SAMR: Paths to Growth

Ruben R. Puenteedura, Ph.D.
Substitution
Tech acts as a direct tool substitute, with no functional change

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

Modification
Tech allows for significant task redesign

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

Enhancement

Transformation
Ruben R. Puenteedura, As We May Teach: Educational Technology, From Theory Into Practice. (2009)
<table>
<thead>
<tr>
<th>Social</th>
<th>Mobility</th>
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<th>The EdTech Quintet – Associated Practices</th>
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<td>Social</td>
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<tr>
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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?
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## Bloom's Taxonomy: Cognitive Processes

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<th>Anderson &amp; Krathwohl (2001)</th>
<th>Characteristic Processes</th>
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</table>
| **Remember**                | • Recalling memorized knowledge  
                              | • Recognizing correspondences between memorized knowledge and new material |
| **Understand**              | • Paraphrasing materials  
                              | • Exemplifying concepts, principles  
                              | • Classifying items  
                              | • Summarizing materials  
                              | • Extrapolating principles  
                              | • Comparing items |
| **Apply**                   | • Applying a procedure to a familiar task  
                              | • Using a procedure to solve an unfamiliar, but typed task |
| **Analyze**                 | • Distinguishing relevant/irrelevant or important/unimportant portions of material  
                              | • Integrating heterogeneous elements into a structure  
                              | • Attributing intent in materials |
| **Evaluate**                | • Testing for consistency, appropriateness, and effectiveness in principles and procedures  
                              | • Critiquing the consistency, appropriateness, and effectiveness of principles and procedures, basing the critique upon appropriate tests |
| **Create**                  | • Generating multiple hypotheses based on given criteria  
                              | • Designing a procedure to accomplish an untyped task  
                              | • Inventing a product to accomplish an untyped task |

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Some Valuable S/A Shared Practices

• Checklists

• Augmented Note Taking Strategies

• Visualization Methods (5 Primary Domains)

• Simple Blogging

• Simple Digital Storytelling Video

• Flipped Classroom – Materials Creation

• Flipped Classroom – Peer Discussion/Instruction Methods

• LMS Practices
The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking

Pam A. Mueller¹ and Daniel M. Oppenheimer²
¹Princeton University and ²University 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.
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\[ y = 45x^2 - x + 2 \]
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Refraction

• Pick:

  1. A Content Area
  2. A 21C Learning Skill
  3. A Shared Practice

• Create a SAMR Ladder that looks at a topic in 1. through the lens of 2., focused into actual practice by 3.
Refraction Example: *Connecting the Dots*

**Primary 21C Lens:** Cross-Disciplinary Knowledge & Synthesis

**Primary Shared Practice Focus:** Visualization Methods
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The table shows the timeline of human development in various aspects. Social development began around 200,000 years ago, followed by increased mobility around 70,000 years ago. Visualization significantly advanced around 40,000 years ago. Storytelling evolved further around 17,000 years ago, and gaming emerged around 8,000 years ago.
James Burke Connections Episode 4

Science historian James Burke's ten part series Connections traces the progression of technology from ancient to modern times. According to Burke, every invention comes from putting the right pieces of already available technology together to build something new. By tracing the history of technology through a series of "triggers," each one of which sets off the next, Burke demonstrates how technology is an interconnected web and how one seemingly unrelated innovation leads to another.

Episode Overview

The fourth episode of Connections shows us how Europeans transitioned from the Middle Ages to the Renaissance. When the Roman Empire fell, Western civilization was once again splintered; people were not sharing ideas or striving for knowledge as they once had. However, increased commercialism and international markets, which originated shortly before the onset of the plague and later flourished when survivors were made rich with inheritances, fueled international communication. The invention of the printing press eased the spread of knowledge to set off a revolution of innovation and chain of invention.

Jump to Episode

1. The Trigger Effect
2. Death in the Morning
3. Distant Voices
4. Faith in Numbers
5. The World of Experiments
1833

The Analytical Engine

Charles Babbage designed but was never able to produce a working model but it is significant in that it relied upon punched cards for data and programs and would employ a language similar to modern assembly language complete with loops and conditional branching (for the nerds out there).
1870: FINALLY COUNTING EVERYONE

This census was the first to record the names and other personal information of all African-Americans, including those who were formerly enslaved. In researching your African-American ancestors, moving backward from the present, the 1870 federal census may be the last census in which you are able to identify these ancestors by name. The 1870 census often even serves as a powerful tool in identifying former slave owners, a necessary step for anyone desiring to reclaim the heritage of their enslaved ancestors.
From Shared Practices to Aspirational Goals
Say hello to Watson

Meet IBM Watson, a cognitive system that enables a new partnership between people and computers that enhances, scales and accelerates human expertise.

Transform clinical trial matching with cognitive computing
Try out Chef Watson
Watson, now learning Japanese

Explore Watson
**LET'S GET COOKING!**

- **CHEDDAR**
  - Cheddar cheese is a relatively hard, pale-yellow-to-off-white (unless artificially coloured), sometimes "sharp" i.e., acid-tasting, natural cheese. Originating in the English village of Cheddar in Somerset, cheeses of this style are produced beyond this region in several countries.

- **COCOA**
  - Cocoa solids are a mixture of many substances remaining after cocoa butter is extracted from cocoa beans. When sold as an end product, it may also be called cocoa powder, cocoa, and cacao. In contrast, the fatty component of chocolate is cocoa butter. Cocoa butter is 80% to 85% of cocoa mass.

- **APPLE JUICE**
  - Apple juice is a fruit juice made by the maceration and pressing of apples. The resulting expulsed juice may be further treated by enzymatic and centrifugal clarification to remove the starch and pectin, which holds fine particulate in suspension, and then pasteurised for cooking in place.

- **WALNUT**
  - A walnut is an edible seed of any tree of the genus *Juglans* (Family Juglandaceae), especially the Persian or English walnut, *Juglans regia*. Broken nutshell of the eastern black walnut from the tree *Juglans nigra* are also commercially available in small quantities, as are foods prepared with walnut butters.

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**HERE ARE SOME IDEAS**

- **Cheddar Cake**
  - maple syrup, vanilla sugar, egg white, egg, vanilla extract, walnut, vegetable oil, butter, apple juice, blackberry, cheddar, cocoa, heavy cream

Based on: *Banana Layer Cake With White Chocolate-Cream Cheese Frosting And Walnuts* from *Bon Appétit*.
Analytics free and easy

Predictive analytics and data visualization built for you. Analyze your data in minutes on your own without downloading software.

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What is Watson Analytics?

Watson Analytics offers you the benefits of advanced analytics without the complexity.

A smart data discovery service available on the cloud, it guides data exploration, automates predictive analytics and enables effortless dashboard and infographic creation.

You can get answers and new insights to make confident decisions in minutes—all on your own.

IBM introduces Powerful Analytics for Everyone

Watch the video
A 73-year-old retired nurse... He now moved much more...

Upon examination, his phys...

Over the past several years,... He immediately referred th..

- Apathy
- Hypokinesia
- Hemiballism
- Parkinson's disease
- Slow, shuffling gait
- Akinesia
- Huntington's disease
- Alzheimer's disease

Add patient details