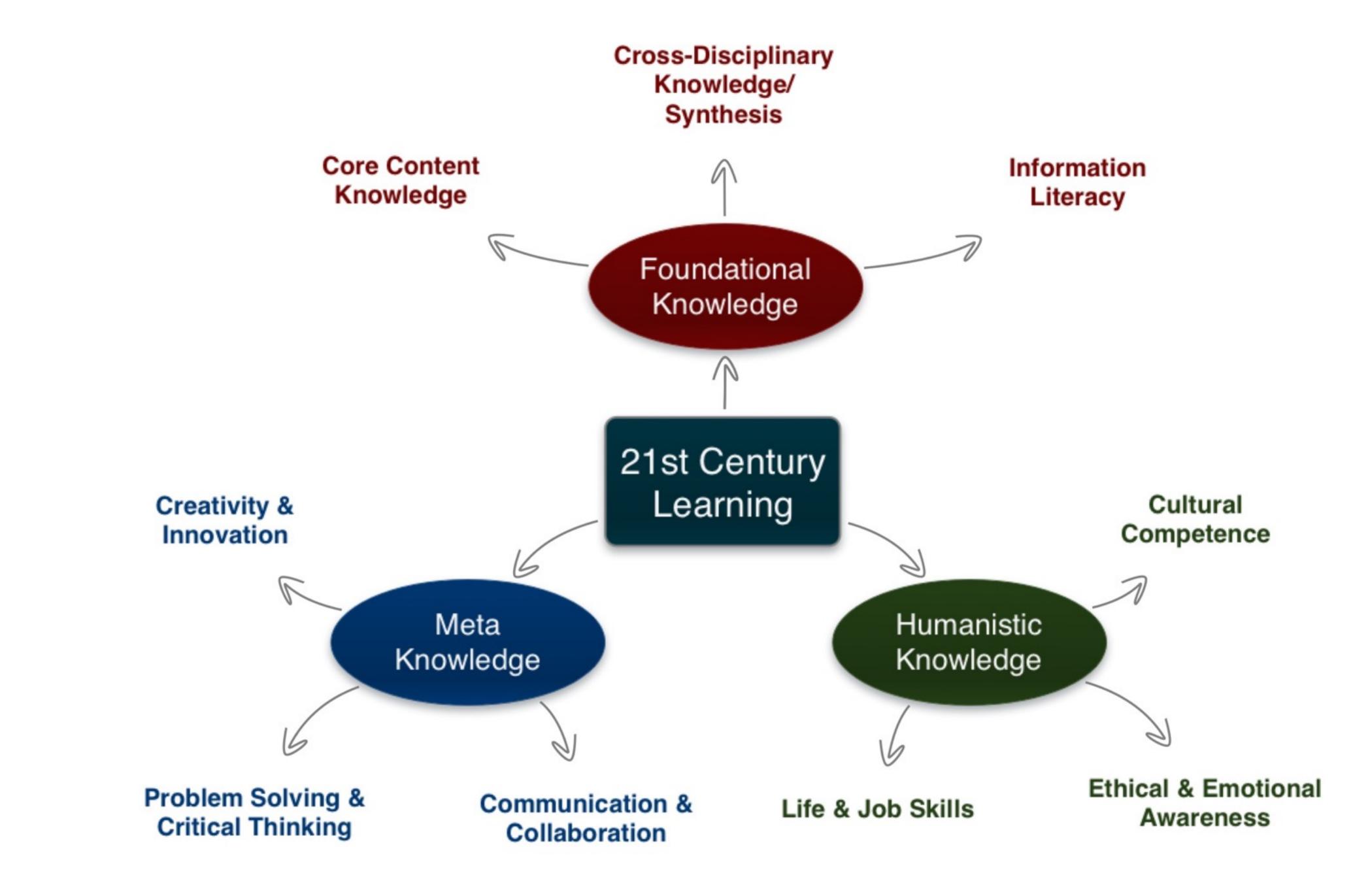
# SAMR: An Executive School Leadership Perspective

Ruben R. Puentedura, Ph.D.



Tech acts as a direct tool substitute, with functional improvement

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

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

Modification Tech allows for significant task redesign Transformation

## Augmentation

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

## 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

### iPad 🔶

Library

 $\equiv$ 

William Rosen

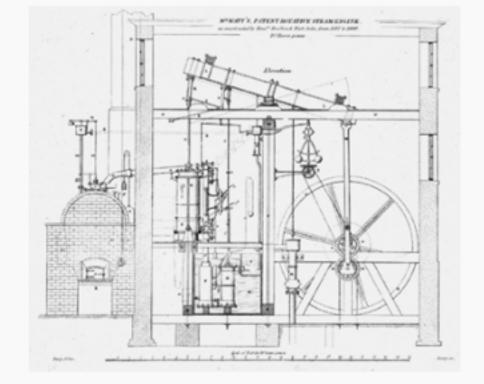


Fig. 5: The caption for this technical drawing reads "Mr. Watt's Patent Rotative Steam Engine as constructed by Messrs. Boulton & Watt, Soho, from 1787 to 1800. 10 Horse power." By 1787, the engine had evolved considerably from the earlier versions, using the sun-and-planet gear to drive the large wheel; the Watt linkage to connect the beam with the cylinder, on the left; and even Watt's feedbackdriven flyball governor—the two balls hanging

above and to the left of the large wheel—to control

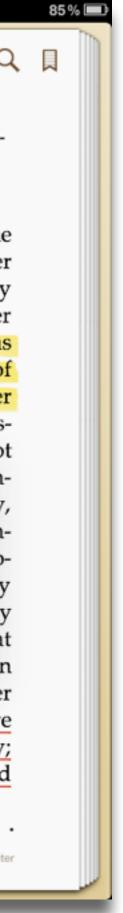
10:37 PM

The Most Powerful Idea in the World  ${}_{\mathrm{A}}\mathrm{A}$  Q 🔲

the wheel's speed. Science Museum / Science & Society Picture Library

THE SUN-AND-PLANET (or, for that matter, the crank plus connecting rod, which was, after all, Watt's first choice for producing rotary motion, and would be everybody's after the Wasbrough patent expired in 1794) was a huge step toward the introduction of steam power into mills and factories, rather than pumps. But it was only a step. The les-Get data & graph this; how does this immei ory, pro but compare with later trends in patents unissued per year? con protect by 178 ary pac that ĥad ohn Locke in the centur, preceding. Consider that from 1700 to 1740, fewer than five patents were issued in Britain annually; from 1740 to 1780, the annual number had

 Back to page 10
 440 of 850
 10 pages left in this chapter



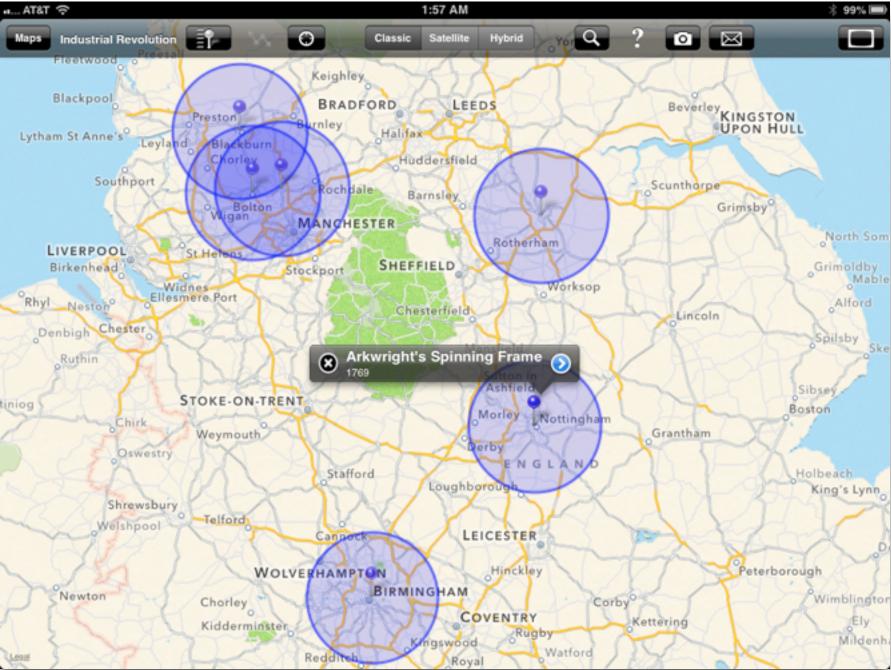
### Modification Tech allows for significant task redesign

