SAMR: A Leadership Perspective

Ruben R. Puente {dura, Ph.D.
1. Why does SAMR work?
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

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

Content

Technology

PK

PCK

CK

TPK

TPCK

TCK

TK

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2. SAMR ladders, innovation and timelines for adoption
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**Enhancement**

**Transformation**
3. Starting points and questions
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?
The SAMR Ladder:
Questions and Transitions

• **Substitution:**
  • What will I gain by replacing the older technology with the new technology?

• **Substitution to Augmentation:**
  • Have I added an improvement to the task process that could not be accomplished with the older technology at a fundamental level?
  • How does this feature contribute to my 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 my design?

• **Modification to Redefinition:**
  • What is the new task?
  • Will any portion of the original task be retained?
  • How is the new task uniquely made possible by the new technology?
  • How does it contribute to my design?
4. The EdTech Quintet as pathfinder
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<th>Social</th>
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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.”
5. Benchmarks for success
<table>
<thead>
<tr>
<th>Study</th>
<th>SAMR Classification</th>
<th>Description</th>
<th>Effect Size</th>
<th>50th perc. →</th>
<th>73rd perc. →</th>
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</thead>
<tbody>
<tr>
<td>Algebra I</td>
<td>S to A</td>
<td>S: Computerized algebra drills, some tied to real-world scenarios</td>
<td>≈ 0.2</td>
<td>58th perc.</td>
<td>92nd perc.</td>
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<tr>
<td>Effectiveness of Cognitive Tutor Algebra I at Scale, by John F. Pane, Beth Ann Griffin, Daniel F. McCaffrey, Rita Karam</td>
<td></td>
<td>A: Tools for basic visualization; adaptive response to student progress</td>
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<td>Earth Science</td>
<td>A to M</td>
<td>A: Interactive tools for concept exploration and visualization</td>
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<td>Using Laptops to Facilitate Middle School Science Learning: The Results of Hard Fun, by Alexis M. Berry, Sarah E. Wintle</td>
<td></td>
<td>M: Narrated animation as final project</td>
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(≈ 1.4 a month later)
(50th perc. → 92nd perc.)
Surveying Seymour Papert’s Four Expectations

• **Expectation 1:** suitably designed formative/summative assessment rubrics will show improvement when compared to traditional instruction.

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

• **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.

• **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 their community, and engagement with communities beyond their own.
“Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited.”
## Bloom's Taxonomy: Cognitive Processes

<table>
<thead>
<tr>
<th>Anderson &amp; Krathwohl (2001)</th>
<th>Characteristic Processes</th>
</tr>
</thead>
</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 |
## Facione: Critical Thinking – Cognitive Skills and Subskills

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<thead>
<tr>
<th>Skill</th>
<th>Subskills</th>
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<tbody>
<tr>
<td>Interpretation</td>
<td>Categorization</td>
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<td>Decoding Significance</td>
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<td>Clarifying Meaning</td>
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<td>Analysis</td>
<td>Examining Ideas</td>
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<td>Identifying Arguments</td>
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<td>Evaluation</td>
<td>Assessing Claims</td>
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<tr>
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<td>Querying Evidence</td>
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<td>Justifying Procedures</td>
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<td>Presenting Arguments</td>
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<td>Self-Regulation</td>
<td>Self-examination</td>
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