Building Transformation: Frameworks and Practices

Ruben R. Puente <br>dua, Ph.D.
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Tech allows for the creation of new tasks, previously inconceivable

Modification
Tech allows for significant task redesign

Augmentation
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Substitution
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Ruben R. Puentedura, As We May Teach: Educational Technology, From Theory Into Practice. (2009)
Step 1
The teacher provides a description, explanation, or example of the new term

Step 2
Students restate the explanation of the new term in their own words

Step 3
Students create a nonlinguistic representation of the term

Step 4
Students do activities that help them add to their knowledge of vocabulary terms

Step 5
Students are asked to discuss the terms with one another

Step 6
Students are involved in games that allow them to play with the terms
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<tr>
<th>Study</th>
<th>SAMR Level</th>
<th>Description</th>
<th>Effect Size</th>
</tr>
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<tbody>
<tr>
<td>Ligas (2002)</td>
<td>S</td>
<td>CAI system used to support direct instruction approach for at-risk students.</td>
<td>0.029</td>
</tr>
<tr>
<td>Xin &amp; Reith (2001)</td>
<td>A</td>
<td>Multimedia resources provided to contextualize learning of word meanings and concepts.</td>
<td>0.264</td>
</tr>
<tr>
<td>Higgins &amp; Raskind (2005)</td>
<td>M</td>
<td>Software/hardware used for text-to-speech, definitions, pronunciation guide for children with reading disabilities.</td>
<td>0.600</td>
</tr>
<tr>
<td>Salomon, Globerson &amp; Guterman (1989)</td>
<td>R</td>
<td>Software presents students with reading principles and metacognitive questions as part of the reading process.</td>
<td>1.563</td>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>Algebra I</td>
<td>S to A</td>
<td><strong>S</strong>: Computerized algebra drills, some tied to real-world scenarios</td>
<td>$\approx 0.2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>A</strong>: Tools for basic visualization; adaptive response to student progress</td>
<td>50th perc. $\rightarrow$ 58th perc.</td>
</tr>
<tr>
<td>Earth Science</td>
<td>A to M</td>
<td><strong>A</strong>: Interactive tools for concept exploration and visualization</td>
<td>$\approx 0.6$</td>
</tr>
<tr>
<td>Using Laptops to Facilitate</td>
<td></td>
<td><strong>M</strong>: Narrated animation as final project</td>
<td>50th perc. $\rightarrow$ 73rd perc.</td>
</tr>
<tr>
<td>Middle School Science Learning:</td>
<td></td>
<td></td>
<td>($\approx 1.4$ a month later)</td>
</tr>
<tr>
<td>The Results of Hard Fun, by</td>
<td></td>
<td></td>
<td>(50th perc. $\rightarrow$ 92nd perc.)</td>
</tr>
<tr>
<td>Alexis M. Berry, Sarah E. Wintle</td>
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Figure 1 captures the key qualities—the future is already here. Six Cs form the agenda: character, citizenship, communication, critical thinking and problem-solving, collaboration and teamwork, and creativity and imagination.

As we delve into the meaning of these concepts, it is important to stress that we should not launch into an abstract discussion. In the next period of development, these core priorities must be defined, operationalized in practice, measured to mark success and to clarify progress and next steps, and widely shared in terms of spreading what works. This process of specificity and dissemination is our strength. We must put it to good use for the next phase of success.

Figure 1. The capacity of educators in Ontario, as noted, is at such a high level as a result of the strategies of the past nine years that much of the leadership—what we might call leading from the middle—is already in the system. It needs to be cultivated and spread throughout the province, including establishing clarity of each of the six clusters and their interrelationships, learning experiences that develop the skills and dispositions in question, and the means of measuring and fostering progress in their development. But the middle cannot lead in a vacuum. Focused leadership from the government will continue to be essential.

Michael Fullan. Great to Excellent: Launching the Next Stage of Ontario's Education Agenda. (2013)
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Fig. 2. Estimates by 160 gynecologists of the probability that a woman has breast cancer given a positive mammogram, before and after receiving training in how to translate conditional probabilities into natural frequencies.
Brief Lecture or Group Discussion (~10 minutes)

ConcepTest (~1-2 minutes)

- Fewer than 30% of students answer correctly: The instructor revisits and explains the concept
- Between 30-75% of students answer correctly: Peer Discussion: students try to convince each other (~2-3 minutes)
- More than 75% of students answer correctly: The instructor explains remaining misconceptions

ConcepTest (~1-2 minutes)

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![Images of artifacts representing different time periods.](image-url)
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![Images related to social mobility, visualization, storytelling, and gaming]
Location
Position in space

Condition
Mix of natural & artificial features that give meaning to a location

Links
Connections between places

Formal Region
Group of places with similar conditions

Functional Region
Group of places linked together by a flow
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