### Augmentation

Tech acts as a direct tool substitute, with functional improvement

**Substitution** 





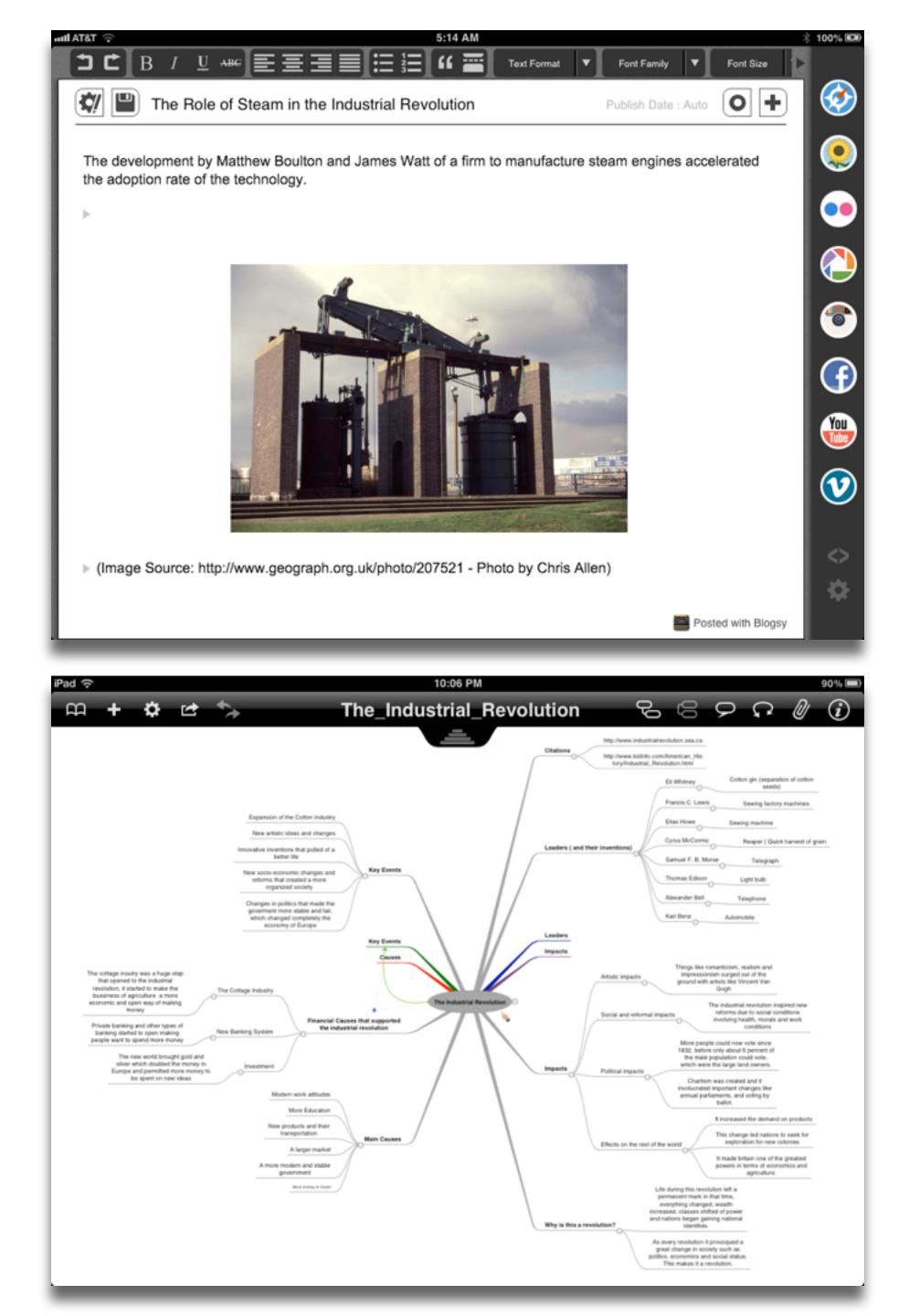
### Modification

Tech allows for significant task redesign

### Augmentation

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**Substitution** 



### Redefinition

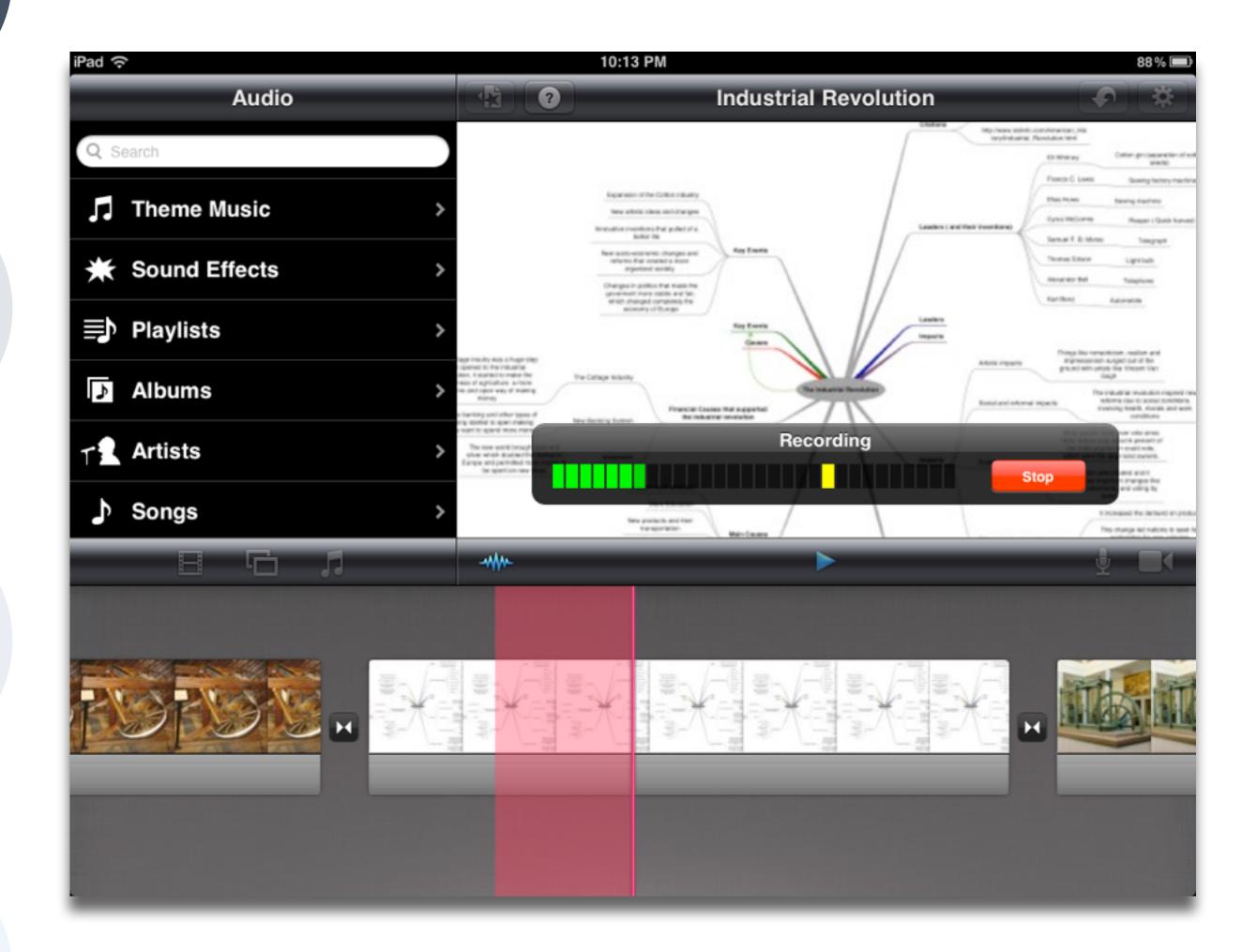
# Tech allows for the creation of new tasks, previously inconceivable

