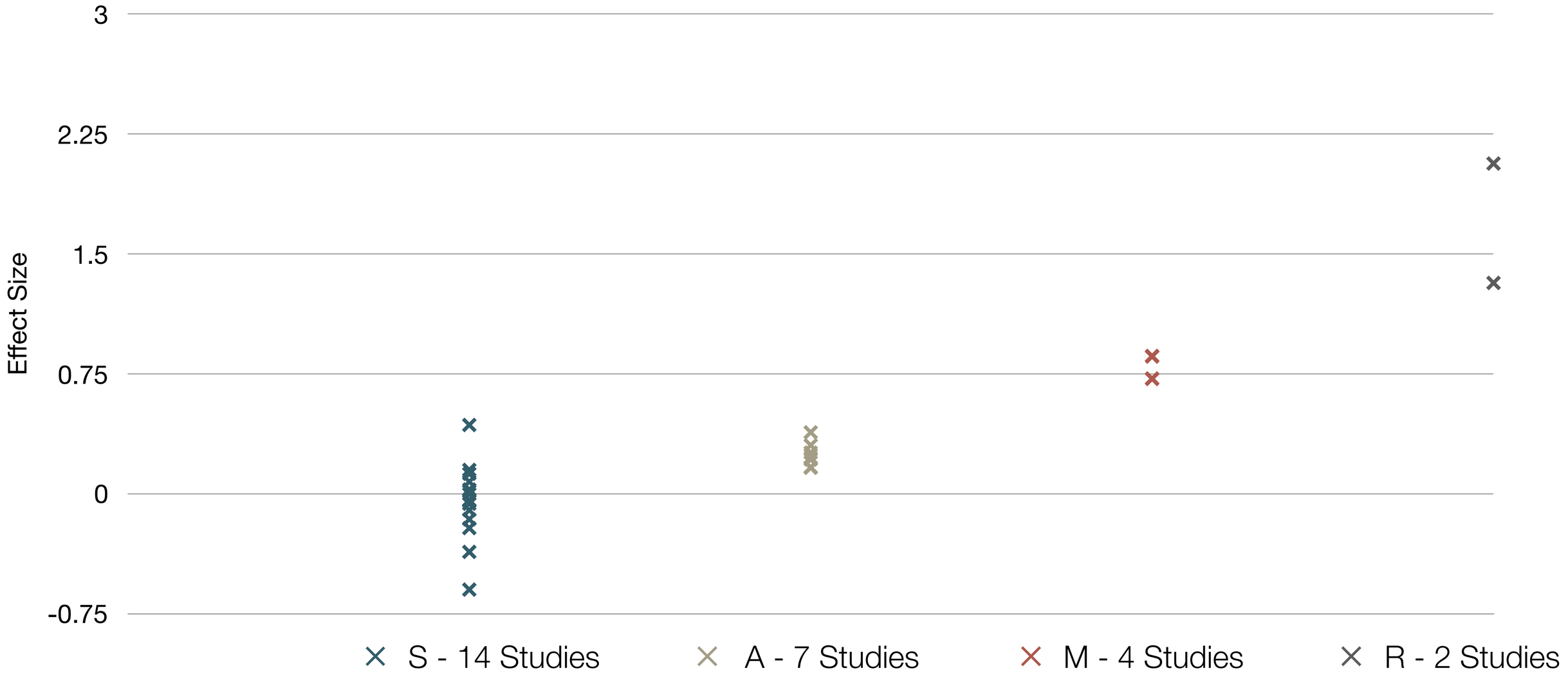
Tamim, Rana M., Robert M. Bernard, Eugene Borokhovski, Philip C. Abrami, and Richard F. Schmid. "What forty years of research says about the impact of technology on learning a second-order meta-analysis and validation study." *Review of Educational Research 81*, no. 1 (2011): 4-28.

SAMR and the Use of Technology to Enhance Reading Performance in Middle School



Pearson, P.D., Ferdig, R.E., Blomeyer Jr, R.L., & Moran, J. "The Effects of Technology on Reading Performance in the Middle-School Grades: A Meta-Analysis With Recommendations for Policy." *Learning Point Associates/North Central Regional Educational Laboratory (NCREL)* (2005).

SAMR and the Use of Tablets in Education



Tamim, R.M., Borokhovski, E., Pickup, D., Bernard, R.M. & El Saadi, L. “Tablets for Teaching and Learning: A Systematic Review and Meta-Analysis." *Commonwealth of Learning (COL)* (2015).

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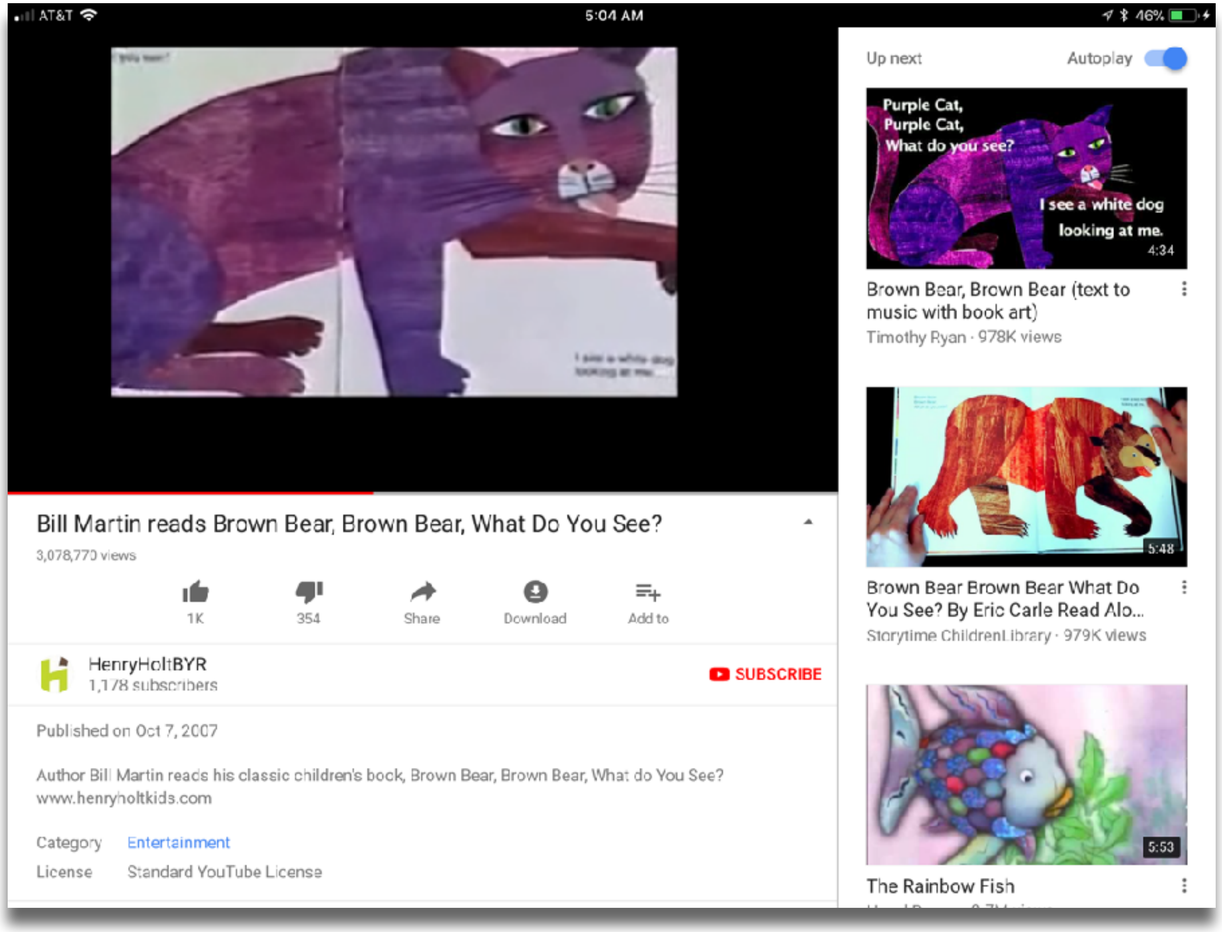

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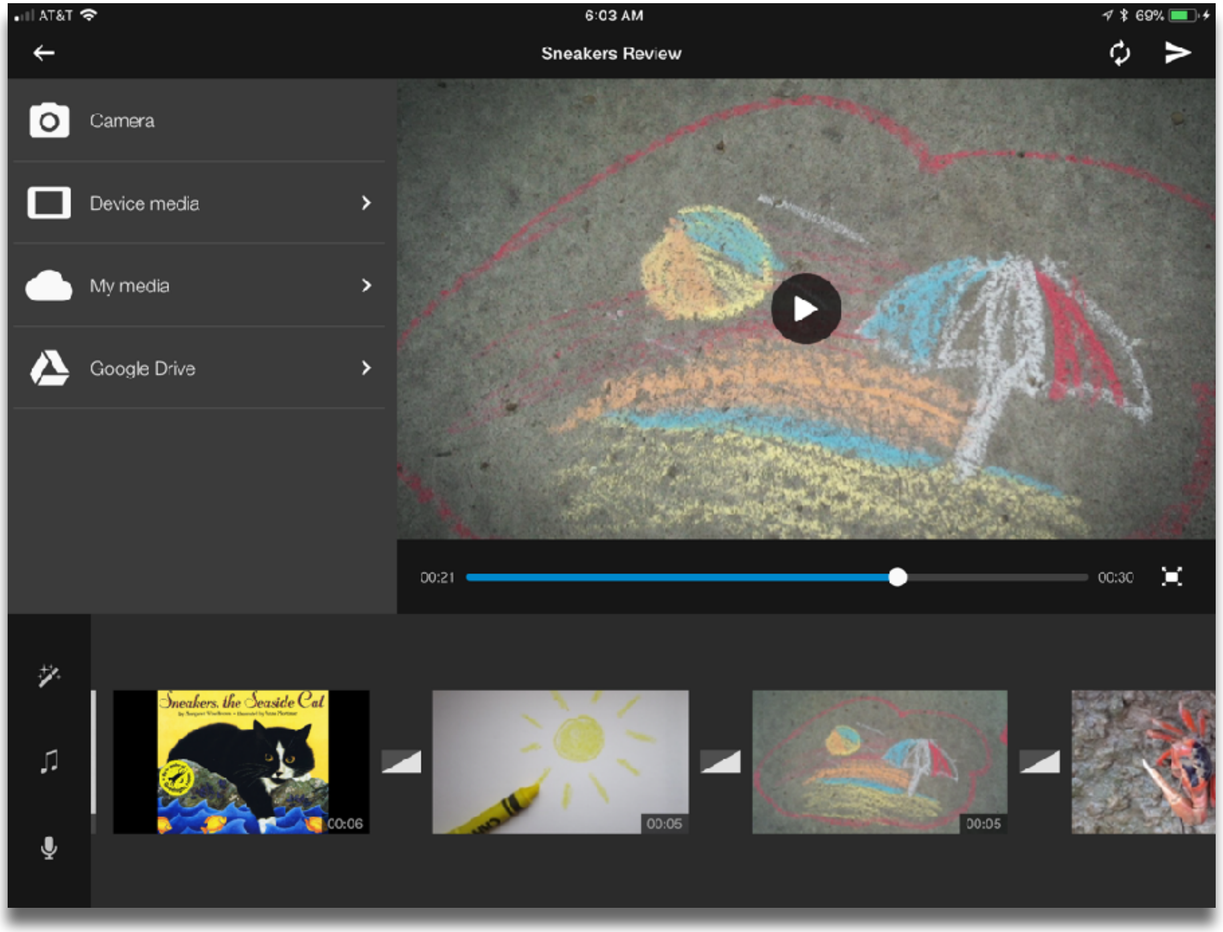

