1. Framing Goals for Transformation
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?
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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2. Informing Design and Assessment
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.
Black and Wiliam: Defining Formative Assessment

“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>
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</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

<table>
<thead>
<tr>
<th>Skill</th>
<th>Subskills</th>
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<tbody>
<tr>
<td>Interpretation</td>
<td>Categorization</td>
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<tr>
<td></td>
<td>Decoding Significance</td>
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<td></td>
<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>
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<tr>
<td>Inference</td>
<td>Querying Evidence</td>
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<td>Conjecturing Alternatives</td>
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<td>Drawing Conclusions</td>
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<tr>
<td>Explanation</td>
<td>Stating Results</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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3. Transformation in Practice
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.
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**Challenge Based Learning**
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Email: rubenrp@hippasus.com
Twitter: @rubenrp

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