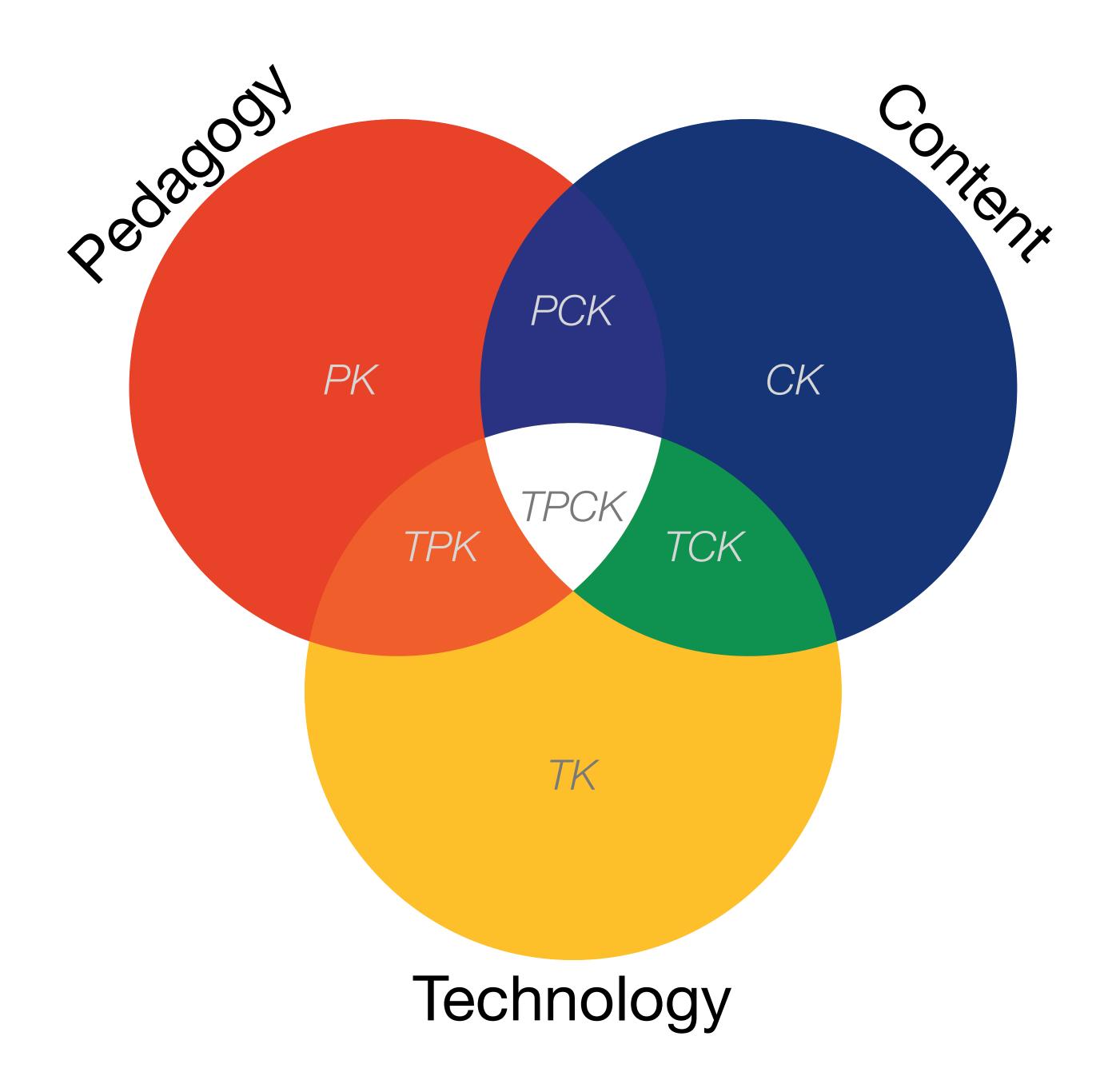
### Modification Tech allows for significant task redesign

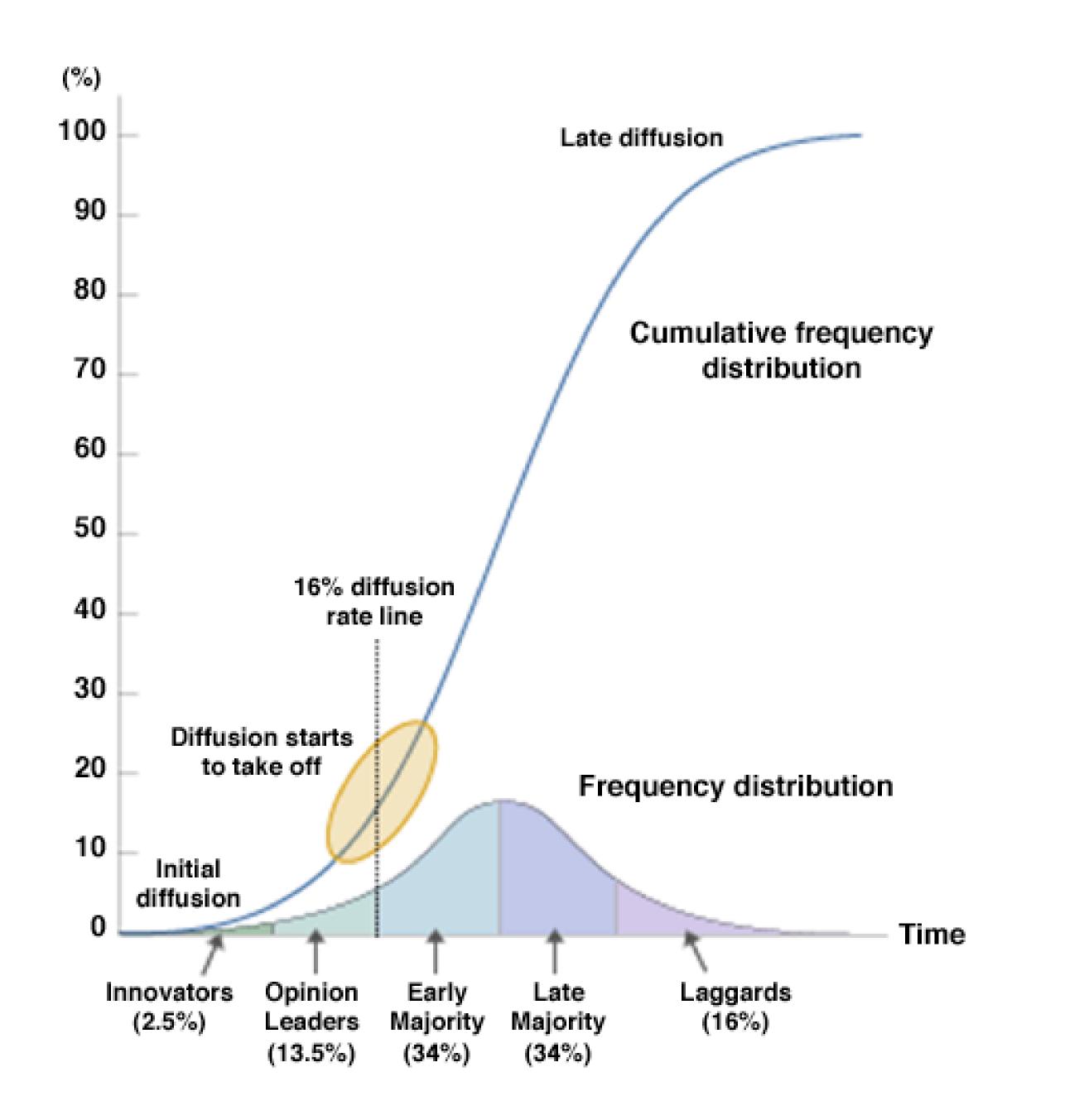
### Augmentation

Tech acts as a direct tool substitute, with functional improvement

**Substitution** 







Research Article

# The Pen Is Mightier Than the Keyboard: **Advantages of Longhand Over Laptop Note Taking**



Pam A. Mueller<sup>1</sup> and Daniel M. Oppenheimer<sup>2</sup> <sup>1</sup>Princeton University and <sup>2</sup>University of California, Los Angeles

### Abstract

Taking notes on laptops rather than in longhand is increasingly common. Many researchers have suggested that laptop note taking is less effective than longhand note taking for learning. Prior studies have primarily focused on students' capacity for multitasking and distraction when using laptops. The present research suggests that even when laptops are used solely to take notes, they may still be impairing learning because their use results in shallower processing. In three studies, we found that students who took notes on laptops performed worse on conceptual questions than students who took notes longhand. We show that whereas taking more notes can be beneficial, laptop note takers' tendency to transcribe lectures verbatim rather than processing information and reframing it in their own words is detrimental to learning.