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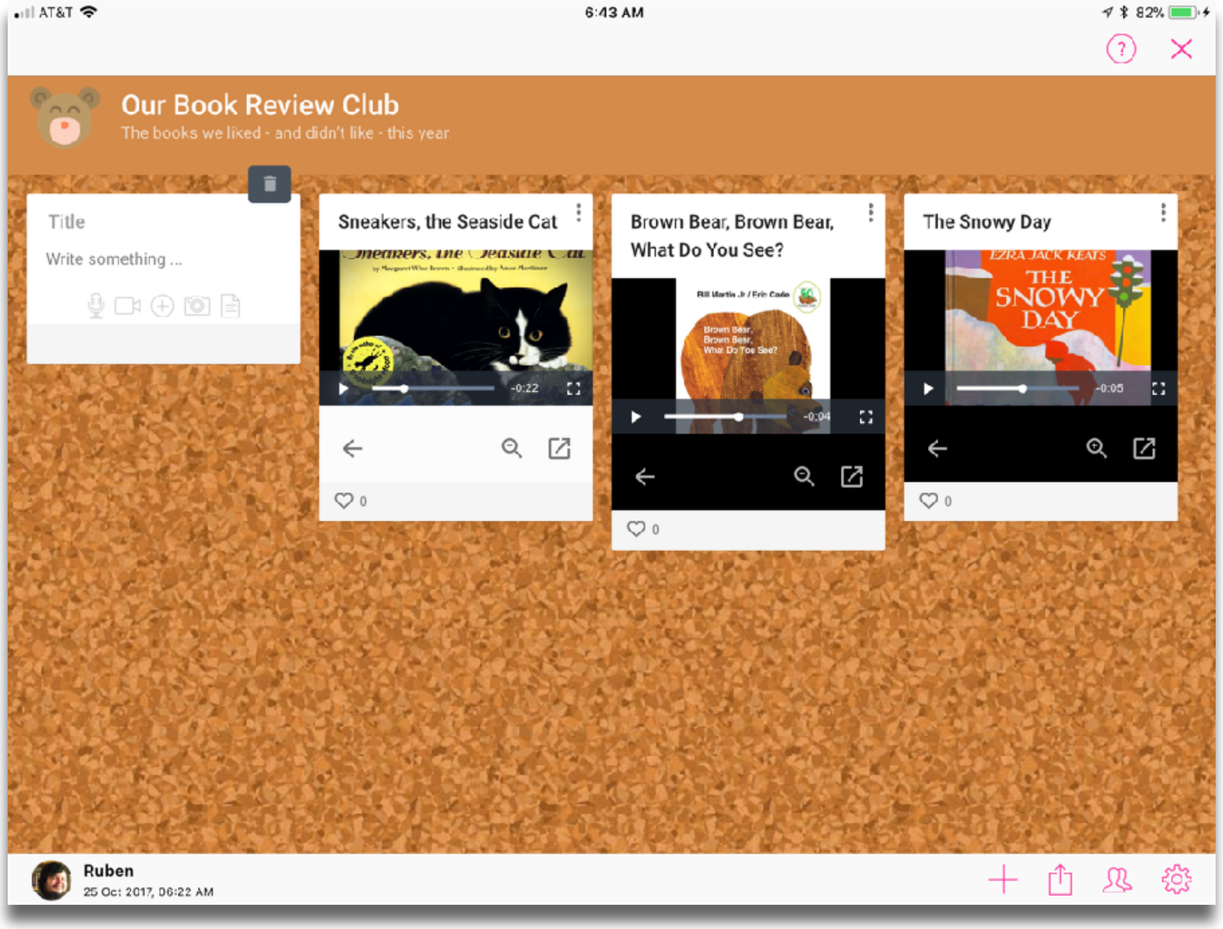

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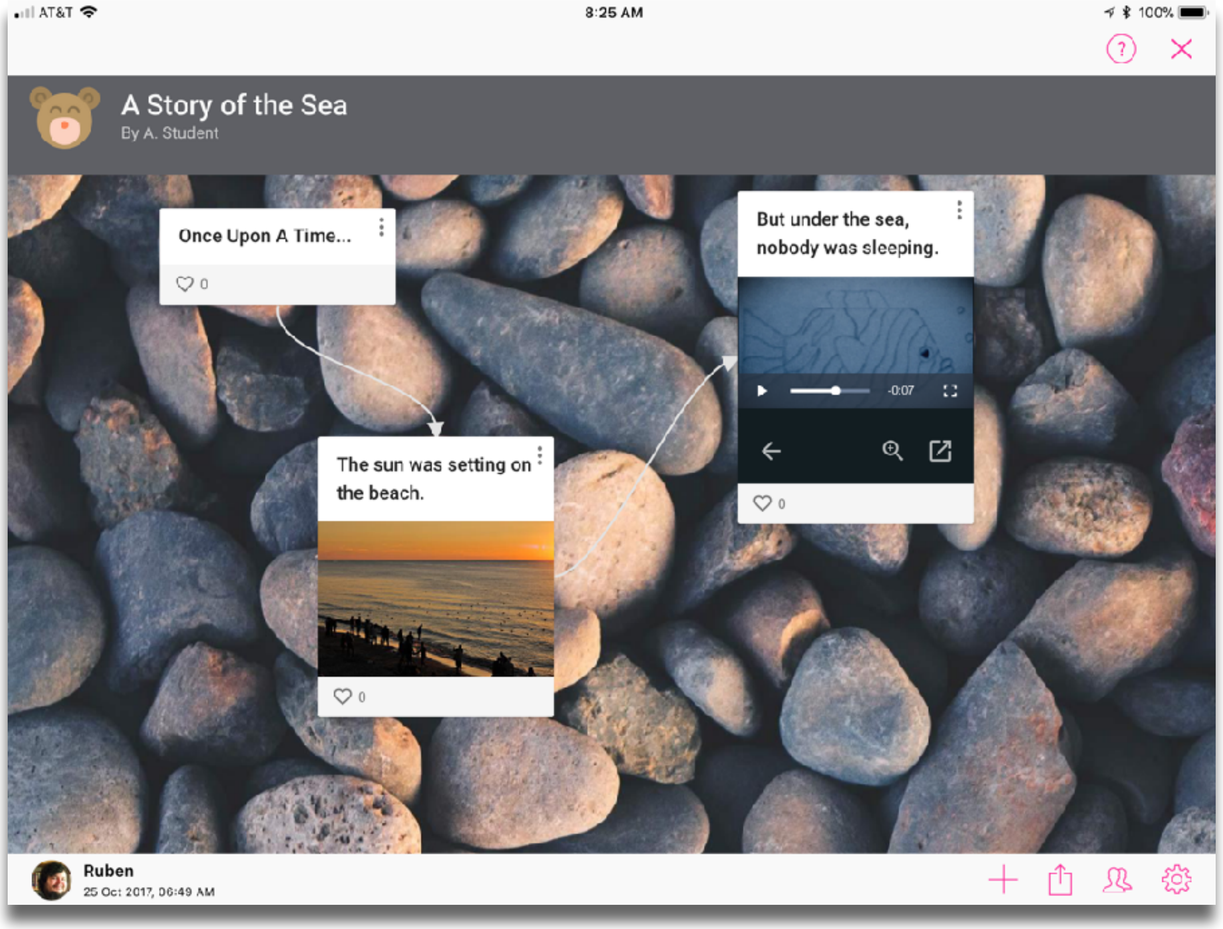


Social	Mobility	Visualization	Storytelling	Gaming
200,000 years	70,000 years	40,000 years	17,000 years	8,000 years

Ruben R. Puentedura, “Technology In Education: The First 200,000 Years” *The NMC Perspective Series: Ideas that Matter*. NMC Summer Conference, 2012.

Social

Bookmarks

RSS Feeds

Discussions

Microblogging

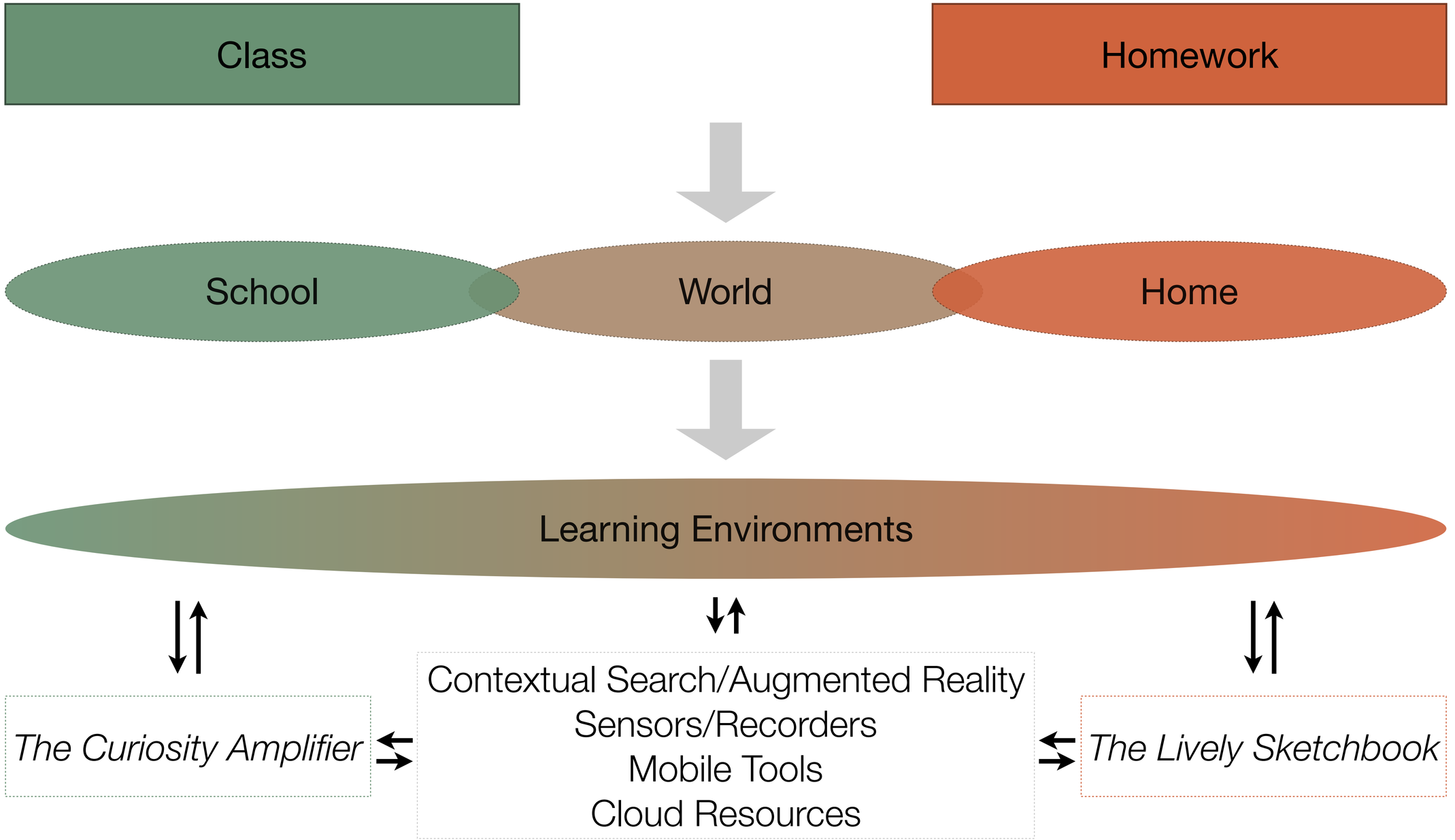
Blogging

Wikis

Telepresence

File Sharing

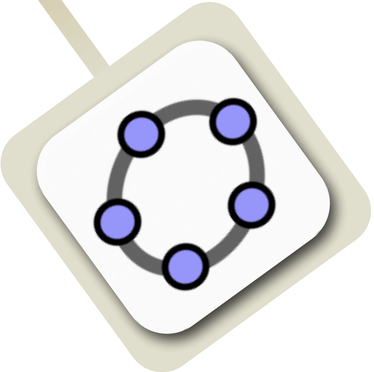
Mobility



John Seely Brown. “A New Culture of Learning”. *NMC Summer Conference, Closing Keynote*. (2010)

Ruben R. Puentedura, “The Lively Sketchbook”. *Hippasus Blog*. (2010)

Visualization



Storytelling

Narrative sources;
Narrative constraints

Pictorial vocabulary;
Narrative transitions;
Text/image integration

CDS Seven Elements;
Montage structures

Narrative structures;
Narrative flows

Ludic elements

Image Assembly → Sequential Art → Moving Image → Interactive Media → Interactive Fiction

TIME

PLACE

Infinite Canvas

CONNECTION

SOCIAL

Formal Definition of **Game** (Salen & Zimmerman)

"A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome."

