

SAMR: Guiding Development

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Transformation

Redefinition

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

Modification

Tech allows for significant task redesign

Enhancement

Augmentation

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

Substitution

*Tech acts as a direct tool substitute, with no
functional change*

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 a feature to the task process that could not be done 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 depend upon the new technology?
 - How does this modification contribute to my design?
- **Modification to Redefinition:**
 - What is the new task?
 - Will it replace or supplement older tasks?
 - How is it uniquely made possible by the new technology?
 - How does it contribute to my design?

Seymour Papert: Four Expectations

- **Expectation 1:** the scholastically unsuccessful group among the students will advance by several grade levels on standard achievement tests in mathematics and language. We shall, of course, confirm the significance of any such observation by comparison with a control group matched on a series of variables set up before the outset of the experiment.
- **Expectation 2:** observers will agree that the student in the experiment not only learned more than in a traditional class, but learned it in a more articulate, richer, more integrated way.
- **Expectation 3:** students will develop, or adapt concepts and metaphors derived from computers and use them not only as intellectual tools in the construction of models of such things as "number" and "theory" but also in elaborating models of their own cognitive processes. This will in turn have an impact on their styles of learning and problem-solving.
- **Expectation 4:** the use of computer metaphors by children will have effects beyond what is normally classed as "cognitive skill". We expect it will influence their language, imagery, games, social interactions, relationships, etc...

Measuring the 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.”

Stiggins: Seven Principles of Assessment

- **Where Am I Going?**

- Provide a clear and understandable vision of the learning target
- Use examples and models of strong and weak work

- **Where Am I Now?**

- Offer regular descriptive feedback
- Teach students to self-assess and set goals

- **How can I close the gap?**

- Design lessons to focus on one aspect of quality at a time
- Teach students focused revision
- Engage students in self-reflection, let them keep track of and share their learning

Wiliam: A Framework for Formative Assessment

| | Where the learner is going | Where the learner is right now | How to get there |
|---------|--|--|--|
| Teacher | Clarifying learning intentions and criteria for success | Engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding | Providing feedback that moves learners forward |
| Peer | Understanding and sharing learning intentions and criteria for success | Activating students as instructional resources for one another | |
| Learner | Understanding learning intentions and criteria for success | Activating students as the owners of their own learning | |

Bloom's Taxonomy: Cognitive Processes

| Anderson & Krathwohl (2001) | Characteristic Processes | |
|--|---|---|
| Remember | <ul style="list-style-type: none"> • Recalling memorized knowledge • Recognizing correspondences between memorized knowledge and new material | |
| Understand | <ul style="list-style-type: none"> • Paraphrasing materials • Exemplifying concepts, principles • Classifying items • Summarizing materials | <ul style="list-style-type: none"> • Extrapolating principles • Comparing items |
| Apply | <ul style="list-style-type: none"> • Applying a procedure to a familiar task • Using a procedure to solve an unfamiliar, but typed task | |
| Analyze | <ul style="list-style-type: none"> • Distinguishing relevant/irrelevant or important/unimportant portions of material • Integrating heterogeneous elements into a structure • Attributing intent in materials | |
| Evaluate | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Generating multiple hypotheses based on given criteria • Designing a procedure to accomplish an untyped task • Inventing a product to accomplish an untyped task | |

Critical Thinking: Cognitive Skills and Subskills

| Skill | Subskills |
|-----------------|---|
| Interpretation | Categorization Decoding Significance Clarifying Meaning |
| Analysis | Examining Ideas Identifying Arguments Analyzing Arguments |
| Evaluation | Assessing Claims Assessing Arguments |
| Inference | Querying Evidence Conjecturing Alternatives Drawing Conclusions |
| Explanation | Stating Results Justifying Procedures Presenting Arguments |
| Self-Regulation | Self-examination Self-correction |

Hippasus



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