Psychological Science 1 - 10© The Author(s) 2014 Reprints and permissions: sagepub.com/journalsPermissions.nav DOI: 10.1177/0956797614524581 pss.sagepub.com





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

### **Substitution**

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

### ●●●●○ AT&T LTE

 $\times$ 

### 5:07 AM

Technoloa

### Modification Tech allows for significant task redesign

### Generalize patterns

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

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



## Modification Tech allows for significant task redesign

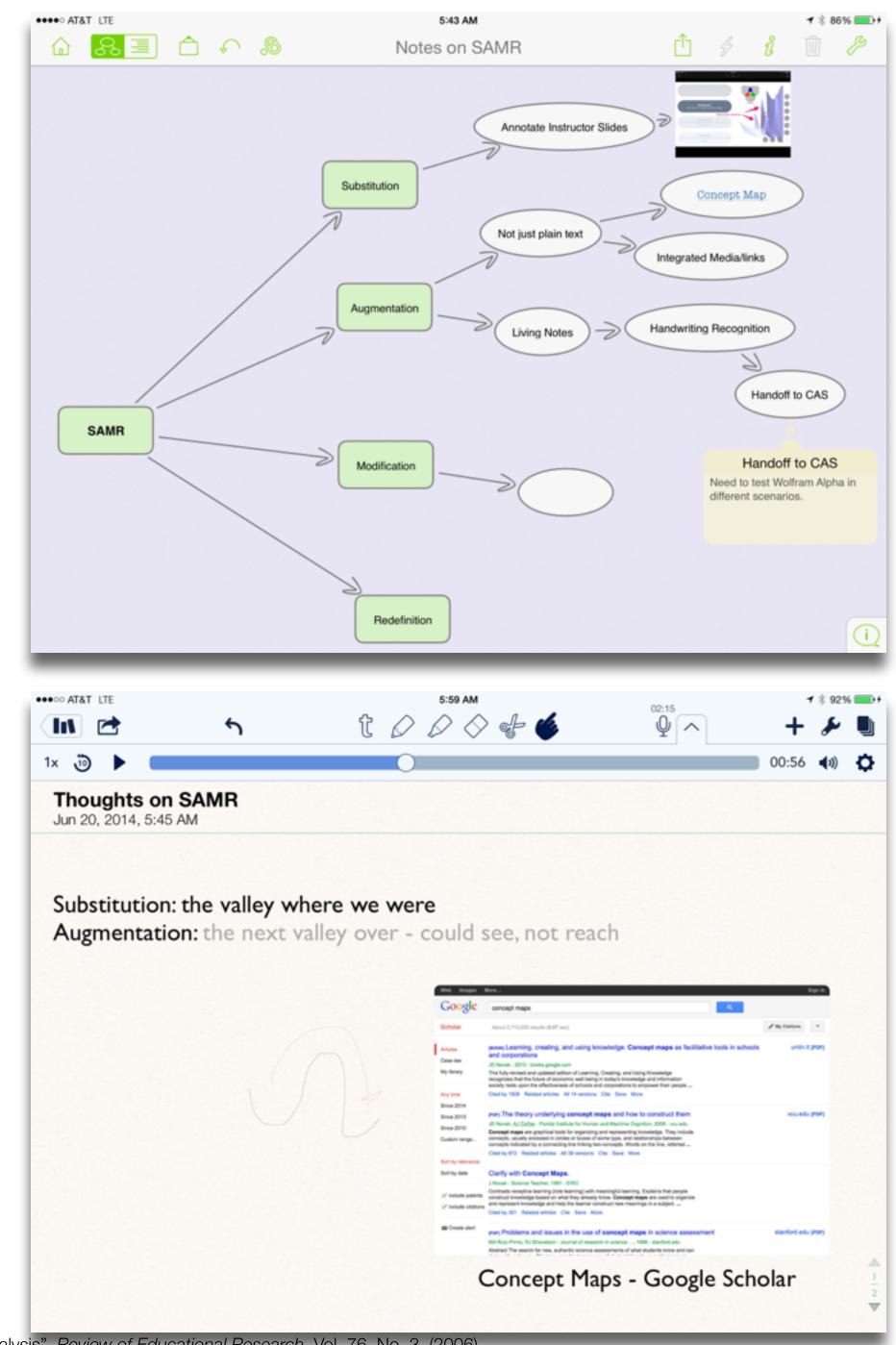
### Augmentation

Tech acts as a direct tool substitute, with functional improvement

### **Substitution**

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

John C. Nesbit and Olusola O. Adesope, "Learning With Concept and Knowledge Maps: A Meta-Analysis". Review of Educational Research, Vol. 76, No. 3. (2006)

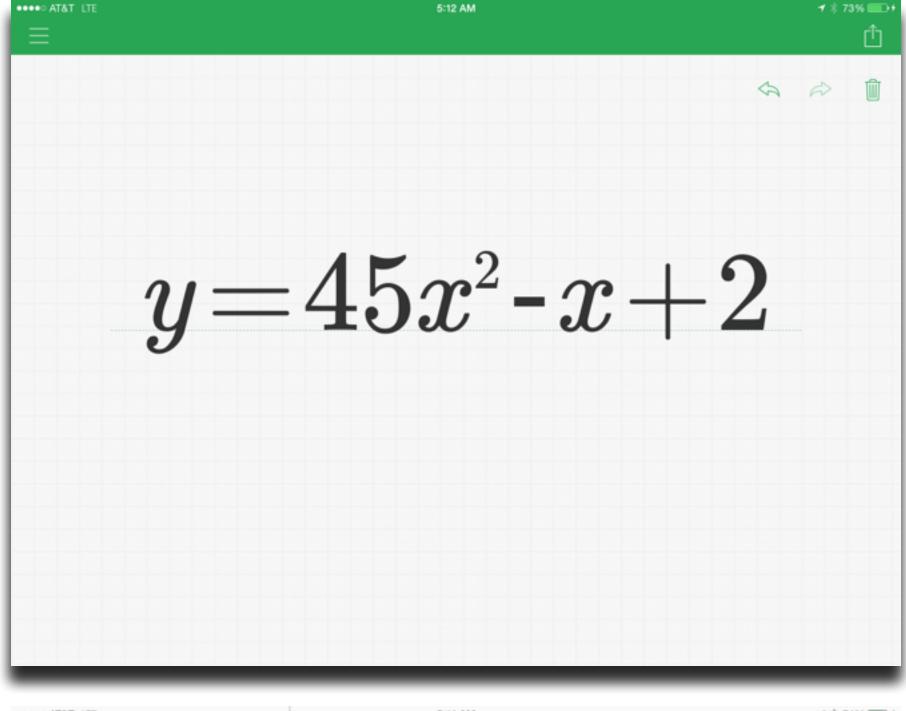


### Modification Tech allows for significant task redesign

### Augmentation

Tech acts as a direct tool substitute, with functional improvement

**Substitution** 



| ●●●●○ AT&T LTE    |                  |                       | 5:14 AM 🕇 🐐 74%                                                             | i 💼 + |
|-------------------|------------------|-----------------------|-----------------------------------------------------------------------------|-------|
|                   | Examples         |                       | <b>Wolfram</b> Alpha                                                        | Û     |
| sin(x)            | W                |                       | $y්$                                                                        | ්     |
| Mathematics       | Words &          | Units & Measures      | Input                                                                       | $\gg$ |
|                   | Linguistics      |                       | $y = 45 x^2 - x + 2$                                                        |       |
| hilit             | 2                |                       | Geometric figure                                                            | $\gg$ |
| Statistics & Data | People & History | Dates & Times         | parabola                                                                    |       |
|                   |                  | 457                   | Properties                                                                  |       |
|                   |                  |                       | Plots                                                                       |       |
| Chemistry         | Culture & Media  | Money & Finance       | y<br>25<br>20<br>15<br>10<br>-0.09.40.2 0.20.40.6 x<br>(x from -0.6 to 0.6) |       |
| 2                 |                  | ti fit                | y<br>\$200                                                                  |       |
| Physics           | Art & Design     | Socioeconomic<br>Data | (x from -3 to 3)<br>-3-2-1 1 2 3 x                                          |       |
|                   | 600              | -j-                   | Alternate forms                                                             | $\gg$ |
| Astronomy         | Music            | Health & Medicine     | $-45 x^2 + x + y - 2 = 0$                                                   |       |
|                   | _                |                       | y = x(45x - 1) + 2                                                          |       |
| 0°                | 2.00             | ŏ                     | Properties as a real function                                               |       |
| Examples H        | istory Favori    | tes About             | R (all real numbers)                                                        |       |

### Modification

Tech allows for significant task redesign

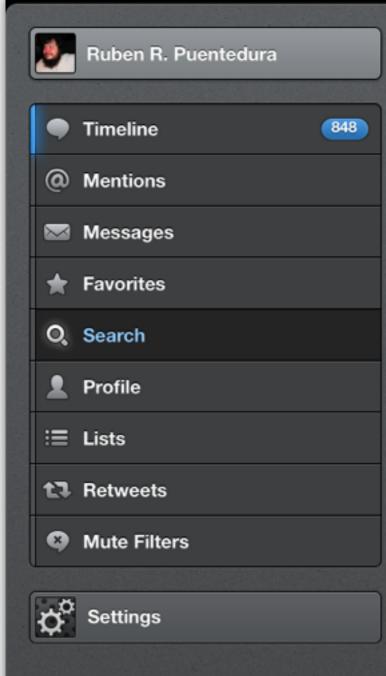
### Augmentation

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**Substitution** 

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### 5:22 AM

### #thoughtvectors

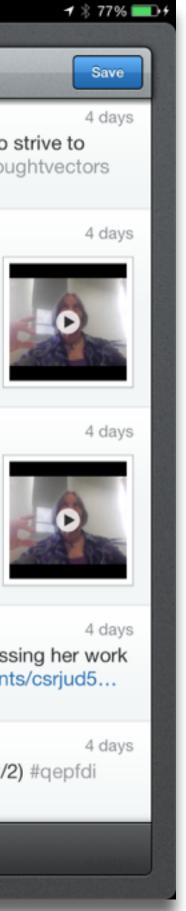


Search

Cindy Jennings @cljennings Sad to me: @ChristinaDEI noting that her father had to strive to share his vision in ways that ppl wanted to hear it. #thoughtvectors