Katie Salen and Eric Zimmerman. *Rules of Play: Game Design Fundamentals*. The MIT Press, 2003.

The EdTech Quintet – Associated Practices	
Social	Communication, Collaboration, Sharing
Mobility	Anytime, Anyplace Learning and Creation
Visualization	Making Abstract Concepts Tangible
Storytelling	Knowledge Integration and Transmission
Gaming	Feedback Loops and Formative Assessment

Choosing the First SAMR Ladder Project: Three Options

- **Your Passion:**
  - If you had to pick one topic from your class that best exemplifies why you became fascinated with the subject you teach, what would it be?
- **Barriers to Your Students' Progress:**
  - Is there a topic in your class that a significant number of students get stuck on, and fail to progress beyond?
- **What Students Will Do In the Future:**
  - Which topic from your class would, if deeply understood, best serve the interests of your students in future studies or in their lives outside school?

In this exercise you will design a SAMR ladder to transform a unit of instruction; the complete exercise should take about 1 hour.

- Please break up into teams of 3-5 participants.
- Your team should take 10 minutes to select the topic that you will use as the basis for your ladder. You should select the topic according to one of these criteria:
    - Your Passion:
      If you had to pick one topic from your class that best exemplifies why you became fascinated with the subject you teach, what would it be?
    - Barriers to Your Students' Progress:
      Is there a topic in your class that a significant number of students get stuck on, and fail to progress beyond?
    - What Students Will Do In the Future:
      Which topic from your class would, if deeply understood, best serve the interests of your students in their future lives?
- You should make sure that the topic is not too broad or too narrow - for instance, trying to transform the entire Algebra curriculum would be too ambitious for this exercise, but focusing solely on factoring polynomials using the difference of squares would be too narrow.
- Having chosen a topic, you should design a SAMR ladder to transform how it is taught today. Plan to spend about 20 minutes identifying key pedagogical goals and creating a "rough" version of the ladder, followed by 20 minutes refining and revising the ladder to put it into final form, including the tools you plan to use and reasonably detailed descriptions of the activities planned.
- In the final 10 minutes of this exercise, transcribe a description of your ladder, making sure that the writeup is understandable by someone who has not participated in your discussions, and is detailed enough that they could implement your ladder with a minimum of additional work needed.

S to A: The Value of Shared Practices

- Augmented Note Taking and Annotation
- Visualization Methods:
  - 5 Primary Domains: Space, Time, Networks, Text, Number
- Simple Blogging
- Simple Digital Storytelling Video
- Flipped Classroom:
  - Materials Creation
  - Peer Discussion/Instruction Methods
- Simple Interactive Fiction
- LMS Practices

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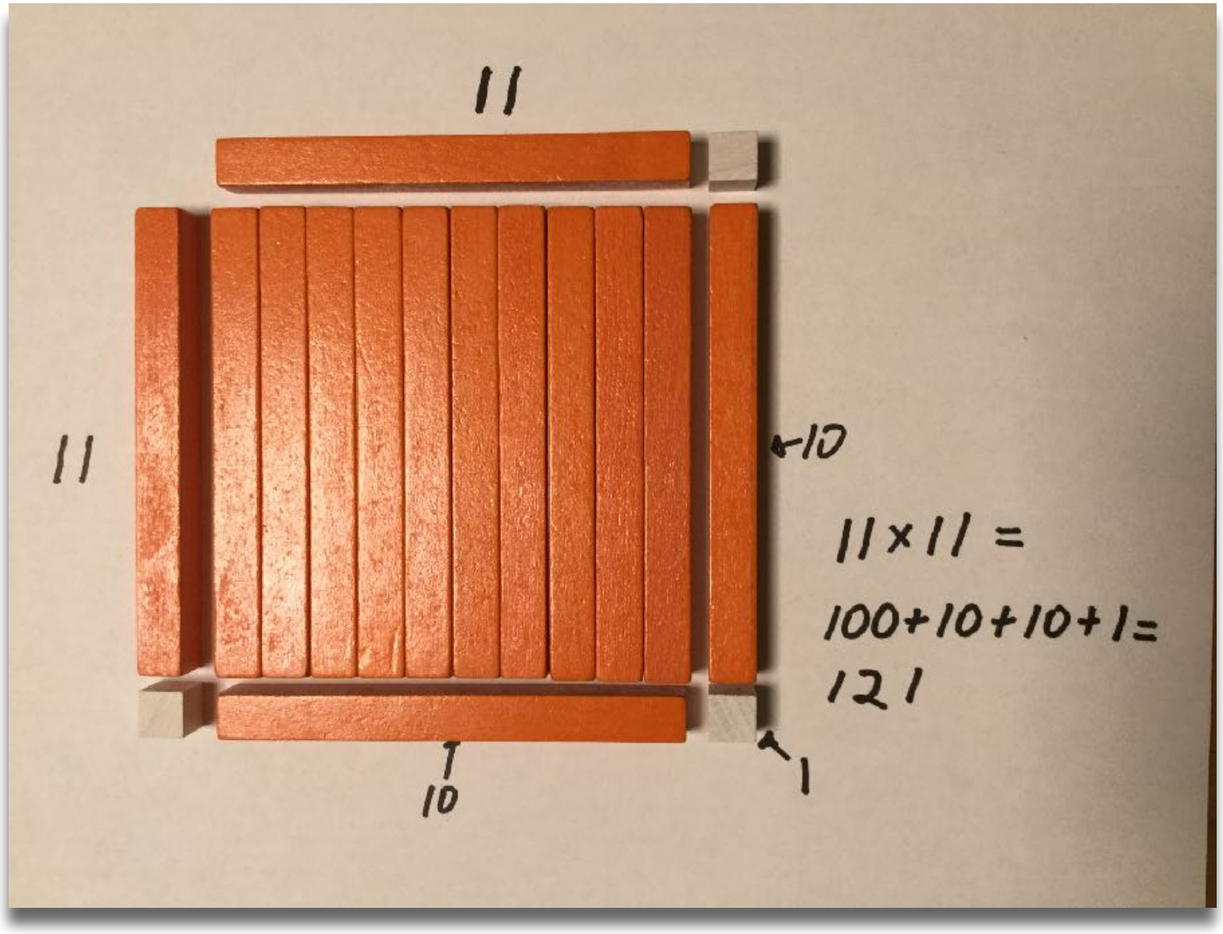

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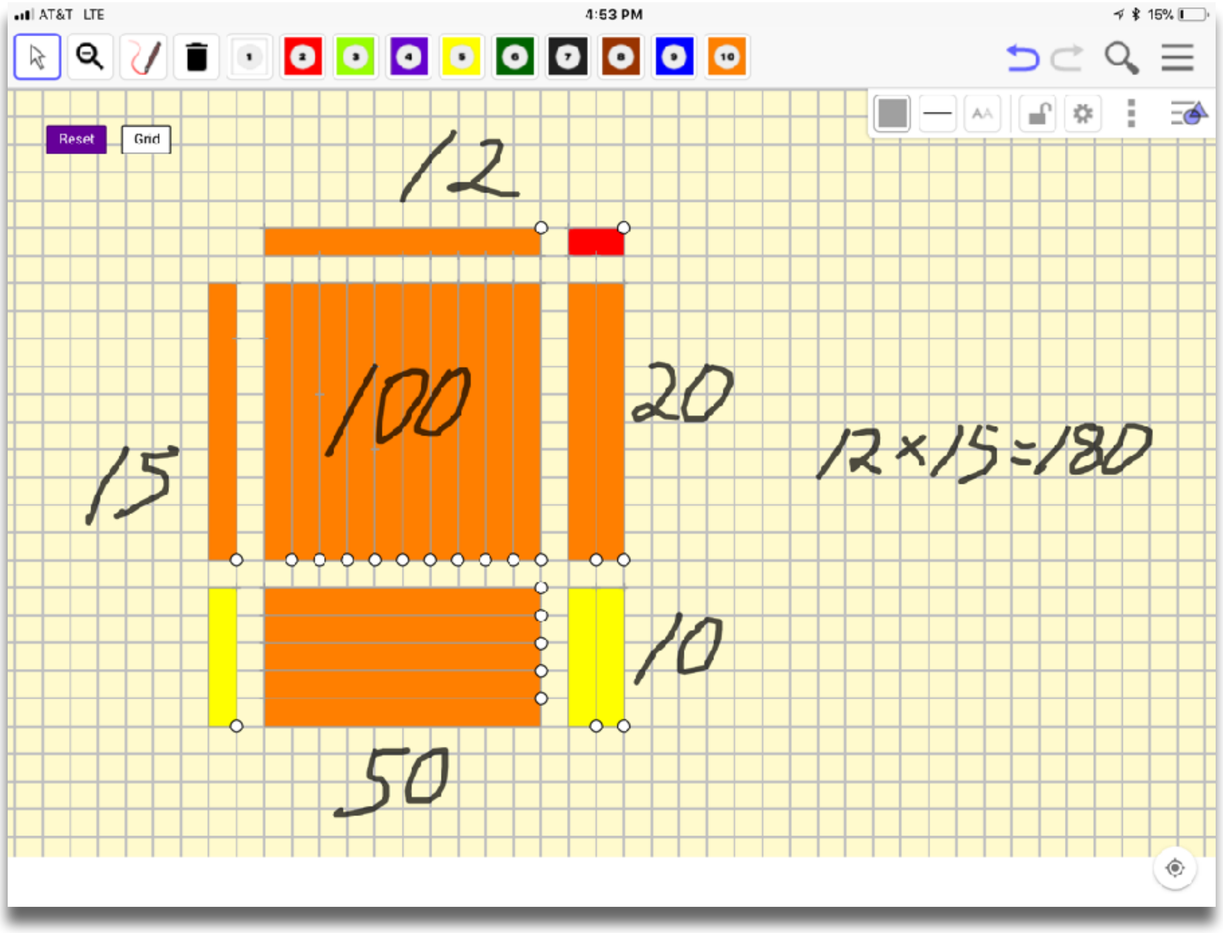

