Frameworks for Educational Technology: SAMR, the EdTech Quintet, and the Horizon Report

Ruben R. Puente-dura, Ph.D.
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Enhancement

Ruben R. Puentedura, As We May Teach: Educational Technology, From Theory Into Practice. (2009)
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<th>Description</th>
<th>Effect Size</th>
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<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>
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<tr>
<td>Xin &amp; Reith (2001)</td>
<td>A</td>
<td>Multimedia resources provided to contextualize learning of word meanings and concepts.</td>
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<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>
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<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>
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<td><strong>Algebra I</strong></td>
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<td>S: Computerized algebra drills, some tied to real-world scenarios</td>
<td>≈ 0.2</td>
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<tr>
<td><em>Effectiveness of Cognitive Tutor Algebra I at Scale</em>, 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>
<td>50th perc. → 58th perc.</td>
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<td><strong>Earth Science</strong></td>
<td>A to M</td>
<td>A: Interactive tools for concept exploration and visualization</td>
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<td><em>Using Laptops to Facilitate Middle School Science Learning: The Results of Hard Fun</em>, by Alexis M. Berry, Sarah E. Wintle</td>
<td></td>
<td>M: Narrated animation as final project</td>
<td>50th perc. → 73rd perc. (≈ 1.4 a month later) (50th perc. → 92nd perc.)</td>
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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.”

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. 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)
Scholarly Primitives: What Methods Do Humanities Researchers Have in Common and How Might Our Tools Reflect This?


- Discovering: selecting according to a criterion, showing relationships of items selected to the original set
- Annotating: searching, browsing, accessing, collecting, categorizing, providing commentary, analyzing
- Comparing: find differences, similarities and create meaning from them
- Referring: linking, referencing
- Sampling: searching, browsing, accessing, collecting
- Illustrating: showing an example, highlighting features within an example
- Representing: changing depiction mode, publishing
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Place/Space

Place → Identity
Home ← Diaspora
Rooted ← Nomadic

Theatrical Space

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An authentic connection between academic disciplines and real-world experience

A framework and workflow to develop 21st century skills

The purposeful use of technology for researching, analyzing, organizing, collaborating, communicating, publishing and reflecting.

The opportunity for learners to do something important now, rather than waiting until they are finished with their schooling

The documentation and assessment of the learning experience from challenge to solution

An environment for deep reflection on teaching and learning

A process that places students in charge of their learning

These attributes enable Challenge Based Learning to engage all learners, provide them with valuable skills, span the divide between formal and informal learning, and embrace a student's digital life.

Key Components

The Challenge Based Learning process begins with a big idea and cascades to the following: an essential question, a challenge, guiding questions, activities, and resources, a solution, implementation, evaluation, reflection, assessment, and publishing.

The Big Idea:
The big idea is a broad concept that can be explored in multiple ways, is engaging, and has importance to learners, and the larger society. Examples of big ideas are Resilience, Separation, Creativity, Health, Sustainability, and Democracy.

Essential Question:
By design, the big idea allows for the generation of a wide variety of essential questions. Eventually the process narrows to one essential question that reflects the interests of the learners and the needs of their community.

The Challenge:
From the essential question a concise challenge is articulated that asks the learners to create a specific solution that will result in concrete, meaningful action.

Guiding Questions, Activities and Resources:
Generated by the learners, guiding questions represent the knowledge needed to successfully develop a solution and provide a map for the learning process. The learners identify lessons, simulations, activities, and content resources, to answer the guiding questions and set the foundation for them to develop innovative, insightful, and realistic solutions.

Solutions:
Each challenge is stated broadly enough to allow for a variety of solutions. The solution should be thoughtful, concrete, clearly articulated and actionable in the local community.

Challenge Based Learning - About CBL (2011)
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