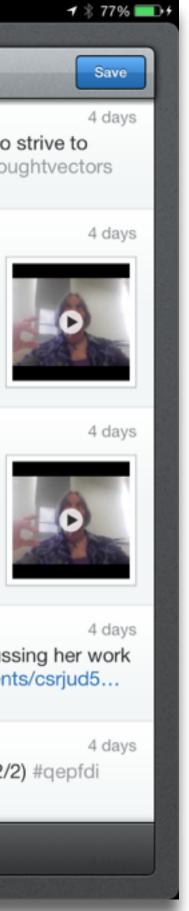


Jon Becker @jonbecker Watch @GardnerCampbell interview @ChristinaDEI, Doug Engelbart's daughter, LIVE
youtube.com/watch?v=NBKjI0... #thoughtvectors





Gardner Campbell @GardnerCampbell #thoughtvectors Hangout w Christina Engelbart (@ChristinaDEI): youtube.com/watch?v=NBKjI0.... Join us there or G+ plus.google.com/events/ csrjud5...





Gardner Campbell @GardnerCampbell Hangout w Christina Engelbart (@ChristinaDEI), discussing her work w #thoughtvectors at VCU. 4:30! plus.google.com/events/csrjud5...



Cindy Jennings @cljennings Early mention of Maria Montessori has my attention! (2/2) #qepfdi #thoughtvectors

100 Tweets

### Redefinition

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

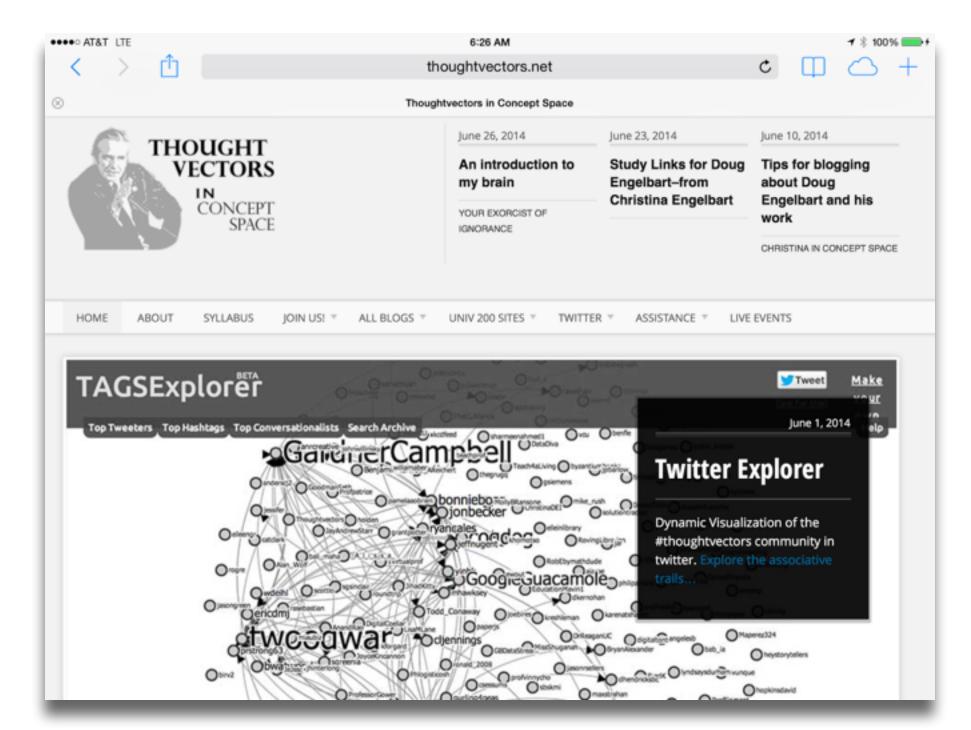
### Modification Tech allows for significant task redesign

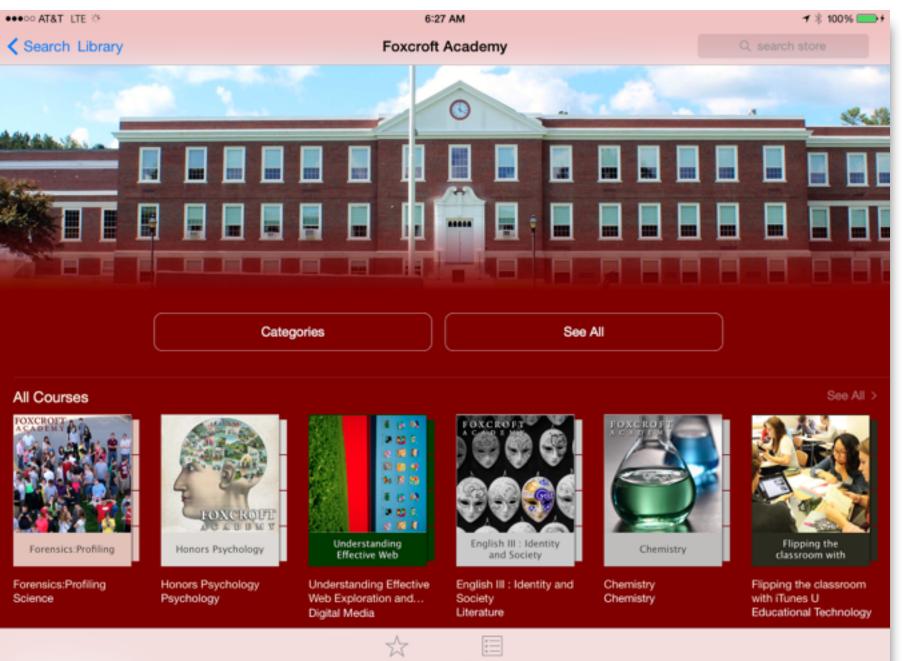
### Augmentation

Tech acts as a direct tool substitute, with functional improvement

**Substitution** 

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





Featured

Top Charts

# Determining SAMR Level: Questions and Transitions

## Substitution:

- What is gained by replacing the older technology with the new technology?
- Substitution to Augmentation:
  - technology at a fundamental level?
  - How does this feature contribute to the design?
- Augmentation to Modification:
  - How is the original task being modified?
  - Does this modification fundamentally depend upon the new technology?
  - How does this modification contribute to the design?
- Modification to Redefinition:
  - What is the new task?
  - Is any portion of the original task retained?
  - How is the new task uniquely made possible by the new technology?
  - How does it contribute to the design?

Has an improvement been added to the task process that could not be accomplished with the older

| Study                                                                                                                                                                  | SAMR Classification | Description                                                                                                                                                            | Effect Size                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Algebra I</b><br><i>Effectiveness of Cognitive</i><br><i>Tutor Algebra I at Scale</i> ,<br>by John F. Pane, Beth Ann<br>Griffin, Daniel F. McCaffrey,<br>Rita Karam | S to A              | <ul> <li>S: Computerized algebra drills, some tied to real-world scenarios</li> <li>A: Tools for basic visualization; adaptive response to student progress</li> </ul> | <b>≈ 0.2</b><br>50th perc. → 58th perc.                                                |
| <b>Earth Science</b><br>Using Laptops to Facilitate<br>Middle School Science<br>Learning: The Results of<br>Hard Fun, by Alexis M.<br>Berry, Sarah E. Wintle           | A to M              | <ul> <li>A: Interactive tools for concept exploration and visualization</li> <li>M: Narrated animation as final project</li> </ul>                                     | ≈ 0.6<br>50th perc. → 73rd perc.<br>(≈ 1.4 a month later)<br>(50th perc. → 92nd perc.) |