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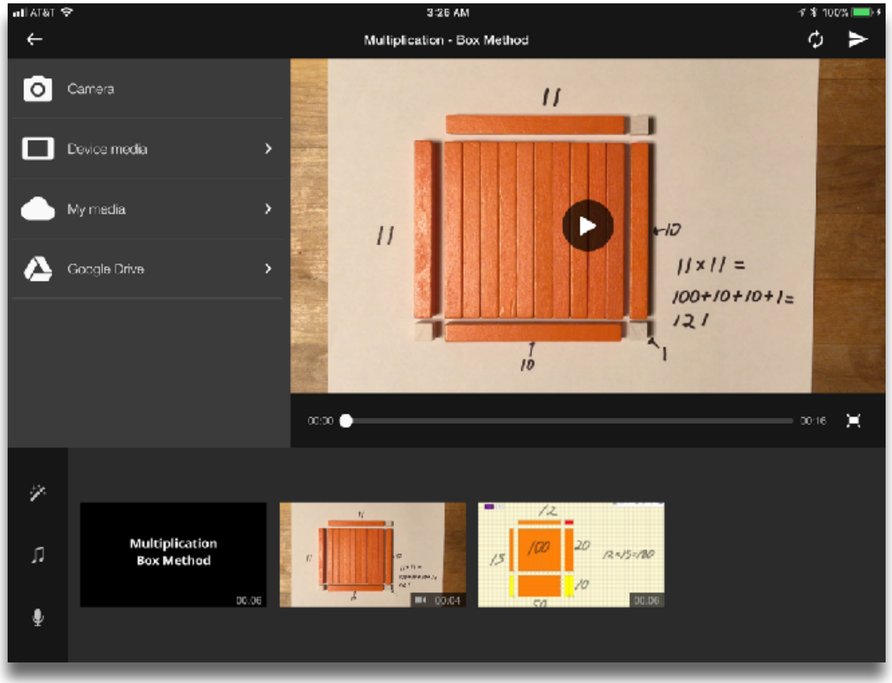

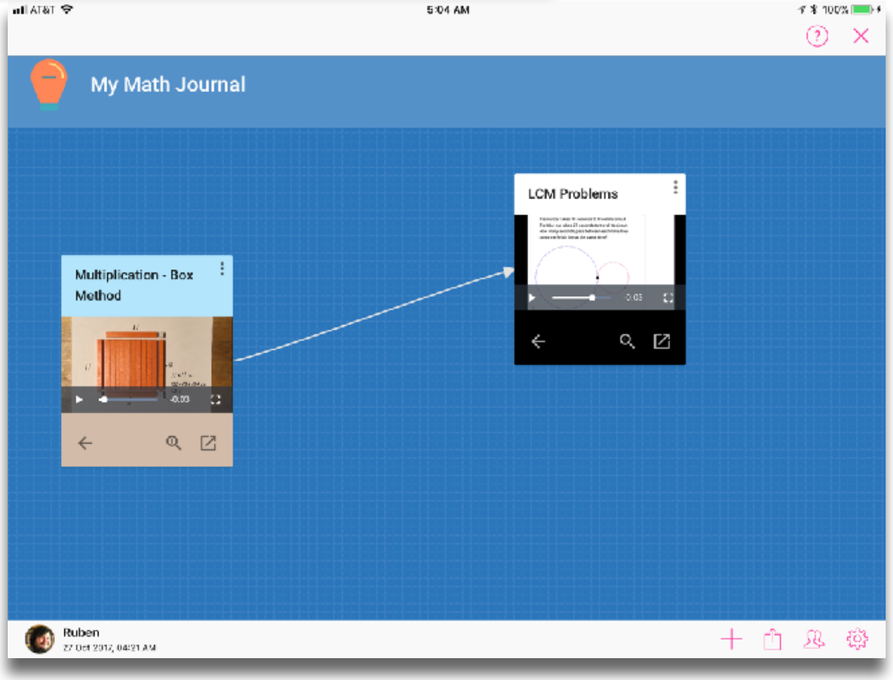

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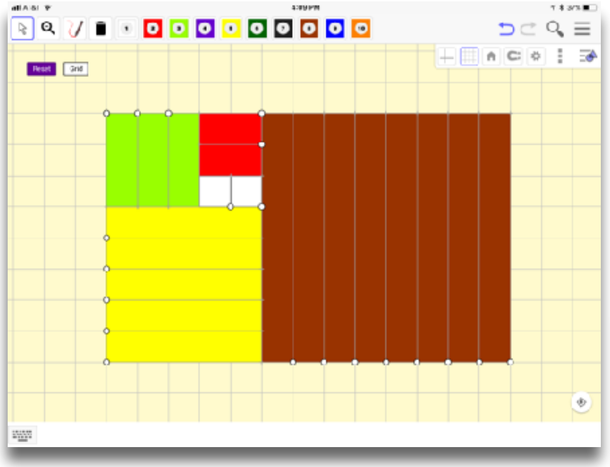

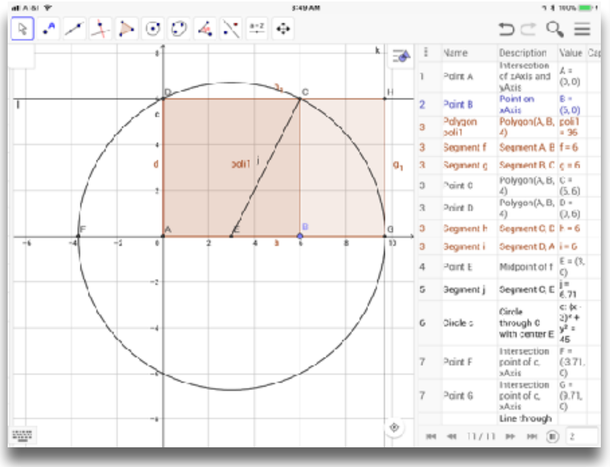

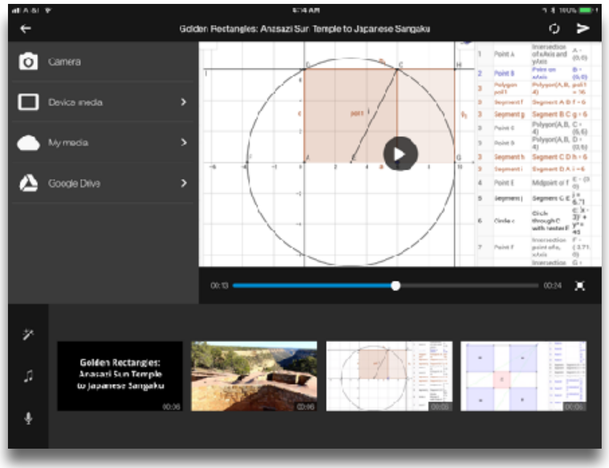

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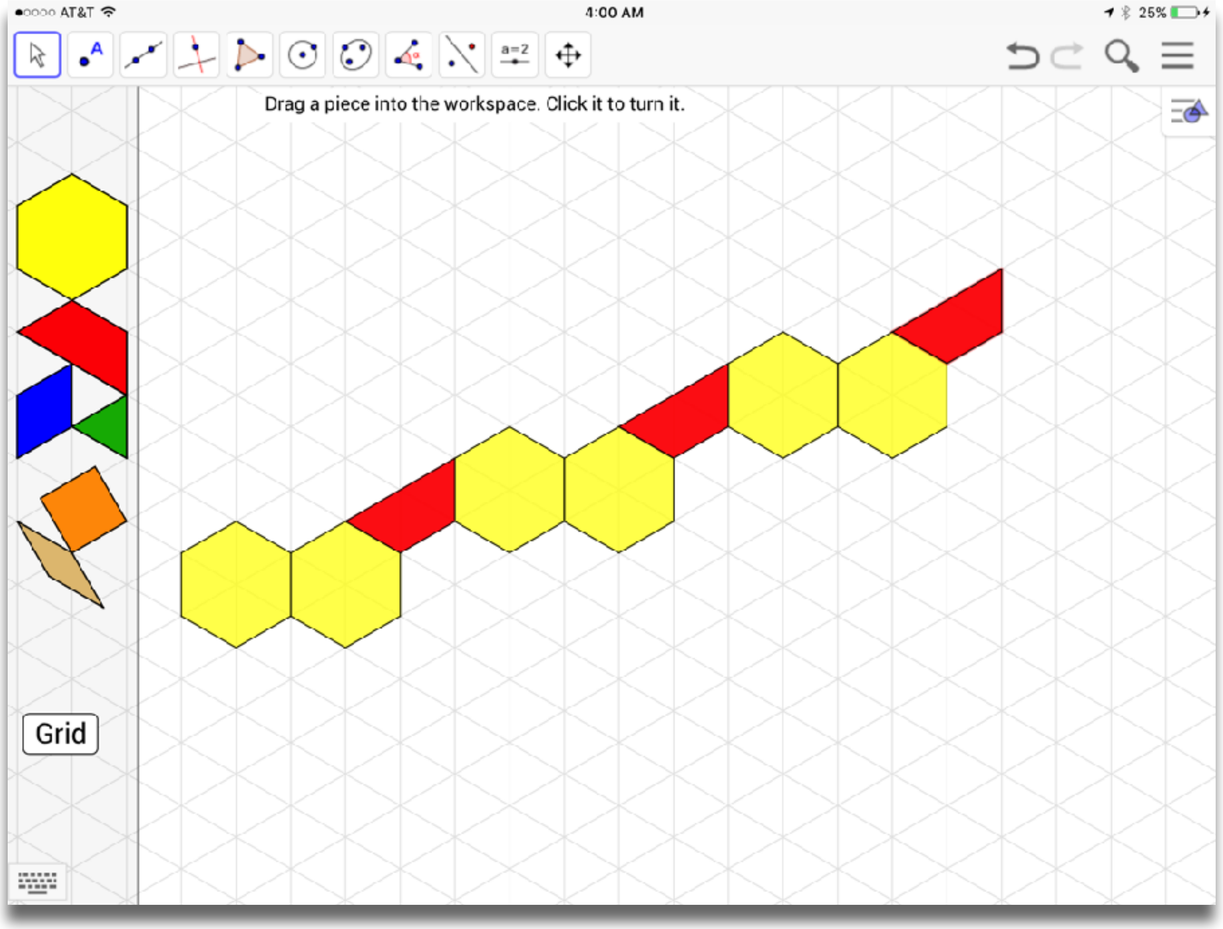