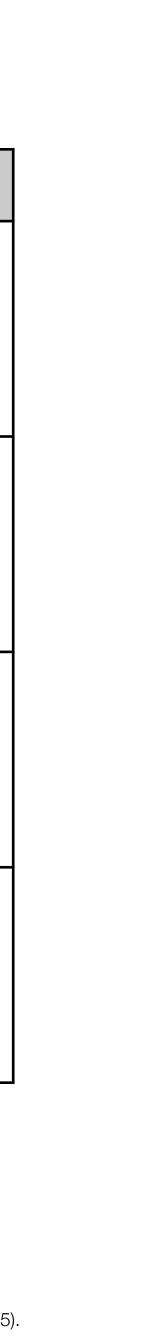
| Meta-analysis                                      | Number<br>of<br>studies | ES type          | Mean<br>ES | SE   |
|----------------------------------------------------|-------------------------|------------------|------------|------|
| Bangert-Drowns (1993)                              | 19                      | Missing          | 0.27       | 0.11 |
| Bayraktar (2000)                                   | 42                      | Cohen's d        | 0.27       | 0.05 |
| Blok, Oostdam,<br>Otter, and<br>Overmaat<br>(2002) | 25                      | Hedges's g       | 0.25       | 0.06 |
| Christmann and<br>Badgett (2000)                   | 16                      | Missing          | 0.13       | 0.05 |
| Fletcher-Flinn<br>and Gravatt<br>(1995)            | 120                     | Glass's ∆        | 0.24       | 0.05 |
| Goldberg, Rus-<br>sell, and Cook<br>(2003)         | 15                      | Hedges's g       | 0.41       | 0.07 |
| Hsu (2003)                                         | 25                      | Hedges's g       | 0.43       | 0.03 |
| Koufogiannakis<br>and Wiebe<br>(2006)              | 8                       | Hedges's g       | -0.09      | 0.19 |
| Kuchler (1998)                                     | 65                      | Hedges's g       | 0.44       | 0.05 |
| Kulik and Kulik<br>(1991)                          | 239                     | Glass's $\Delta$ | 0.30       | 0.03 |
| Y. C. Liao<br>(1998)                               | 31                      | Glass's ∆        | 0.48       | 0.05 |
| YI. Liao and<br>Chen (2005)                        | 21                      | Glass's ∆        | 0.52       | 0.05 |
| Y. K. C. Liao<br>(2007)                            | 52                      | Glass's ∆        | 0.55       | 0.05 |

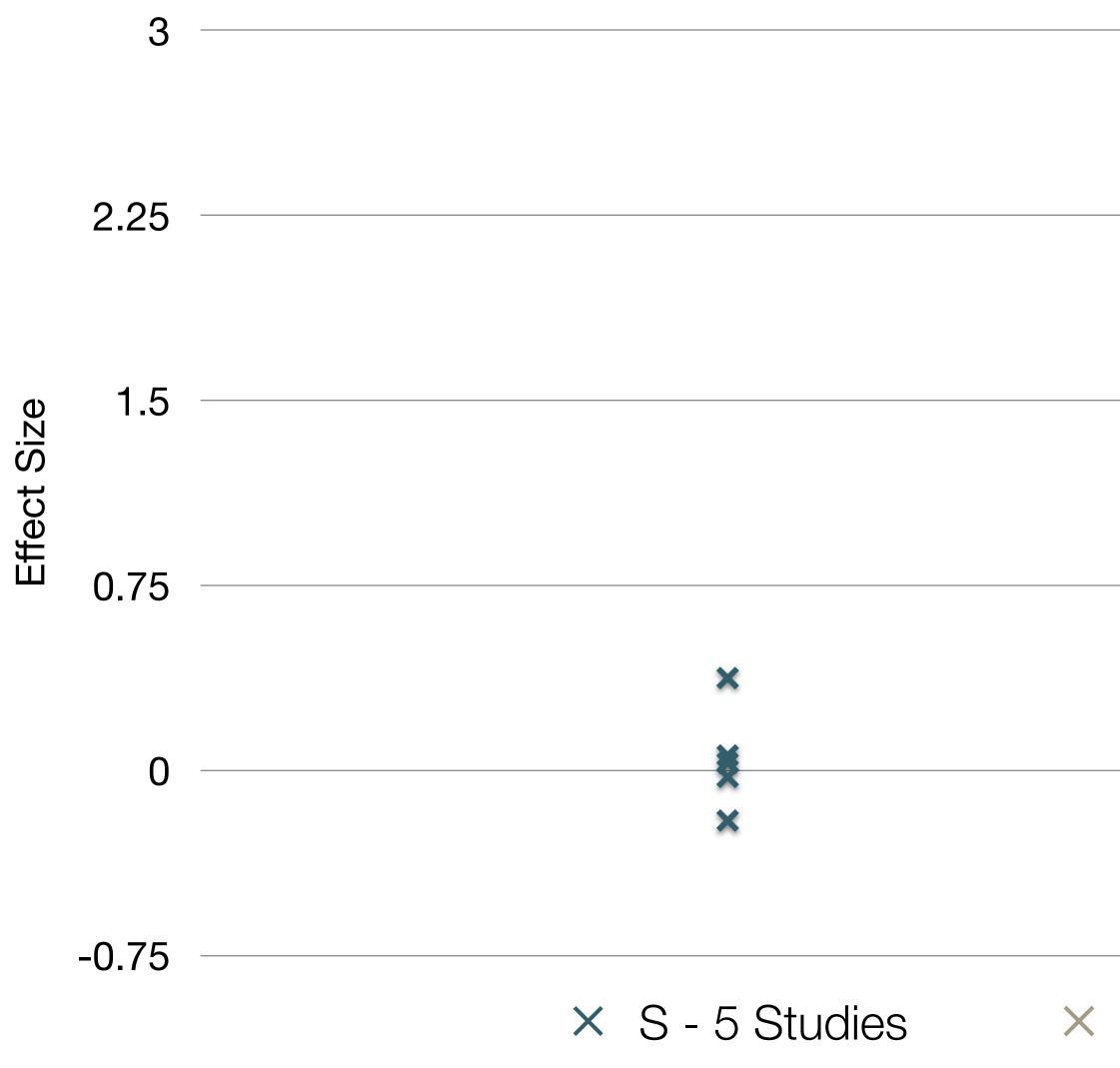
|                                                   | Number<br>of |                                               | Mean  |      |
|---------------------------------------------------|--------------|-----------------------------------------------|-------|------|
| Meta-analysis                                     | studies      | ES type                                       | ES    | SE   |
| Michko (2007)                                     | 45           | Hedges's g                                    | 0.43  | 0.07 |
| Onuoha (2007)                                     | 35           | Cohen's d                                     | 0.26  | 0.04 |
| Pearson, Ferdig,<br>Blomeyer, and<br>Moran (2005) | 20           | Hedges's g                                    | 0.49ª | 0.11 |
| Roblyer, Castine,<br>and King<br>(1988)           | 35           | Hedges's g                                    | 0.31  | 0.05 |
| Rosen and Salo-<br>mon (2007)                     | 31           | Hedges's g                                    | 0.46  | 0.05 |
| Schenker (2007)                                   | 46           | Cohen's d                                     | 0.24  | 0.02 |
| Soe, Koki, and<br>Chang (2000)                    | 17           | Hedges's g<br>and<br>Pearson's r <sup>a</sup> | 0.26ª | 0.05 |
| immerman<br>and Kruepke<br>(2006)                 | 114          | Pearson's r <sup>a</sup>                      | 0.24  | 0.03 |
| Forgerson and<br>Elbourne<br>(2002)               | 5            | Cohen's d                                     | 0.37  | 0.16 |
| Waxman, Lin,<br>and Michko<br>(2003)              | 42           | Glass's ∆                                     | 0.45  | 0.14 |
| Yaakub (1998)                                     | 20           | Glass's $\Delta$<br>and g                     | 0.35  | 0.05 |
| Zhao (2003)                                       | 9            | Hedges's g                                    | 1.12  | 0.26 |

a. Converted to Cohen's d.



| Study                                   | SAMR Level | Description                                                                                                               | Effect Size                               |
|-----------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Ligas (2002)                            | S          | CAI system used to support direct instruction approach for at-risk students.                                              | <b>0.029</b><br>(50th perc. → 51st perc.) |
| Xin & Reith (2001)                      | Α          | Multimedia resources provided to contextualize learning of word meanings and concepts.                                    | <b>0.264</b><br>(50th perc. → 60th perc.) |
| Higgins & Raskind<br>(2005)             | Μ          | Software/hardware used for text-to-speech,<br>definitions, pronunciation guide for children<br>with reading disabilities. | <b>0.600</b><br>(50th perc. → 73rd perc.) |
| Salomon, Globerson &<br>Guterman (1989) | R          | Software presents students with reading principles and metacognitive questions as part of the reading process.            | <b>1.563</b><br>(50th perc. → 94th perc.) |





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).

|               |                 | ×           |
|---------------|-----------------|-------------|
|               |                 |             |
|               |                 | ×           |
|               |                 | ×           |
|               |                 |             |
|               |                 |             |
| A - 4 Studies | × M - 8 Studies | × R - 3 Stu |

idies

# Surveying Seymour Papert's Four Expectations

- Expectation 1: suitably designed formative/summative assessment rubrics will show improvement when compared to traditional instruction.
- Expectation 3: student work will demonstrate more and more varied critical thinking cognitive skills, particularly in areas related to the examination of their own thinking processes.
- their community, and engagement with communities beyond their own.

• Expectation 2: students will show more instances of work at progressively higher levels of Bloom's Taxonomy.