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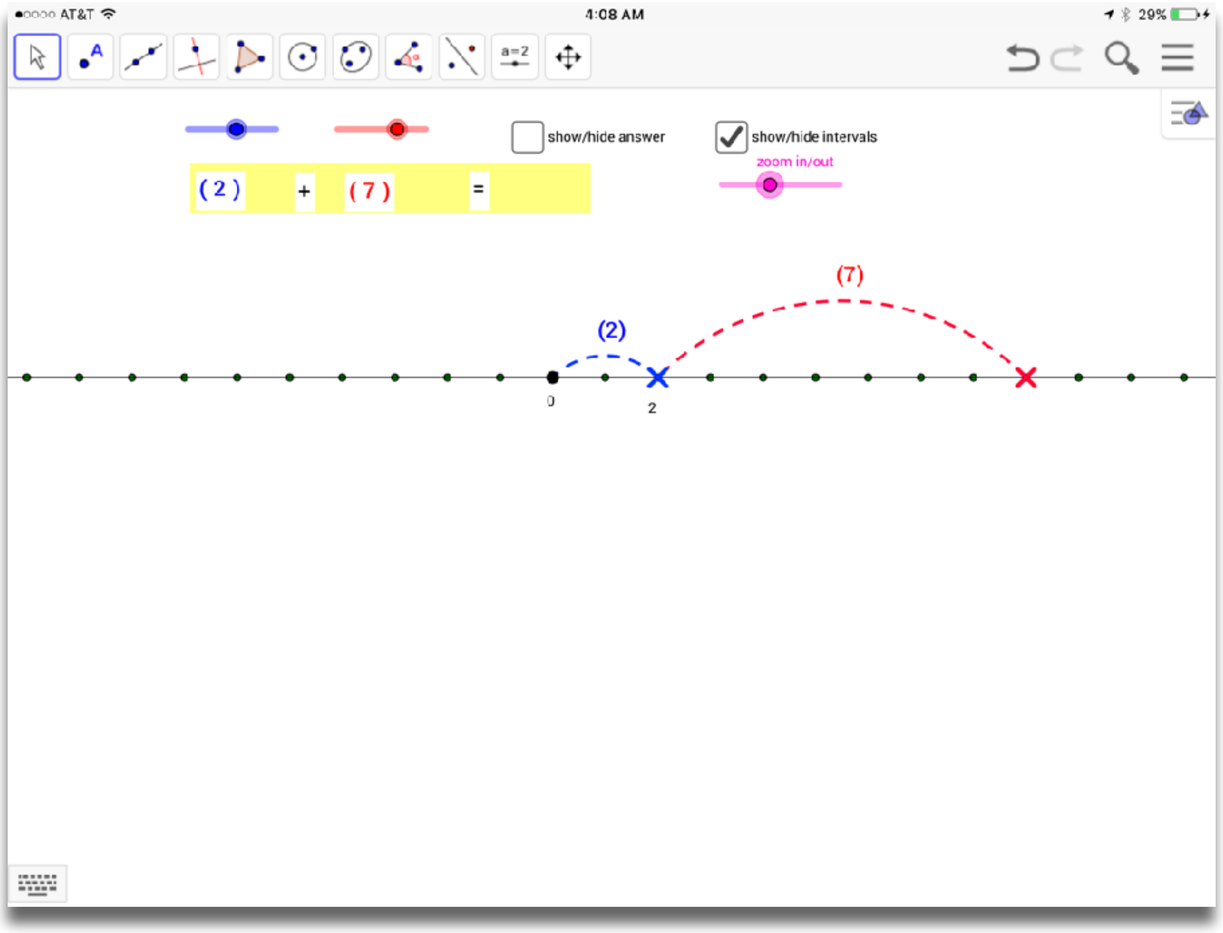

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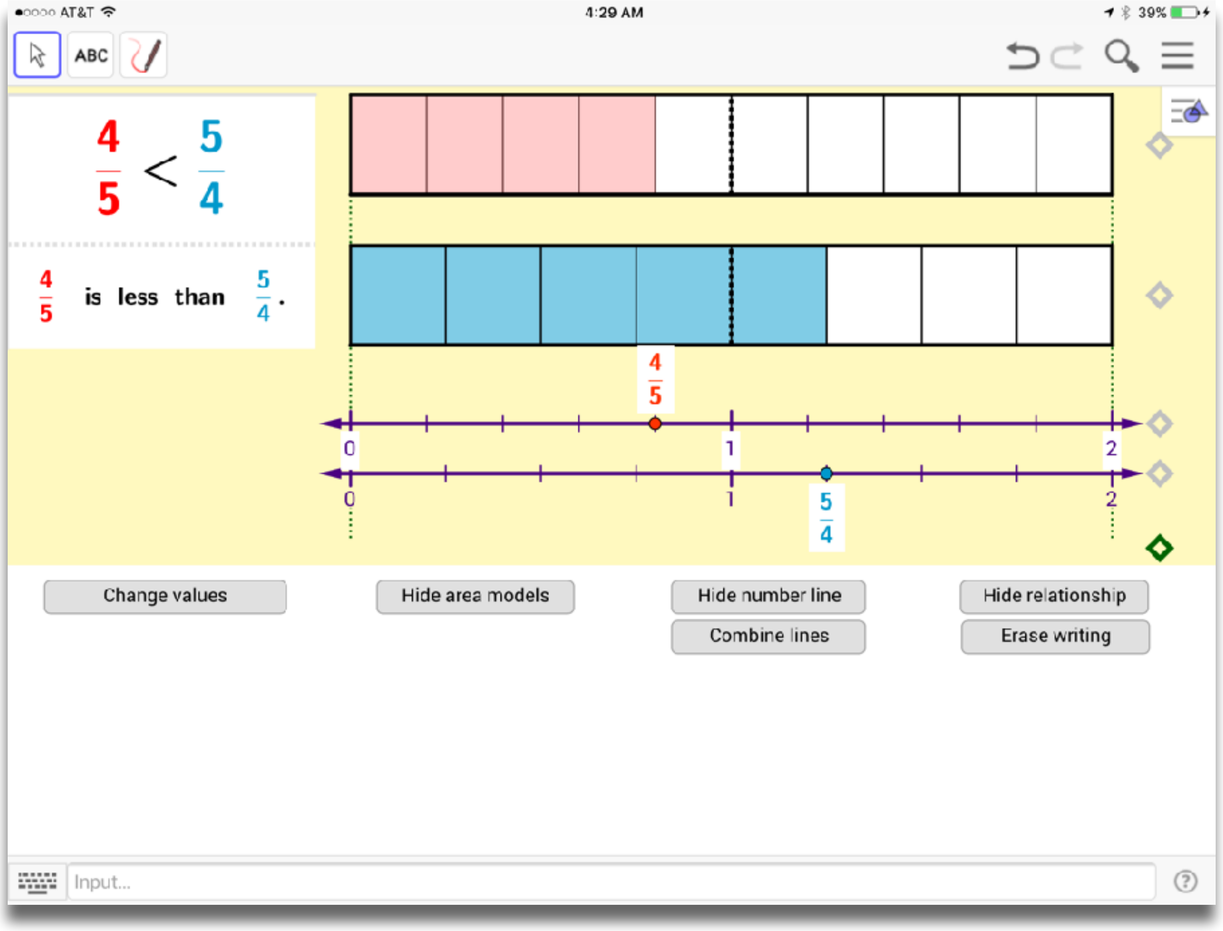

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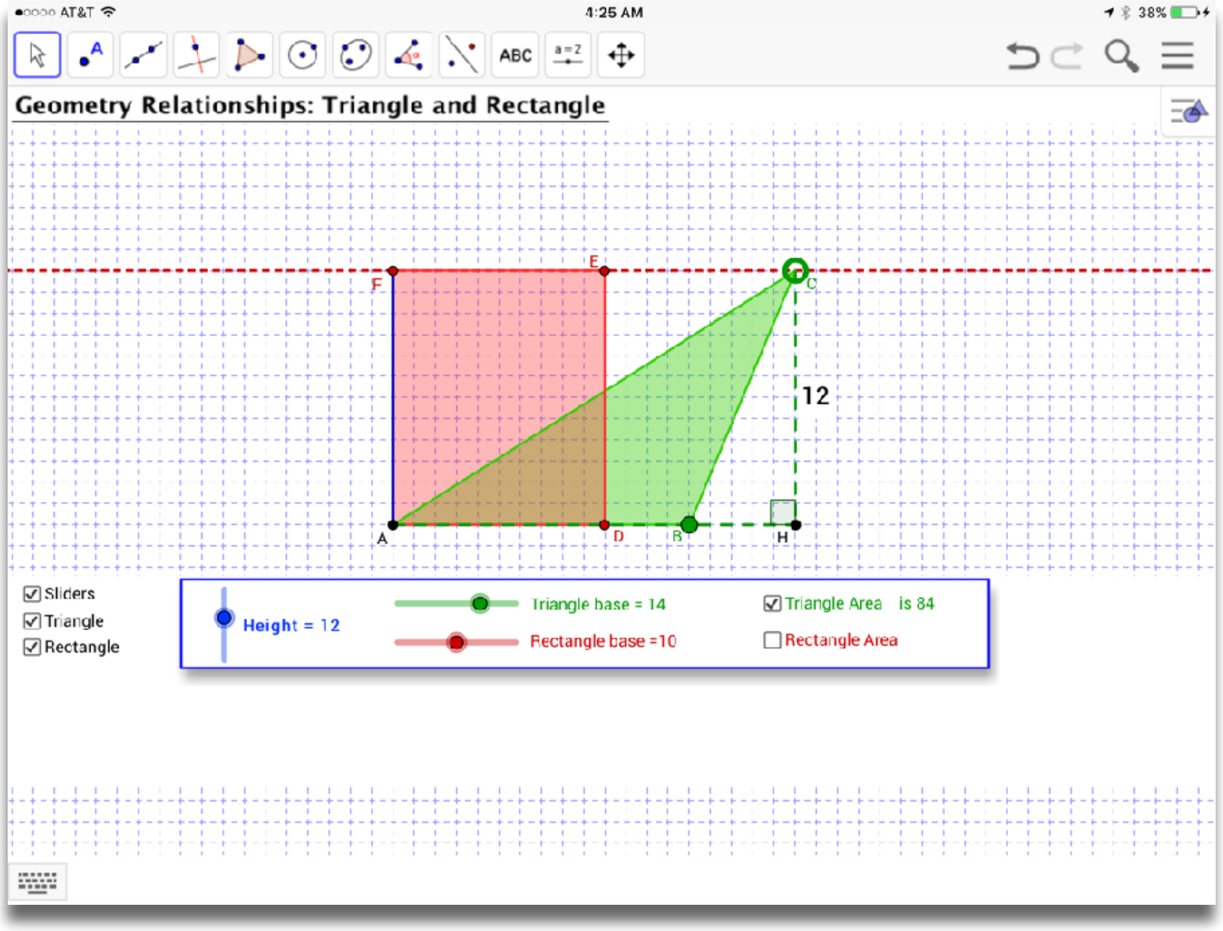

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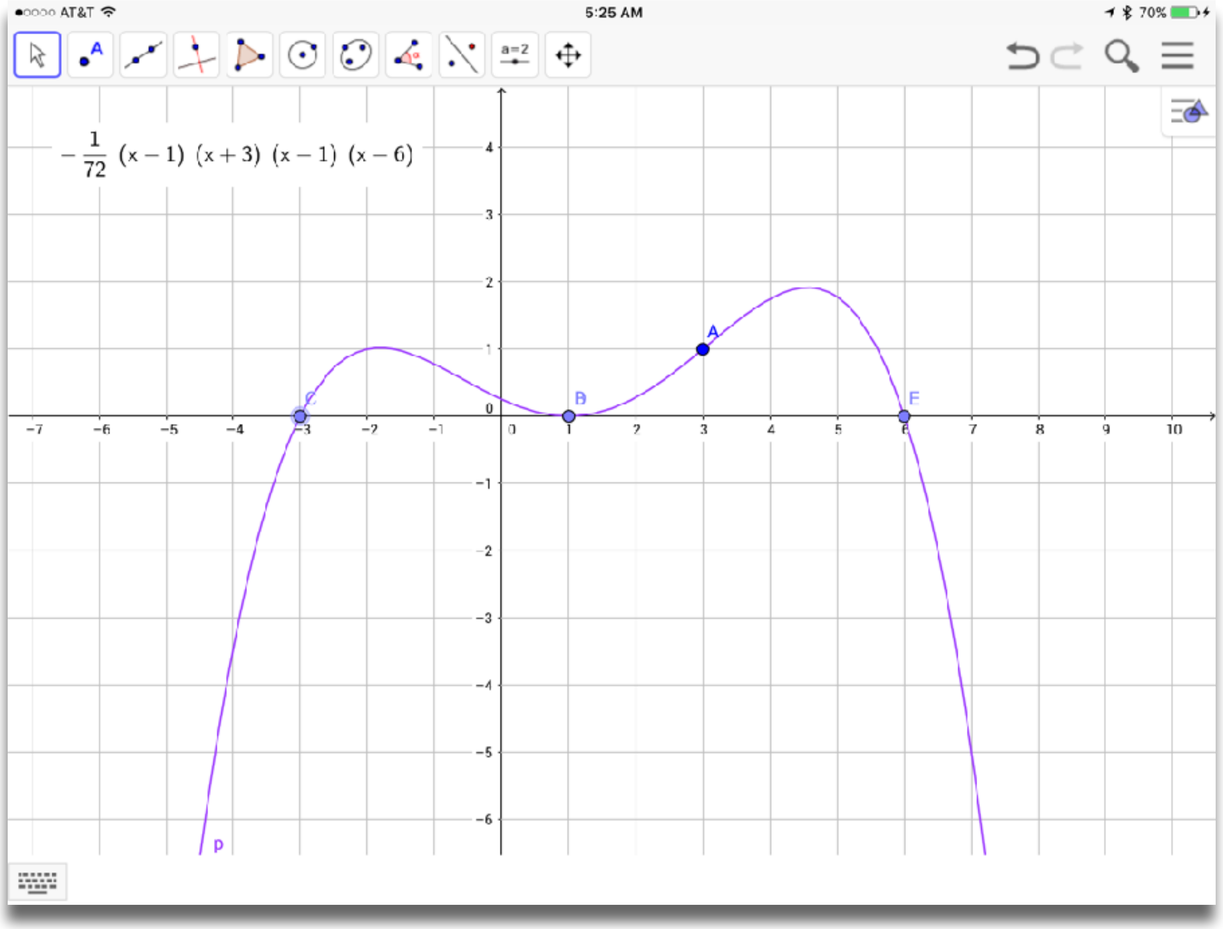

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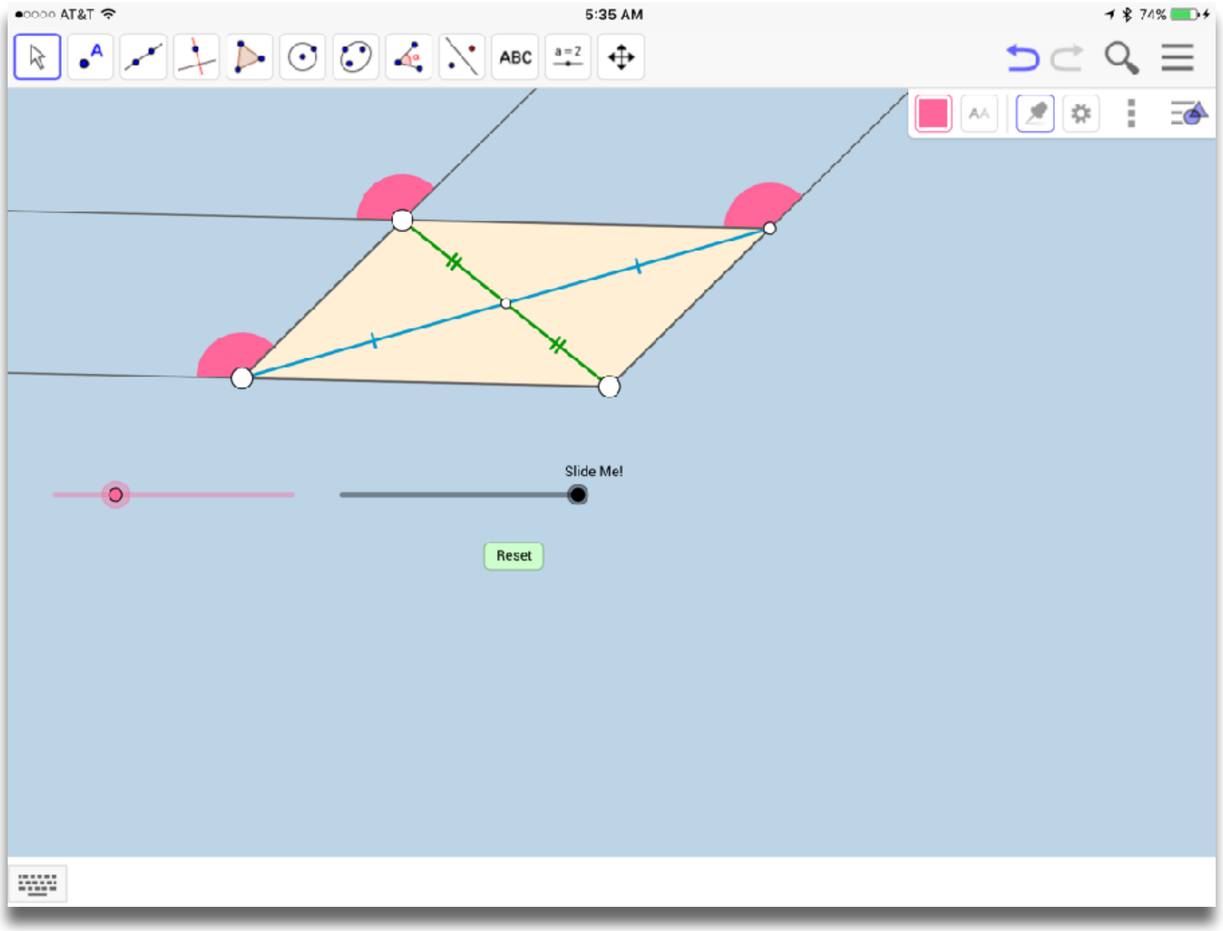

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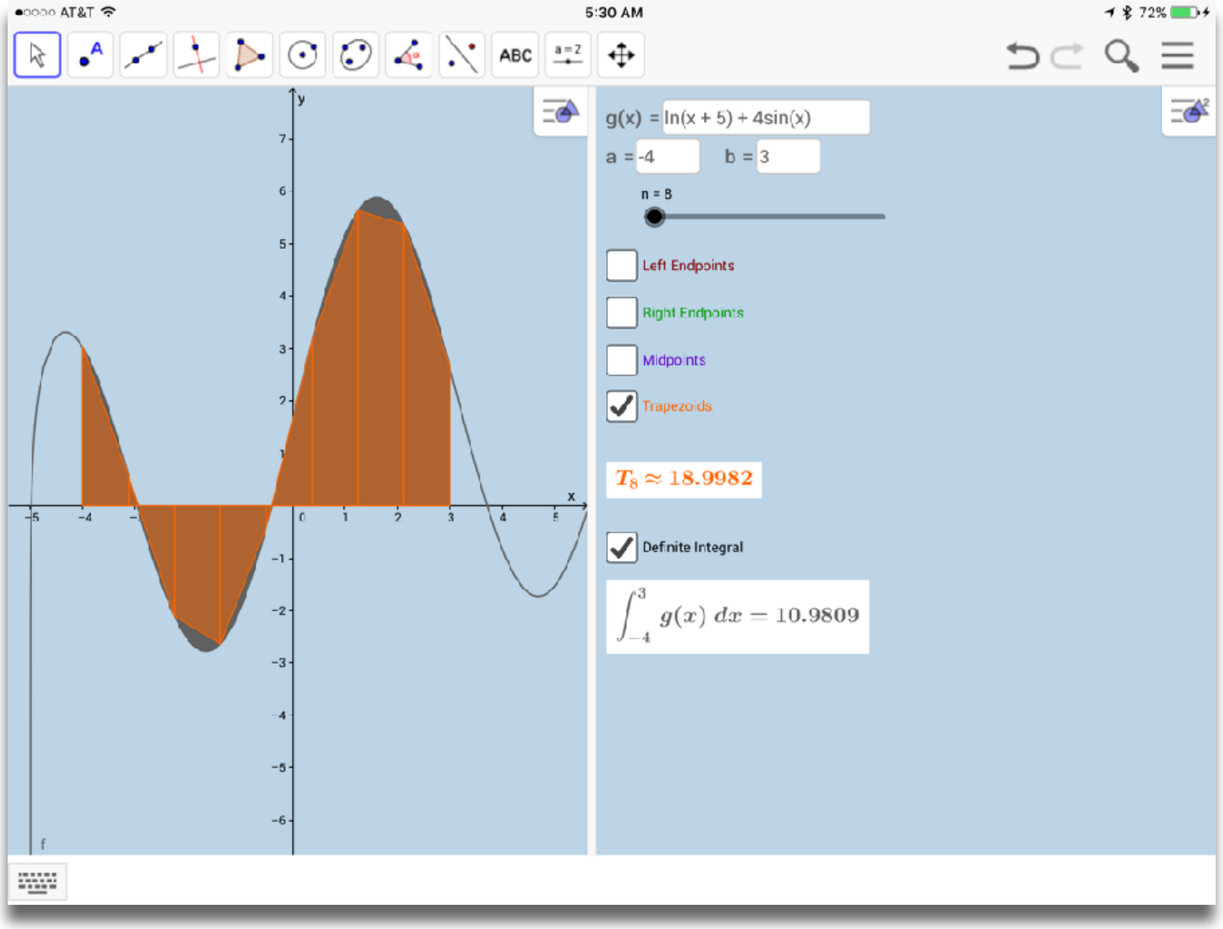

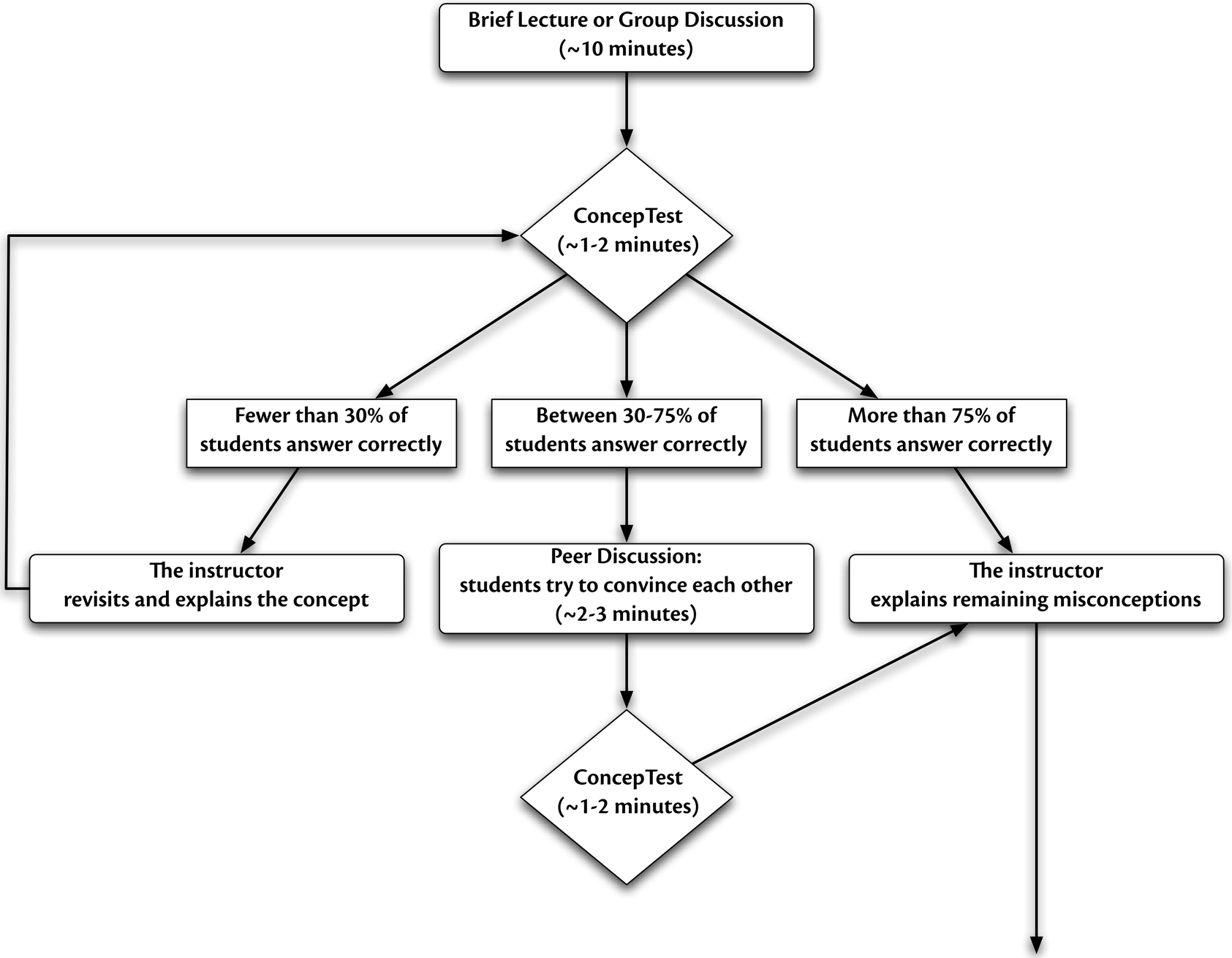

Mazur, E. *Peer Instruction - A User's Manual*. Prentice Hall (1997)