• Expectation 4: student daily life will reflect the introduction of the technology. This includes (but is not limited to) directly observable aspects such as reduction in student attrition, increase in engagement with civic processes in







| Key Trer                | nds Driving Ed Tech Adoption                                              | Impor                      | tant Ed Tech Developments                     |
|-------------------------|---------------------------------------------------------------------------|----------------------------|-----------------------------------------------|
| Fast<br>(1-2 yrs.)      | Rethinking the Roles of Teachers<br>Shift to Deeper Learning Approaches   | Adoption:<br>1 yr. or less | BYOD<br>Cloud Computing                       |
|                         | Increasing Focus on OER<br>Increasing Use of Hybrid Learning Designs      | Adoption:<br>2-3 yrs.      | Games and Gamification<br>Learning Analytics  |
| Mid-Range<br>(3-5 yrs.) |                                                                           | Adoption:<br>4-5 yrs.      | The Internet of Things<br>Wearable Technology |
| Long-Range<br>(5+ yrs.) | Rapid Acceleration of Intuitive Technology<br>Rethinking How Schools Work |                            |                                               |

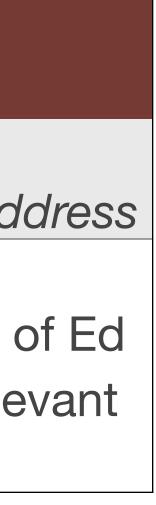
| Significant | Chal | lenges |
|-------------|------|--------|
|-------------|------|--------|

| Solvable                                                              | Difficult                                                  | Wicked                                                          |
|-----------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------|
| understand and know how to solve                                      | understand but solutions are elusive                       | complex to define, much less add                                |
| Authentic Learning Opportunities<br>Integrating Personalized Learning | Complex Thinking & Communication<br>Safety of Student Data | Competition from New Models o<br>Keeping Formal Education Relev |

# Impeding Ed Tech Adoption

Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2014). NMC Horizon Report: 2014 K-12 Edition. Austin, Texas: The New Media Consortium.

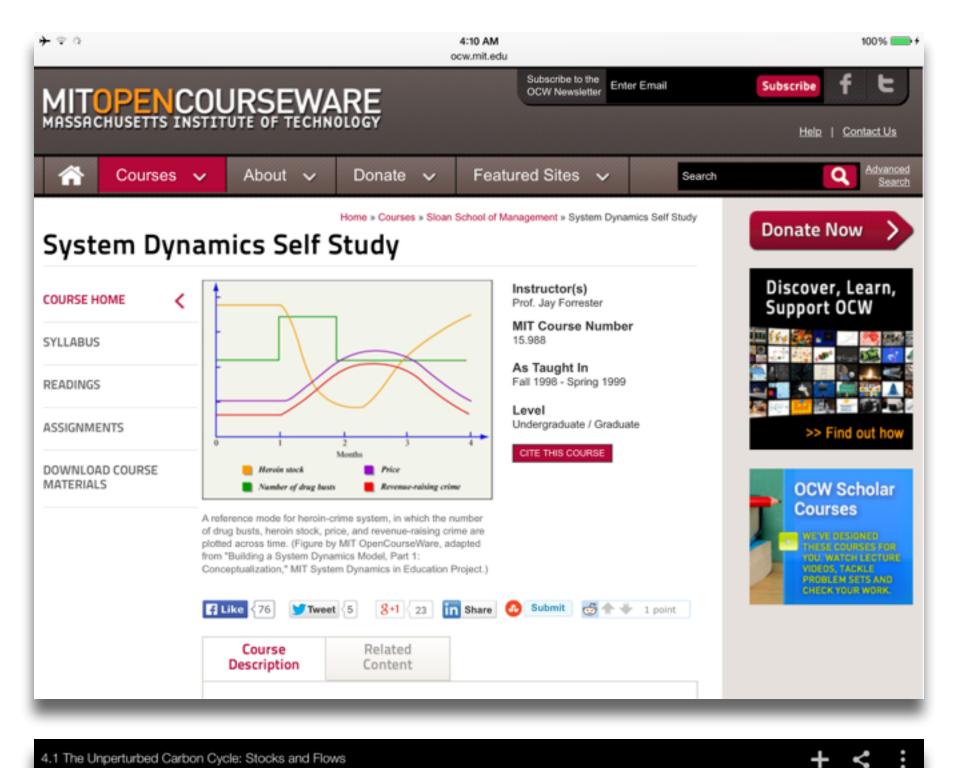


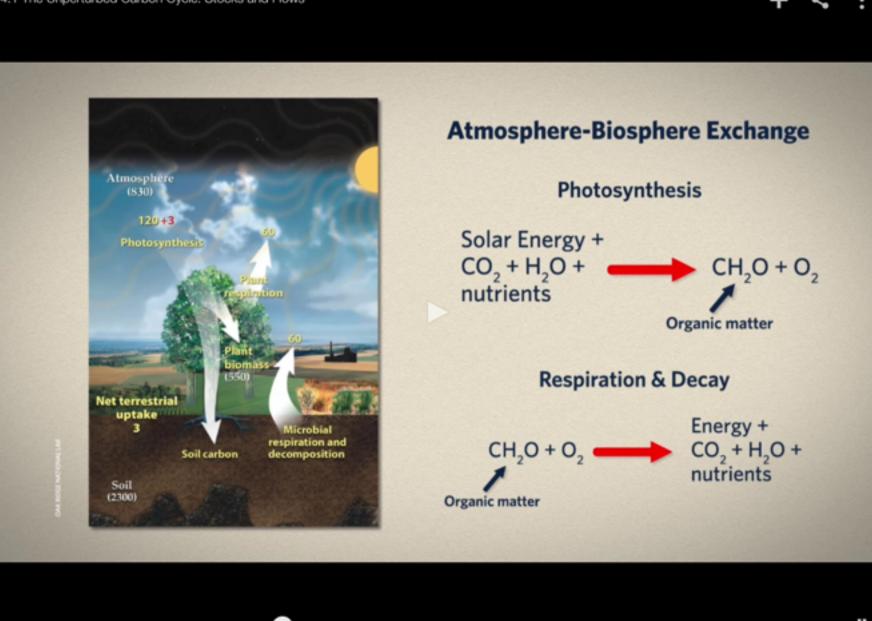


## Modification Tech allows for significant task redesign

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

### **Substitution**





### Modification Tech allows for significant task redesign

### Augmentation

Tech acts as a direct tool substitute, with functional improvement

**Substitution** 



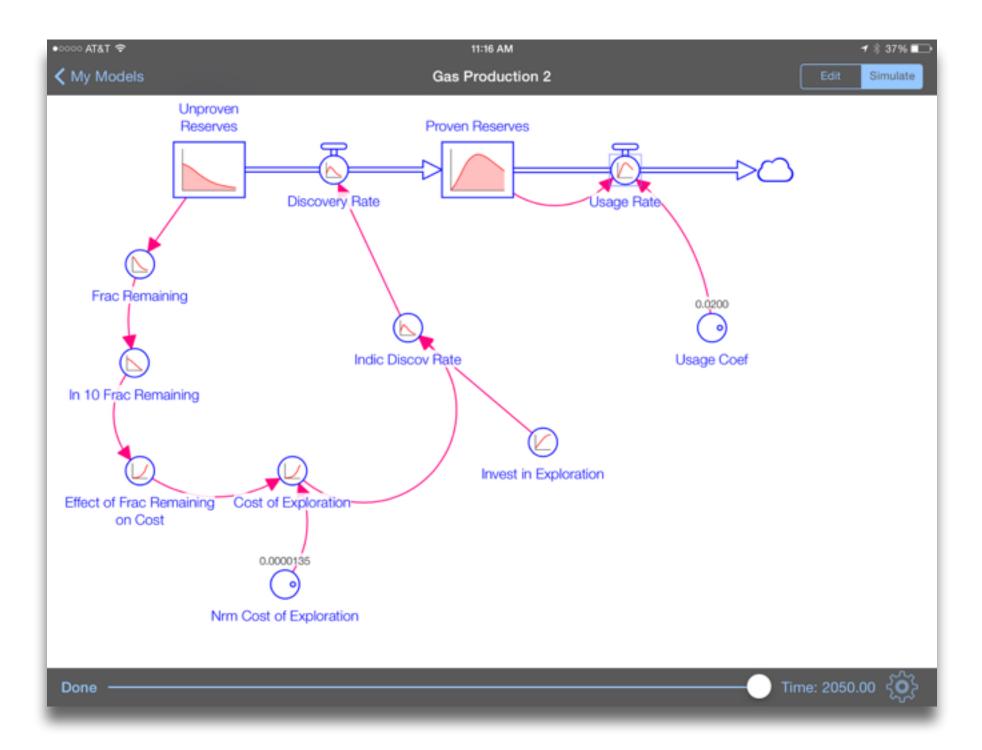
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### Redefinition