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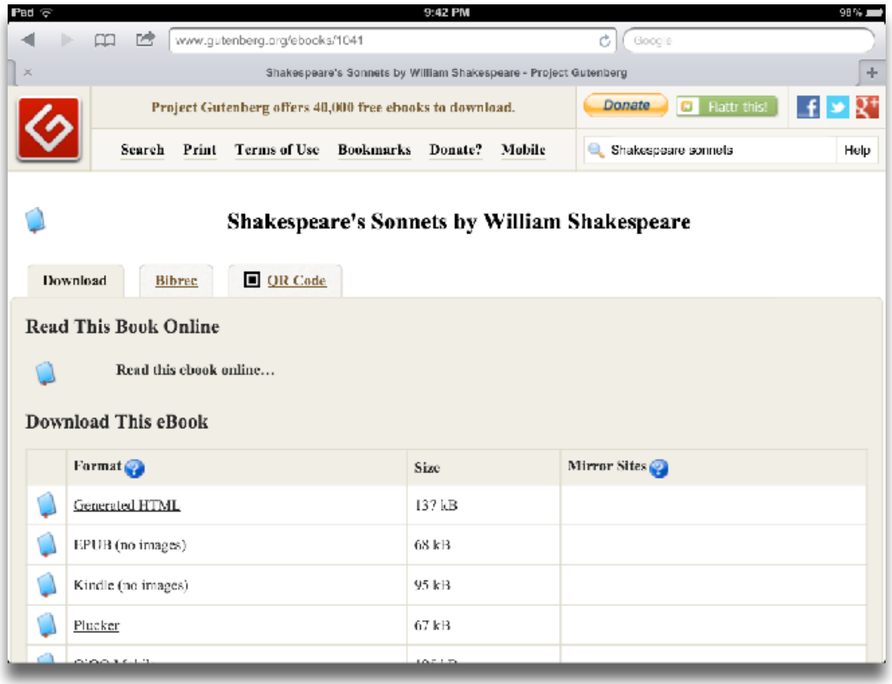

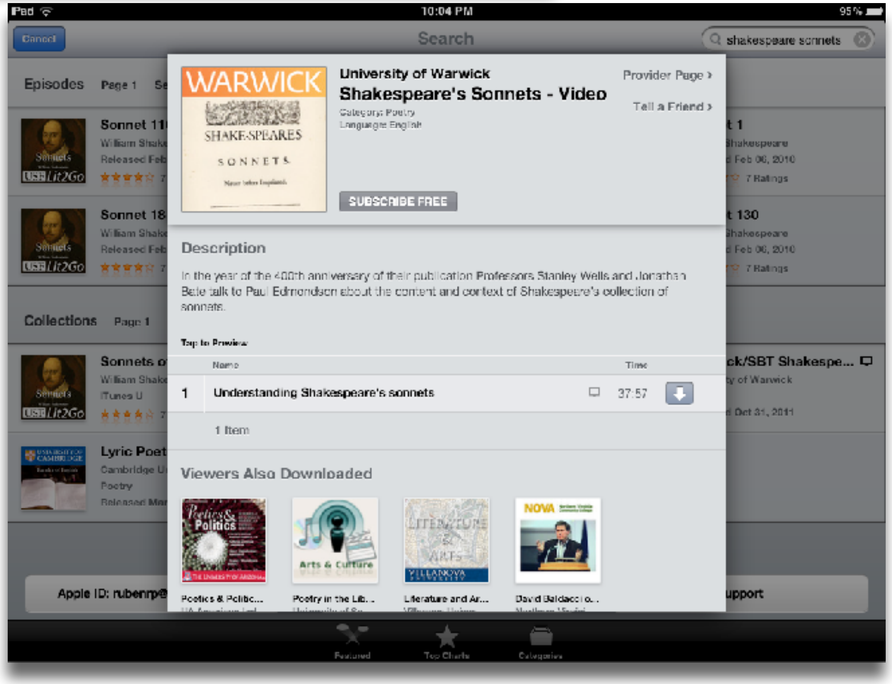

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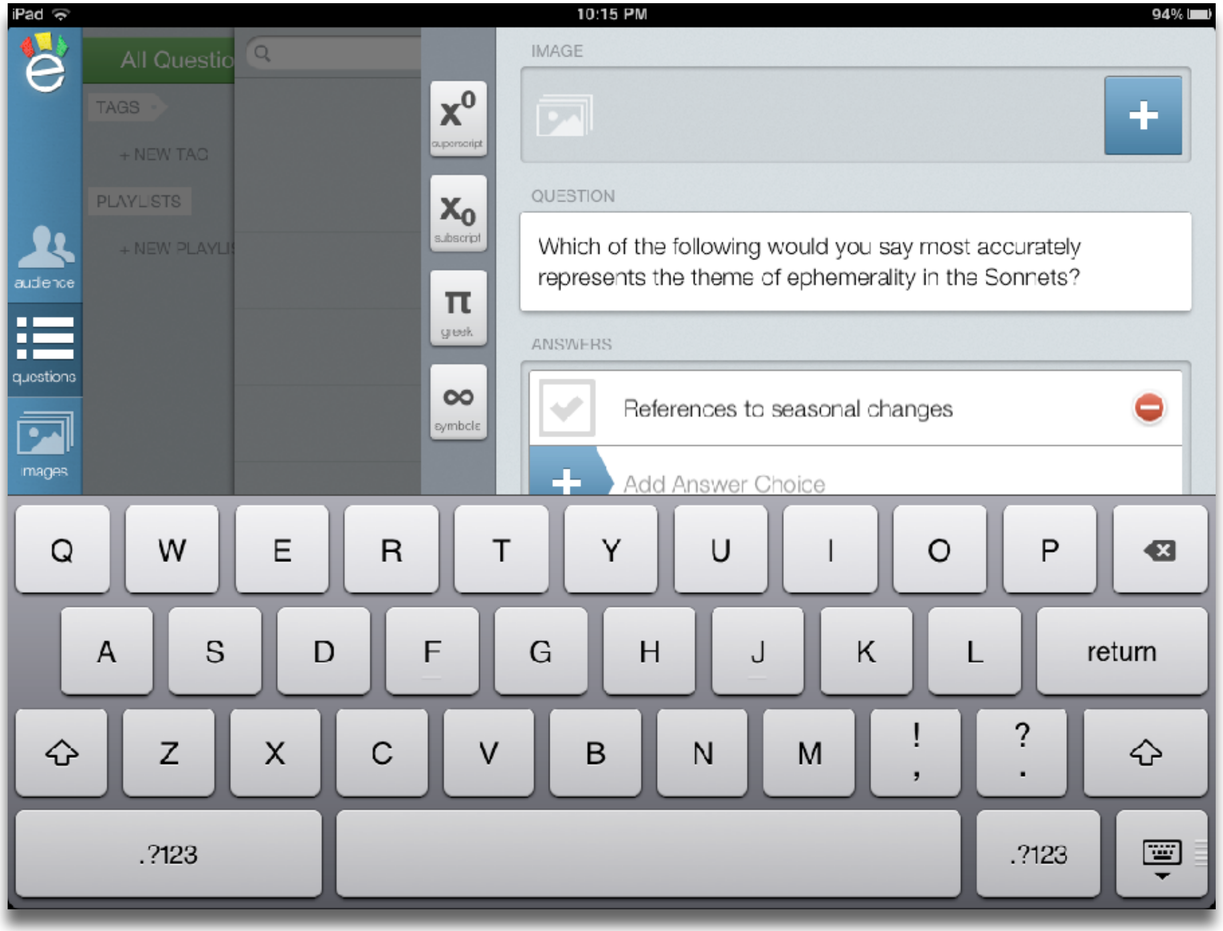

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Thick *vs*. Thin Approaches

- **Thick Approaches:** *detailed knowledge of a few cases*
  - Consider multiple intertwined causes
  - Try to explain multifaceted outcomes
  - Rely on elaborate theoretical assumptions
  - Suitable for rich understanding of specific events
  - Frequently associated with qualitative analysis
- **Thin Approaches:** *partial knowledge of many cases*
  - Look at simple causes and outcomes
  - Rely on theoretically neutral propositions
  - Suitable for hypothesis testing and generalization
  - Frequently associated with quantitative analysis
- It is possible to thicken thin approaches by e.g. triangulation, developing quantitative indicators of qualitative concepts, nested analysis

Michael Coppedge. *Democratization and Research Methods*. Cambridge University Press. (2012).

Four Defining Characteristics of Action Research

- Practical Nature
- Change-Oriented
- Part of a Cyclical Process
- Teachers are Active Researchers and Participants

Martyn Denscombe. *The Good Research Guide: For small-scale social research projects (5th Edition).* Open University Press. (2014).

Three Approaches to Action Research	
Technical Action Research	Improve the effectiveness or efficiency of educational practice
Practical Action Research	Improve the teacher's understanding and professional development
Emancipatory Action Research	Improve the educational organization or system and remove obstacles to change

Wilfred Carr and Stephen Kemmis. *Becoming Critical: Education, Knowledge, and Action Research.* Deakin University Press. (1986).