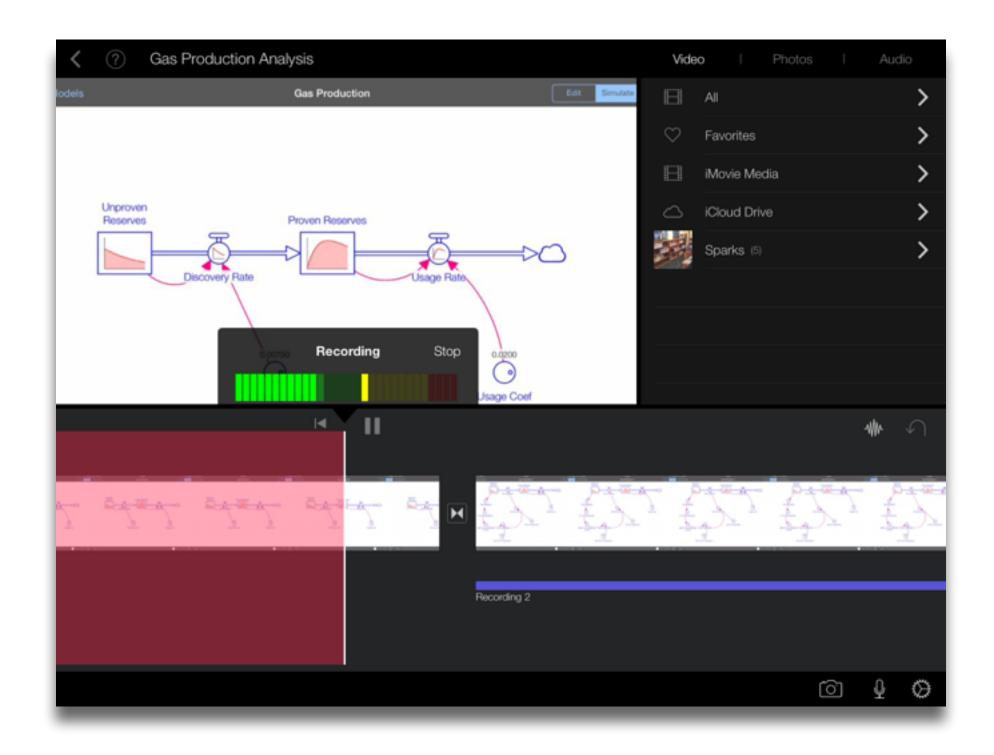
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| Key Trer                                     | nds Driving Ed Teo                                                                                                                          | ch Adoption                                       | Import                      | ant Ed Tech Developments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Fast<br>(1-2 yrs)                            | Fast<br>(1-2 yrs.)Rethinking the Roles of Teachers<br>Shift to Deeper Learning ApproachesMid-Range<br>(3-5 yrs.)Increasing Focus on OER<br> |                                                   | Adoption:<br>1 yr. or less  | BYOD<br>Cloud Computing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|                                              |                                                                                                                                             |                                                   | Adoption:<br>2-3 yrs.       | Games and Gamification<br>Learning Analytics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|                                              |                                                                                                                                             |                                                   | Adoption:<br>4-5 yrs.       | The Internet of Things<br>Wearable Technology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| Long-Range<br>(5+ yrs.)                      | Rapid Acceleration of In<br>Rethinking How S                                                                                                |                                                   |                             | <image/> Image: Control of the state of t |  |
|                                              | Significant                                                                                                                                 | Challenges Im                                     | peding Ed <sup>-</sup>      | Tech Adoption                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| Solvable<br>understand and know how to solve |                                                                                                                                             | Difficult<br>understand but solutions are elusive |                             | Wicked<br>ve complex to define, much less add                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
|                                              | earning Opportunities<br>Personalized Learning                                                                                              | Complex Thinking<br>Safety of St                  | & Communicat<br>tudent Data | tion Competition from New Models or Keeping Formal Education Relevant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |

| iving Ed Tec                                                                                                                    | Import                                                     | tant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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-------------|--|
| thinking the Roles of Teachers<br>to Deeper Learning Approaches<br>Increasing Focus on OER<br>ng Use of Hybrid Learning Designs |                                                            | Adoption:<br>1 yr. or less                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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|                                                                                                                                 |                                                            | Adoption:<br>2-3 yrs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Games and Gamification<br>Learning Analytics                   |  |
|                                                                                                                                 |                                                            | Adoption:<br>4-5 yrs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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        |  |
| Acceleration of Ir<br>ethinking How S                                                                                           |                                                            | Appendix<br>Appendix<br>To a set as a data for a data<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix<br>Appendix | Image: State |                                                                |  |
| Significant                                                                                                                     | Challenges Im                                              | peding Ed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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        |  |
| e<br>v how to solve                                                                                                             | Diffie<br>how to solve understand but sol                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Wicked complex to define, much less add                        |  |
| Opportunities<br>lized Learning                                                                                                 | Complex Thinking & Communication<br>Safety of Student Data |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Competition from New Models o<br>Keeping Formal Education Rele |  |

| Key Trer                | nds Driving Ed Tec                             | ch Adoption                                       | Importa                     | ant Ed Tech Developments                                           |                            |                         |
|-------------------------|------------------------------------------------|---------------------------------------------------|-----------------------------|--------------------------------------------------------------------|----------------------------|-------------------------|
| Fast<br>(1-2 yrs.)      |                                                |                                                   |                             |                                                                    | Adoption:<br>1 yr. or less | BYOD<br>Cloud Computing |
|                         |                                                |                                                   | Adoption:<br>2-3 yrs.       | Games and Gamification<br>Learning Analytics                       |                            |                         |
| Mid-Range<br>(3-5 yrs.) | Increasing Focu<br>Increasing Use of Hybrid    |                                                   | Adoption:<br>4-5 yrs.       | The Internet of Things<br>Wearable Technology                      |                            |                         |
| Long-Range<br>(5+ yrs.) | Rapid Acceleration of In<br>Rethinking How S   |                                                   |                             |                                                                    |                            |                         |
|                         | Significant                                    | Challenges Im                                     | peding Ed -                 | Tech Adoption                                                      |                            |                         |
| understand a            | Solvable<br>and know how to solve              | Difficult<br>understand but solutions are elusive |                             | Wicked<br>ve complex to define, much less add                      |                            |                         |
|                         | earning Opportunities<br>Personalized Learning | Complex Thinking<br>Safety of St                  | & Communicat<br>tudent Data | ion Competition from New Models o<br>Keeping Formal Education Rele |                            |                         |

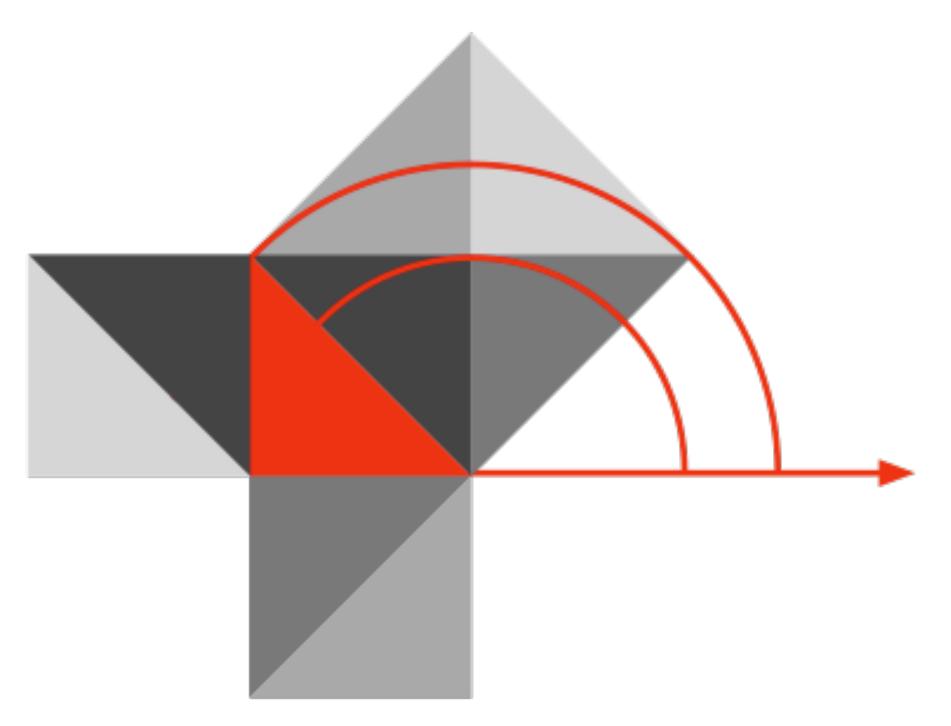
Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2014). NMC Horizon Report: 2014 K-12 Edition. Austin, Texas: The New Media Consortium.







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