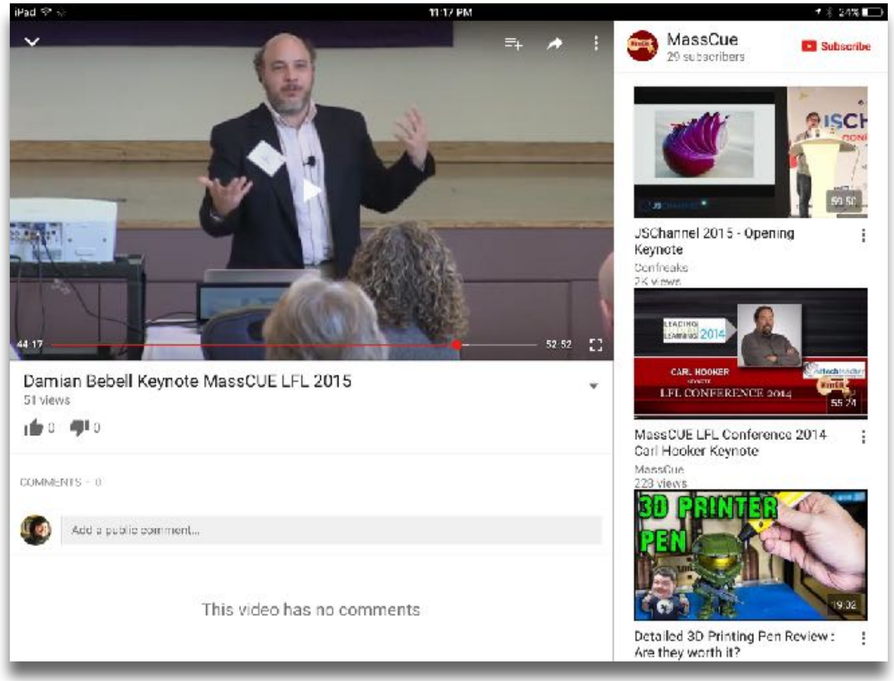
Redefinition
Tech allows for the creation of new tasks, previously inconceivable

Modification
Tech allows for significant task redesign

Augmentation
Tech acts as a direct tool substitute, with functional improvement

Substitution
Tech acts as a direct tool substitute, with no functional change

Extending Traditional PD



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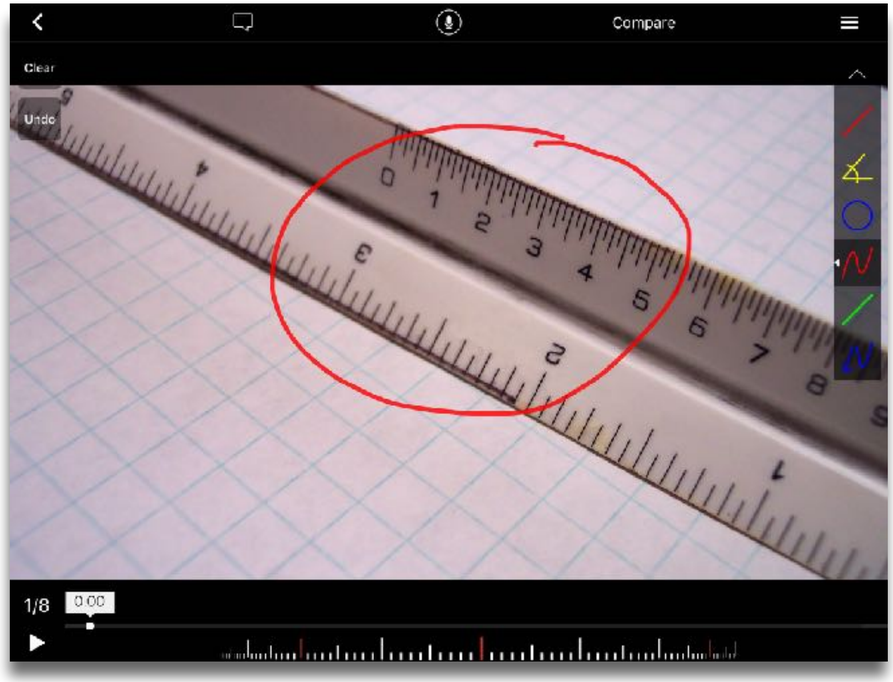
Peer Coaching as PD



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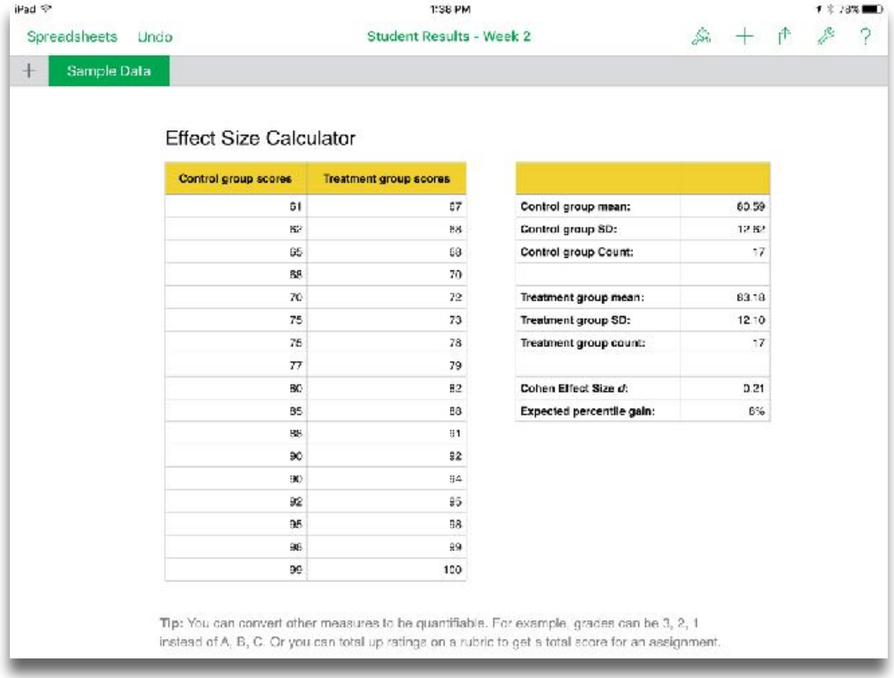
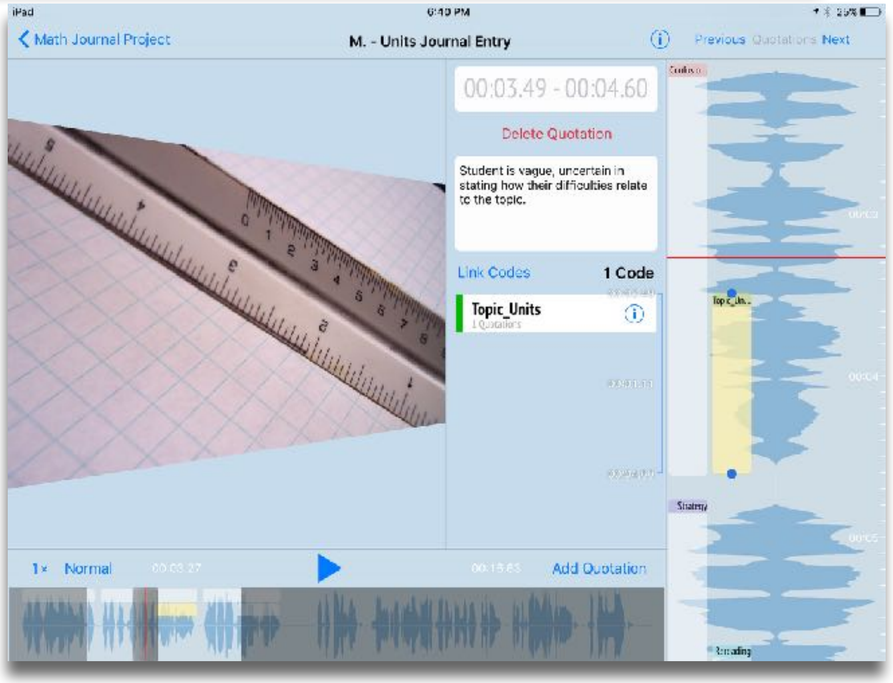
Action Research as PD





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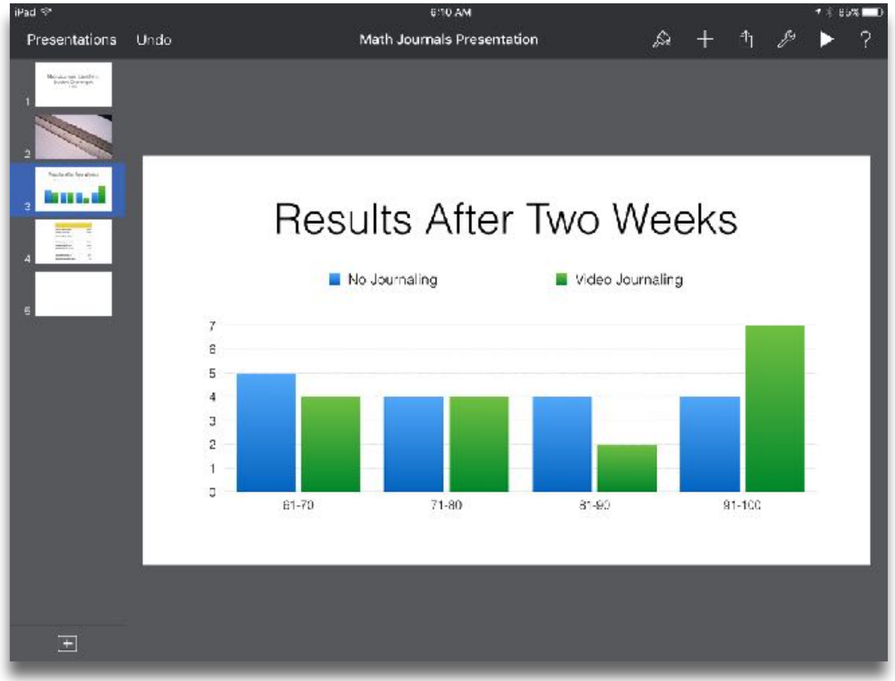
Digital Storytelling as PD



Some Resources Referenced

- Damian Bebell, *Keynote MassCUE LFL 2015* https://www.youtube.com/watch?v=f5e6fniwJUo
- Apple Education, *Research for Educators* https://itunes.apple.com/us/book/research-for-educators/id1088992950?mt=11
- Arlene Borthwick and Melissa Pierson (Eds.), *Transforming Classroom Practice: Professional Development Strategies in Educational Technology*. ISTE (2008)

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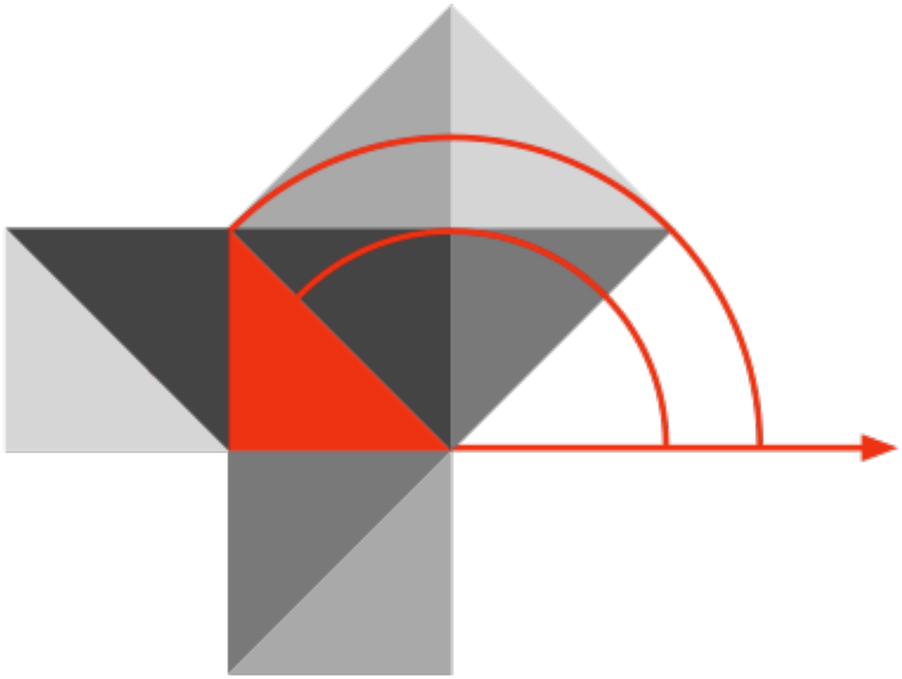

Blog: http://hippasus.com/blog/
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